

Old-Age and Survivors Insurance
ANALYSIS OF LONG-RANGE COST FACTORS

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This study has been prepared for the use of the staff of the Social Security Administration and limited circulation to other insurance, administrative research and reference personnel concerned with the subject treated. It has not been submitted to the Commissioner for Social Security for official approval.

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Foreword

Actuarial Studies.---Several types of actuarial studies have been prepared within the Office of the Actuary: (a) long-range cost analyses for the old-age benefits and old-age and survivors insurance programs, showing two illustrative projections of costs, designated, respectively, "low" and "high"; (b) specific fundamental or philosophical discussions, such as Actuarial Study No. 10; (c) detailed illustrative discussions showing anomalies and complexities in the existing program, such as Actuarial Study No. 14, or interpreting parts of the program in terms of the amount of life insurance in force, such as Actuarial Study No. 16. The purposes of the present study, which differs from all three types, is to furnish a background against which will stand out more clearly the limitations of long-range studies, and to guard against oversimplification in interpreting cost factors, either individually or in combination.

Cost Factor Analysis:---Individual cost factors include the linked elements of mortality and survival, of fertility and sterility, of immigration and emigration and internal migration, of employment and unemployment, of wage rates and hours of work, in none of which has analysis been yet sufficiently developed to make our studies altogether dependable. The wide range of reading which preceded the preparation of this report indicates how many additional studies are needed in these fields and the incompleteness (for our purposes) of much of the best tabulated materials so far available. We hope that the scope of this study deals with enough important factors so that its lack of absolute completeness will not be altogether indefensible.

Structure of the Study:---Coverage of the entire population is the goal of a national social insurance program. The organization of this study first outlines the coverage and benefit structure of old-age and survivors insurance and the exclusions from the population provided by that structure. It then provides analysis of the whole population. Not only is nearly half the gainful employment of the country barred from coverage, but individual citizens move from the covered to noncovered employment, and vice versa. The study then deals with the many cost factors in the light of this incomplete and interrupted protection. The directness of customary insurance in reaching completeness of protection at issuance is lacking in old-age and survivors insurance. There are several steps toward full protection and away from it: (1) the securing of a benefit account number; (2) the accumulation of wage credits under a covered status; (3) the acquisition of an insured status, either currently insured, fully insured, or permanently insured; (4) the frequent loss of the currently or fully insured status; (5) the absence of any complete vesting, since changes may be made by Congress in either benefits or contributions.

Lag and Selection.---The deferment of benefits is due to various factors of which the most important are enumerated. In combination they produce a rising level of benefits for many years. Administrative lag

in payment of benefits is only a minor factor. In the development of Ordinary life insurance, the process of selecting insurable lives is sometimes so effective that in early years after the issuance of insurance the claim rate is very low. This delay in reaching an ultimate claim rate is in a sense duplicated in social insurance by the factors of lag and immaturity, which are briefly discussed.

Individual Histories.—The over-all aggregate cost story requires frequent supplementation by stories of what happens to individuals. Individuals included and excluded over different periods of time may develop random fluctuations in such factors as work, earnings, protection, and the like. Comparisons between work histories of different individuals may disclose random fluctuations which, unimportant in the aggregate, seem important because of apparent discrimination among persons. This discussion while limited to a consideration of broad aggregates, does outline the factors which would explain these differences.

Certain Mortality Theory.—Ever since the preparation of the early mortality tables there have been efforts to determine mathematical expressions to sum up a so-called "law of mortality." Gompertz and Makeham developed equations which fairly well represented mortality rates by age over the intermediate portion of the table. The mortality curve, starting high at birth, reaches a low at about age 10, then slowly rises to about age 50, after which age the curve turns rather sharply upward. In successive experience analyses, the steady steepening of the mortality slope with advance in age, as greater improvement has occurred at the younger than at the older ages, apparently indicates that the early statements of the law of mortality had application only to the conditions of the time. The differences in mortality by marital status and the radical change in marital status in the 20's suggest one reason for the flattening out of the mortality curve over this period. We have no evidence of any mathematical expression which remains correct in interpreting the mortality of a century ago and the mortality of today.

Family Partnerships.—Social insurance, individual life insurance, and the special bulk protections called "group," "wholesale," "National Service Life Insurance" and so forth, all deal with presumptive personal needs largely of a family consequence. Benefits in the event of death, or invalidity, are of more importance when there is a family. Deaths in old age are of more consequence when there is a wife. Fundamental to this whole old-age and survivors insurance benefit structure is the recognition of family significance. It has been suggested that when a man and wife are both earning wages that their combined earnings should be divided by two, and equal benefit rights for each built upon the partnership. In 1944, when nearly half the population was working, either in civilian or military activities, dependents averaged only one and one-third per worker. The steady increase in the number of married women gainfully employed, with the unusual increase during the war years, suggests that possibly the future will also provide more opportunities for part-time gainful work for women. We have brought out the lessons of the war experience that absenteeism, temporary disability, and other problems,

have commonly involved a popular assumption that gainful work means only fulltime employment--a concept carried over into pay rates. Any significant change in future hours of labor and rates of pay would drastically alter current cost analyses which have largely ignored this possibility.

Wage Rates.--The whole theory of compensation in reference to the value of deferred benefits such as pensions, and the value of current benefits such as group insurance, has been steadily changing. The Bureau of Internal Revenue has been making tentative rulings on the conditions under which certain employer costs do or do not constitute wages, and whether or not they are deductible for income tax purposes. For individual income tax reporting, it is quite possible that future decisions will rule that sums employers set aside for deferred pensions to their employees are not current income, but represent future income to be accounted for by the employee in the year in which he receives the benefits. Because of wage stabilization agreements, labor unions had often bargained for compensation in forms other than cash. These extra wages are generally excluded from current earnings subject to the income tax. Since this report was originally prepared, wage rates have shown a definitely inflationary characteristic, tending to point up the basic discussion as to potential ranges in these factors.

Cost Allocation.--Discussion of administrative costs in this study is particularly sketchy. Benefit payments and administrative costs have been so definitely segregated in reports on the trust fund that the type of cost accounting used by life insurance companies has not been thoroughly explored for old-age and survivors insurance. If a unified social insurance program similar to that proposed in the second Wagner-Murray-Dingell bill were established, administrative cost allocation by risk would become necessary and the whole subject of overhead costs would require study.

The Aging Process.--Current studies of employment status and of suitable occupations for the aged and analyses of the particular needs of the aged have been sufficiently comprehensive to indicate a basic awkwardness in the assumption that a boundary line exists at some such age as 65, with full-time work expected below that age and complete unemployment beyond it. The aging process is a more gradual force, which promptly recognized, should lead to the development of new special work opportunities for older persons. If this program be carried to extremes, possibly only seriously handicapped persons beyond the age of 65 would earn so little as to qualify for benefits. This would be a very important cost factor.

The purposes of this study--the illustrative discussion of so many cost factors--is to increase the understanding of our social insurance structure, to stimulate so informed an interest as to lead toward a sounder benefit structure. A study of this type, indicating the marked difference between the social sciences and the physical sciences shows that the social sciences involve a very broad range of potential costs and many well-nigh intangible factors. This report has indicated the need for and should stimulate further studies leading to a more scientific appraisal of each cost factor.

W. R. Williamson
Actuarial Consultant

I. INTRODUCTION

Studies of the Office of the Actuary have usually had specific purposes rather than the intent to build up a general framework for a better understanding of the cost factors in old-age and survivors insurance. The particular limitations of the individual actuarial studies have precluded adequate treatment of many individual cost factors, which are much more numerous and complex than those in the life insurance business. Several years ago the Board's actuarial consultant summarized the cost elements applicable to the original old-age insurance program.^{1/} More recently a brief outline of this subject was prepared.^{2/} The present study, which deals only with cost factors individually, presents a more comprehensive consideration of the basic data, bringing together the results of a group of short studies on demographic and related data and indicating their applicability to old-age and survivors insurance.

Gross Sections and Trends

In these cost studies two approaches are necessary. The first is to take a cross-sectional view at a given time—as for instance, the distribution of the population by race, sex, and age indicated by a decennial census. The second is to follow the factor over time, noting the dynamic development of the population or various groups from one date to another. Sometimes, if annual cross sections are available, changes can be noted from year to year. Sometimes many decennial censuses are available. The first type of analysis is likely to lead to the assumption that the cross section will remain the same. As an illustration, in 1940 the nonwhite population represented about 10 percent of the total; one might assume that the same percentage will persist into the future. A dynamic analysis, however, determines the variation in the birth rate and the death rate, by race and with time; with these additional facts we are more cautious about projections into the future. For virtually all factors on costs, both types of analysis will be used. We may analyze 1940 costs according to the census data and study the results of continuance of 1940 demographic rates. Further analysis, however, is then in order to see if such results should be modified by the dynamic qualities of the various factors under consideration.

^{1/} Williamson, W. R., "Cost Factors in Old-Age Insurance," 1938. Reprinted from Social Security Bulletin, Vol. 1, No. 7 (July 1938).

^{2/} Immerwahr, George, Factors Considered in OASI Estimates, Social Security Board, 1945.

Averages and Frequency Distributions

The various statistical data on which the many cost factors are based lend themselves generally to the computation of the various types of averages—arithmetic mean, median, mode—and frequency distributions, which must be employed with discretion. The arithmetic mean is accurate in that it shows the per capita magnitude, which may be multiplied by the number of elements in the group to obtain the total magnitude for the group. While the median and mode do not have this particular convenience, they may prove convenient on occasion.

In general, it is best to use a frequency distribution rather than any form of average. In many phases of cost analysis satisfactory results can be obtained only by use of frequency distributions. For example, benefit amounts cannot be computed directly from mean wage amounts, since the benefit formula is such that the benefit amount is not in strict proportion to the average monthly wage. Instead, a frequency distribution by average monthly wage with certain specified intervals must be substituted. An actual tabulation of a random sample of more than 5,000 primary benefit claims awarded in 1941 showed that the mean primary benefit computed by the benefit formula from the mean amount of legal "average monthly wage" and the mean number of increment years^{3/} deviated by more than \$1 from the mean primary benefit actually awarded. Even when a frequency distribution was based on \$25 intervals in the "average monthly wage," the mean computed benefit differed by a few cents from the true mean, since there was some variation in the mean number of increment years between the lower and upper limits of the typical \$25 "average monthly wage" interval; the only way to overcome this difference would be to obtain cross distributions of "average monthly wage" and increment years. The actual numerical results were as follows:

Mean primary benefit computed from mean amount of "average monthly wage" and mean number of increment years.....	\$24.35
Mean primary benefit computed from primary benefits derived as means within individual \$25 "average monthly wage" intervals.....	22.78
Mean primary benefit actually awarded in the tabulated sample.....	22.87

The relationship between ages of husband and wife is another of the many examples of problems for which frequency distributions must be used. If the mean seniority of a 65-year-old husband over his wife is 5 years, it does not follow that, for a cohort of 100,000 husbands attaining age 65 in a given year, all or even a majority of their wives

^{3/} Years in which at least \$200 in wage credits is received and for each of which a 1-percent increment is added to the basic benefit.

would attain age 60 in that year. In fact, the use of average ages will produce results which are vastly inferior to those computed from age-frequency distributions. We may say that the average retirement age assumed in a calculation is 68, but the use of such an average is likely to involve errors of varying magnitude. Careful computation should employ a frequency distribution, which, incidentally, should take into account the fact that some workers have not retired even at age 90. This frequency distribution might have age 68 as its mean (or median or modal) retirement age, but in that case age 68 would be the result--the index, so to speak--of the retirement computation and not the basis for the computation.

Graphs, Charts, and Tables

Graphs and charts, usually based on tables of data which many scientific-minded persons would much prefer to study first-hand, may convey information more quickly and in a more forceful way than the tables themselves. Individuals differ in the relative amount of information which they can obtain from tables or charts, but for popular use charts have a great advantage. There is a current vogue for picture charts which make use of symbols of people or things to express quantities or weights, each figure representing a certain number of units. Just how a three-dimensional figure is to be interpreted as to size on a two-dimensional picture is not always clear. This study uses graphic displays of frequency distributions with connected intervals, largely in the form of line charts with continuous curves. Such curves may, in fact, imply that the data have been smoothed or are smoother than is actually the case. It should always be remembered that much of the data is not very dependable and that nearly all figures are subject to considerable margin of error.

Graduations

Actuarial study has been greatly facilitated by smoothing out crude data developed in the experience of life insurance companies, especially by the creation of the useful tool of the mortality table, which lends itself to various types of summation and differencing. This process, however, creates an illusion of great dependability. Protests and warnings of actuaries as to the limitations have done much to develop a more popular realistic understanding of the artificiality of the results. Life insurance companies apply generally uniform standards of selection to risks, which result in closed groups of policyholders. These groups of identical people appear in successive valuations year after year without change in their dates of birth or occupational designation. Despite all precautionary measures, the data developed by the Bureau of the Census lack much in smoothness and consistency as to the characteristics of the enumerated lives; nor does the selection of lives for insurance purposes give us representative data for population analysis.

Census data may yield results which are far from consistent. The same individual, for instance, may have reported one birth date in the 1890 census, another in 1900, and a still different one in 1910. There may also be some shifting between the white and nonwhite categories, and perhaps more between the foreign-born and the native-born population. Sometimes error will largely counterbalance error. Many errors, however, seem to go uncompensated. Underregistration of births and deaths and underenumeration of the population in a decennial census seem to have no counterbalancing factors.

The number of births in a year varies not only with the age and sex composition of the population but also with economic and cultural conditions. The variations in births year after year carry over into variations in the numbers at successive ages in the population at successive censuses. A too-powerful smoothing formula applied to the population may produce results more inaccurate than the original unsmoothed data. Graduation usually assumes a rather simple continuity of the function. We know that today there should be a dip in the population curve around age 50 on account of the deaths of World War I and another dip around age 25 on account of the deficiency in the number of births during that war. The smoothing out of these dips will result in errors which will carry over into the projected population of the future. Sound graduation requires close familiarity with the data.

An irregular series based on a large number of cases may usually be improved by graduation. Such graduation is desirable as a guide to future experience. There are several methods of graduation--graphic, interpolated series, summation formulas, or mathematical formulas. The criteria of a good graduation are smoothness and closeness to the observed facts. Perhaps the latter is more essential than the former, especially in dealing with population data.

Limitations in Data

There is usually considerable noncomparability in successive studies of statistical arrays or frequency distributions. National vital-statistics records have been developed in an expanding registration area, with resulting noncomparability. Even if studies be confined to the same registration area, there is still considerable chance of error because of immigration and emigration. From year to year we lose the identical population necessary for strict comparability. This lack of comparability affects mortality rates and birth rates, two of the most important demographic factors. On the other hand, the blind desire for comparability may actually postpone many improvements in the method and scope of study.

There is considerable variability in reporting ages; often a girl in her early 'teens would like to be reported in her late 'teens. A woman in the thirties may report herself in the twenties. It is

believed that a habit of understatement of age was pretty well entrenched in the censuses of 1910, 1920, and 1930 among people in the upper age ranges. On the other hand, the various benefits available to aged persons in 1940 seem to have created a new source of error in the overstatement of age in the 1940 census by persons nearing age 65^{4/}. Constant change in the completeness of registration of births and deaths affects the mortality and birth rates.

The 1930 census tabulated Mexicans as a separate group because of the substantial proportion with Indian ancestry in whole or in part. Beginning with the census of 1940, Mexicans have been tabulated as "white," and the 1930 census figures included in the 1940 census reports, for purposes of comparison, have been adjusted to include the Mexicans with the whites. Persons with a very slender trace of Negro blood have usually been reported as Negro, but perhaps such practice is gradually changing with time. Thus there may be considerable migration between the races in successive censuses. Most records are built up from the statements of individuals. One individual will, in most cases, report for the whole family. There is little check on the information obtained.

It is not difficult to see how errors creep even into old-age and survivors insurance statistics of covered and insured employees and beneficiaries. Errors in age are probably most numerous, but doubtless they occur also in such other areas as marital and parental status.

The usual source of age information for statistical purposes of old-age and survivors insurance is the application for the account number. Since this application may have been filed through the employer, the employee may have deliberately misstated his age to retain his job. Moreover, tabulations of account-number applications show "heaping" at certain ages quite analogous to "heaping" in census data. The ages shown in beneficiary data are more reliable because they are based on "proofs" of age, but even these are not entirely accurate because of administrative liberality in accepting proofs. For example, a claimant who is clearly over age 65 will have his claim approved even though he cannot prove that his age is, as he claims, exactly 77.

Census data show an undue piling up of ages ending with 0 and 5 and a lesser piling up at ages ending with 2 and 8. This practice naturally follows from a general predilection for round figures and even numbers. It connotes, however, on the part of the informant a lack of exactness and a disregard of the importance of the information desired. When the Bureau of the Census maintains quinquennial groups of ages intact, in their graduation, the heaping at zero may be moved forward to ages ending in 1, 2, and 3, while the heaping at ages ending in 5 moves forward to ages 6, 7, and 8. Perhaps heaping would be better dealt with

^{4/} Smith, T. Lynn, "The Recent Increase of Persons in the Social Security Ages," American Sociological Review, June 1945, pp. 414-418.

by distributing equally to both sides of the heap, at least at age 65 in the 1940 data. Another method would be to keep the decennial age group intact, since the pattern of heaping might repeat itself every 10 years in conformity with our decimal system. Each individual situation must be fully understood and modifications should be based on such understanding of each situation, rather than on any general rule.

Credibility

It is important to use sound judgment as to the credibility of tabulated experience. We know that a small exposure cannot be given any great credibility. The Bureau of the Census has recognized this fact in their warnings regarding the use of the 5-percent sample. They even refrain from calculating percentages if the base is less than 2,000, that is, if the sample is less than 100. We know that the mortality of 1918 was influenced very strongly by the influenza epidemic and that it would not be sound to use the mortality of that year as a guide to the mortality of the future. Likewise the mortality of 1921 was abnormally favorable, apparently because the high mortality during the 1918 pandemic removed the weaker lives prematurely. During a business cycle we move from a boom to a depression; neither of the extremes gives a normal experience. In general, very low or very high experience is likely to mean that peculiar conditions were present and changed the normal tempo of events.

For example, several large surveys were made in the depression years 1935-36, such as the Consumer Purchases Study on Consumer Incomes and Expenditures,^{5/} the National Resources Committee's Survey of Income, 1938, and the National Health Survey.^{6/} The Richmond Family Composition Study^{7/} was based on the National Health Survey data. It is unfortunate that much of this material must be discounted as unrepresentative of long-range conditions.

The year 1940 was the first in which Nation-wide social security benefits were available—a factor which evidently modified age reporting in the 1940 census considerably, especially at the higher ages. Likewise during the deep depression of the 1930's public relief and employ-

^{5/} Department of Agriculture, Bureau of Home Economics; Department of Labor, Bureau of Labor Statistics; Central Statistical Agency; Works Progress Administration; and National Resources Committee, jointly. Published in various forms by the different agencies since 1938.

^{6/} National Institute of Health, U. S. Public Health Service, in cooperation with WPA, 1938.

^{7/} Social Security Board, Bureau of Research and Statistics, Division of Health and Disability, in cooperation with WPA. Published by the Board in various forms since 1940.

ment was available to indigents which may have caused many people to minimize their possessions and earning capacities; the cross section developed by the 1940 census carries the limitations inherent in that particular period.

Among the many gaps in information needed as a basis for illustrating probable future costs of old-age and survivors insurance, one is the lack of suitable figures on wages and hours. At present, various bureaus and organizations are beginning to develop time series to show the change in the normal working week for labor as a whole—change in both hourly rates as well as in weekly and annual rates of compensation.

The Bureau of Census has made a great effort to obtain more comprehensive data about our population and to tabulate them in such a way as to facilitate their use for statistical purposes. In revising procedures and enlarging scope, comparability has sometimes been lost, and the new way may not always be the best way, but the ultimate effect should be to improve our information on such factors as family characteristics, employment, the labor force, tenure, and income. In collecting vital statistics, Census has made a valuable contribution to the study of American demography—and the results of the aggressive attack on the problem of obtaining accurate records are beginning to be evident.

The traditional mortality table is developed from a cross section of observation over a definite period but does not provide for future changes in mortality. We know, however, that since mortality rates have, on the whole, been continuously decreasing, a "generation life table," taking into account such improvement, is much better than one based on a cross section applying only to a limited period. Warren S. Thompson and P. K. Whelpton of the Scripps Foundation for Research in Population Problems, in their estimates of the population of the future, have used this method of generation life tables in their mortality assumptions.

Although actuarial techniques are complicated greatly by the recognition of trends, the best assumption of future developments must be brought into the analysis so that policies may not reflect unduly complacent attitudes at one point or unduly alarmed views at another.

In the United States, the first old-age cost examination was based on a cross section of observed factors, much like the British method. Beginning with the cost analysis presented to the Advisory Council, two illustrative trends have been used, one assuming a somewhat low cost, the other somewhat high, but both ignoring certain uptrends. No account was taken of increase in the wage scale or of a decline in the interest rate. It must always be recognized that the institution of a social security program will of itself have the effect of changing future experience in many ways and that adequate information on various cost factors may be difficult to obtain until the operation of the system yields actual facts. One classical example is that the experience of a cash benefit sickness system tends to show higher rates than existed before benefits became available. In view of changing trends, limited current experience needs to be used with caution in forecasting long-range trends.

II. THE OLD-AGE AND SURVIVORS INSURANCE SYSTEM

Coverage and Exclusions

The Federal old-age and survivors insurance system is perhaps the largest social insurance system in the world, though its coverage is limited. Social security concepts are properly applicable to the entire population rather than to a limited portion only. Because of its limited coverage, the old-age and survivors insurance program is in a somewhat anomalous position, not being on one hand a staff pension plan like Railroad Retirement or Civil Service Retirement, nor being a universal social insurance scheme on the other hand. Consequently our ideas on reserve accounts, Government subsidies, and the like have not been susceptible to consistent formulation.

Generally speaking, the old-age and survivors insurance system covers workers in commerce and industry and their survivors and dependents. The Social Security Act defines covered employment by listing the exclusions from covered employment. The original act listed only some seven classes of excluded employments. The 1939 amendments extended the list considerably. These amendments narrowed the exclusions of seamen and employees of Federal instrumentalities, tried to clarify and somewhat enlarged the exclusions under agricultural labor, and brought workers aged 65 and over into covered employment.

The exclusions, listed in a somewhat different fashion from that followed in the law, are as follows:

- (a) Retired and nonworking aged people;
- (b) Nonworking children, including most school children;
- (c) Nonemployed women, including housewives;
- (d) Defective and other unemployable persons;
- (e) Unpaid family workers;
- (f) Casual workers;
- (g) Service in non-American shipping;
- (h) Self-employed persons;
- (i) Railroad employees;
- (j) Government employees, Federal, State, and local;
- (k) Agricultural employees;
- (l) Domestic workers in private homes;
- (m) Workers in certain nonprofit organizations; i.e., the religious, charitable, scientific, literary, and educational groups;
- (n) Service performed in any calendar quarter in the employ of any organization exempt from income tax, if ---
 - (1) The wages for such service do not exceed \$45;
 - (2) Such service is in connection with the collection of dues or premiums for a fraternal beneficiary society, etc.;
 - (3) Such service is performed by a student enrolled and regularly attending classes;

- (o) Service performed in the employ of an agricultural or horticultural organization exempt from income tax;
- (p) Service performed for a voluntary employees' beneficiary association providing life, sick, accident, or other benefits to members, provided that --
 - (1) No part of the net earnings inures to the benefit of any private shareholder or individual;
 - (2) 85 percent or more of the income consists of collections from members to meet payments of benefits and expenses;
 - (3) Admission is limited to individuals in the employ of the United States Government and/or no part of the net earnings inures to the benefit of any private insurance shareholder or individual;
- (q) Service performed in any calendar quarter in the employ of a school, college, or university not exempt from income tax, if such service is performed by a student and remuneration does not exceed \$45 (exclusive of room, board, and tuition);
- (r) Service performed in the employ of a foreign government;
- (s) Service performed in the employ of an instrumentality wholly owned by a foreign government, if --
 - (1) Such service is of a character similar to that performed in foreign countries by U. S. Government employees;
 - (2) An equivalent exemption is granted with respect to similar service performed in the foreign country by U. S. Government employees;
- (t) Service performed as a student nurse in the employ of a hospital or a nurses' training school;
- (u) Service performed by an individual engaged as a fisherman except --
 - (1) The taking of salmon or halibut for commercial purposes;
 - (2) Service performed in connection with a vessel of more than 10 net tons;
- (v) Service performed by an individual under age 18 in the delivery or distribution of newspapers;
- (w) Services performed during any pay period if less than one-half of such services were for covered work.

The list of exclusions when presented in full detail is rather formidable. It means that a line has continually to be drawn between covered and noncovered work. It means also that the Social Security Administration and the Treasury Department have the problem of agreeing on covered and noncovered work, since the former makes determinations of coverage for benefit purposes, the latter for tax purposes. Not only does the problem of determining coverage involve the examination of the nature of the industry in which the worker is employed, but also involves the question as to whether an "employer-employee relationship" exists, and this question is often confused by complicated and shifting standards of measurement.

In addition to the exclusion of a large part of all unemployment, the \$3,000 a year limitation on taxable wages exempts from taxation some of the pay roll of covered employment. As a result, the taxable pay roll in 1940 seems to have constituted less than half the total national income and only about two-thirds of the total wages and salaries paid out in all employment during the year.

Stages of Exclusion

Covered workers are generally divided into current workers who receive taxable wages in a certain year and workers with cumulative taxable wages, i.e., those who have received wages at any time since the act became effective. However, there are various stages of coverage as follows:^{1/}

- (1) Present retirement beneficiaries who are actually in receipt of monthly primary benefits with respect to their own wage records.
- (2) Aged workers who have been awarded primary benefits but whose monthly payments have been suspended or deferred, generally because of their return to covered employment.
- (3) Aged workers already eligible who have not yet filed their claims, generally because they still work in covered employment.
- (4) Workers under age 65 who have had sufficient covered employment to be permanently fully insured.
- (5) Fully insured workers, i.e., those with covered employment sufficient to give them quarters of coverage in at least half the quarters already elapsed since the system became effective on January 1, 1937, so that at the current moment their dependents are protected in the event of the worker's death, but not necessarily permanently protected.
- (6) Currently insured workers, i.e., those who have earned covered wages in at least 6 of the last running 12 calendar quarters; and their dependents have current death-benefit protection only.
- (7) Uninsured individuals who have, however, been paid taxable wages at some time in the past.
- (8) Noncovered workers who have never received taxable wages.
- (9) Children and other persons who have not entered the labor market.

^{1/} Discussion by D. C. Bronson of Manuel Gelles' paper, "Some Actuarial Aspects of Social Insurance," The Record, American Institute of Actuaries, Vol. 33, Part 1 (June 1944). The 1946 Amendments liberalized the provision for currently insured status by requiring only 6 quarters of coverage in the last 12 running quarters plus the quarter of death.

This list relates to both retirement and survivor benefits; a separate list could be prepared for each category of benefits. Payment of each of the various types has its own conditions and limitations. Full wife's benefits are payable only if the wife has attained age 65, is living with her husband, and is not entitled to primary benefits. Child's benefits are payable only if the child was dependent, remains unmarried, and is under age 18. Widow's benefits are payable only if the widow is age 65 and has not remarried, while for widow's current benefits care of a child beneficiary is substituted for the age-65 requirement. Parent's benefits so far have been paid only rarely and are the only benefits with a dependency test measured in terms of income. The "work clause" applies to all categories of beneficiaries. Under the work clause, monthly benefits are withheld for every month in which the beneficiary renders services in covered employment for wages of \$15 or more. If benefits are not withheld in the month in which the event causing such withholding occurs, there is a compensatory suspension of benefits in later months (including, in some cases, a penalty suspension).

Perhaps the most serious recent exclusion from coverage and insured status was caused by the period of noncovered military service. It is estimated that the maximum strength of the armed forces at any one time was about 12 million men though the total number who passed through the armed forces during 1940-45 was in the neighborhood of 15 million. Members of the armed forces may have as much as 5 or 6 years' service, with an average of perhaps 3 years. Many of them were young men without dependents, but a large number of married men and fathers were also included. What is the insured status of these individuals? A very few around 65 years of age are permanently fully insured and cannot lose insured status because of a period of noncoverage. Perhaps one-third were fully or currently insured at the time of induction. With the lapse of each quarter, however, many of these automatically shifted to uninsured status, because their quarters of coverage no longer equalled half the number of quarters elapsed. By the time most servicemen came home and resumed work, perhaps one-fifth of those fully insured at induction lost fully insured status and nearly all who were currently insured lost currently insured status. The Analysis Division of the Bureau of Old-Age and Survivors Insurance estimated that approximately 800,000 members of the armed forces lost their insured status before January 1, 1945 or prior death.^{2/}

The war also had an effect upon the insured status of wartime workers in general. Many of these were women who have accumulated wage credits for the first time; large numbers of them may soon be out of the labor market. Many men similarly situated will drop from covered employment. Temporary workers will sooner or later lose their insured

^{2/} Issues in Social Security, a report to the Committee on Ways and Means of the House of Representatives by the Committee's Social Security Technical Staff, 1946 - p. 262. The 1946 Amendments, however, contained special provisions for granting insured status to all veterans for 3 years after discharge.

status altogether. In addition, many who shifted from noncovered employment to covered employment will lose their insured status if they leave the latter. Others have left covered employment for Government employment where their insured status gradually disappears.

Fortunately internal migration between covered jobs does not of itself constitute a threat to insured status; it does not matter in which State or combination of States wage credits are acquired. Migration, however, can mean going from covered to a noncovered employment or vice versa. Thus there will be a considerable number of "ins" and "outs" at all times, especially throughout the war and immediately thereafter. These in-and-out shifts not only are costly from an administrative viewpoint, but will produce many apparent inequities for workers. Some workers will obtain benefits at bargain rates, while others will pay substantial amounts of taxes and receive no benefits.

An idea of the extent of the in-and-out movement may be gained by comparing the total number of employees who received wage credits during a recent year with the labor force. During 1943, there were 48.6 million workers who received wage credits, while the entire average civilian labor force is said to have amounted to only 52 million workers. However, fewer than 60 percent of those who received wage credits had wages in all four quarters of the year and 15 percent had wages in only one quarter. In no quarter of 1943 did more than 38.2 million of the 48.6 million workers receive wage credits. The figure 38.2 million would be a somewhat inflated figure of the number of covered jobs, because wage credits in a quarter do not always mean work throughout the entire quarter. The difference between covered jobs and workers with wage credits represents a rough approximation of the number of intermittent or in-and-out workers.

The development of the old-age and survivors insurance system has been steady particularly in number of beneficiaries. The progress of certain phases of the program since its inception in 1937 is shown below:

Calendar Year	Taxable Payroll ^{1/} (in billions)	Contributions Collected ^{2/} (in millions)	Benefits Paid (in millions)	Workers with Wage Credits (in millions)	Average Creditable Wage
1937.....	\$29.6	\$493	\$1	32.9	\$899
1938.....	26.5	474	10	31.8	832
1939.....	29.7	568	14	33.8	881
1940.....	33.0	637	35	35.4	926
1941.....	41.8	789	88	41.0	1,014
1942.....	52.9	1,012	131	46.4	1,127
1943.....	62.4	1,239	166	47.7	1,289
1944.....	64.4	1,316	209	46.3	1,369
1945 ^{3/} ...	62.9	1,285	274	46.4	1,336

1/ Partly estimated.

2/ Would equal 2 percent of pay roll (1 percent from employers and 1 percent from employees) except for lag between wage payments and tax collections.

3/ Preliminary.

Chart 1 pictures the comparative coverage of old-age and survivors insurance at present and possible coverage in the future. It represents high and low illustrations of (1) the population aged 15 and over; (2) individuals with cumulative wage credits; (3) individuals with current wage credits; and (4) 1940 full-time covered jobs. This chart has been drawn in a rather freehand fashion with reasonable assumptions not only for births and deaths but also for employment and unemployment and non-covered workers and the in-and-out movement. It is designed to give the reader a general idea as to the possible coverage in the future and its relationships to total population and covered jobs. The chart does not show the number with either fully or currently insured status.

Insured Status

Inasmuch as the eligibility requirements under the old-age and survivors insurance program are both complicated and restrictive, their effect should be the subject of careful study in making cost estimates. Even though it may be possible to determine reasonably well the size of the covered labor force as distinct from the total labor force, it is quite another thing to derive from this the number insured. The relationship between the insured population and covered labor force is far from simple or direct. At any time large numbers of persons may be regularly attached to the covered labor force who are not insured, and vice versa.

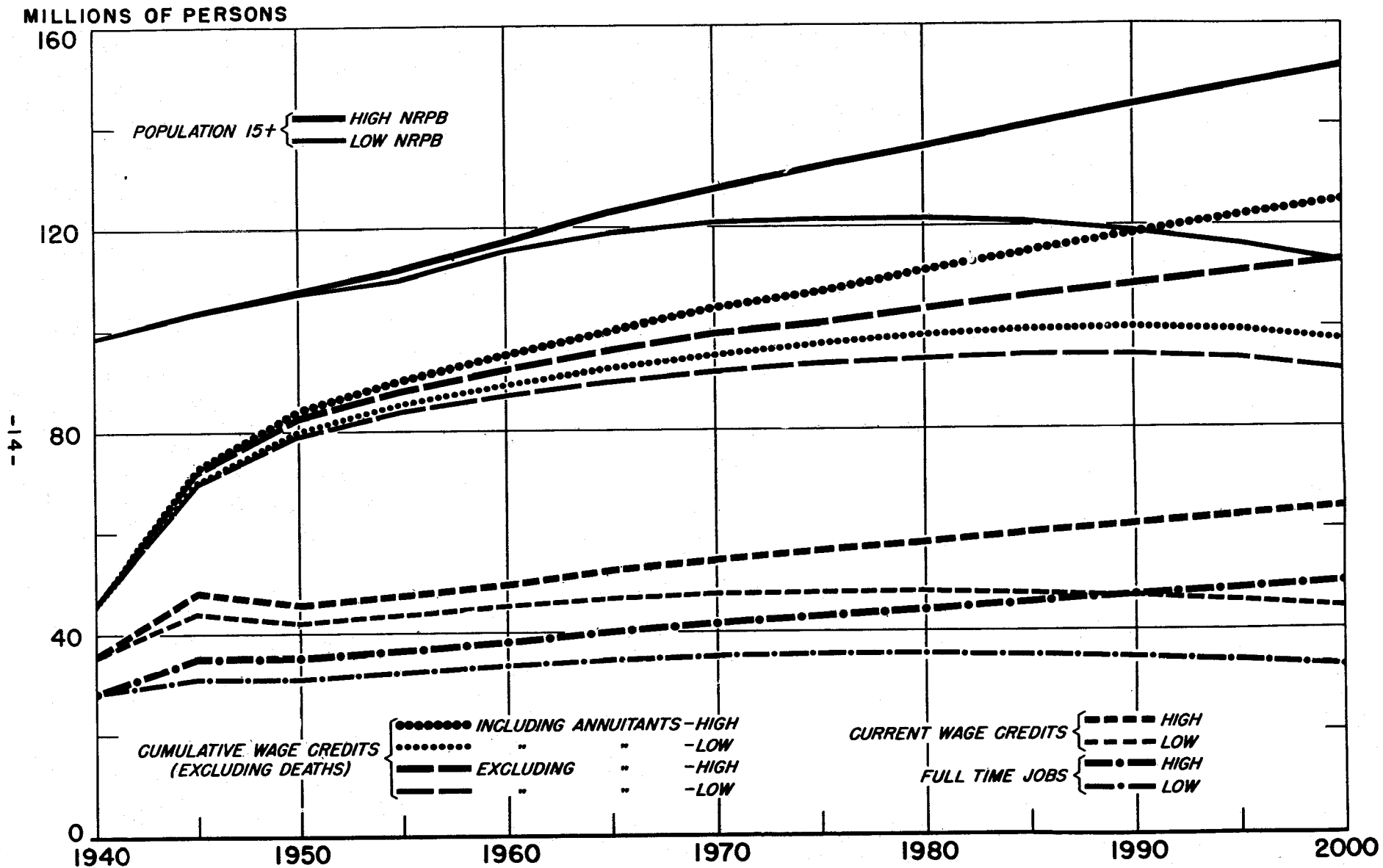
Numerical determination of the insured population, rather than of the covered labor force, is needed in estimating the numbers of claims and benefits. Fully insured status is the more important type of status because it confers eligibility for primary benefits (sometimes accompanied by dependent's benefits to wife and child) and death benefits. Currently insured status is valuable only with respect to certain types of survivor benefits--child's benefits, widow's current benefits, and lump-sum death payments--and then only in lieu of fully insured status.

As a practical definition, it may be said that a worker is fully insured if--

- (1) He has had "quarters of coverage" (i.e., calendar quarters with taxable wages of at least \$50 each) equal in number to at least half the calendar quarters elapsing between January 1, 1937 (or his 21st birthday if later) and his 65th birthday (or death if earlier);
- (2) The number of such quarters is at least 6. It need not, however, exceed 40.

Under this rule the required number of quarters of coverage really depends on the worker's date of birth. For example, for a worker to be fully insured on or after attainment of age 65 or at death, regardless of when he dies, he must have 40 quarters of coverage if he was born in 1892 or later. If he was born before 1892, however, the number required

CHART I.
ESTIMATED COVERAGE OF OASI, 1940-2000



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at age 65 or death for fully insured status would be less than 40. For example, a worker born in February 1880 would need only 16 quarters of coverage to be fully insured from 1945 on; and in the event of death before 1945, he, like workers born at any other date, would need fewer than 16 quarters of coverage. The following tabulation illustrates the requirements under various conditions:

Date	Quarters of coverage needed to be fully insured at—				
	Death in first quarter of—				Age 65, or death at any time
	1940	1945	1955	1965	
1875, first 6 months, or earlier year.....	6	6	6	6	6
1880, first quarter...	6	16	16	16	16
1890, first quarter...	6	16	36	36	36
1892-1915.....	6	16	36	40	40
1920, first quarter...	6	7	27	40	40
1930, first quarter...	6	6	7	27	40

Within any one year-of-birth group, the probability of being fully insured depends on the regularity of covered employment. The number of fully insured workers seems closer to the number employed than does the total number with some covered employment.

In the 6 years 1937-42 more than 60 million workers had some wages in covered employment, but only about one-third of them had such wages in each of the 6 years and more than one-fifth had wages in only 1 of the years (and most of these apparently in only 1 of the 24 calendar quarters of the period). Some 31 million workers were fully insured as of January 1, 1943, including virtually all 19 million workers with wages in all 6 years, plus a majority of workers with wages in 5 of the 6 years but only a minority of those with wages in only 4, 3, or 2 years. Workers with wages in only 2 years could not possibly have more than 8 quarters of coverage (and generally had only 2, 3, or 4) so that they could become fully insured only in certain age categories, while workers with wages in only 1 year could not acquire either fully or currently insured status with respect to this period.

About 3 million workers were currently insured^{3/} as of January 1, 1943, without being fully insured, so that in all there were some 34 million workers who had some form of death-benefit protection on that date. About half of the 3 million workers who were currently but not fully insured were persons who entered covered employment in 1940 or 1941.

The fact that the proportion of fully insured workers among all covered workers is about 50 percent has very little significance as a characteristic of the covered labor force, an indication of the character

^{3/} Currently insured status requires 6 quarters of coverage in the 13 quarters preceding the date of death (including quarter of death).

of the insured-status provisions, or a guide to future costs. The most significant thing that can be said about this base of total covered workers is that in many year-of-birth cohorts, particularly among men, it approximates the total population.

The really significant measures, both as indices of the program and as technical tools, are the proportions of insured workers among the various year-of-birth cohorts of the total population. At the present time these proportions are approaching 60 percent in the male cohorts of the population which have been exposed to the program for a reasonable length of time. The following tabulation traces the 1900-1909 male year-of-birth cohort to January 1, 1944:

Year	Quarters of coverage required for fully insured status	Living cohorts of males born in 1900-1909 as of January 1 of specified year			
		Total number (in millions)	Number with some wage credits since 1936 (in millions)	Fully insured	
				Number (in millions)	Percent of total cohort
1940	6	9.80	7.25	4.99	50.9
1941	8	9.77	7.62	5.01	51.3
1942	10	9.73	8.08	5.05	51.9
1943	12	9.69	8.51	5.18	53.4
1944	14	9.64	8.87	5.25	54.5

The number of fully insured workers has increased from year to year, despite a very slow decrease in the total cohort due to deaths. This increase in the number insured is really a net increase, because the insured group is decreased not only by deaths but also by some loss of fully insured status on the part of workers who are fully insured in one year but fail to obtain the additional number of quarters of coverage necessary for fully insured status the next year. After January 1, 1947, a considerable proportion of the fully insured in this year-of-birth cohort will be permanently insured, (that is, they will have acquired 40 quarters of coverage) so that there will be no possibility of loss of status. Meanwhile in every year and particularly in times of good employment, it is likely that numerous additional workers in the group will acquire fully insured status for the first time.

The use of separate year-of-birth cohorts is essential in the projection of the number fully insured into future years, because each year-of-birth cohort has not only its own generation mortality table but also the insured-status requirements peculiar to it. For example, as shown in the earlier tabulation, persons born before 1875 can become permanently insured with only 6 quarters of coverage, whereas persons born in 1892 or later must have 40 quarters.

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The following tabulation shows the proportions of fully insured workers among the total population on January 1, 1944, among all the year-of-birth cohorts from 1860 to 1929:

<u>Year of birth</u>	<u>Attained age</u>	<u>Male</u>	<u>Female</u>
1925-29....	14-18	6	3
1920-24....	19-23	45	36
1915-19....	24-28	59	31
1910-14....	29-33	57	20
1905-09....	34-38	57	17
1900-04....	39-43	52	14
1895-99....	44-48	46	12
1890-94....	49-53	43	9
1885-89....	54-58	39	7
1880-84....	59-63	33	5
1875-79....	64-68	28	4
1870-74....	69-73	21	2
1860-69....	74-83	9	1

The peak is 59 percent for the cohort of men born in 1915-19. Some decrease in this proportion may be expected as long as the war emergency continues, since many members of this group will lose their insured status while in the armed forces; after the war, however, the proportion may rise well above 60 percent and remain there throughout the cohort's lifetime. For every male cohort born in 1920 or later, and perhaps also for the male cohorts of 1905-14, eventual proportions of 60 percent or more seem reasonable, assuming no drastic reductions in covered employment other than a moderate postwar decline.

Based on this reasoning, it would appear conservative to expect that, in a mature program, the proportions of fully insured men will be 60 percent of all male cohorts at attained age of 25 years or older. In fact, 60 percent has been used under the low assumptions of Actuarial Study No. 19⁴ for all men over age 25 in the year 2000 and 71 percent has been used under the high assumptions. Considering the increasing industrialization of our society, these proportions seem very reasonable. For women, of course, the proportions are likely to be considerably lower. Moreover, in contrast to men, a female cohort is likely to decrease in the proportion of fully insured as the group gets older, since many women do not remain in covered employment long enough to acquire permanently insured status.

⁴ Bronson, D. C., Actuarial Study No. 19, Social Security Board, Office of the Actuary, 1944.

The fact that only a small proportion of today's aged population is insured, while the younger cohorts carry these high proportions of insured through the years, is the principal factor in increasing costs. Only some change in the law to give the aged of today the insured status and benefit rights they could have obtained if the program had started a generation earlier could raise benefit rolls and benefit payments to the effectiveness we expect in the future.

Estimates of the number currently insured are relatively more speculative than those of the fully insured, but the number who are only currently insured without becoming fully insured will probably never be much higher than at present. The difference in quarters-of-coverage requirements between fully insured status and currently insured status will increase until 1957, hence the ratio of the number currently insured only to those fully insured will tend to increase until that year. On the other hand, the number currently insured only may fluctuate considerably from one year to another, since it reflects short-range changes in employment conditions.

Every boundary line, such as the requirement of 50 percent of the quarters in covered employment, will leave a considerable number of workers with wage credits who are just barred from benefits. There will tend to be a conscious effort to qualify such persons for benefits perhaps with a certain amount of cooperation from employers, employees, and families. For example, some persons who formerly ran their own businesses are incorporating and working for the new corporation on a salary basis to gain wage credits for old-age and survivors insurance. Persons past age 65 who need only a few more quarters to qualify for benefits are working for the required number. The very establishment of boundary lines creates simultaneously the impulse to meet the conditions for receipt of benefits.

Benefits

Old-age and survivors insurance now provides monthly benefits to aged workers on retirement at or after age 65, to the aged wives of these retired workers, to qualified aged widows, and to dependent children of a retired worker. Such benefits are paid also to children of deceased insured workers and to their widowed mothers during the period of presumptive childhood--that is, until the child has reached the age of 18. In the absence of a widow or child, parents aged 65 and over who have been wholly dependent on the deceased insured worker may receive benefits. If no one is eligible for monthly benefits for the month in which the fully or currently insured worker dies, a lump-sum equal to six times the primary benefit amount is payable. The lump-sum payment is made to the spouse if living with the insured worker, or to another person who has paid the worker's burial expenses. The formula for determining the primary benefit amount as set forth in Section 209 of the Social Security Act is the sum of the following:

"(e) (1) (A) 40 per centum of the amount of an individual's average monthly wage if such average monthly wage does not exceed \$50, or (B) if such average monthly wage exceeds \$50, 40 per centum of \$50, plus 10 per centum of the amount by which such average monthly wage exceeds \$50 and does not exceed \$250, and

"(2) an amount equal to 1 per centum of the amount computed under paragraph (1) multiplied by the number of years in which \$200 or more of wages were paid to such individual. Where the primary insurance benefit thus computed is less than \$10, such benefit shall be \$10.

"(f) The term 'average monthly wage' means the quotient obtained by dividing the total wages paid an individual before the quarter in which he died or became entitled to receive primary insurance benefits, whichever first occurred, by three times the number of quarters elapsing after 1936 and before such quarter in which he died or became so entitled, excluding any quarter prior to the quarter in which he attained the age of twenty-two during which he was paid less than \$50 of wages and any quarter, after the quarter in which he attained age sixty-five, occurring prior to 1939."

The whole program is based on the family as a unit, with the benefits of the individual family members based on the "primary benefit amount" of the insured worker. Except when affected by maximum or minimum provisions, the benefits of individual family members bear the following ratios to the primary benefit amount:

<u>Type of monthly benefit</u>	<u>Percent of primary benefit amount</u>
Wife's.....	50
Child's.....	50
Widow's.....	75
Parent's.....	50

To understand clearly the various situations in which benefits are paid to members of a worker's family, it is necessary to differentiate two types of such families--one the family of the worker who is himself receiving primary benefits and the other that of a worker who has died fully or currently insured. In the first, or retirement classification, the family members who may be eligible for benefits include the worker's wife if she has attained age 65 and the worker's child under age 18. As indicated in the schedule above, either the wife or child would normally receive a benefit equal to one-half the worker's primary benefit. Thus,

if the worker's primary benefit were \$30 a month, the combined benefits of the worker and his wife normally would be \$45. The combined benefits of the worker and one child (assuming the worker had no wife or a wife still under age 65) would be the same amount and the combined benefits of the worker and two children would be \$60. Since very few women bear children after attaining age 47, the combination of primary beneficiary, wife, and child receiving benefits simultaneously is rare and usually found only for families in which the child was adopted or where the wife is the child's stepmother.

For survivor families, the benefits of the individual family members are based on the worker's primary benefit amount determined at the moment of his death. For example, if a worker has received wages of \$100 a month continuously from January 1937 through December 1944 and dies in January 1945 at age 45, the primary benefit amount upon which the survivor benefits would be based would be \$25 increased by 8 percent, a total of \$27. If this worker were survived by a widow and one child, their combined benefits would be \$33.75 or 125 percent of the primary benefit amount (75 percent for the widow plus 50 percent for the child). The combined benefits for a widow and two children would be \$47.25, for two children only (i.e., no widow) \$27, or for two aged parents, \$27.

When monthly benefits are payable, no less than \$10 a month may be paid with respect to a single wage record. Thus, if the deceased worker's primary benefit amount was \$12 and he is survived by only one dependent parent, that parent's benefit would be \$10, not \$6. When benefits are paid to two or more beneficiaries, however, the pro rata share of each beneficiary may be less than \$10 (for example, \$7.50 for a widow and \$5 for each child) so long as the aggregate amount is at least \$10. The maximum limitations are more complicated. The total payable in monthly benefits with respect to one worker, if above \$20, cannot exceed the smallest of the following:

- (1) 80 percent of the worker's average monthly wage; or
- (2) Twice the worker's primary benefit amount; or
- (3) \$85.

These maximums come into play only when more than one beneficiary exists, since the retirement benefit of a single worker, for example, could not, under the formula, reach any such amounts.

Under the provisions of the old-age and survivors insurance program, monthly benefits are available to parents of deceased wage earners under the following conditions:

- (1) The wage earner must be fully insured at death;
- (2) The wage earner must not be survived by a widow or by an unmarried child under 18;

- (3) The parent must be aged 65 or over--if not aged 65 or over at the time the wage earner died, benefits are deferred until the parent attains age 65 and are then awarded only if the parent had filed proof of dependency within 2 years of the wage earner's death;
- (4) The parent must have been "chiefly dependent upon and supported by" the wage earner at the time of the wage earner's death (this is the only benefit under old-age and survivors insurance under which a means test must be applied before entitlement; all other benefits are paid regardless of other income or resources of the recipient.)
- (5) The parent must be the actual father or mother of the wage earner or, if a stepparent or adopting parent, must have been the wage earner's stepparent before the wage earner attained age 16 or must have adopted the wage earner before such age.

The second condition is the most restrictive. The great majority of male wage earners are married, making parents ineligible for benefits not only when the widow can qualify for monthly benefits, but also in the substantial proportion of cases in which the widow cannot be entitled to monthly benefits for several years. A substantial number of married women wage earners have children, and although their children are precluded from benefits based on the mother's wage record because the child is assumed to be dependent on the father, their parents too are precluded from receiving benefits on the basis of the daughter's wage record because of the existence of these children.

The following table illustrates monthly amounts of family benefits for some of the various types of families, assuming various combinations of the worker's average monthly wage and number of "increment years"--i.e., years in which the worker has received wages of \$200 or more. The maximum of twice-the-primary-benefit is most often applicable; the 80-percent limitation applies only when the worker's average wage is fairly low, and the \$85 limitation when the average monthly wage is nearly \$250.

Illustrative family benefits

Family combination	Assuming 5 increment years and average monthly wage of—			Assuming 20 increment years and average monthly wage of—		
	<u>\$50</u>	<u>\$100</u>	<u>\$250</u>	<u>\$50</u>	<u>\$100</u>	<u>\$250</u>
Retired worker families:						
Primary (worker) only	\$21.00	\$26.25	\$42.00	\$24.00	\$30.00	\$48.00
Primary and wife.....	31.50	39.38	63.00	36.00	45.00	72.00
Primary and 1 child..	31.50	39.38	63.00	36.00	45.00	72.00
Primary and 2 or more children.....	<u>1/40.00</u>	<u>2/52.50</u>	<u>2/84.00</u>	<u>1/40.00</u>	<u>2/60.00</u>	<u>3/85.00</u>
Survivor families:						
Widow (aged 65 or over) only.....	15.75	19.69	31.50	18.00	22.50	36.00
Widow and 1 child....	26.25	32.81	52.50	30.00	37.50	60.00
Widow and 2 children.	36.75	45.94	73.50	<u>1/40.00</u>	52.50	84.00
Widow and 3 or more children.....	<u>1/40.00</u>	<u>2/52.50</u>	<u>2/84.00</u>	<u>1/40.00</u>	<u>2/60.00</u>	<u>3/85.00</u>
1 child only.....	10.50	13.13	21.00	12.00	15.00	24.00
2 children.....	21.00	26.25	42.00	24.00	30.00	48.00
3 children.....	31.50	39.38	63.00	36.00	45.00	72.00
4 or more children...	<u>1/40.00</u>	<u>2/52.50</u>	<u>2/84.00</u>	<u>1/40.00</u>	<u>2/60.00</u>	<u>3/85.00</u>
1 parent.....	10.50	13.13	21.00	12.00	15.00	24.00
2 parents.....	21.00	26.25	42.00	24.00	30.00	48.00

- 1/ 80 percent of the average monthly wage.
- 2/ Twice the primary benefit.
- 3/ \$85 maximum.

If the worker's average monthly wage is \$100, the only maximum ever applicable is that of twice the primary benefit, which would always be lower than either \$85 or 80 percent of the average monthly wage. Thus with 20 increment years, the worker's primary benefit amount is \$30 and the combined benefits of either a retired worker and two or more children, of the widow and three or more child survivors of a deceased worker, or of four or more children of a deceased worker would equal \$60, or twice the primary benefit amount. If the worker's average monthly wage is \$50 and if there are 20 increment years, making the primary benefit \$24, the 80-percent rule has the limiting function so that family benefits cannot exceed \$40 a month.

When a family includes two or more insured workers there may be exceptions to the rules stated above. Thus, if both husband and wife are over age 65 and each is entitled to primary benefits in his or her own right, the wife may receive a wife's benefit on her husband's account provided the primary benefit payable to her is deducted from such wife's benefit, or, if her own primary benefit exceeds what she would receive as his wife, she can receive only the primary benefit. An aged widow may also have acquired primary benefit right of her own so that a similar rule becomes applicable. The possibility that each member of a married couple may acquire primary benefit rights of his or her own is a complicating factor in benefit illustrations of long-range costs. Though a woman is not likely to be continuously in covered employment until age 65, she may have had sufficient covered employment to acquire primary benefit rights which may exceed the wife's benefits that she could obtain on her husband's account. In any event, if her husband defers retirement, she may claim her own primary benefit until she becomes eligible for wife's benefits (if greater) at the time of his retirement.

The Federal Government follows State laws in determining the legal status of members of the family. Since there is little uniformity among the States in their laws governing marriage, divorce and remarriage, adoption, descent, and distribution, further complications arise in determining eligibility for family benefits.

If the old-age and survivors insurance system provided a flat benefit to everybody attaining, say, age 65, regardless of previous wages received or taxes paid, it would be a rather simple matter to make the various cost analyses. Under the present system, benefits are derived from wages and employment as the end product of a chain of formulas and relationships, so that the connection between benefits and wages is complex.

The legal "average monthly wage," on which all benefits are based, is the quotient of the worker's total amount of wage credits from covered employment since 1936, divided by three times the number of his divisor quarters. A worker is charged a divisor quarter for each calendar quarter beginning with (a) the first quarter of 1937 or (b) the quarter in which he attained age 22, whichever is later, and ending with the quarter preceding the worker's death or his entitlement to primary benefits, whichever is earlier. Two other particulars apply to the scope of divisor quarters. The first of these is that a calendar quarter before attainment of age 22 is counted as a divisor quarter if the worker received at least \$50 of wages in it, and the second is that no calendar quarter in 1937 or 1938 occurring after the worker's attainment of age 65 can be charged as a divisor quarter, probably because, under the original law, wages received in such a quarter could not be credited to the worker.

Of considerable significance is the fact that in the long-run situation all calendar quarters falling between age 22 and the quarter of death or entitlement are included among the divisor quarters regardless of

whether they are quarters in which the worker received wages. When a considerable part of the worker's normal working lifetime has been spent in noncovered employment or unemployment, his legal average monthly wage may be far below his average rate of earnings while in covered employment and his primary benefit amount is also affected.

Though many workers who have only limited attachment to covered employment will never become insured, there have been, and will be, many insured workers whose attachment to covered employment has been so intermittent that their "average monthly wage" is far below their normal level of earnings. For example, at the beginning of 1944 a worker could be currently insured with only 6 quarters of coverage provided these quarters fell within the years 1941-43. If his only wages in covered employment were at the rate of \$150 a month from July 1, 1942, to December 31, 1943, he would be currently insured at the beginning of 1944. His legal average monthly wage, to be used in determining his primary benefit amount in case of his death in the first quarter of 1944, would be not \$150 but about \$32. His primary benefit amount would be about \$13, whereas the primary benefit amount of a worker who had been steadily engaged in covered employment at \$150 a month would be about \$32.

Again a worker who attains age 65 after the program has been in existence many years, say in 1980, need have only 40 quarters of coverage to be fully insured, while four times that number of divisor quarters may be charged against him. A woman, for example, who worked steadily in covered employment from 1937 through 1946 but then left it and did not attain age 65 until 1980 would have a very small primary benefit. If her 1937-46 wages averaged only \$100 a month, her ultimate primary benefit amount would barely be above the \$10 minimum.

These illustrations serve to show that merely to predicate an annual-earnings average does not fix the average benefit level. Forty job-years at \$1,500 a year from 1937 to 1976, for example, might represent one fully insured worker with a primary benefit of \$38.50, or four fully insured workers with primary benefits of \$13.75 each.

Moreover, as has been pointed out, because of the benefit formula average wage levels, even if expressed in terms of the legal average monthly wage, cannot determine the average primary benefit amount. Frequency distributions in terms of intervals of the legal average monthly wage must be known. At present, the true mean accrued primary benefit amount of insured workers is roughly \$1.50 lower than the mean that would be derived directly from the mean legal average monthly wage without reference to frequency distributions.

The source of information for the present cross section of average wages and benefits is a 1-percent "continuous work history sample," which has now been developed to include wage histories to

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January 1, 1944.^{5/} Tabulations of this sample include distributions of insured workers according to their age and 1937-43 cumulative wage credits, and from these distributions it is possible to estimate the workers' accrued primary benefit amounts rather closely. The following tabulation shows some of the figures for the 1,921 fully insured workers born in 1883 and included in the sample; these workers were 60 years old (age last birthday) on January 1, 1944, and during 1937-43 all had at least 14 quarters of coverage—enough to give them fully insured status.

Inter- val of cumu- lative wage credits 1937-43	Corre- sponding inter- val of average monthly wage	Number of male fully insured workers (1% sample)	Mean legal average monthly wage of workers	Mean num- ber of increment years ^{1/} of workers	Mean accrued primary benefit amount of workers
Less than \$2,100	Less than \$25	18	\$19.92	4.1	\$10.00
2,100- 4,199	25-49	135	39.71	5.3	16.72
4,200- 8,399	50-99	529	76.14	6.2	24.01
8,400- 16,799	100-199	942	144.74	6.8	31.47
16,800 or more	200 or more	297	240.12	7.0	41.74
Total		1,921			^{2/} 29.77

^{1/} Number of years in which wages of at least \$200 were received.

^{2/} Weighted average of mean accrued primary benefit amount for the various wage intervals.

The mean primary benefit amount accrued for this entire year-of-birth group is \$29.77, or, rounded to the nearest multiple of 25 cents, \$29.75. Only 1 percent of the workers had a legal average monthly wage of less than \$25; 64 percent had \$100 or more.

Of these 1,921 workers, 941, or almost half, had 28 quarters of coverage during 1937-43, the maximum number possible. The mean accrued primary benefit amount of these workers was \$33.50, and 87 percent of

^{5/} See Social Security Yearbook, 1944, for detailed data on the cumulative work history and wage credits of workers in this sample.

them had a legal average monthly wage of \$100 or more. By contrast, 60, or 3 percent of the 1,921 workers, had only 14 quarters of coverage, the minimum number needed for fully insured status as of January 1, 1944. The mean accrued primary benefit amount for these workers was only \$18.46, and only 7 percent had an average monthly wage as high as \$100. If the average monthly wage for these 60 workers had been computed on the basis of quarters of coverage only, rather than divisor quarters, 48 percent of them would have had an average monthly wage of at least \$100; and the mean accrued primary benefit amount for the 60 workers would have been about \$26.50.

The more detailed tabulation below shows mean accrued primary benefit amounts of insured workers as of January 1, 1944; all figures (except those for workers actually entitled to primary benefits) are approximated to the nearest multiple of 25 cents:

<u>Attained age</u>	<u>Fully insured workers</u>		<u>Currently insured workers only</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
25-34.....	\$26.50	\$20.75	\$16.25	\$12.00
35-44.....	30.00	22.75	16.75	12.00
45-54.....	31.00	23.25	16.75	11.75
55-64.....	30.00	22.75	15.75	11.50
65 and over..	25.75	20.50	13.50	10.75
Actually entitled...	23.95	18.97	-----	-----
Eligible but not entitled	<u>1/</u> 26.75	<u>1/</u> 22.00	13.50	10.75

1/ Represents fully insured workers aged 65 or over who had not filed application for primary benefits and were, therefore, presumably still at work.

In an immature program, the primary benefit curve follows the same general trend as that of current wage averages. The group at ages 45-54, at which the highest wages are paid, is also the age group with the highest average accrued primary benefit amount. The following points should be noted:

(1) Among fully insured workers aged 65 and over, the average primary benefit for those who have filed applications for primary benefits is considerably lower than the average primary benefit amount for the age

group as a whole. This difference arises because persons who filed applications in the early years of the program were those who had suffered from intermittent employment due to disability or lay-off and these same factors caused their average monthly wage to be lower than that for the group with steady employment, many of whom are still at work.

(2) The mean primary benefit amounts for the workers who are currently insured only are approximately half the corresponding mean amounts for fully insured workers because, as noted above, currently insured workers have generally received all or most of their wages in the last few years of the period 1937-43, while their divisor quarters run from January 1, 1937.

(3) No mean primary benefit amounts are shown for ages under 25, because the continuous work-history sample does not provide a set method for computing these benefit amounts at the younger ages, since it does not indicate which of the quarters before age 22 were not quarters of coverage and so are excluded from divisor quarters. Data on death claims, however, show that the primary benefit amounts at ages 20-24 differ only slightly from those at ages 25-34. The years just before 1944 were weighted heavily in determining the average monthly wage for young workers, and in these years wages paid at the young ages were abnormally high. For workers at all ages under 35, primary benefit amounts have been adversely affected by periods of service in the armed forces. 6/

(4) The decline in average primary benefit amount accrued after ages 45-54 is not necessarily a permanent feature. Assuming wage levels remain at the 1937-43 average, the 45-54 group should have practically the same average 20 years hence when they will have attained ages 65-74, while the group then at ages 45-54 may have only a slightly higher average.

In projecting future average primary benefits on the basis of the present cross section, care should be taken to explain the economic assumptions in terms of the distribution of wages among the different groups of workers. As mentioned above, it makes a considerable difference whether a certain number of job-years at a specified wage level are assumed to be divided among a large group of workers or among workers who have already had substantial wage credits. The greater the movement between covered and noncovered employment, the lower the ultimate primary benefit level will be, even if the total volume of covered employment is the same. On the other hand, as time goes on the accrued primary benefit amounts of workers who have been in the program for many years will become less responsive to wage changes or even to unemployment, because the average monthly wage itself becomes less responsive to change as its divisor grows and also because a \$10 change in the average monthly wage will generally produce only a \$1 change in the primary benefit amount.

6/

The 1946 Amendments modify this situation by providing survivor benefits for survivors of certain veterans dying within 3 years after discharge. In such cases the average monthly wage is deemed to be not less than \$60.

Over the years, the effect of the increment may be fairly substantial, depending again on the rate of turn-over in covered employment. At the end of 1943, after 7 years of possible covered employment, fully insured workers averaged somewhat more than 6 increment years. By the end of this century the average number of increment years of primary beneficiaries may be as high as 30 or more, and this factor of itself may have a substantial effect on average primary benefit amounts. For widow's current benefits and child's benefits the average number of increment years is not likely ever to exceed 15 or 20, since the fathers of most children who receive benefits die at a comparatively early age.

III. POPULATION

Present Population

All social insurance is affected directly or indirectly by population trends. The population of this country is dynamic--changes are constantly occurring. The changes with which we are primarily concerned are births, deaths, immigration, and emigration. The population is increased by births and immigration, and is decreased by deaths and emigration. The United States is a comparatively new Nation and its population has been growing steadily. Year by year, births have exceeded the deaths by wide margins and we have also had a great influx of population through immigration with comparatively little loss through emigration.

Our total population in 1945 is estimated at 139,000,000, almost exactly double the figure 50 years earlier. In the decade of the 1920's there was a net population gain of 16½ million, of which about 3 million was due to net immigration. In the decade of the 1930's the gain was only 9 million in population, with immigration and emigration practically counterbalancing. In the decade 1935-1944, the estimated gain in population, almost entirely due to excess of births over deaths, has been 12 million.

Demographers must be constantly on the alert to decide whether a given period of time is representative. Though the number of births during most of the decade of the 1930's was probably subnormal, many estimates of the future population of the United States were made on this presumably abnormal base. On the other hand, an increase of 12 million in the population from 1935-1944 is perhaps also abnormal. It includes not only the years during which we came out of the depression but also the early war years during which marriages and births were abnormally high.

Does a current annual increase of only 1 million in the population give us anything to worry about? Offhand, no; but in reality, yes. The net reproduction rate for the period 1935-39 for the white population was just a little below 1.0. This means that if the birth rates and death rates of such period persisted, age for age, annual births would ultimately fall below annual deaths and the population would thereafter decrease, unless immigration made up the deficiency.

Since 1940, however, our birth rate has increased over that of the preceding 6 years. Again the question arises: Is this latter period representative? Undoubtedly not; it is abnormally high on account of the great number of marriages prior to the war and during the war. For the past few years there has been an annual excess of more than 1 million births. In 1942 we had an excess of 1.4 million registered births over registered deaths; in 1943 about 1.5 million; in 1944 again 1.4 million.

One of the most interesting phenomena of nature is the virtual numerical equality of the sexes throughout life. At birth, the males outnumber the females roughly in the ratio of 1,055 to 1,000. This sex

ratio at birth varies only slightly from year to year. In fact the variation in the last 28 years for all births, white and nonwhite combined, has been only from 1,052 to 1,060 males per 1,000 females. The sex ratio at birth for the white race is higher--about 1,060 males compared with 1,000 females, while for Negroes this ratio is about 1,033 males per 1,000 females. There has been a popular belief, not well authenticated, that this ratio increased during wartime. Statistics indicate some increase during the war, but it has been slight, at least in comparison with the war losses in male lives. Such increase could be attributed at least in part to the higher-than-normal sex ratio among first births, which make up the majority of the gain in births in wartime.

Although boy babies outnumber girl babies by 5 or 6 percent at birth, the ratio of males to females for the entire population is lower. For example, according to the 1940 census we had only 1,007 males per 1,000 females in the total population. This is the lowest ratio ever recorded; the highest, in 1910, was 1,060 males per 1,000 females. The 1945 population estimates show virtual equality in the male and female population. In a stationary population--according to 1942 mortality and the actual 1942 sex ratio of 1,062 white boy babies to 1,000 white girl babies and 1,035 Negro boys to 1,000 girl babies--we would ultimately have 985 males per 1,000 females among the whites and 967 among the Negroes, or an over-all average of 983 males per 1,000 females in the total population.

One reason for this rapid change in the sex ratio of the population is the waning influence of the immigrant aliens among whom the ratio of males to females was high--for instance, 1420 males per 1,000 females among 1915-19 immigrants; 1,320 per 1,000 for the next 5 years and 1,220 per 1,000 for the next.^{1/} Since the inflow of immigrants has been comparatively small in the last 20 years, the importance of immigration as a factor in the sex ratio will presumably decrease year by year.

Future Population

The size of the future population will depend on the number of survivors of our present population, the net number of immigrants, and the number of babies born and surviving in the future. To get a reliable basis for appraising future births, we should explore the actual births and the trend of births in the past. The Bureau of the Census has estimated that the registration of births is currently about 92.5 per cent complete.^{2/} Completeness of registration of births varies greatly by State and especially by race. It also varies from year to year, but little is known of this last variation. The Bureau of the Census has compiled a series of

^{1/} Myers, R. J., "Population, Birth and Mortality Trends," Transactions, Actuarial Society of America, 1940.

^{2/} Department of Commerce, Bureau of the Census, Vital Statistics--Special Reports, Vol. 17, No. 18, April 20, 1943.

birth rates for the registration area of the United States, beginning with 1915 and death rates beginning with 1900.^{3/} It should be specifically emphasized that these rates are based on registered births and deaths. Registered deaths are perhaps 98 percent complete.

To obtain the proper basis for examining the future population of the United States, we should first estimate the total number of births and deaths as well as the birth rates and death rates during a sufficient period of the past. Such a series, corrected for underregistration, is provided in chart 24/. The crude birth rate, adjusted for underregistration, established a low of 18.1 per 1,000 population in 1933, but increased regularly thereafter to 23.9 in 1943. This is an increase of 32 percent in the actual rate in the 10 year period; while Thompson and Whelpton's original medium fertility rate for native white women assumed a decrease of 8 percent in the crude birth rate over the same decade, their later medium rate (National Resources Planning Board) assumed only about an 8-percent decline from 1940 to 1980. It will be noted that the crude death rate varied only slightly from 11.4 per 1,000 in 1934 to 10.7 in 1942.

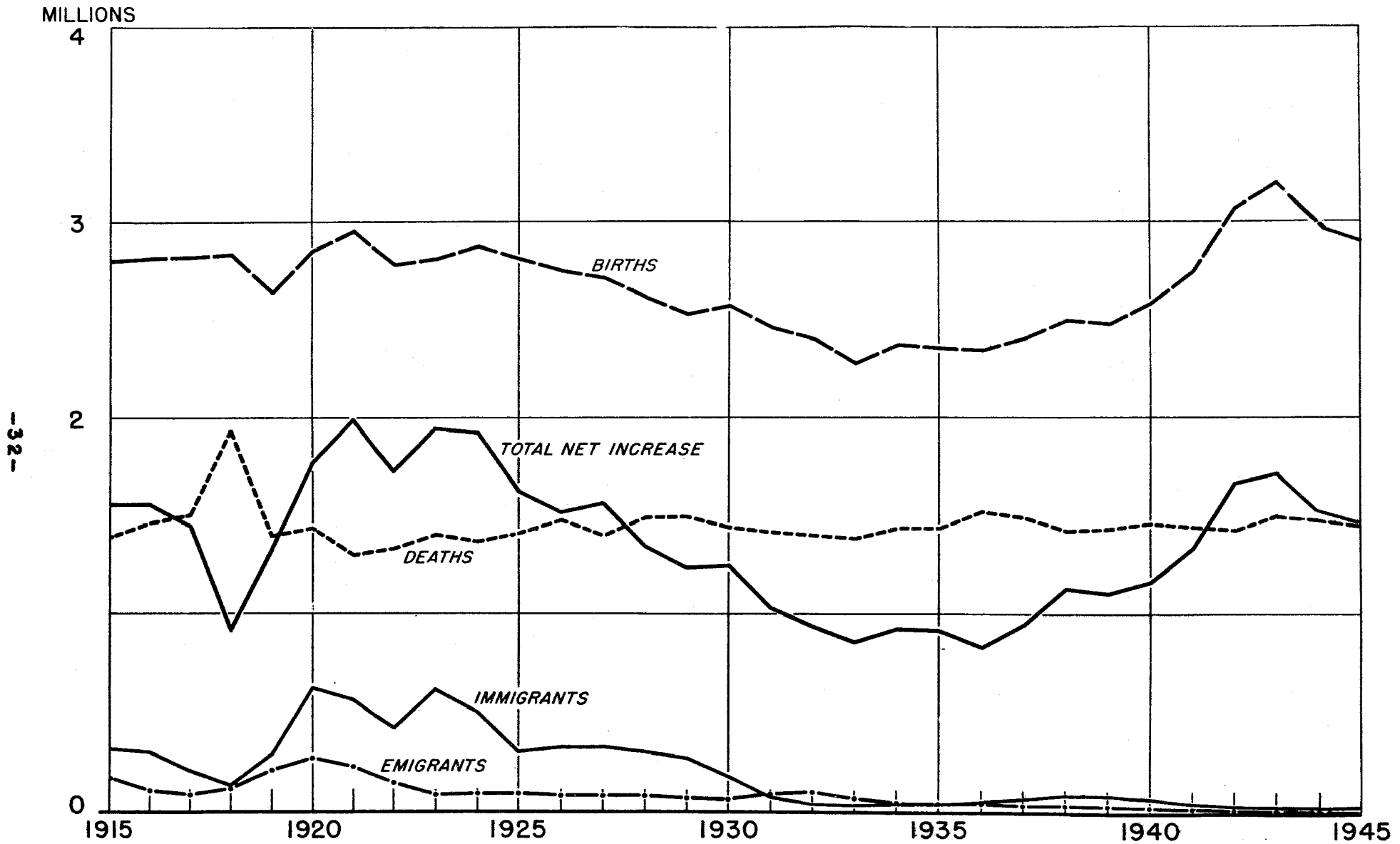
Birth rates fell considerably from 1915 to 1933 or even 1940. Decline in birth rates is accentuated by the fact that foreign-born women have by this time largely attained higher ages than the optimum for childbearing. The urban fertility rates have fallen behind the rural rates for both the white and the nonwhite population. On the other hand, the fertility rates of the nonwhite have been maintained better than those of the white; however, the death rates of the nonwhite are much higher and, as a result, the net reproduction rate is only slightly above that of the white. Fertility rates of white, nonwhite, urban, and rural women have all decreased considerably over the last 25-year period, that is, from 1915 to 1940. The fertility rate of the South has been maintained much better than that of other regions of the country even after allowing for differences in race and urban and rural residence. Fertility rates also vary considerably from year to year, depending on economic conditions.

Fluctuations in the birth rate from year to year cause fluctuations in the age composition of the population which, in turn, cause fluctuations in future births. The most striking major fluctuations in births are caused by wars. Just before a war marriages are hastened and births increased. During the actual hostilities there is usually a drop in births due to the absence of, and casualties among, potential fathers. After the end of the war marriages and births generally increase again. This pattern will cause a ripple in various phases of our national life which will recur

^{3/} Department of Commerce, Bureau of the Census, Vital Statistics Rates in the United States 1900-1940, 1943.

^{4/} For 1915-30 data, Thompson, W.S., and Whelpton, P.K., Population Trends in the United States, pp. 234, 266; for 1931-38, Myers, R.J., "Population, Births and Mortality Trends in the United States," Transactions, Actuarial Society of America, Vol. 41, p. 71; for figures since 1938, Shudde, L. O., unpublished memorandum to the Board's actuarial consultant, dated April 28, 1944.

CHART 2.
POPULATION CHANGES, 1915-45*



*ALLOWANCE FOR EXPANDING REGISTRATION AREA. UNDERREPORTING ASSUMED TO BE 8½% FOR BIRTHS AND 3% FOR DEATHS.

generation after generation. In a few years the primary schools will be confronted with at least 25 percent more pupils than they have now. A few years later this heavy load will be shifted to the high schools and still later to the colleges. As these cohorts become wage earners, the employers of young labor will find the supply suddenly increased and the Bureau of Old-Age and Survivors Insurance will probably have an increase in application for account numbers and in new wage records. As these young people reach the modal age for marriage, there will be a hump in the marriage curve and a little later a resultant hump in the births and consequent hump in the population. This will in turn produce another peak in the births a generation later, so that we may expect recurrent peaks and dips in the population curve at successive intervals of an average generation.

An interesting aspect of the spread of human generations was explored by Dr. Lotka,^{5/} who found that, although generations may be spaced anywhere from 10 to 55 years, in practice there is relatively a rather narrow range. Thus a generation of girl babies born today would, say 200 years hence, have descendants in perhaps a half dozen generations, but the bulk of them would be in the seventh, eighth, and ninth generations. A generation averages some 25 years in length and is the difference in age between mother and daughter.

Long-range decrease in the natality rate has been experienced elsewhere; it is evident in Great Britain, which has had for many years a net reproduction rate of less than 1.0 due primarily to a great drop in the birth rate^{6/}. Actually the lowest birth rates in 1940 were 13.3 for France and 13.4 for Belgium.

It has been said that the maximum potential birth rate is about 50 per 1,000 population^{7/}. It has been estimated that our crude birth rate was about 33 per 1,000 in 1880 and 32 in 1890. In recent years a crude birth rate of 43 has been reported in Mexico and Costa Rica and of 42 in El Salvador and Egypt. Broadly speaking, the birth rates of Western European countries have shown a rapid decline which started earlier and has been more severe than in the United States. This trend in the birth rate has been associated with industrialization, urbanization, and the diffusion of knowledge of birth control. On the other hand, many countries outside of Western Europe and America are still maintaining a high reproduction rate, even though perhaps not quite so high as formerly. The highest net reproduction

^{5/} Lotka, Alfred J., "The Spread of Generations," Human Biology, September 1939.

^{6/} Reddaway, W. B., The Economics of a Declining Population, 1939.

^{7/} Thompson, Warren S., Plenty of People, 1944.

rates are to be found in such countries as Russia, with 1.7 (1926-28); Japan, 1.44 (1937); Roumania, 1.40 (1930-31); Egypt, 1.4 (1937); Union of South Africa, 1.3 (1938). The Office of Population Research of Princeton University has calculated that the net reproduction rate for India was 1.33 for the period 1930-31.

Most past estimates of future U.S. population have been rather wide of the mark mainly because of difficulty of estimating immigration and births. Demographers now are careful not to use the term "forecasts" but rather refer to their estimates as "illustrations" under certain assumptions as to natality, mortality, and net migration.

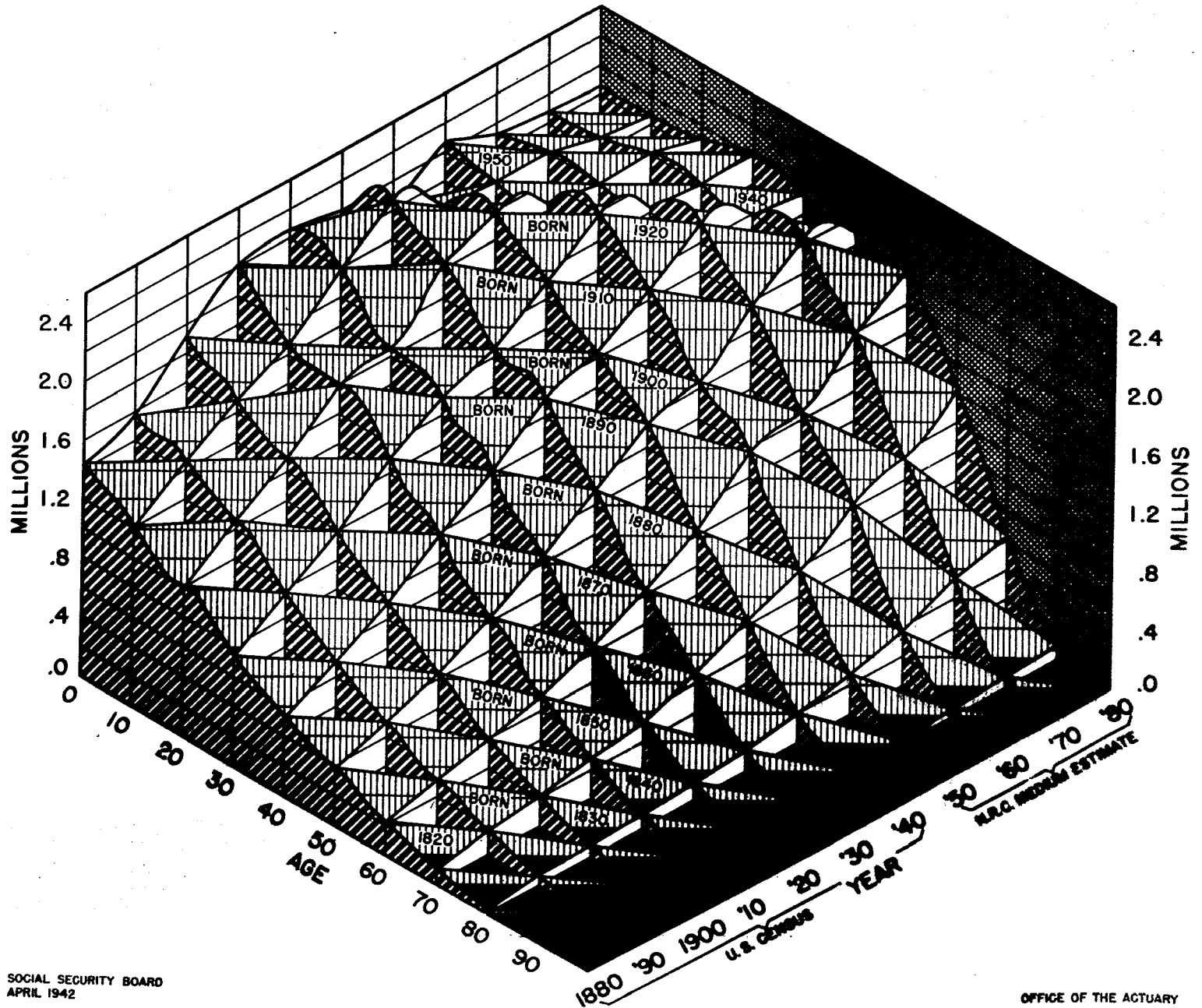
Various methods have been used to represent the population trends year by year—numerical tables, graphs, the three-dimensional surface, and charts representing three dimensions.

Chart 3, a two-dimensional chart representing three dimensions, was prepared under the supervision of Eugene Rasor of the Office of the Actuary. The base from left to right represents 100 years, thus including about 60 years of the past and 40 years of the future. The depth represents attained age and calendar year. Thus in 1980, on the basis of National Resources Committee medium fertility and medium mortality estimates, with net immigration of 100,000 per year, 70-year-old persons would number 1.4 million.

Perhaps a better figure is that of the National Resources Planning Board^{8/} published in 1943 after the 1940 census data had become available and prepared by the same demographers, Thompson and Whelpton. In this latter study, the assumptions regarding improvement in mortality in the higher ages were less optimistic and the medium figure comes out with 1.2 million at age 70 in 1980 compared with their earlier estimate of 1.4 million. The birth rate, of course, cannot influence this 1980 figure for the aged. A more optimistic assumption on the birth rate resulted, however, in a larger total population. There are 12 tables of population projections out of a total of 18 possibilities under the assumptions made. In table 1 appear estimates of the population in 1960, 1980, and 2000 under each of the 12 assumptions divided into three broad age groups: children under age 18; the working population aged 18-64, inclusive; the aged population, 65 and over. The table also includes the ratio of the highest to the lowest population and of the highest to the lowest percentage. It will be noted that the first part of the table assumes no war losses, but that the last part of the table is derived after further assumptions of decreased births and increased deaths on account of war losses. As an illustration, however, only one unit of war losses has been used—100,000 white and 10,000 nonwhite deaths and a like

^{8/} Thompson, Warren S. and Whelpton, P.K., of the Scripps Foundation for Research in Population Problems, Estimates of Future Population of the United States, 1940-2000, National Resources Planning Board, 1943.

CHART 3.
POPULATION, BY ATTAINED AGE, 1880-1980



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Table 1. Population forecasts, 1940-2000^{1/} (Thompson-Whelpton)

[Population in thousands]

Year	Assumptions			Population				Percentage distribution			Thompson-Whelpton table number
	Fertility	Mortality	Net immigration (per annum)	Total	Under 18	18-64	65 and over	Under 18	18-64	65 and over	
1940...	---	---	---	132,534	41,236	82,278	9,020	31.1	62.1	6.8	---
War losses not assumed											
1960...	High	High	None	154,359	46,463	94,421	13,475	30.1	61.2	8.7	2
...	do.	Medium	...	155,106	46,516	94,992	13,598	30.0	61.2	8.8	3
...	do.	...	100,000	156,841	46,954	96,273	13,614	29.9	61.4	8.7	4
...	do.	Low	None	156,471	46,558	95,535	14,378	29.8	61.0	9.2	5
...	do.	High	...	150,902	43,072	94,355	13,475	28.5	62.6	8.9	6
...	do.	Medium	...	151,645	43,121	94,926	13,598	28.4	62.6	9.0	7
...	do.	...	100,000	153,355	43,534	96,207	13,614	28.4	62.7	8.9	8
...	do.	Low	None	153,006	43,160	95,468	14,378	28.2	62.4	9.4	9
...	do.	High	...	147,653	39,888	94,290	13,475	27.0	63.9	9.1	10
...	do.	Medium	...	148,392	39,933	94,861	13,598	26.9	63.9	9.2	11
...	do.	...	100,000	150,077	40,322	96,141	13,614	26.9	64.0	9.1	12
...	do.	Low	None	149,750	39,969	95,403	14,378	26.7	63.7	9.6	13
...	Ratio, highest to lowest.....			1.062	1.177	1.021	1.067	1.127	1.049	1.103	
1980...	High	High	None	171,276	49,574	104,037	17,665	28.9	60.8	10.3	2
...	do.	Medium	...	174,353	49,968	105,884	18,501	28.7	60.7	10.6	3
...	do.	...	100,000	179,000	51,167	109,269	18,564	28.6	61.0	10.4	4
...	do.	Low	None	179,383	50,256	107,702	21,425	28.0	60.1	11.9	5
...	do.	High	...	157,929	40,297	99,967	17,665	25.5	63.3	11.2	6
...	do.	Medium	...	160,904	40,613	101,790	18,501	25.2	63.3	11.5	7
...	do.	...	100,000	169,358	41,653	105,141	18,564	25.2	63.6	11.2	8
...	do.	Low	None	165,854	40,843	103,586	21,425	24.6	62.5	12.9	9
...	do.	High	...	145,821	32,016	96,140	17,665	22.0	65.9	12.1	10
...	do.	Medium	...	148,701	32,261	97,939	18,501	21.7	65.9	12.4	11
...	do.	...	100,000	152,857	33,077	101,216	18,564	21.6	66.3	12.1	12
...	do.	Low	None	153,585	32,441	99,719	21,425	21.1	65.0	13.9	13
...	Ratio, highest to lowest.....			1.230	1.598	1.137	1.213	1.370	1.103	1.350	
2000...	High	High	None	185,142	53,051	112,539	19,552	28.7	60.7	10.6	2
...	do.	Medium	...	190,693	54,036	115,641	21,016	28.3	60.7	11.0	3
...	do.	...	100,000	198,560	56,042	120,929	21,589	28.2	60.9	10.9	4
...	do.	Low	None	198,702	54,760	118,505	25,437	27.6	59.6	12.8	5
...	do.	High	...	154,458	36,708	98,198	19,552	23.8	63.5	12.7	6
...	do.	Medium	...	159,420	37,378	101,026	21,016	23.4	63.4	13.2	7
...	do.	...	100,000	166,632	38,950	106,093	21,589	23.4	63.6	13.0	8
...	do.	Low	None	166,983	37,868	103,678	25,437	22.7	62.1	15.2	9
...	do.	High	...	129,072	24,181	85,339	19,552	18.7	66.2	15.1	10
...	do.	Medium	...	133,552	24,613	87,923	21,016	18.4	65.9	15.7	11
...	do.	...	100,000	140,156	25,802	92,765	21,589	18.4	66.2	15.4	12
...	do.	Low	None	140,750	24,931	90,382	25,437	17.7	64.2	18.1	13
...	Ratio, highest to lowest.....			1.539	2.318	1.417	1.301	1.621	1.111	1.708	
Effects of war on births and deaths assumed ^{2/}											
1960...	High	Medium	100,000	154,776	46,301	94,877	13,598	29.9	61.3	8.8	3
...	Medium	...	100,000	151,326	42,917	94,811	13,598	28.4	62.6	9.0	7
...	Low	...	100,000	148,082	39,738	94,746	13,598	26.8	64.0	9.2	11
...	Ratio, highest to lowest.....			1.045	1.165	1.001	1.000	1.116	1.044	1.045	
1980...	High	Medium	100,000	173,847	49,772	105,591	18,484	28.6	60.8	10.6	3
...	Medium	...	100,000	160,444	40,452	101,508	18,484	25.2	63.3	11.5	7
...	Low	...	100,000	148,280	32,128	97,668	18,484	21.7	65.8	12.5	11
...	Ratio, highest to lowest.....			1.172	1.549	1.081	1.000	1.318	1.082	1.179	
2000...	High	Medium	100,000	190,043	53,840	115,210	20,993	28.3	60.7	11.0	3
...	Medium	...	100,000	158,881	37,241	100,647	20,993	23.4	63.4	13.2	7
...	Low	...	100,000	133,102	24,521	87,588	20,993	18.4	65.8	15.8	11
...	Ratio, highest to lowest.....			1.428	2.196	1.315	1.000	1.538	1.084	1.436	

^{1/} Adjustment for underenumeration of children under 5 by 1940 census.^{2/} Net after deductions of 1 unit each for war deaths and war births (1 unit of 100,000 white and 10,000 nonwhite deaths and a like reduction in war births).Source: National Resources Planning Board, Estimates of Future Population of the United States, 1940-2000.

reduction in births on account of the war. Our total deaths during this war amounted to approximately three units (without regard to race). Births were maintained at such a high level during the war that no adjustment therefor is necessary.

As an illustration, the assumption of medium fertility, medium mortality, and net immigration of 100,000 persons a year would produce a population of 165 million in 1980 (compared with the previous Thompson and Whelpton figure of 159 million under somewhat different medium assumptions). This assumed population would attain a peak of 167 million about 1995 and decrease slightly by the year 2000. It should be noted that adjustment has been made for underenumeration of children under age 5 in the 1940 census. In 1940 the adjusted number of children under age 18 was 41 million; the working population, 82 million; and the aged, 9 million—comprising, respectively, 31 percent, 62 percent, and 7 percent of the total. In the year 2000 these three groups would be 23 percent, 64 percent, and 13 percent of the population, respectively. The percentages for the aged increase with time, while those for the children decrease and those for the productive group remain practically stationary. War losses would decrease the number and proportion in the productive age group. This table makes it possible to compare the effect of fertility and mortality separately. For instance, considering only the year 2000 and holding mortality at the medium assumption, the size of the population would vary from 190 million for the high fertility and 133 million for the low fertility assumption, a difference of 57 million. If fertility is held at the medium assumption, high mortality would give 154 million population and low mortality 167 million, a difference of but 13 million in the year 2000. Thus 4 or 5 times as much change in the population would result from a reasonable variation in fertility as from a reasonable variation in mortality. We can prognosticate mortality rates much better than fertility rates. A more detailed analysis of the various demographic factors and their trends will be made later in this study.

IV. OTHER DEMOGRAPHIC FACTORS

Introduction

We have already treated the population in broad outline, including some discussion of the future population. We will now investigate in more detail the cross sections and trends by age, race, and sex. These trends depend on various demographic factors.

The basic demographic factors--births, deaths, immigration, and emigration--involve many other factors: marriage, first and subsequent; termination of marriage by death, divorce, and separation--legal or otherwise; family composition, marital status, and parental status. Marital status in turn relates to the single, married, widowed, and divorced; parental status to the married who have no children, one child, two, three, four, five, and six or more children. Old-age and survivors insurance is concerned with the survival of parents; the possibilities of the survival of both parents, of survival of the father or mother only or of neither. The widowed and divorced may or may not have children.

Proper cost analysis of old-age and survivors insurance involves all these demographic factors. It also involves sickness, invalidity (or long-duration disability) and unemployment, for these account for the "ineffectives" in the labor force at any one time. Such analysis involves the age of entering employment and the age of retirement. It does not involve noncovered wages but is concerned with the period in noncovered work in establishing the average monthly wage. It involves the pattern of covered employment--the number of quarters of covered and noncovered employment or unemployment, and to some extent the order in which they occur. The pattern of covered employment determines the amount and types of benefits for which the worker and his family are eligible.

The census population used in the following pages is the enumerated population without adjustment for underenumeration. Birth and death rates are the registered-birth rates and the registered-death rates unless otherwise indicated. The marriage rate and the divorce rate are similarly unadjusted.

The population enumerated in 1940 included 131.7 million persons of whom 66.1 million (50.2 percent) were males and 65.6 million (49.8 percent) females. It comprised 118.2 million white persons (89.8 percent) and 13.5 million nonwhite (10.2 percent). Of the nonwhite, about 95 percent were Negro and 5 percent of other nonwhite races; Mexicans were designated as white. In 1940 the foreign-born comprised 11.4 million or 8.7 percent of the total; of the foreign born, about 30 percent remained aliens.

The 1940 population included 40 million children under 18, 9 million persons aged 65 or over, and 83 million in the middle group. Of the total, therefore, 30 percent were children, 7 percent were aged, and 63 percent in what are commonly called the working years. Of 37 million children aged 5-20, 26 million or 70 percent were in school.

The 1940 census showed that among men and women aged 14 and over—numbering 50.5 million each—40 million men and 13 million women were in the labor force. Thus 79 percent of the males aged 14 and over, and 25 percent of the females, were in the labor force. Of these, 6 million men, or 15 percent, and about 1.7 million women, or about 13 percent, were unemployed or engaged in public emergency work.

The Bureau of the Census estimates the July 1, 1945, population at 69.7 million males and 69.9 million females. It is estimated that 89.6 percent of the population is white and 10.4 percent nonwhite, a relative increase for the nonwhite in the 5-year period. Children under age 18 are estimated at 42 million, as compared with 40 million in 1940 and 43 million in 1930. Persons aged 65 and over number 10 million, instead of 9 million as in 1940. Thus 7.2 percent of the population are now aged 65 and over compared with 6.8 percent 5 years previously, a net increase which correspondingly reduces the percentage of children under age 18.

Birth Rates

The birth rate is vital to study of old-age and survivors insurance because it affects (1) the size of the family and the cost of child's benefits; (2) the size of the labor force; and (3) the ultimate size of the group of aged. Perhaps the most reliable estimate of early crude birth rates is that of Dublin and Lotka, who reported that the birth rate for the 5 years centering in 1872 was 37.3 per 1,000 population.^{1/} To obtain this estimate, they reconstructed the birth rates retrospectively so as to yield the present native white population, using the age distribution of the 1920 census and computing retrospectively the United States unsmoothed crude birth rates for each 5-year period beginning in 1872. These rates, together with those for England and Wales for single years beginning in 1871, are shown in table 2.

American birth rates follow those of England and Wales quite closely. Since 1905 they have generally held well above English rates. In 1943 England's birth rate was higher than it had been at any time since 1925, while ours was higher than at any time since 1924. It will be noted that the birth rates in both England and the United States fell off most rapidly soon after the end of World War I. For instance, our birth rate of 24.2 in 1921 decreased to 18.8 in 1929 (a good year) and fell further during the depression to 16.6 in 1933. Since that time,

^{1/} Dublin and Lotka, "On the True Rate of Natural Increase," Journal of the American Statistical Association, September 1925, p. 317.

Table 2.--Unsmoothed crude birth rates per 1,000 population for England and Wales, and United States, 1871-1943

Year	England and Wales <u>1/</u>	United States <u>2/</u>	Year	England and Wales <u>1/</u>	United States <u>2/</u>
1871....	35.0		1908....	26.9	
1872....	35.8	37.3	1909....	25.9	
1873....	35.5		1910....	25.1	
1874....	36.0				
1875....	35.5		1911....	24.3	
1876....	36.2		1912....	23.9	28.1
1877....	36.0	34.0	1913....	24.1	
1878....	35.8		1914....	23.9	
1879....	34.9		1915....	21.9	25.0
1880....	34.1		1916....	20.9	24.9
			1917....	17.8	24.5
1881....	34.0		1918....	17.7	24.7
1882....	33.9	34.1	1919....	18.5	22.4
1883....	33.5		1920....	25.5	23.7
1884....	33.8				
1885....	33.0		1921....	22.4	24.2
1886....	32.9		1922....	20.4	22.3
1887....	32.0	31.4	1923....	19.7	22.1
1888....	31.2		1924....	19.0	22.2
1889....	31.1		1925....	18.3	21.3
1890....	30.0		1926....	17.8	20.5
			1927....	16.7	20.5
1891....	31.5		1928....	16.7	19.7
1892....	30.5	31.4	1929....	16.3	18.8
1893....	30.9		1930....	16.3	18.9
1894....	29.8				
1895....	30.2		1931....	15.8	18.0
1896....	29.7		1932....	15.3	17.4
1897....	29.5	29.4	1933....	14.4	16.6
1898....	29.3		1934....	14.8	17.2
1899....	29.1		1935....	14.7	16.9
1900....	28.9		1936....	14.8	16.7
			1937....	14.9	17.1
1901....	28.6		1938....	15.1	17.6
1902....	28.7	28.0	1939....	14.9	17.3
1903....	28.7		1940....	14.6	17.9
1904....	28.0				
1905....	27.5		1941....	14.2	18.9
1906....	27.4		1942....	15.8	21.0
1907....	26.7	28.3	1943....	17.9	21.9

1/ Through the year 1924, observed birth rates for England and Wales from the Journal of the American Statistical Association, September 1925, pp. 317-318. Since 1925, from the Statistical Abstract for the United Kingdom and National Insurance Gazette, Aug. 24, 1944.

2/ Through the year 1915, Journal of the American Statistical Association, September 1925, pp. 317-318; from 1916 through 1940, Vital Statistics Rates in the United States, 1900-1940; since 1940, Statistical Abstract of the United States, 1943. Through 1914, adjusted birth rates to reproduce 1920 population; since 1915, based on registered-birth rates without adjustment for underenumeration.

however, the rate has increased to a maximum of 21.9 in 1943. In that year, the number of births in both urban and rural areas increased over 1942, the former by 4.6 percent, the latter by 4.3 percent. The 1944 birth rate was slightly lower, and the 1945 rate is expected to be still lower. These crude birth rates are based on registered births only and do not take account of the unregistered births, which may be 7.5 percent of the total.

Over the years our birth rate has fallen tremendously, from an estimated 33 births per 1,000 population in 1885 to 22 per 1,000 in 1943. Offhand it appears that our fertility rate has declined rapidly during the intervening period, but it must be borne in mind that today's population is older and therefore has a smaller percentage of childbearing women. About 86 percent of the foreign-born female population are over age 35 while most of these foreign-born women were in the childbearing ages 20 years ago. Moreover, the total number of foreign-born persons is decreasing relatively rapidly. In 1930, 12.7 percent of the total white population was foreign-born; in 1940, only 9.7 percent. In 1940, in the original birth-registration States (excluding Rhode Island), 83 percent of all births were to native-born parents, 12 percent to couples in which one member was native-born, and only 5 percent to parents born outside the United States.^{2/} In 1910 rural areas contained 54 percent of the total population and in 1940, only 44 percent, while the rural farm population accounted for only 21 percent of the total population in 1940.

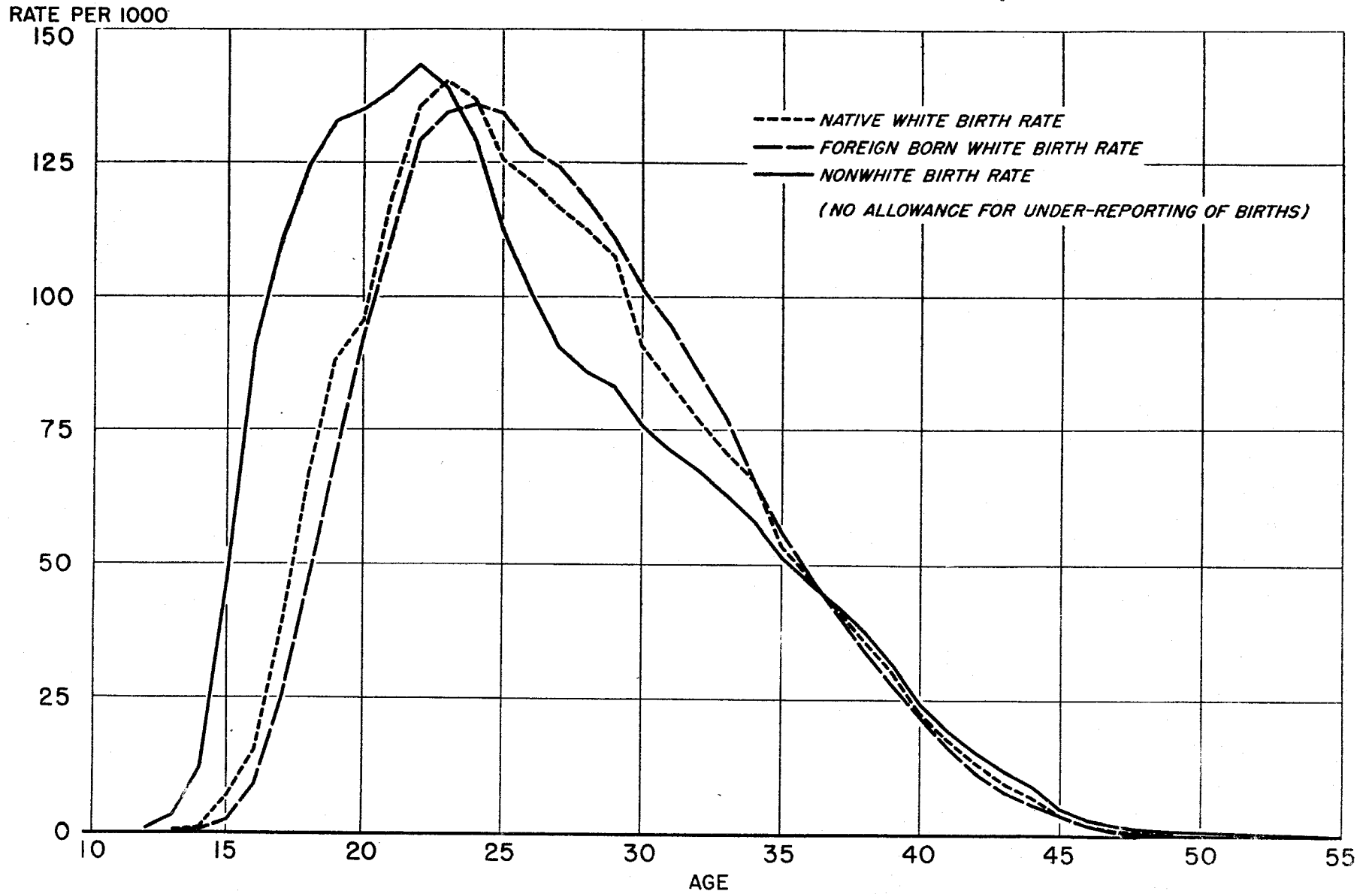
The decline in fertility rates is not peculiar to the white race nor to the native whites. Chart 4 shows the age-specific birth rates in 1940 for the native white, the foreign-born white, and the nonwhite, drawn to the same scale and readily comparable. The nonwhite birth rate is the highest and starts at much younger ages than the other two. It also reaches its peak earlier and declines earlier than that for the white. Birth rates of foreign-born white and native white differ little; the main difference is that the native white rate is higher at the younger and lower at the older ages. The native white peak is somewhat higher at a somewhat younger age. Age-specific birth rates are birth rates at specific ages or age groups. They therefore take into account the ages of the women, so important in natality statistics. For this reason a standardized population is usually used in comparing the births of one country or State or community with those of another.

Chart 5 shows the course of the birth rate over the last 20 years, by age group. On the right-hand side of the chart the course of the birth rate is drawn by order of birth. Birth rates since the depression have increased only for age groups from 20-34, inclusive. From the standpoint of order of birth, there has been an increase since the depression in the rates of first births, second births, and a slight increase in third

^{2/} Metropolitan Life Insurance Company, "Nine Out of Ten American Babies Now Born to Native Parents," Statistical Bulletin, March 1945.

CHART 4.

AGE SPECIFIC BIRTH RATES PER 1000 WOMEN, 1940



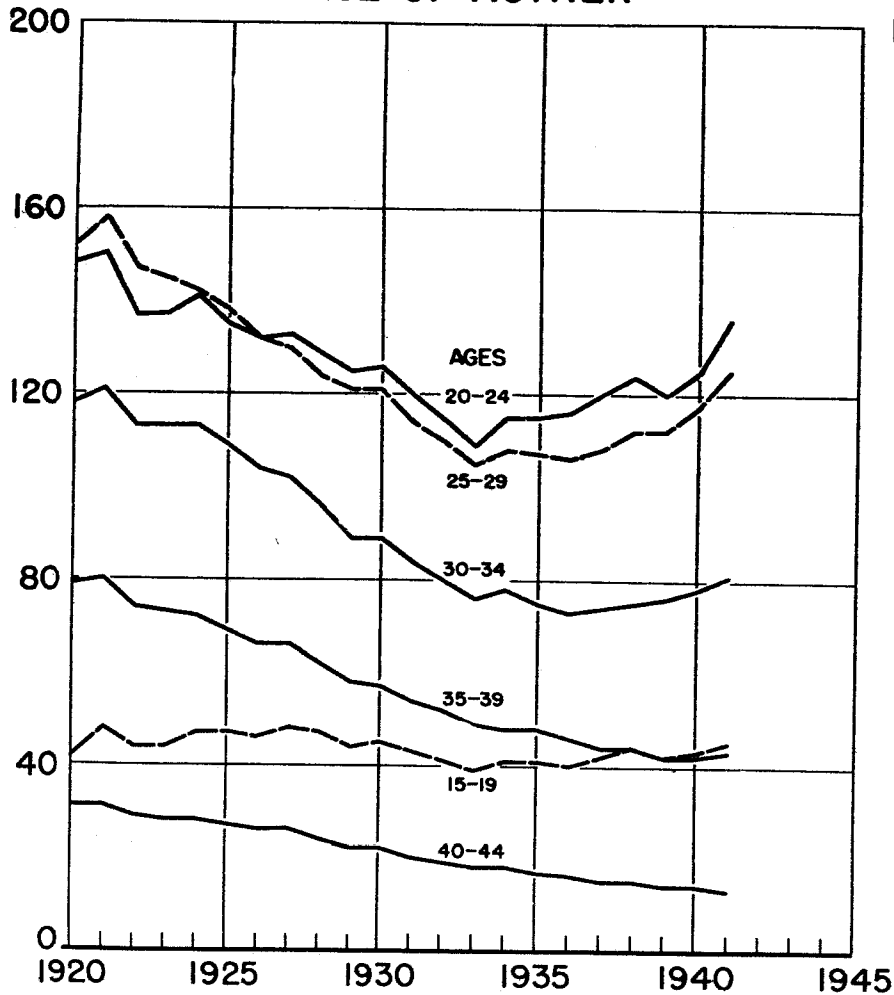
- 42 -

CHART 5.

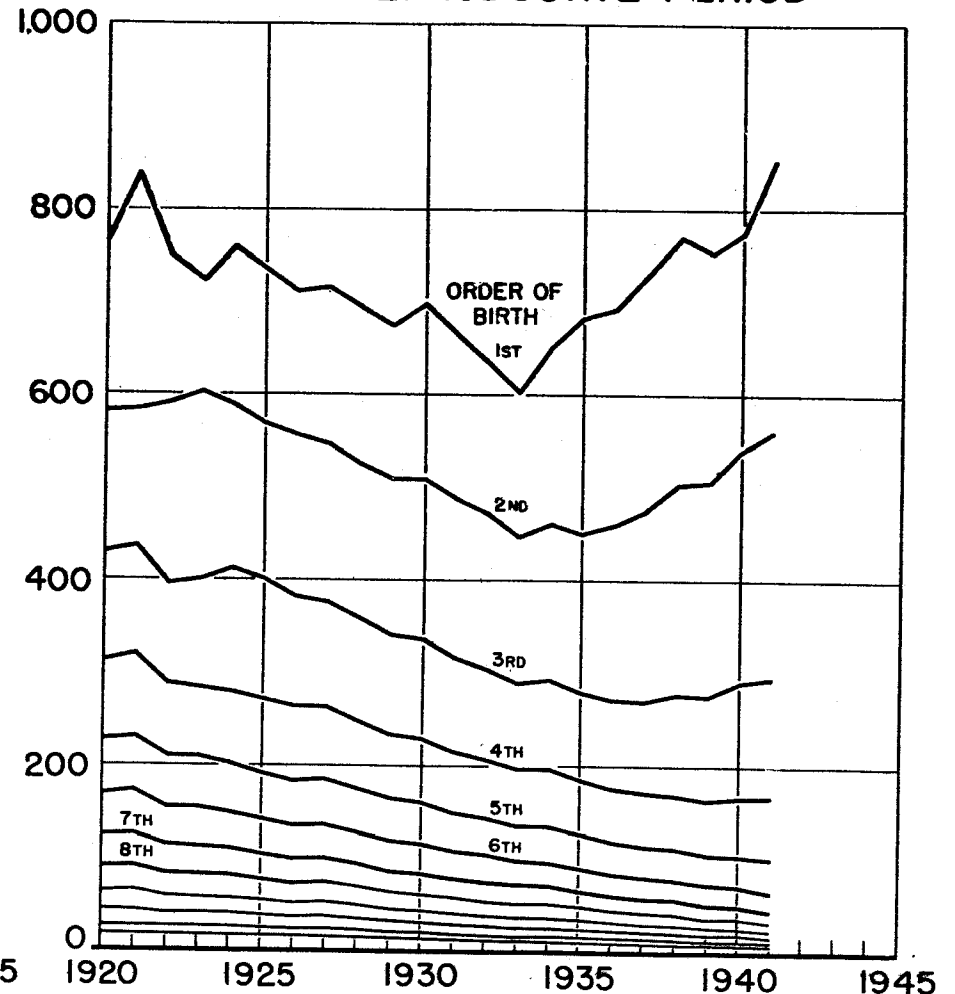
TRENDS IN REPRODUCTIVITY IN U.S., 1920-41

(EXPANDING BIRTH REGISTRATION AREA)

ANNUAL BIRTHS PER 1,000 WHITE WOMEN BY AGE OF MOTHER



BIRTHS BY ORDER OF CHILDREN PER 1,000 WHITE WOMEN DURING THEIR REPRODUCTIVE PERIOD



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births. Correlation of the two charts leads to the conclusion that the size of the family is still shrinking, as is evidenced both by the fact that the births from mothers aged 35 and over have declined as well as the fact that the fourth and higher orders of birth have continued to decline through 1941.

Thus the increase in the rate of first and second births may be almost entirely due to the increased number of marriages contracted just before the war and during its early phase. However, the successful treatment of sterility and low fertility in childless men and women undoubtedly has some influence on these figures. There are many reliable practitioners today who claim cures in at least 40-50 percent of their cases involving childlessness. As the knowledge that sterility can be cured becomes more widespread, we should expect a further increase in first and second births. A recent Gallup poll (1945) indicated that women favored larger families than they did in 1941.

Under the present provisions, old-age and survivors insurance benefits are generally not available for illegitimate children (depending on the intestacy laws of the different States) in respect to a father's wage record, so that the number of illegitimate children receiving benefits is probably small and could have little effect on benefit costs. On the other hand, a change in the illegitimate birth rate may mean an opposite change in the total birth rate, or a change in social security laws may mean a shift between the children receiving aid to dependent children and old-age and survivors insurance children. During the years 1941-43 when the total number of births increased greatly, the illegitimate births remained almost level at 83,000 per year. Moreover, it is reasonable to believe that there has been a marked increase in the proportion of registered illegitimate births. In this connection it is of interest that there is a movement in the Council on Vital Records and Vital Statistics, an organization of State registration executives, to have States adopt a short form of birth certificate which would not reveal the fact of illegitimacy of the child to the public but would retain that information for official records.

Stillbirths, counted neither as births nor deaths, numbered about 79,000 each in 1942 and 1943. This is an increase over the figure for depression years but a significant decrease from the 90,000 in 1928, even though from a smaller registration area. In that year the ratio of stillbirths to 1,000 live births was 40; thereafter the rate apparently decreased year by year to the low of 27 per 1,000 live births in 1943. The past trend indicates that this rate should continue to decrease as medical science makes further advances, and thus aid in maintaining our present birth rate. Probably many deaths of very young infants were reported as stillbirths.

In the future, birth rates might be expected first to increase a year or two after the close of the war and then gradually decrease over perhaps a long period of time, with ups and downs resulting from general economic conditions, and fluctuations in the age composition of the

population. The size of the family may continue to shrink with continued urbanization and industrialization. Children in urban areas are usually a financial burden, but in rural areas they may be of considerable economic value and earn their keep at as early ages as 10 or 12 years. Doubtless this factor explains in large part the differential in birth rates between our urban and rural areas as well as the long-range decline in average birth rates. The 1940 census gave some evidence that urbanization had been checked. According to the July 1944 census estimate, however, the proportion of the population in urban areas made a sharp upturn—perhaps due to war conditions—and thus resumed the trend in force up to 1930.

There has been a tremendous movement of population during the war. Demobilization of the armed forces is likely to be followed by additional shifts of population. Postwar migration of Negroes from the agricultural South to the urban North is expected to be particularly heavy. Among servicemen from the South polled by the Army Service Forces, 41 percent of the Negro enlisted men expressed their intention to leave the South and settle in the Northeast and 11 percent in the Pacific Northwest.^{3/} One effect of this migration will be to accelerate the mechanization of farms. Mechanical cotton pickers, flame cultivators, and rotary hoes are expected to prevent the disruption of agriculture that would otherwise have resulted. This initially heavy postwar migration is expected to take place regardless of work opportunities on farms or in cities. Travel and education gained during the war have given the long time trend away from the agricultural South an added impetus of tremendous strength.^{4/}

Warren S. Thompson says that we may look forward to future decentralization.^{5/} He believes that the increased use of electric power, modern transportation, and the telephone will inevitably stimulate decentralization, and cites the failure of the urban population to reproduce itself as one of the main factors in decentralization. The shift here under consideration may not mean any actual decrease of urban areas, but only a decrease relative to the total population. Even if we concede that the future industrial and population growth may be in nonmetropolitan areas, this does not necessarily mean that the existing metropolitan areas will actually lose population. Even if we concede that population will migrate away from farms, it is possible that the course of migration will be to small cities and towns rather than to large cities and towns. A recent deterrent to the maintenance of crowded cities is their vulnerability to new methods of destruction.

Other influences on birth rates are: education, religion, economic status, occupation, home ownership, standards of living, environmental mores, and low fecundity.

^{3/} U. S. Army Service Forces, What the Soldier Thinks; Post-War Plans of the Soldier, 1945, pp. 3-5.

^{4/} Meyer, Agnes E. "Machines, Migration," The Washington Post, May 6, 1946.

^{5/} Thompson, Warren S., Plenty of People, 1944, p. 114.

On the effect of religion on the birth rate, we have the results of a survey of white women in Indianapolis.^{6/} A tabulation of the number of children ever born per 100 wives aged 40-44 found 224 as an over-all average, 274 when both man and wife were Catholic, 219 when both were Protestant, and only 142 when both were Jews. The number of children born was highest for families paying the lowest rent and decreased to the lowest point for those paying \$50-59 per month, increasing somewhat for those paying still higher rent. Religious and economic factors affecting the birth rate are interrelated and it is difficult to analyze their effect separately.

There is also a more scientific approach to forecasts of future birth rates. The birth rate depends on the percentage of the population remaining single, on the percentage of married women who remain childless, and on the average number of children born to those who become mothers. There is considerable evidence that at certain ages a smaller percentage of the population is single than in previous censuses. The percentage of women of childbearing age who were single in 1890 was greater than that in 1940. For example, in 1890, in age group 20-24, 52 percent of the female population were single, whereas in 1940 only 47 percent were single. Moreover, for age group 25-29 the percentage single in 1890 was 25.4 and in 1940, only 22.8 percent. Only at the higher ages, 45 and over, do the single in 1940 show a higher percentage than in previous censuses. This would be the natural result of a lower marriage rate among the older generations of women who were in the marriageable ages 30, 40 and 50 years ago. In 1890, 46 percent of women aged 20-24 were married and in 1940, 51 percent; for ages 25-29, the corresponding figures were 71 and 74 percent. In 1940, according to the Bureau of Census figures childless married women comprised 20 percent of all married women 15-7 years of age, whereas the corresponding percentage in 1910 was 14 percent. The net result appears to be that we now have relatively a smaller number of single women at the younger ages, a larger number of childless married women, and a lower average number of children among those who become mothers.

In a study on "Sterility in American Marriages,"^{7/} Alfred J. Lotka, using figures from the 1920 census, finds the effective or gross sterility of marriages of American white women as 17.1 percent. After three adjustments—1.2 percent for premature death of wives, 2.0 percent for premature death of husbands, and 0.8 percent for divorced wives—the net sterility rate, however, is found to be only 13.1 percent.

A declining birth rate ultimately means a greater proportion of elderly persons and a smaller proportion of women of childbearing ages than we have in the population today. Such a tendency necessitates a

^{6/} Kiser, Clyde V., and Whelpton, P. K., "Social and Psychological Factors Affecting Fertility," Milbank Memorial Fund Quarterly, July 1943 and January 1944.

^{7/} National Academy of Science Proceedings, 1928, Vol. 14.

greater understanding of population problems, including social security measures for retirement, dependents and survivors. The declining birth rate does not necessarily mean a decline in population for at least a generation or two. Gradually the age composition of the population changes as it grows older, with the result that the percentage of child-bearing women decreases from year to year. Many countries, notably U.S.S.R., Great Britain, Canada, Australia, New Zealand, Belgium, and France, are evidently trying to check decline in their birth rates through family allowances, loans, or differential wage scales for workers according to the number of children in a family.^{8/}

Mortality and Survival Rates

A study of mortality rates is important in old-age and survivors insurance, not only because these rates are used in making estimates of the future size of the population, the labor force, and the aged beneficiary group, but also because they determine the incidence of deaths which affect both survivor and retirement benefits.

The rate of mortality at any given age is the number of deaths within 1 year among 1,000 persons alive at the beginning of that year. The survival rate is simply the complement of the mortality rate, so reference to falling mortality rates, by implication refers also to rising survival rates.

Over a long range, mortality rates have decreased enormously. In fact, the decline has been so great that we cannot expect it to continue similarly far into the future.

One author has estimated general mortality experience over a period of 400 years from 1500 to 1900,^{9/} finding that rates were declining as early as the seventeenth century and continued to decline thereafter at an accelerated pace. In fact, during the second half of the nineteenth century mortality rates for the 35-49 age group fell to one-fifth or one-sixth of their level during the sixteenth century.

Crude death rates are not very meaningful unless the age composition of the population is known. In 1900 we had a crude death rate of 17.2 per 1,000 population; in 1910, about 15; in 1920, 13; in 1930, 11; and in 1940, only 10.8. This decrease has been realized despite the fact that we have a greater proportion of people aged 65 years and over than ever before. Putting it in another way, an increase in the crude death rate would be expected in an aging population. This increasing proportion of the aged, with its higher death rates, naturally

^{8/} Glass, D. V., The Struggle for Population, 1936.

^{9/} Peller, Sigismund, "Studies on Mortality Since the Renaissance," Bulletin of the History of Medicine, April 1943.

has its weight in producing higher crude death rates which involve the deaths at all ages and may conceal the improvement in the death rates at specific ages. On the other hand, the recent increase in births will weight the group of children with its low death rates more than formerly and may outweigh the tendency to a higher crude death rate.

Death rates for different ages or age groups are called "age-specific death rates." Under most age-specific mortality tables, the death rates after age 25 or 30 double every 8 or 9 years. "Sex-specific death rates," "race-specific death rates," and combinations are also available.

The useful actuarial device of standardized death rates has come into considerable use. Under this method a reasonably constituted population is taken as a standard and to it are applied the age-specific mortality rates of the community or population under investigation. This gives what may be called "expected deaths," and the adjusted death rate may then be found by dividing the sum of the expected deaths by the population that was taken as a standard. The standard population, for convenience, is usually taken as a total of, say, a million. In 1917 the International Statistical Institute settled on a standard million made up of the populations of 19 European countries. This standard, however, has not come into general use in the United States.

The best cross section of the mortality rates of recent years for the population is probably the U. S. Life Tables 1939-41, published by the Bureau of the Census.^{10/} This report contains four life tables, namely, white males, white females, Negro males, and Negro females. It will be noted that the other nonwhite races have been omitted, but they represent no more than 0.4 percent of the total population. The tables are based on the 1940 census of population and registered deaths for the 3 years 1939-41, inclusive. Registration of deaths has sometimes been considered to be 97 or 98 percent complete. The death rate on the basis of 100-percent registration would then, on the average, be about 2 or 3 percent higher were the census enumeration complete. There is probably a considerable differential according to age, race, and sex. Because of errors and bias in age grouping in both the census enumerations and death registrations, the death rates derived from these two sets of data are not completely accurate.

The death rate is high at the two extremes of the life-span and is lowest at about age 10. The infant mortality rate is defined as the number of deaths among infants within the first year of life per 1,000 live births. The U. S. Life Tables 1939-41 indicate great differences in mortality rates by sex and by race. According to this table, the infant mortality rate for white males was 48, for white

^{10/} Department of Commerce, Bureau of the Census, Vital Statistics--
Special Reports, Vol. 19, No. 4.

females 38, per 1,000; for Negro males 82, and for Negro females 66, per 1,000. The relative rates are shown in table 3; the first two columns show female mortality as a percent of male mortality and the last two, Negro mortality as a percent of white mortality, by sex. It will be noted that for age groups from 10 to 65 white female mortality is only from two-thirds to three-fourths as great as white male mortality. Among Negroes, however, the female mortality ranges from 80 to 90 percent of the male mortality for ages 25 to 75. In some age groups, Negro male mortality is as much as three times as great as white male mortality and Negro female mortality, as compared with white female mortality, reaches a ratio as high as 367 percent for age 20. This great differential in death rates may be ascribed in part to differences in economic status and occupations but may also be due in part to inherent biological differences. The age, sex, and race composition of the population is most important in social insurance relationships because changes in composition may result in changes in aggregate death rates. This analysis shows that retirement benefits are relatively more important among whites than among Negroes and death benefits perhaps more important among Negroes than among whites. This difference is of special significance for the problem of extended coverage because of the relatively high percentage of Negroes among agricultural and domestic workers now excluded from the system.

The Bureau of the Census has supplied death rates of 1940 by marital status, namely, single, married, widowed, and divorced, by age, sex, and race (table 4). Mortality varies greatly by marital status—so much, in fact, as almost to lead to question of the accuracy of the original data. There is, however, a large differential in mortality rates according to marital status in all countries where such data are available. In every case married men have a more favorable rate in contrast to nonmarried men than do married women in contrast to nonmarried women. The greatest differential appears to exist in France, but Great Britain also shows similar relationships.^{11/} Even our own earlier statistics bear out this same conclusion.^{12/}

The Bureau of the Census believes that the actual number of divorced heads of families who have not remarried is understated. Some of the widowed may also report themselves as married, that is, according to their previous marital status. Since each death rate is the quotient of the number of deaths by the number exposed to death in the same group, an error might result either from an error in the numerator or in the denominator of the fraction. A small error in the numerator will usually result in a considerable error in the quotient, but in this case it is

^{11/}

Depoid, P., Bulletin de la Statistique General de la France, January-March 1937.

^{12/}

Spiegelman, Mortimer, "The Broken Family—Widowhood and Orphanhood," The Annals, American Academy of Political and Social Science, November 1936.

Table 3.--Comparison of 1939-41 mortality rates, by sex and race

Age	Female as percent of male		Negro as percent of white			
	White female as percent of white male	Negro female as percent of Negro male	Negro male as percent of--		Negro female as percent of--	
			White male	White female	White male	White female
0.....	79	80	171	217	137	174
5.....	80	94	135	169	127	159
10.....	70	75	138	197	104	149
15.....	67	112	192	285	215	320
20.....	68	98	257	375	251	367
25.....	75	86	302	403	258	345
30.....	79	84	313	396	263	333
35.....	77	86	295	385	255	332
40.....	72	87	265	370	230	321
45.....	68	86	243	355	209	306
50.....	66	86	220	333	189	287
55.....	65	88	187	288	165	253
60.....	67	89	153	228	136	203
65.....	72	87	127	177	111	155
70.....	78	85	106	137	90	116
75.....	83	81	94	113	76	91
80.....	87	76	86	99	65	75
85.....	90	76	76	85	58	65
90.....	93	81	70	75	57	61
95.....	96	85	72	75	61	63
100.....	99	85	82	82	70	70
105.....	104	84	101	98	85	82

Source: U.S. Bureau of the Census, Vital Statistics - Special Reports, Vol. 19, No. 4, p. 31.

Table 4.--Death rates, by age, race, sex, and marital status: United States, 1940

[Provisional rates are the number of deaths in a specified group per 1,000 population of that group enumerated as of Apr. 1, 1940]

Age	Total	Single	Married	Widowed	Divorced	Total	Single	Married	Widowed	Divorced
	Total, white					Total, nonwhite				
All ages....	(1/)	(1/)	10.1	52.3	18.9	(1/)	(1/)	13.9	44.6	22.8
15-19.....	(1/)	(1/)	2.2	5.9	3.2	(1/)	(1/)	5.1	9.5	7.7
20-24.....	2.0	2.1	1.7	4.9	3.7	6.1	6.9	5.0	11.4	6.3
25-34.....	2.5	3.3	2.1	5.0	5.0	7.9	11.1	6.5	13.4	9.8
35-44.....	4.4	6.3	3.8	6.3	8.8	12.4	17.3	10.5	17.8	17.3
45-54.....	9.5	12.6	8.5	11.8	17.6	22.9	28.5	19.0	32.5	32.3
55-59.....	17.3	21.7	15.8	19.6	28.7	34.4	42.2	27.7	46.7	47.1
60-64.....	25.8	29.7	23.7	27.9	41.8	42.1	51.8	33.5	53.0	64.0
65-69.....	38.7	42.3	35.8	41.0	62.8	44.4	53.9	37.5	48.7	69.2
70-74.....	60.8	63.2	56.5	63.4	104.8	64.6	80.9	55.0	67.4	114.5
75-79.....	95.2	99.6	87.9	97.7	165.5	87.5	101.0	77.9	87.8	148.9
80-84.....	147.4	147.6	134.7	150.7	274.4	113.4	145.0	107.9	108.2	250.0
85 and over.	242.0	224.6	205.8	249.7	406.1	176.7	210.2	156.3	173.3	303.3
	White male					Nonwhite male				
All ages....	(1/)	(1/)	12.9	71.1	29.5	(1/)	(1/)	16.5	65.2	34.9
15-19.....	(1/)	(1/)	2.1	11.9	6.1	(1/)	(1/)	4.2	25.6	5.1
20-24.....	2.3	2.5	1.7	7.8	4.8	6.5	7.1	4.8	19.6	10.2
25-34.....	2.8	4.0	2.2	7.8	7.8	8.5	12.1	6.5	21.6	14.4
35-44.....	5.1	8.1	4.2	10.6	13.4	13.2	18.8	10.6	26.1	24.3
45-54.....	11.4	16.2	9.8	19.2	25.1	24.5	30.5	20.2	46.8	41.6
55-59.....	20.9	27.7	18.3	31.0	38.3	36.0	43.6	29.2	62.0	51.4
60-64.....	30.6	37.4	27.1	40.6	51.9	44.2	54.1	35.6	65.7	72.1
65-69.....	44.6	51.9	39.4	56.3	73.4	49.0	58.0	39.9	66.2	74.1
70-74.....	67.8	74.4	60.5	79.3	114.2	70.2	89.6	57.0	84.4	115.3
75-79.....	104.0	109.4	92.3	116.7	175.6	98.5	105.7	81.0	114.7	163.0
80-84.....	158.1	153.4	139.7	172.4	278.7	130.8	149.0	108.7	142.0	216.7
85 and over.	251.4	203.1	214.1	273.2	367.0	199.7	222.5	155.3	214.6	298.7
	White female					Nonwhite female				
All ages....	(1/)	(1/)	7.2	44.9	10.7	(1/)	(1/)	11.3	37.7	15.8
15-19.....	(1/)	(1/)	2.2	4.6	2.8	(1/)	(1/)	5.3	8.0	7.9
20-24.....	1.6	1.5	1.7	4.1	3.3	5.8	6.6	5.1	9.6	5.3
25-34.....	2.2	2.4	2.0	4.1	3.5	7.4	9.6	6.5	11.6	7.9
35-44.....	3.7	4.0	3.5	4.9	5.5	11.7	14.4	10.3	15.9	13.3
45-54.....	7.5	7.9	7.0	9.3	10.5	21.1	24.4	17.4	28.1	23.9
55-59.....	13.5	14.0	12.6	15.6	17.7	32.7	38.9	25.4	41.2	42.3
60-64.....	20.8	20.9	19.2	23.4	28.5	39.9	47.1	29.6	48.0	53.2
65-69.....	32.9	32.0	30.4	35.3	46.7	39.5	46.2	32.7	41.8	62.3
70-74.....	54.0	52.1	49.1	56.8	86.9	58.7	65.1	49.8	59.8	112.9
75-79.....	87.1	90.4	78.0	88.9	142.8	76.8	93.0	68.8	75.6	119.3
80-84.....	138.1	143.0	120.2	139.7	264.0	98.2	138.9	104.9	92.6	316.7
85 and over.	235.0	240.0	175.2	237.4	502.9	159.7	193.8	160.2	154.8	311.1

1/ Not computed.

Source: U.S. Bureau of the Census, Vital Statistics - Special Reports, Vol. 23, No. 2, 1945.

more likely that the denominator and hence also the quotient are subject to substantial error.

Social Security programs are concerned with the mortality rate and the survival rate of all the categories--single, married, widowed, and divorced. Cost analyses are particularly concerned with the death rate of the married, because of the benefits payable to the children and to widows. Deaths of widowed parents are important because their children then become full orphans.

It appears from table 4 that married persons enjoy a superstandard mortality compared with the total, and that the single, widowed, and divorced suffer a substandard mortality. Nonwhite married males appear to benefit most from the marital state, although nonwhite females also show a lower mortality among the married; white males appear to benefit much more than white females. It is possible that just as married persons experience a more favorable mortality than the nonmarried, so parents might have a lower mortality than childless married persons. Early marriages appear to represent a decidedly favorable selection that continues up to the middle ages. Then the selection wears off and steadily the mortality of the single again becomes more nearly that of the total population, save that at the very highest ages the difference between the single and the total widens again, especially in the nonwhite category.

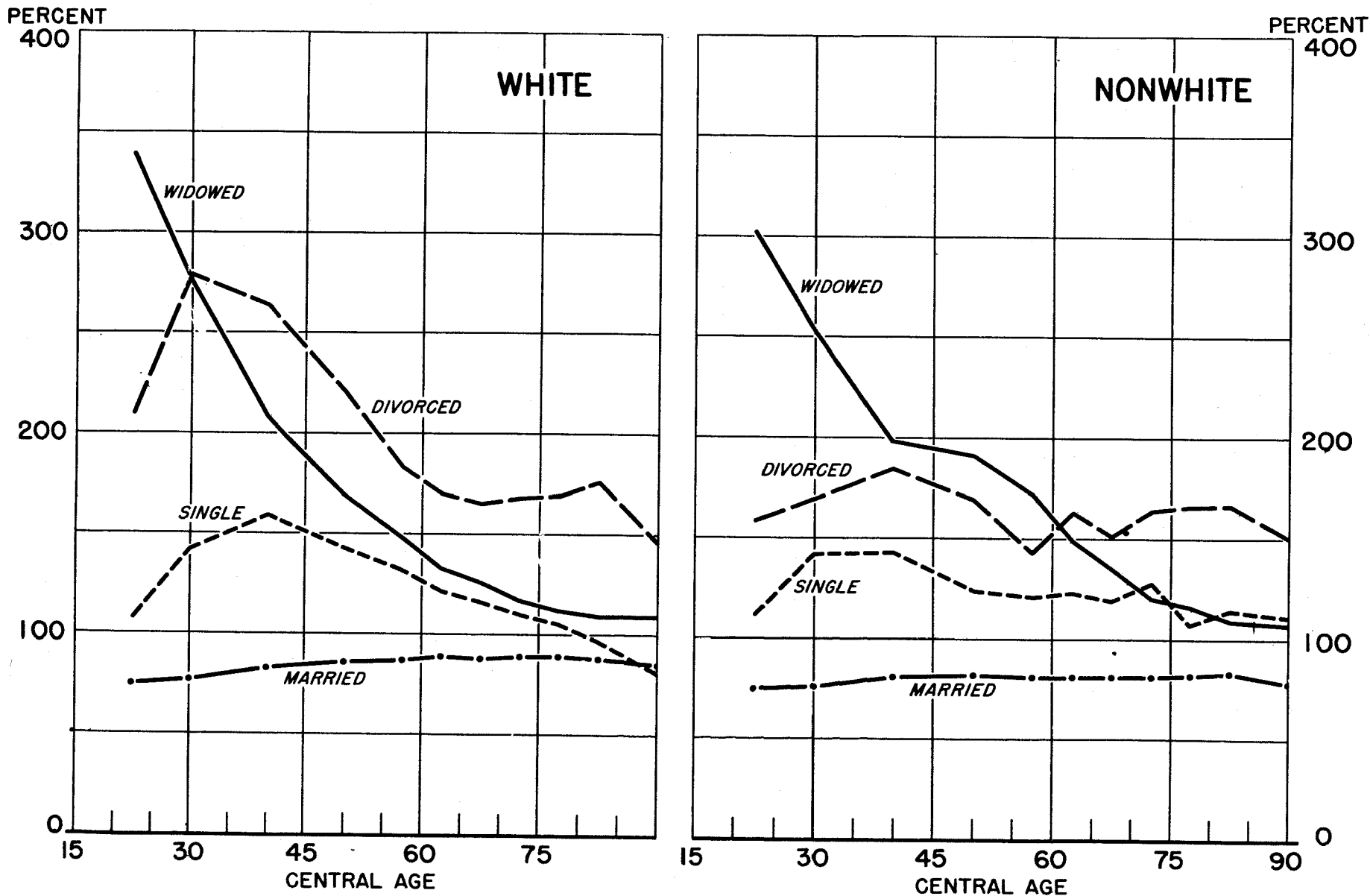
The ex-married (i.e., widowed, divorced, and separated persons) suffer a very unfavorable mortality according to this table. It seems that in marriage there is a matching of the poor lives, on the one hand, and the good lives on the other. Thus the couple with lower life expectancy is more likely to be broken by death, with the result that the remaining spouse has higher-than-average mortality. Furthermore, by this process the mortality of the married is constantly kept at a low level. A similar opinion has been voiced by Mortimer Spiegelman,^{13/} who points out that husband and wife are likely to belong to the same race and social-economic class. The married people from the class with the higher mortality are transferred relatively early into the category of widows or widowers by the death of the spouse. This tends to leave poorer lives in the ex-married class and the better lives in the married class. Mortality among the single is much less favorable than that of the married, but much better than that of the widowed. Finally, the divorced have the highest mortality--higher even than the widowed--especially at the older ages.

Charts 6-9, based on table 4, show these relationships for 1940 mortality according to marital status. The first chart of this series (for men) shows the death rate of each marital status as a percent of

^{13/}

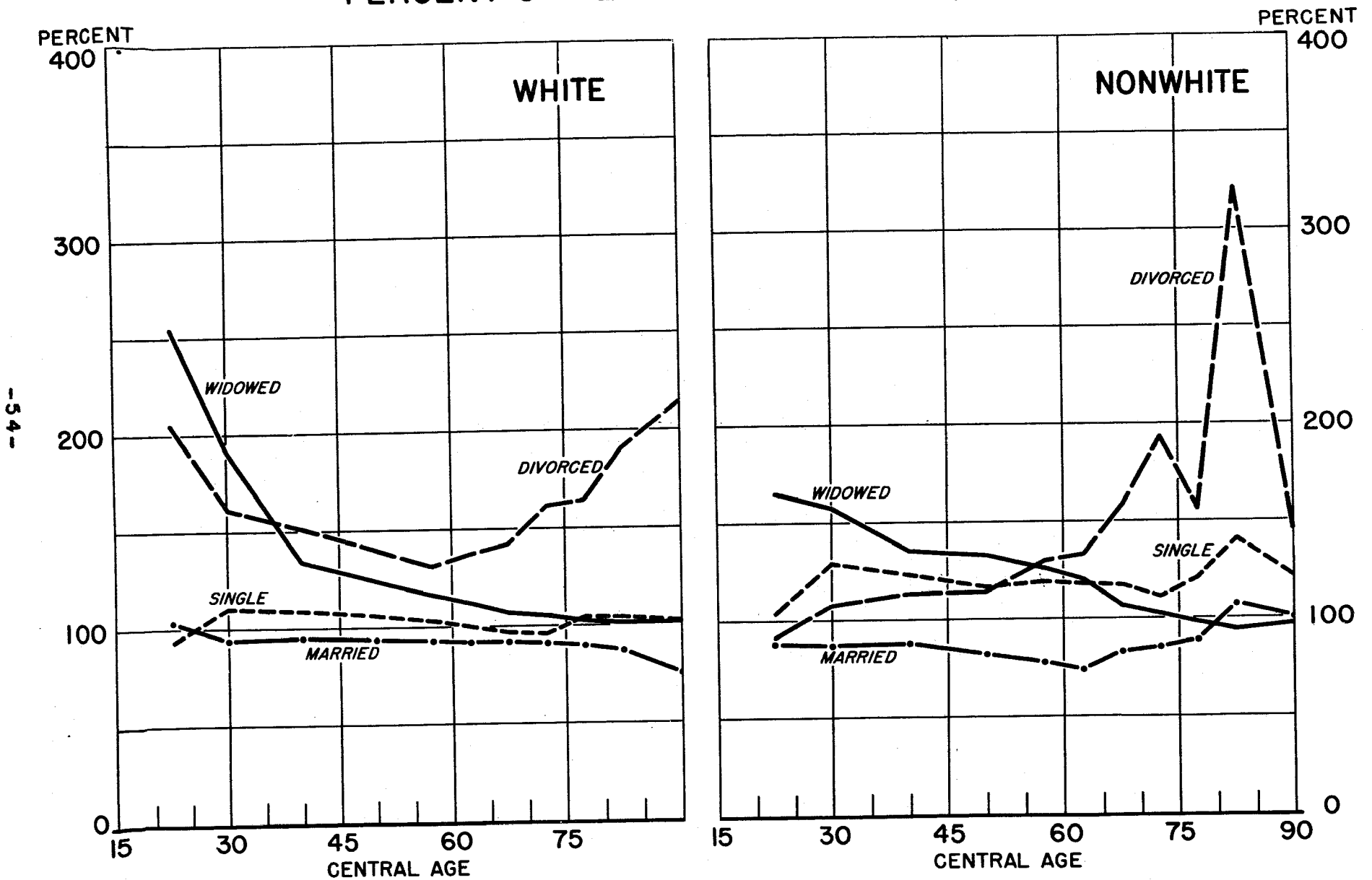
Spiegelman, Mortimer, "The American Family," The Record, American Institute of Actuaries, December 1944.

CHART 6.
 MALE DEATH RATES BY MARITAL STATUS AND AGE AS
 PERCENT OF ALL MALE DEATHS, 1940



-53-

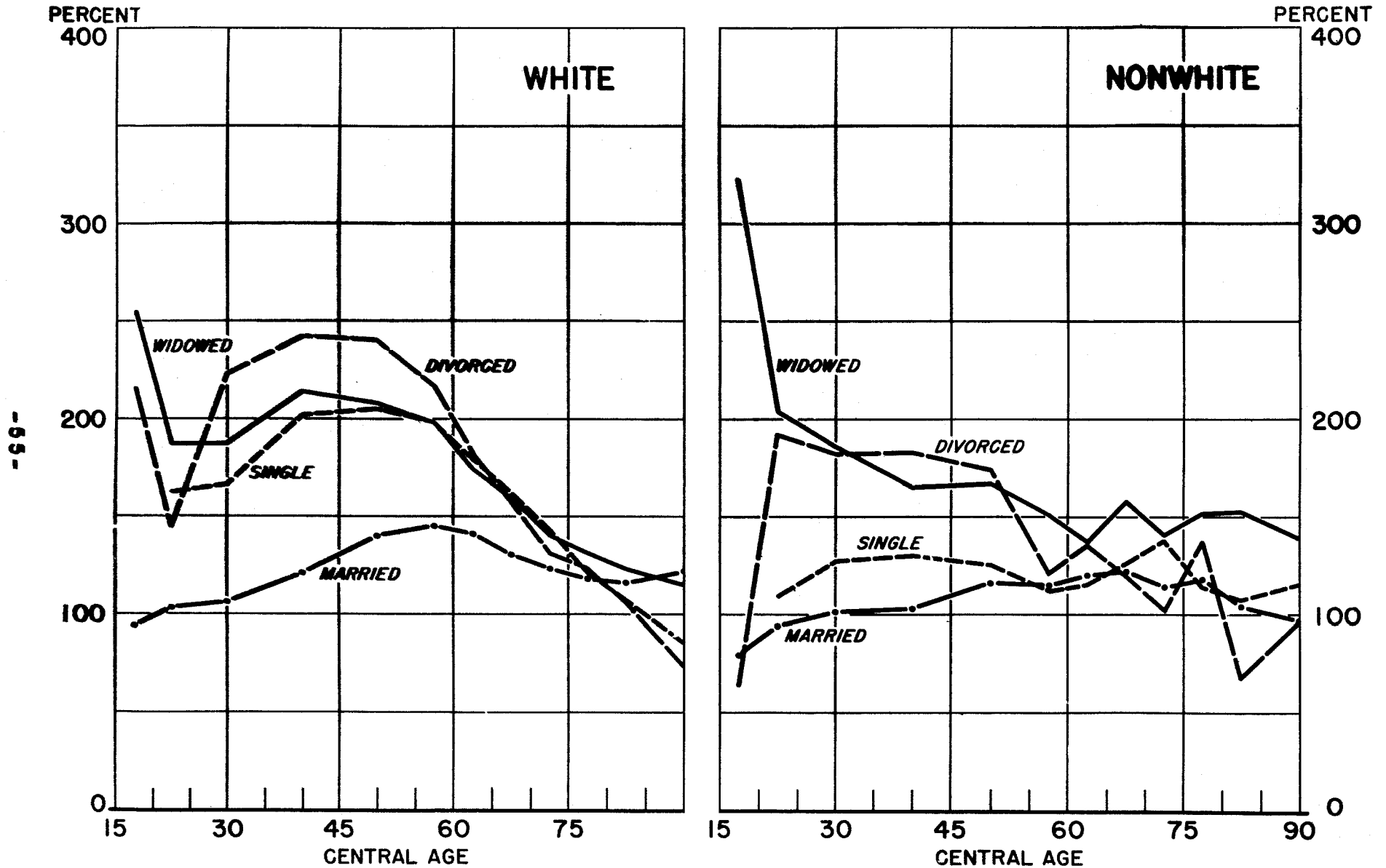
CHART 7.
 FEMALE DEATH RATES BY MARITAL STATUS AND AGE AS
 PERCENT OF ALL FEMALE DEATHS, 1940



-54-

CHART 8.

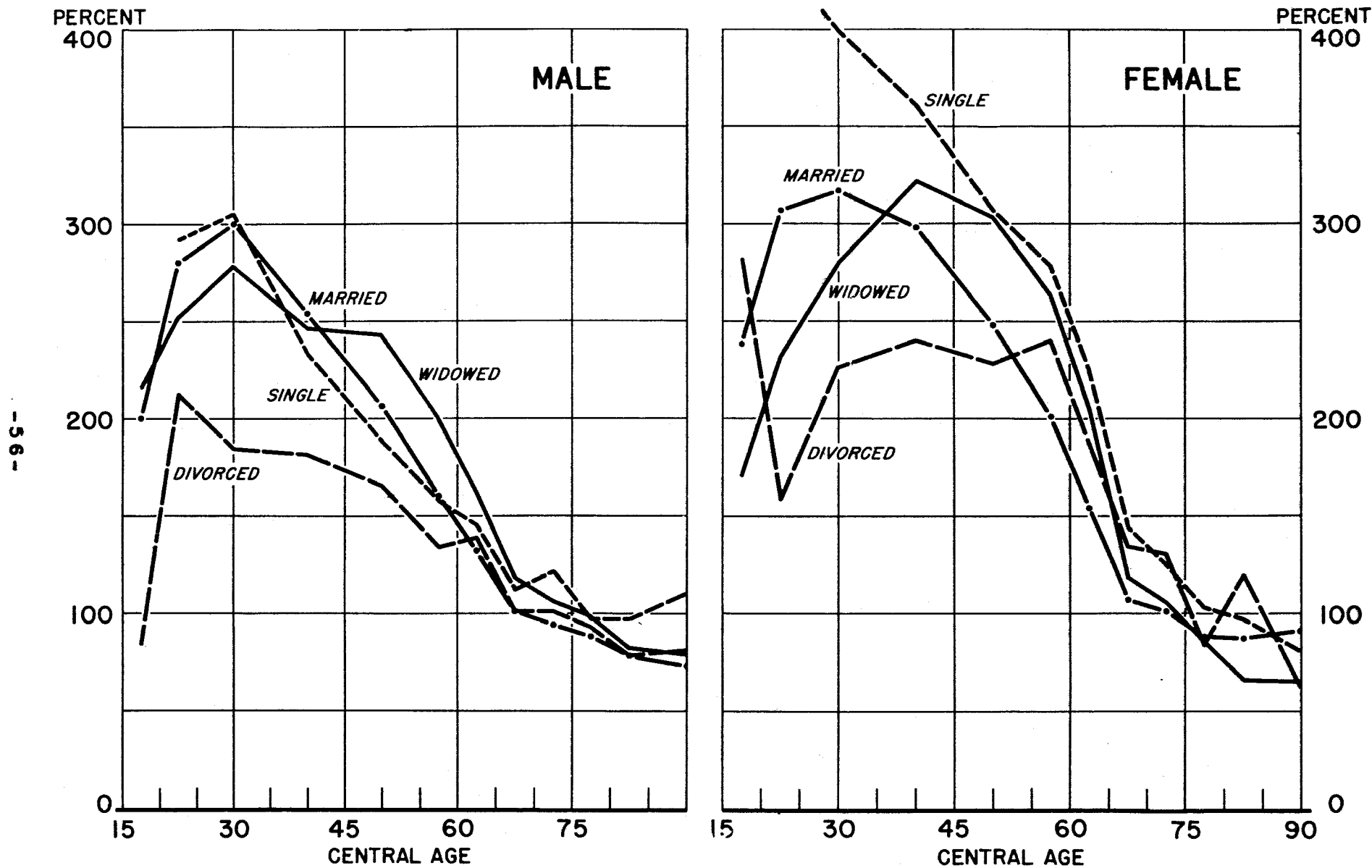
MALE DEATH RATES AS PERCENT OF FEMALE, BY MARITAL STATUS, 1940



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CHART 9.

NONWHITE DEATH RATES AS PERCENT OF WHITE, BY MARITAL STATUS, 1940



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the total death rate; the second shows the same relationship for women; the third illustrates the death rate of males as a percent of that of females; while the fourth shows the nonwhite death rate as a percent of that of the white.

These data are based on the 1940 death rates of the population of the United States; the same conclusions have been arrived at independently by consideration of the mortality experience of the general population in New York State, exclusive of New York City, for the period 1939-41.^{14/} It was found, for example, that from attained ages 20-44 death rates of widowers are from two to four times those of married men. Widows at these ages experience death rates from one and one-third to twice the rates for married women. Furthermore, the mortality of widowers during the last decade improved less than that of either the single or the married, still further widening the difference.

With respect to the relationship between marital status and mortality, marriage seems to be a somewhat more selective process for men than for women. It is pointed out that the man who contemplates becoming head of a family must at least be well enough to work for a living, whereas women can often manage to take care of the home even though they are not in the best of health. We find from another source that the average couple at the time of marriage today has a prospect of joint married life some 5 years longer than would have been their lot 20 years ago.^{15/}

These various relationships have very important connotations in the field of social insurance. Since married men have a more favorable mortality than the other classes, the costs of survivors insurance are comparatively light while there are children in the family. The extra burden of carrying the wives and widows through their old age, however, brings heavier costs for this category. The heavy mortality among the widowed and divorced means that many children will be left as complete orphans on the death of the surviving spouse. The children of divorced couples usually stay with their mother, who may lose all rights to widow's current benefits by the terms of the divorce.

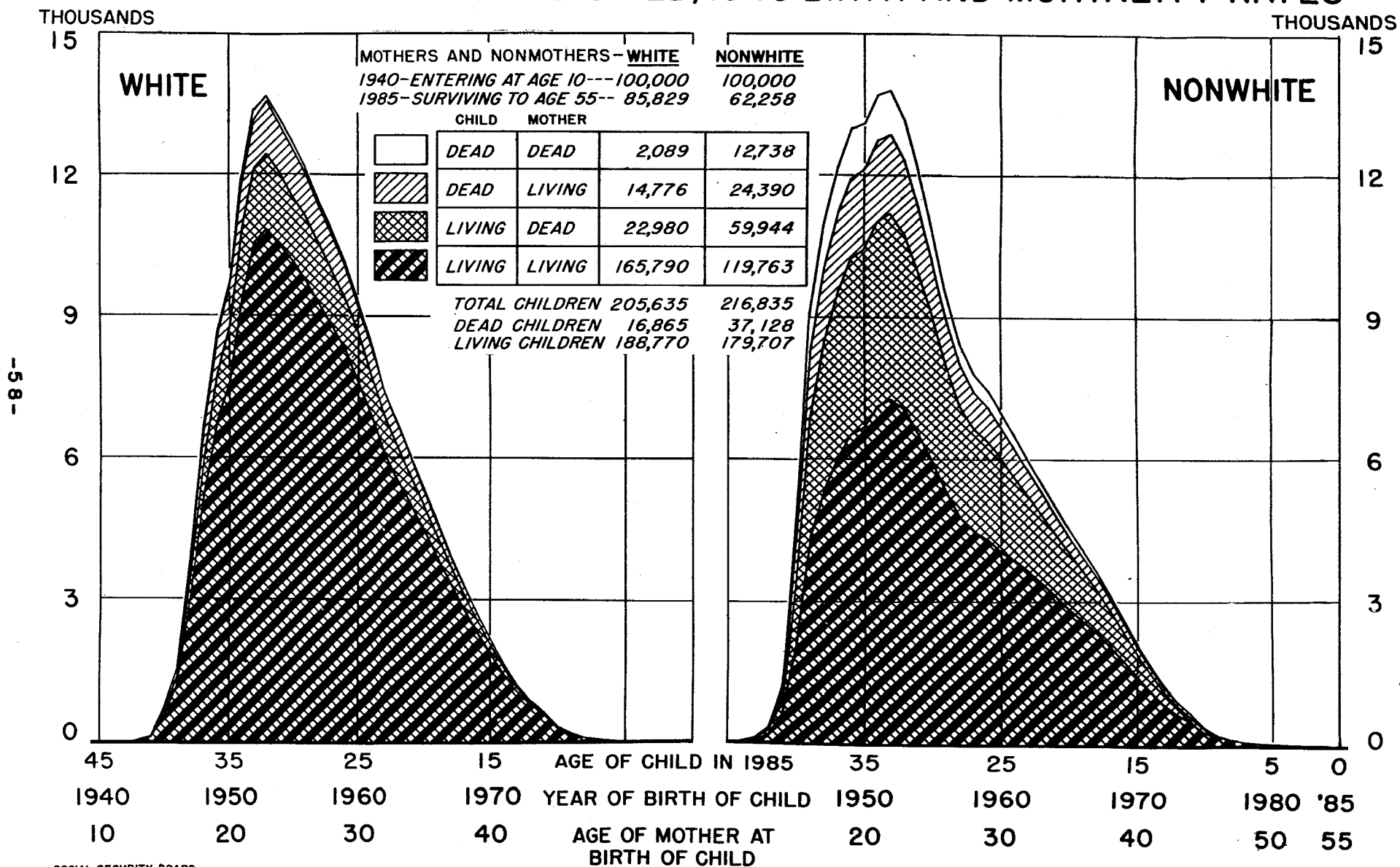
Since the mortality of the nonwhite is much higher than that of the white, it is interesting to observe the combined effect of mortality and birth rates of two generations of women cohorts, the one white, the other nonwhite. In chart 10 are data for two cohorts, each of 100,000 girls, entering at age 10 in 1940 and surviving under 1940 mortality rates applicable to the white and nonwhite female population at that

^{14/} Metropolitan Life Insurance Company, "The Married Live Longer," Statistical Bulletin, July 1943.

^{15/} Metropolitan Life Insurance Company, "Length of Married Life Increases," Statistical Bulletin, February 1944.

CHART 10.

DISTRIBUTION IN 1985 OF CHILDREN BORN TO 100,000 WHITE AND 100,000 NONWHITE FEMALES AGED 10 IN 1940 BY YEAR OF BIRTH AND SURVIVAL OF MOTHER AND CHILD, 1940 BIRTH AND MORTALITY RATES



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time. In 1985, or 45 years later, 86,000 white women survive in contrast to only 62,000 nonwhite women. In other words only 14,000 white women in contrast to 38,000 nonwhite women died in the interval. If the 1940 fertility rates are applied, we find that the 100,000 white women produce 206,000 children, the nonwhite 217,000. In the first category, however, 17,000 children die, as compared with 37,000 in the second. The net result is 189,000 living children in the first, and 180,000 in the second, category at the end of the 45-year observation period.

The chart shows in graphic form just how the original children fall into the four categories at the end of the 45-year period: dead with mother dead, dead with mother living, living with mother dead, and living with mother living. In the first category there are more than six times as many nonwhite children as white, in the second about twice as many, in the third about three times as many, while in the last category 166,000 white children survive together with their mothers against 120,000 nonwhite children with their mothers. The chart illustrates the enormous death toll among the nonwhite which not only decimates the older generation but also has a strong influence in reducing the number of the younger generation. The chart also brings out the much younger age at which childbearing begins among the nonwhite in comparison with the white.

Chart 10 assumes that a static mortality rate would govern throughout the period it covers. Mortality rates, however, have improved greatly during the last 40 years and are still improving. Therefore, it is well to examine the secular trend in mortality showing mortality improvement with time, tracing the death rates of a cohort of individuals over the period 1900-1940.^{16/}

The main difficulty is to find a group sufficiently homogeneous over these 40 years. The original registration States of 1900--comprising the States of New England as well as Indiana, Michigan, New Jersey, New York, and the District of Columbia--will be used for this purpose. Chart 11 provides a cross-sectional view of the death rates by age, race, and sex for 1900 and a similar view of the death rates for 1940. The dots designated M and F on this chart indicate the mortality rates for males and females, respectively at age 50 for 1980 according to the medium mortality assumed by the National Resources Planning Board, thus indicating the plausible progress in mortality rates at age 50 in another 40-year period.

Chart 12 covers males and shows not only the mortality rates for 1900 and 1940, as in the previous chart, but also the year-by-year death rates of the cohort beginning at age 10 in 1900 and ending at age 50 in 1940. Of necessity, the mortality rates of this cohort begin with the

16/

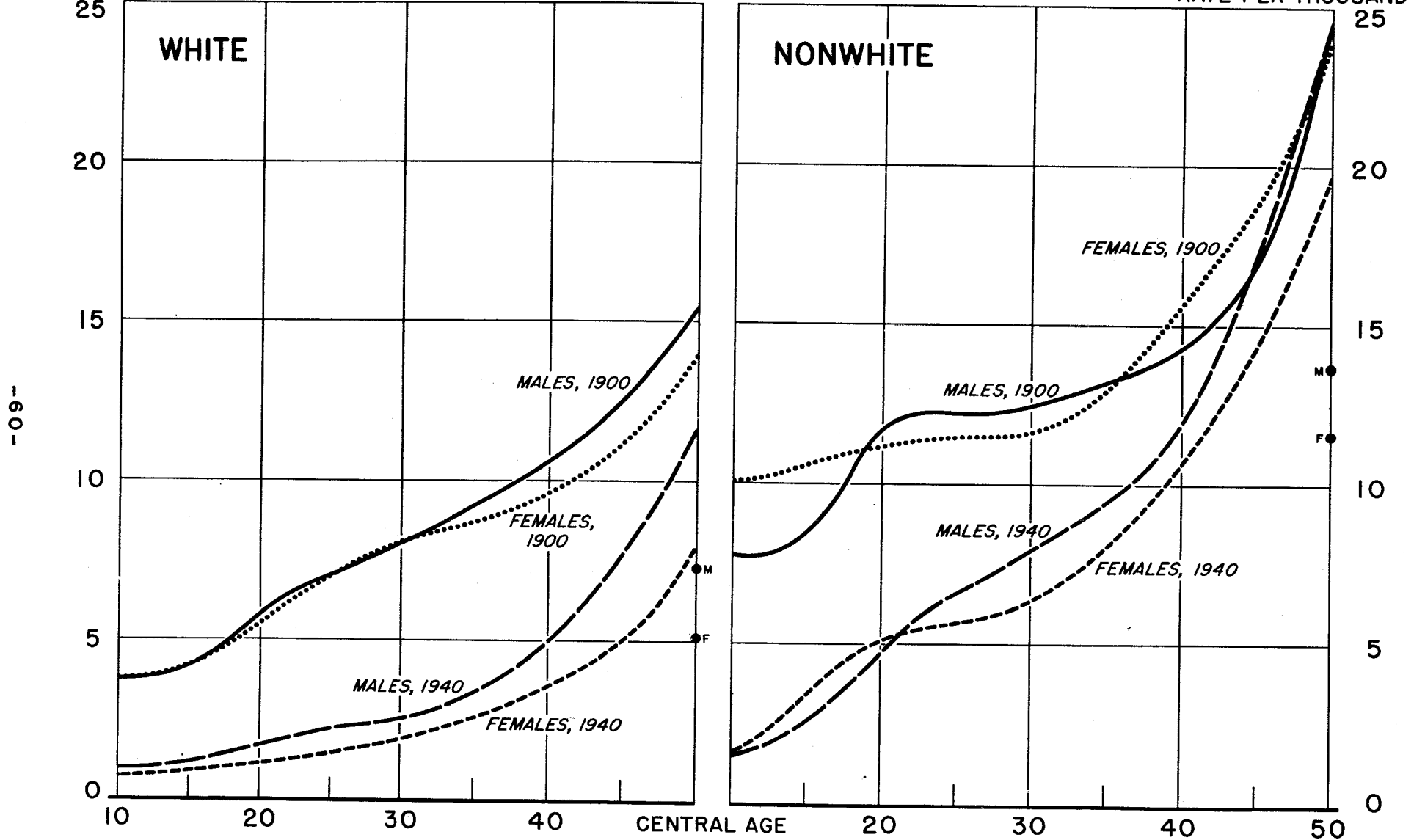
Department of Commerce, Bureau of the Census, Vital Statistics Rates in the United States, 1900-1940, 1943.

CHART II.

DEATH RATES BY RACE, SEX, AND AGE, 1900 AND 1940

RATE PER THOUSAND

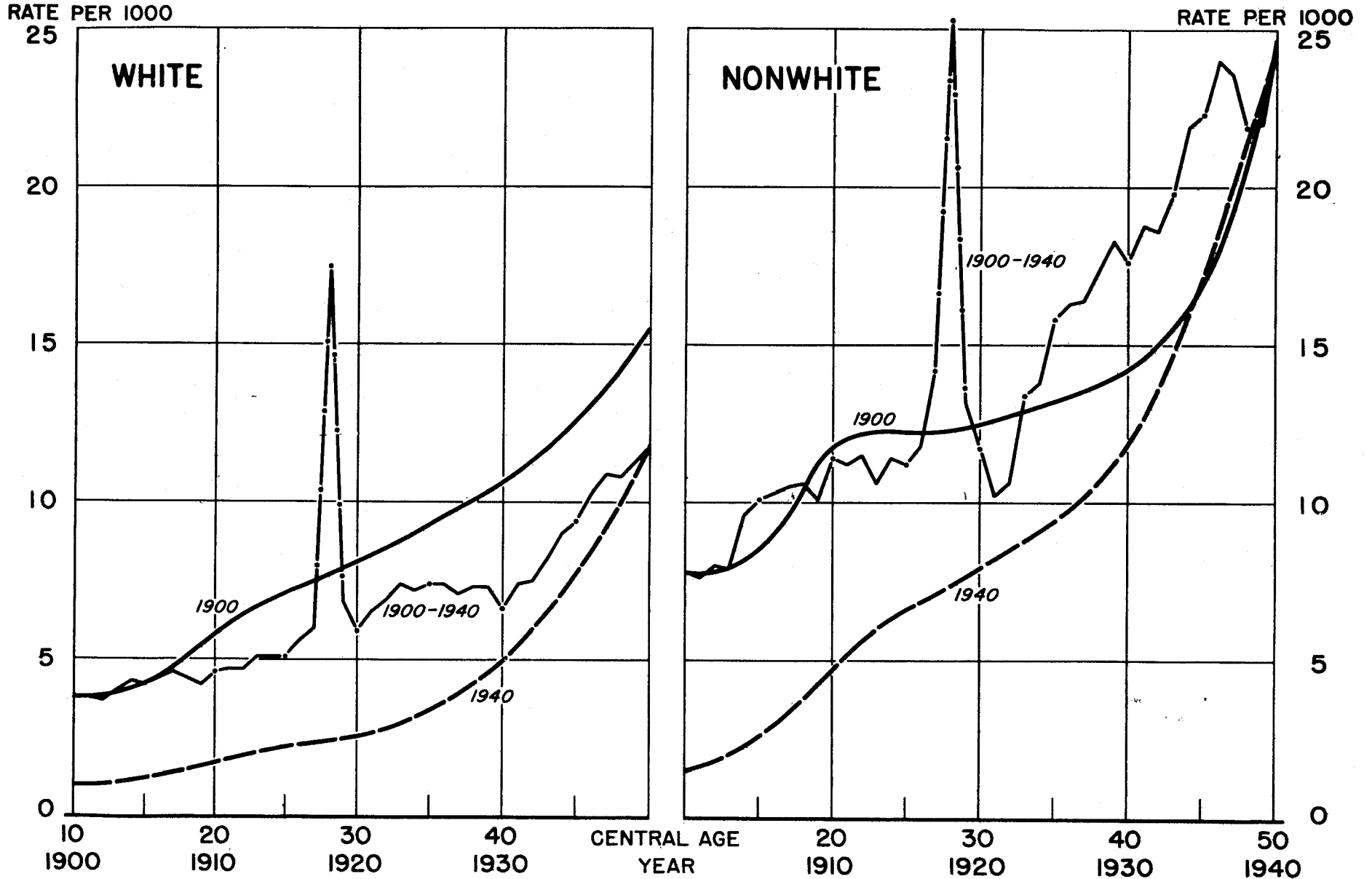
RATE PER THOUSAND



- 09 -

CHART 12.

MALE GENERATION DEATH RATES BY RACE AND AGE, 1900-1940



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1900 rate and end with the 1940 rate. It will be noted at once that the mortality rate did not increase according to the 1900 schedule showing mortality rates at each attained age, but improved in comparison with the 1900 rate until it finally reached the 1940 rate at age 50, far below what might have been expected 40 years before. The course of the rates over this 40-year period is somewhat irregular, as might be expected. Perhaps the most interesting feature is the high mortality rate due to the influenza epidemic of 1918 which, of course, occurred at age 28 in this cohort.

On the right-hand side is the mortality of nonwhites, which presents a more confusing picture. Here the 1940 mortality was generally much lower than that of 1900 except at ages 45-50. The generation death rates first fall below the 1900 mortality, but are greater not only during the influenza epidemic but during most of the period thereafter.

Chart 13, for women, is similar. Here the most striking feature is the relatively great improvement in the death rates as compared with the 1900 rates. The generation mortality rates cut across from the high curve to the low curve with very little increase for either race from age 10 to age 28, when the influenza epidemic occurred. The curves for nonwhite women are not as clear-cut as those for white women. The generation death rates of the former fluctuate widely and rise above the 1900 rates during several years. The generation death rates immediately following the influenza epidemic of 1918 are lower for several years than might be expected in view of their previous trend, probably because the epidemic caused the premature death of some persons who presumably would otherwise have lived for some years longer.

These charts show clearly that the death rates for a certain year apply only to that year and are usually out of date very soon thereafter. For example, for white females aged 10 in 1900 we would, according to chart 13, "expect" in 1930 at age 40 a mortality rate of almost 10 per 1,000. Yet in 1930 the mortality rate for white women at age 40 was only half as much--5 per 1,000.

Although the sample provided by the original registration States might be sufficient to give smooth curves, the generation mortality curves are rather jagged, especially for the epidemic year of 1918, indicating that age-specific death rates fluctuate considerably from year to year, perhaps partly because of variation in reporting rather than actual deaths.

So far, few references have been made to the survival rate. In many cases the survival rate may be used directly in calculating survivorship functions, such as the percent who survive to age 65. Such percents are shown in charts 14 and 15 for males and females, respectively. Of a group of persons at age 20, the following percents would survive to age 65 according to assumed mortality rates:

CHART 13.

FEMALE GENERATION DEATH RATES BY RACE AND AGE, 1900-1940

RATE PER THOUSAND

RATE PER THOUSAND

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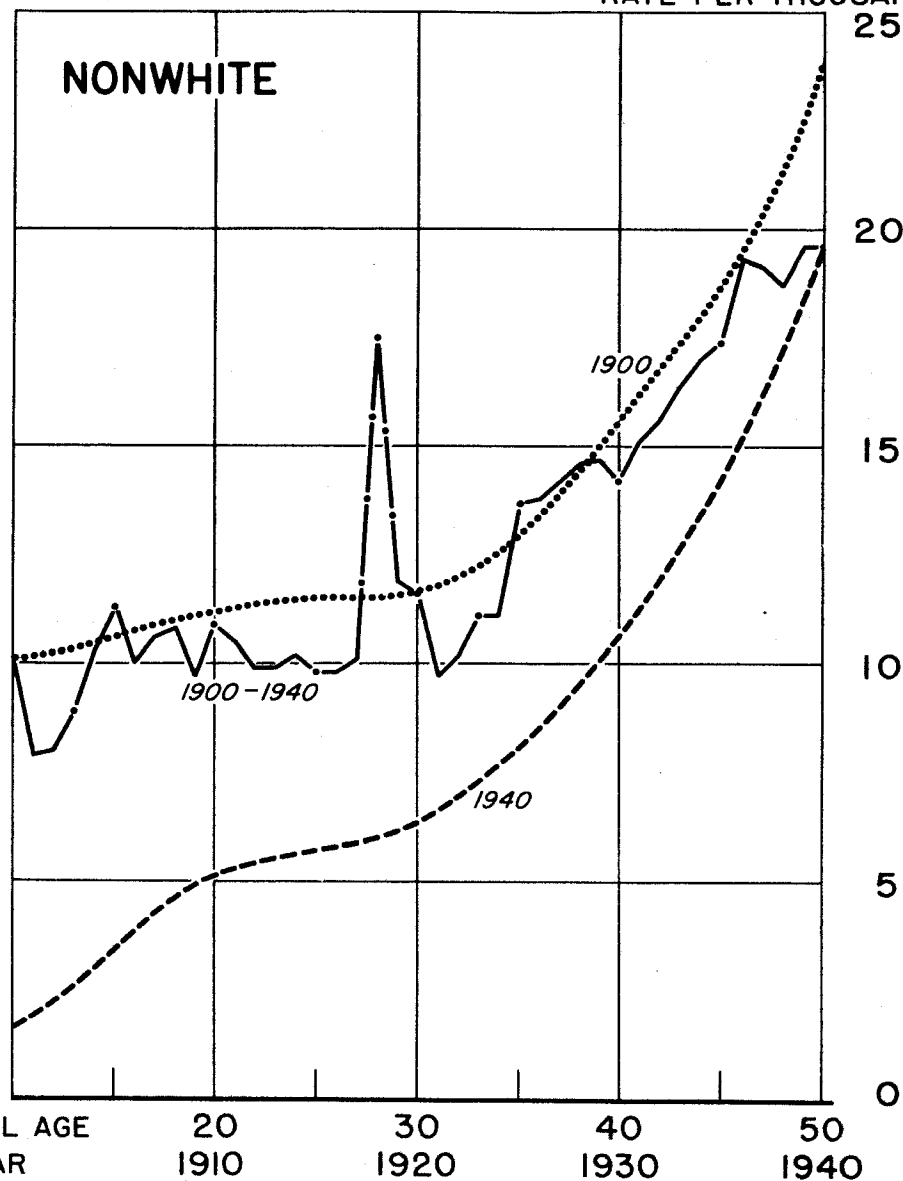
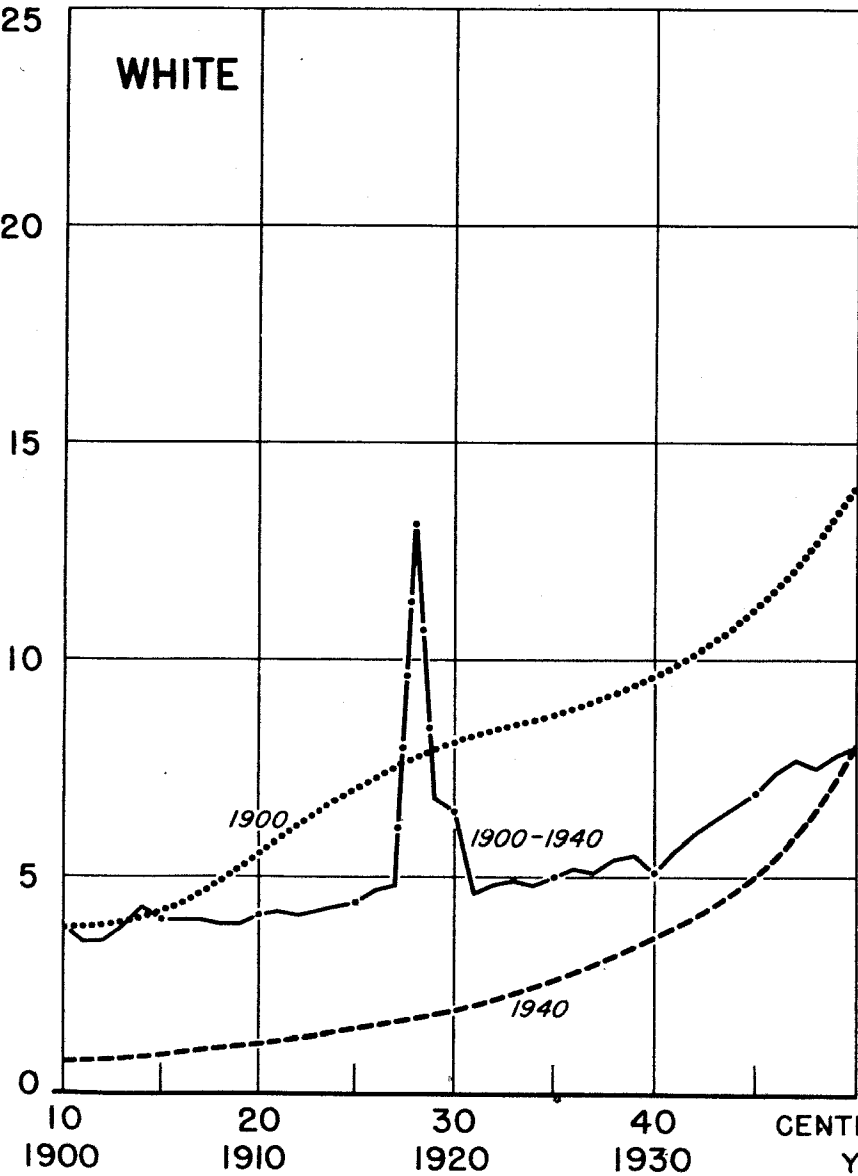
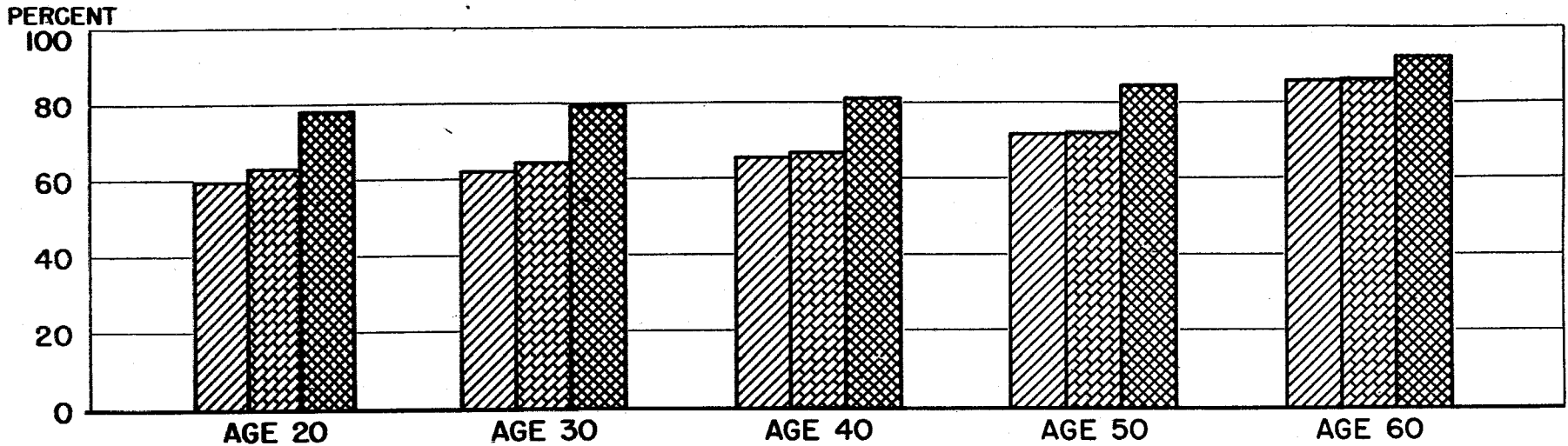


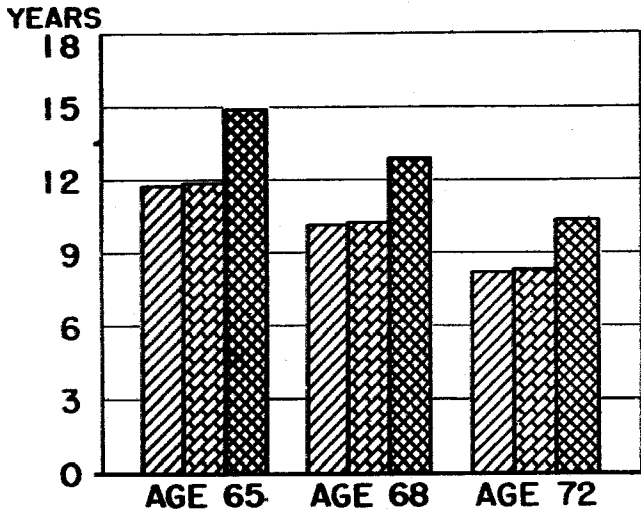
CHART 14.

MALE MORTALITY FACTORS

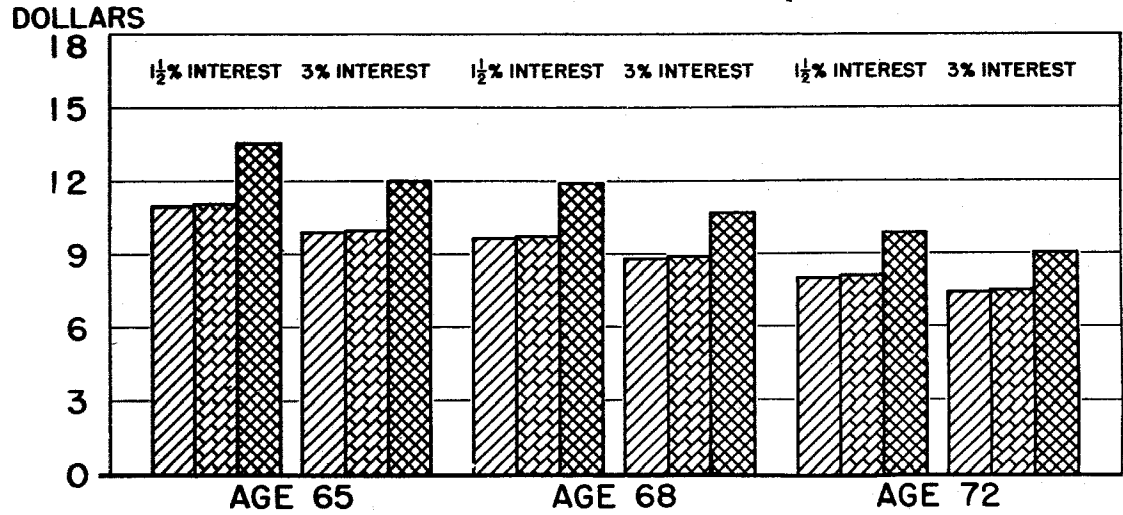
PERCENT WHO SURVIVE TO AGE 65



EXPECTATION OF LIFE



VALUE OF IMMEDIATE ANNUITY OF \$1.00 PER YEAR



 U.S. WHITE MALES 1920-29 TABLE

 U.S. WHITE MALES 1940 TABLE


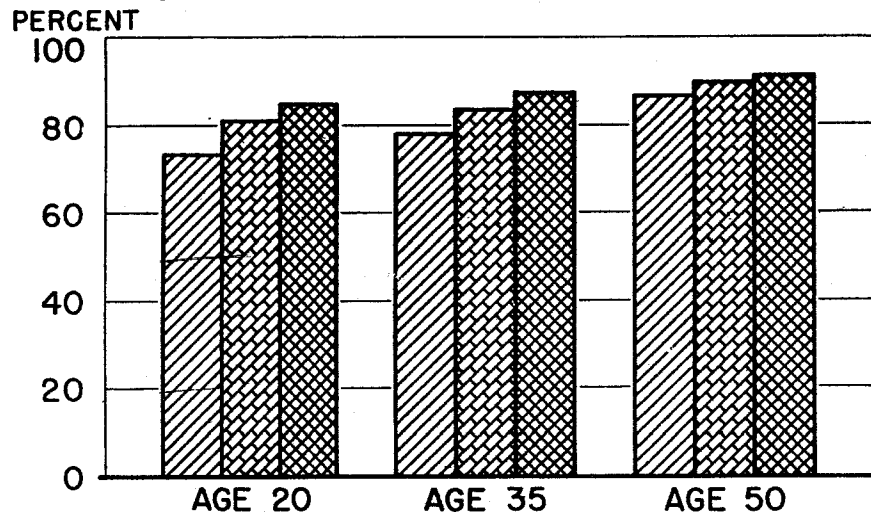
 DUBLIN'S NEW HYPOTHETICAL TABLE

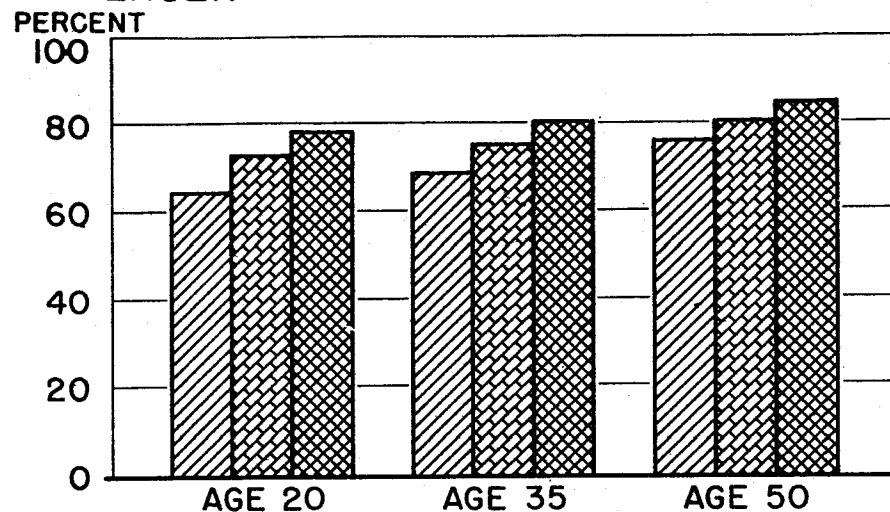
CHART 15.

FEMALE MORTALITY FACTORS

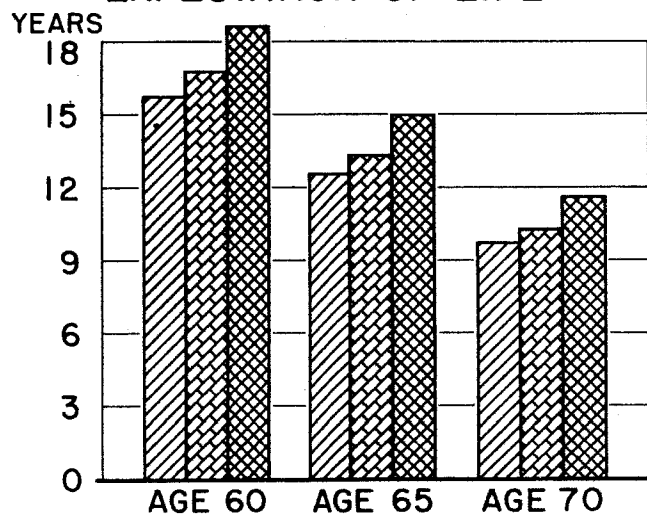
PERCENT WHO SURVIVE TO AGE 60



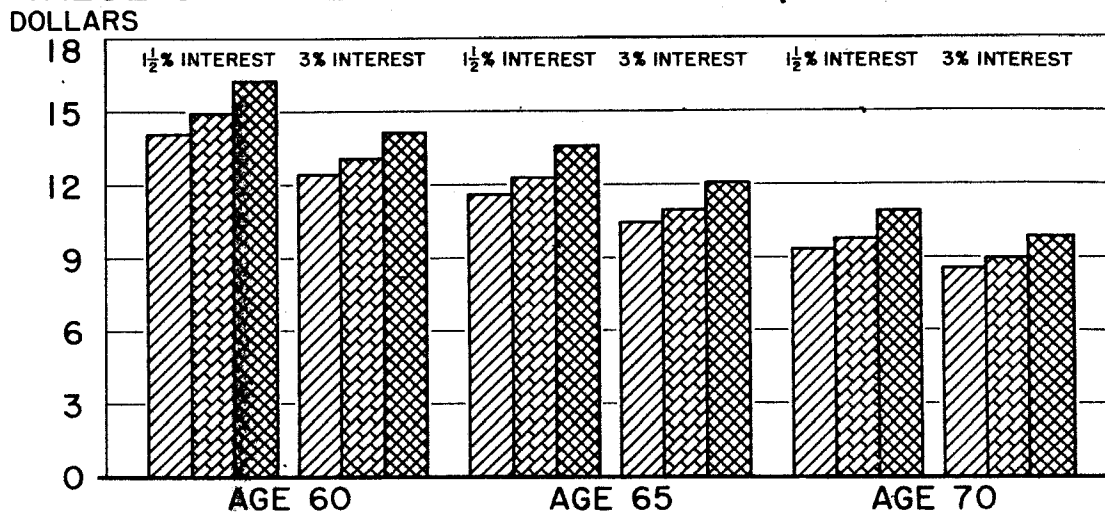
PERCENT WHO SURVIVE TO AGE 65



EXPECTATION OF LIFE




VALUE OF IMMEDIATE ANNUITY OF \$1.00 PER YEAR



 U.S. WHITE FEMALES 1920-29 TABLE

 U.S. WHITE FEMALES 1940 TABLE

 DUBLIN'S NEW HYPOTHETICAL TABLE

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<u>Mortality table</u>	<u>Percent surviving</u>
U. S. white males, 1920-29.....	59.6
U. S. white males, 1940.....	63.2
U. S. white females, 1920-29.....	64.3
U. S. white females, 1940.....	73.1
Hypothetical table, 1941 ¹⁷	76.9

These increasing percentages illustrate clearly the improvement in our survival rates in recent years. For whites in 1940 at age 20, roughly 2 out of 3 will survive to age 65. The hypothetical table may be considered as a sort of goal in improved mortality to aim at in the future. It is likely that this goal will be attained in our time by women; less likely by men.

The same charts also show the expectation of life and life annuity values for men at ages 65, 68, and 72, and for women at 60, 65, and 70, at 1½-percent and 3-percent interest rates. The bars indicate how rapidly these values drop with increasing ages. All these survival rates are much more favorable for women than for men. The fact that survival rates of both men and women increase with time serves to warn us that the old-age costs of old-age and survivors insurance may increase considerably in the future. Ultimately only 10-20 percent of all benefit expenditures represent death benefits to survivors exclusive of aged widow's benefits, leaving some 80-90 percent of the total as old-age benefits. A further reduction in death rates would lower the death benefit outlay only slightly but might boost the old-age benefits substantially.

The whole concept of the normal length of life could change radically as a result of medical research. For example, Russian scientists have recently reported progress in developing a serum which they feel will delay senility and prolong life far beyond what we have considered the normal span.

The business cycle exerts some influence on mortality rates during its various phases. The suicide rate increases as the severity of a depression becomes greater and decreases as the severity lessens. Thus the suicide rate for both sexes combined was 10 per 100,000 population in 1900, increased to 16 in 1915, fell back to 10 in 1920, increased to 17 in 1932, and fell to 14 in 1940. It appears to reach a minimum during a war. Some age-specific suicide rates are available.¹⁸ The total

¹⁷/ Metropolitan Life Insurance Company, "A Lesson in Optimism," Statistical Bulletin, November 1941. This table, prepared by L. I. Dublin and A. J. Lotka, is based on a New Zealand life table, 1935-37, for female lives adjusted for U. S. population experience.

¹⁸/ Metropolitan Life Insurance Company, "Suicides Decline to New Low Level," Statistical Bulletin, July 1944.

reduction for the war years appears to be at least 25 percent in comparison with those of the prewar years. Perhaps one reason for the decline is fuller employment and the greater sense of usefulness and of interest in living that many people find during the national emergency of war.

In the past we have had much higher mortality among lower income groups than among professional and business groups. Today, however, the mortality of both groups seems to be rapidly approaching a common rate. In 1942, the crude death rate per 1,000 policyholders of ordinary life insurance was 7.4; the rate per 1,000 industrial policyholders was 8.7.^{19/} The standardized death rate found by the Metropolitan Life Insurance Company for ages 1-74, inclusive, for its industrial business decreased from 13.5 per 1,000 in 1911 to 6.1 per 1,000 in 1942. In 1911 the expectation of life at birth was 6.4 years less for industrial policyholders than for the general population; the average length of life for their industrial policyholders was 46.6 and that of the general population 53.0 years. In 1942, the expectation of life at birth for the former was 64.4^{20/} and for the latter, 66.6, a difference of only 2.2 years. These figures are not presented as conclusive, since it is not certain that the sample is representative of wage-earning groups.

Mortality also varies by industry and occupation. Some industries, such as steel manufacture and coal mining, are acknowledged to be subject to an extra health or accident hazard because of excessive heat or cold, dust or gas, or a higher incidence of occupational injuries. Insurance companies attempt to measure such additional hazards in terms of extra premiums graded according to the particular risks involved. The Bureau of Labor Statistics has made interesting reports on health and accident hazards in certain dangerous trades, but these reports get out of date very quickly, since industrial processes change rapidly and basic mortality also seems to change.

Social insurance, with its principle of broad sharing, does not require meticulous assessment of the risks of individuals but, as previously noted, the substantial saving of lives resulting from improved sanitation and safety provisions in industry will mean that an increasing proportion of workers and their wives may be expected to attain age 65. Thus we may count on a substantial increase in the number surviving to receive retirement benefits, accompanied by a relatively less substantial decrease in the number whose deaths give rise to survivor benefits. On balance such a trend defers and increases costs.

^{19/} Derived from statistics in The Spectator Insurance Year Book, 1944, p. 137A.

^{20/} Metropolitan Life Insurance Company, "Longevity of Wage-Earners Increases in First Year of War," Statistical Bulletin, August 1943.

In contrast to industrial workers, the agricultural population has had much better than "average" mortality, although the relative improvement in recent decades has been much less than that of industrial workers. Any great shift from agricultural to industrial occupations, or vice versa, would have corresponding effects on mortality. In our limited coverage system, such shifts might affect costs substantially. On the other hand, there are relatively many colored lives in agriculture and domestic service which would produce an opposite effect.

A study of trends of death rates over the last 40 years, by causes of death reveals an individual trend under each cause.^{21/} The greatest increase in death rates was for heart disease; the rate per 100,000 population more than doubled from 137 in 1900 to 293 in 1940. The death rate from cancer almost doubled, from 64 to 120, while the only other significant increase was for diabetes, which rose from 11 to 27. The greatest improvement in death rates came in tuberculosis, for which the rate was 194 in 1900 and 46 in 1940. The decline in the pneumonia rate was almost as striking, from 202 to 70. Some diseases have been almost eradicated during the last 40 years--typhoid fever with a rate of 31 in 1900, reduced to 1 per 100,000 population; diphtheria, with a rate of 40, reduced to 1; scarlet fever, reduced from 10 to 1; and measles, from 13 to 1.

All these are crude rates without regard to age, sex, or race. Specific death rates are also available by age, sex, and race. Tuberculosis, pneumonia, nephritis, and syphilis show particularly high death rates for the nonwhite races. On the other hand, mortality from cancer, diabetes, and heart disease is relatively greater among the white. Considering sex differentials, we find that men have greater fatality rates from tuberculosis, heart disease, pneumonia, nephritis, and accidental death; women, from cancer and diabetes.

Maternal mortality has dropped from 8.0 per 1,000 live births in 1920 to 2.5 per 1,000 in 1943. States vary considerably--from 4.7 for New Mexico to 1.6 per 1,000 live births for Connecticut, North Dakota, Utah, and Washington.

Infant mortality was 179 per 1,000 live births in 1900 and has been reduced to 40 per 1,000 in 1943. Again the variation by State is considerable, from 92 for New Mexico to 30 for Connecticut in 1943.

In fatalities due to motor accidents, of course, there was a downward trend during the war while gasoline and rubber shortages curtailed use of automobiles. Since the end of the war the motor accident fatality rate has increased rapidly.

21/

U. S. Bureau of the Census, Vital Statistics Rates in the United States, 1900-1940, 1943.

The homicide rate had been steadily declining from about 10 per 100,000 population in 1933 to 6 in 1942 and continued to decrease during the war years, disregarding deaths among the armed forces.

The mortality of the foreign born likewise has shown a great decline in recent years^{22/} and is at almost the same level as that of the native born. From 1900 to 1940 the mortality rate for all ages declined 46 percent for the foreign born as against 39 percent for the native white; for ages 25-64 the decline was 47 percent for the foreign born and 35 percent for the native born.

Civilian mortality has remained fairly stable in spite of the war emergency. In fact, the death rate of women seems to have decreased while that of men has increased only slightly, on the whole.

The conclusion is inescapable that the mortality rate has improved enormously and is likely to continue to improve in the future. In some areas the eradication of disease-bearing pests has practically eliminated certain diseases prevalent centuries ago, and cures have been found for many others. We have better housing, better sanitation, better medical care than we have ever had before. On the other hand, some factors make for higher death rates. Perhaps the "rate of living"^{23/} is a strong factor in making heart disease the primary cause of death of the present day. The degenerative and constitutional diseases are taking a heavier toll than ever before, partly because more people escape the other diseases, partly because more people live to the higher ages in which degenerative diseases are more prevalent, and perhaps partly because of a lag in personal adaptation to new strains in modern life.

Some medical writers have expressed a feeling that new medicines which show such initially spectacular results may, in the longer run, prove somewhat debilitating to the general constitution of the patient and perhaps leave him easier prey to some other malady. Not enough is known of the ultimate effect of their use, particularly their repeated use. There is also some evidence that bacteria and viruses develop resistant strains, so that the new medicines may not continue to produce the present effective results. The new "magic treatments" and the social strains of the war, may have tended to relax inhibitions against contracting venereal disease. Should relaxation of precautions grow general, a net influence adverse to good health might result.

There are other counterbalancing forces. The psychological stimulation engendered by the urgency of maximum production during the first few years of the war has worn off. The vitality of the population may already have been sapped somewhat by the stresses and strains of

^{22/} Metropolitan Life Insurance Company, "Mortality of Foreign Born Almost at Level of Native Born," Statistical Bulletin, September 1944.

^{23/} Pearl, Raymond, The Rate of Living, 1928.

the war period. In some regions certain important elements in our food supply dropped below what is necessary for best nutrition. Servicemen returned from every point of the globe, some with diseases with which we are little prepared to cope.

Many overpopulated centers grew up during the war years around camps and war plants. Civilian doctors and nurses everywhere have been overworked. Hospitals have been crowded to capacity. In some places public sanitation measures have been unavoidably relaxed. It is hard to find clear indications that there will be immediate postwar improvement in these conditions. As the war went on, fewer people were being adequately trained in medicine, dentistry, and pharmacy. These and other war-born situations are potential threats to the health of certain segments of the population.

If in the war's aftermath we are fortunate enough to escape an epidemic in either the civilian or military population, precedents will be broken. With an interval of less than 30 years since our last disastrous epidemic, an epidemic is possible in even this enlightened age. The return of a majority of the servicemen seems to have occurred with little of the extra strains suggested.

Other "straws in the wind" augur a temporary break in the downward trend in mortality. If it can be said that our human population has been subjected to strain, how much more truly may the statement apply to our mechanical equipment. Heavy equipment in all industries has been subjected to a long strain. Potentially, we have a situation in which accidents could take a greatly increasing toll of lives. The extent to which the forces of conservation will outlast the emergency is very indeterminate.

Altogether, it is well to recognize the adverse as well as the favorable influences on our mortality. These briefly noted illustrations show what factors may slow down the long-range improvement which presumably is to be expected.

Immigration and Emigration

For several decades a heavy immigration stream poured into the United States, primarily from Europe. The total amount of this movement has been estimated by Warren Thompson for the period 1820-1938 as approximately 38 million persons of whom perhaps 30 million remained here.^{24/} The heaviest influx took place in the first decade of the

^{24/}

Thompson, Warren S., Plenty of People, 1944.

twentieth century and the next heaviest in the following decade. Immigration appears to have been greatest in 1907, next greatest in 1914. In the latter year, World War I broke out; immigration fell to low figures until after the end of the war and rose only to 800,000 in 1921. The greatest emigration took place in the decade 1910-20, when about 2 million people left the United States. The only excess of emigration over immigration was during the depression of the 1930's when emigration was slightly the greater. In recent years the average net immigration was only about 27,000 persons a year. The earlier heavy immigration accounted for a large immediate increase in our over-all population, and also stimulated the rate of increase because birth rates among the foreign born were higher than among the native population. At the present time, however, their birth rates are roughly, age for age, the same as those of the native population. Furthermore, most foreign born, though usually in the child-bearing ages on arrival, are now much older and the crude birth rate is very low.

What may we expect of immigration in the future? In their estimates of future population, Thompson and Whelpton have based some illustrations on an assumption of 100,000 net immigration per year. This figure is probably as reasonable as any, although it is possible that we will again have an increase. The annual immigration quota is about 154,000 according to the Immigration Act of 1924. Our national attitude toward restriction is being thoughtfully criticized. The quota for certain countries may be increased by congressional action. The net volume of immigration will also depend on the action of other countries on emigration.

Under present restrictions, immigration may be expected to have less and less effect on our future birth rate. The birth rates of most European countries have fallen to a level almost parallel with that of the United States; in fact, the birth rates of Great Britain, France, Sweden, and many other countries are less than ours. The Balkan countries have higher birth rates, Russia probably the highest, but these countries have relatively insignificant quotas under our present law.

Over the long range the birth rate has decreased enormously, particularly in the twentieth century. The death rate has also improved greatly and the decline began much earlier than that of the birth rate. The earlier decline of the death rate due to advances in sanitation, medicine and improved living standards effected great population increases which were maintained for several decades when rapidly falling birth rates checked the increase in population. Immigration has come down from the large quotas of previous years to a mere dribble in the 1930's and during World War II. The resultant effect of these three forces is a slowing down of the rate of increase in the population. This more gradual increase in the population will possibly continue until near the end of this century, when the population may attain its peak of some 150 million to 180 million. Under the lower illustration the peak may come earlier, say about 1980, while under the higher, it may come about 2000.

Marriage and Divorce Rates

The family is the fundamental unit on which our whole social and economic structure rests. The composition of the family group is also one of the bases for determining old-age and survivors insurance benefits. Therefore, the Social Security Administration is concerned with data on family composition--primarily marital and parental status. The National Office of Vital Statistics is now considering a plan to start the record of an individual in the State of his birth and the record of a family in the State in which marriage occurs.

The United States is the only major nation that has not had a Nation-wide system for collecting statistics on marriage and divorce. Collection of data on marriage licenses issued was resumed in 1943, under the Population Division of the Bureau of the Census. Since vital statistics are maintained by the States under various systems and degrees of completeness and decentralization, it is difficult to compile and interpret such statistics on a national basis. Only 26 States maintain marriage-record statistics under a centralized State registration office, and only 23 of these present such statistics by age, race, and previous marital status. Statistics are maintained for resident brides and grooms who are married in the State of residence. Marriages occurring outside these States, but within the collection area, are allocated to the State of residence; marriages contracted outside the collection area cannot be so allocated.

In spite of the prolongation of education, marriage is currently occurring at younger ages than ever before. The 1940 census shows that a higher percentage of both men and women 15 years of age and over are married than in former census years. Only for the last census does it

Year	Married persons as percent of population--			
	Age 15 and over		Aged 20-24	
	Male	Female	Male	Female
1890.....	54%	57%	19%	47%
1900.....	55	57	22	47
1910.....	56	59	24	50
1920.....	59	61	28	52
1930.....	60	61	28	52
1940.....	61	61	27	51

appear that the percentage has fallen at all, and this difference may have been due to the relatively heavy unemployment in early 1940 as compared with early 1930. Undoubtedly increase in real wages tends to speed up the time of marriage. This tendency has been well illustrated in the experience in recent years, although statistics have probably

been influenced more by the war than by higher wages. Another contributing factor is the general acceptance of the maintenance of a job by the wife after marriage. The record shows that marriages have been on the increase in 1940, 1941, and 1942, but fell off in 1943 and 1944.

Marriages and divorces per 1,000 population from 1915 through 1944 are shown in table 5. For marriage, the rate was 10.0 per 1,000 population in 1915. Since that time it has been above this figure in nearly every year except during the depression. Before 1940 the highest rate was 12.0 per 1,000 in 1920, immediately after World War I. The rate has increased rapidly during recent years, especially since the war began in Europe in 1939, and set a record of 13.1 in 1942. The rate of 12.6 in 1941 was the second highest rate ever recorded in this country. The number of marriages in 1942 attained a peak of 1.8 million, but in 1943 there was a drop of some 180,000 or 10 percent from this peak. There was a further decrease in 1944 of about 7 percent from this peak. With the return of the servicemen from overseas there should again be an increase in the marriage rate.

What is the marriage rate of women according to age? The answer is provided by table 6, which shows the ratio of the number marrying to those single, for each quinquennial age group through 79, and also the rates for the widowed, the divorced, and the widowed and divorced combined (the previously married). The probability that a single woman will marry within any one year, of course, depends on her age; the highest probability is about 20 percent at ages 20-24. This rate is greatly exceeded by that of 44 percent (also for ages 20-24) for the divorced women which, with the lower rate of 13 percent for the widowed, makes an average of 35 percent for the previously married. This rate for the previously married is higher at all ages than the rate for the single. The marriage rate of the divorced is the highest throughout, while that of widows is higher than that of single women at all ages above 35. It should be stated here that these rates are based on the experience of only 23 States during the year 1940. They seem fairly representative, however, because they include not only the large States, such as New York, Pennsylvania, and Michigan, but also a good cross section of the Southern States, such as Alabama, Florida, Mississippi, and Virginia.

The age-specific marriage rate for women is higher than that for men up to about age 24, after which the marriage rate for men is higher, because men ordinarily marry women younger than themselves. Among those marrying for the first time, the average groom is about 27 years old, the average bride about 24. These averages, however, are higher than the respective modal ages of marriage, that is, the ages at which marriages are most numerous. The modal age is about 24 with a rate of about 18 percent for single men, and about 22 with a rate of 30 percent for single women. For those remarrying, the bride and groom are, of course, likely to be older, the man's average age being 42, the woman's 37. For the age group 45-49 the marriage rate for men is about twice that for

Table 5.--Marriage and divorce rates

Year	Marriages		Divorces		Divorces as percent of marriages	
	Number <u>1/</u> (in thousands)	Rate per 1,000 population <u>2/</u>	Number <u>3/</u> (in thousands)	Rate per 1,000 population <u>2/</u>	In same year	Average of 10 preceding years <u>4/</u>
1915....	1,008	10.0	104	1.0	10.3	11.2
1916....	1,076	10.6	114	1.1	10.6	12.0
1917....	1,144	11.1	122	1.2	10.7	12.4
1918....	1,000	9.7	116	1.1	11.6	11.7
1919....	1,150	11.0	142	1.3	12.3	14.0
1920....	1,274	12.0	171	1.6	13.4	16.5
1921....	1,164	10.7	160	1.5	13.7	15.0
1922....	1,134	10.3	149	1.4	13.1	13.8
1923....	1,230	11.0	165	1.5	13.4	15.0
1924....	1,185	10.4	171	1.5	14.4	15.2
1925....	1,188	10.3	175	1.5	14.7	15.4
1926....	1,203	10.2	181	1.6	15.0	15.7
1927....	1,201	10.1	192	1.6	16.0	16.5
1928....	1,182	9.8	196	1.6	16.6	16.7
1929....	1,233	10.1	201	1.7	16.3	16.9
1930....	1,127	9.2	192	1.6	17.0	16.0
1931....	1,061	8.6	184	1.5	17.3	15.5
1932....	982	7.9	160	1.3	16.3	13.7
1933....	1,098	8.7	165	1.3	15.0	14.2
1934....	1,302	10.3	204	1.6	15.7	17.8
1935....	1,327	10.4	218	1.7	16.4	18.9
1936....	1,369	10.7	236	1.8	17.2	20.0
1937....	1,438	11.2	249	1.9	17.3	21.0
1938....	1,319	10.2	244	1.9	18.5	20.1
1939....	1,375	10.5	251	1.9	18.3	20.5
1940....	1,595	12.1	264	2.0	16.5	20.4
1941....	1,695	12.7	293	2.2	17.3	21.6
1942....	1,772	13.2	321	2.4	18.1	22.4
1943....	1,577	11.8	359	2.6	22.8	24.2
1944....	1,452	11.0	400	2.9	27.5	26.7
1945 <u>5/</u>	1,618	12.3	502	3.6	31.0	32.9

1/ Through 1939, U. S. Bureau of the Census, "Marriages in U. S., 1914-1943," Series PM-1, No. 1; beginning 1940, National Office of Vital Statistics, Vital Statistics-Special Reports, Vol. 23, No. 9.

2/ Rates based on estimates of midyear population except for 1940, which is based on enumerated population.

3/ Through 1939, Department of Commerce, Statistical Abstract of the U. S., 1943; beginning 1940, National Office of Vital Statistics, Vital Statistics-Special Reports, Vol. 23, No. 9.

4/ Through 1939, Metropolitan Life Insurance Company, Statistical Bulletin, October 1943; beginning 1940, calculated in this office.

5/ Preliminary.

Table 6.--Marriage and remarriage rates per 1,000 unmarried women by age, 23 States, 1940

Age	Marriage rates of single women	Remarriage rates of--		
		Widows	Divorced	Widowed or divorced
Total..	88.2	11.6	138.6	26.8
15-19.....	50.9	62.3	371.2	237.0
20-24.....	194.6	131.1	436.5	329.1
25-29.....	153.5	118.9	328.2	246.5
30-34.....	81.4	78.4	211.2	147.0
35-39.....	41.9	49.6	127.7	80.2
40-44.....	21.6	32.9	84.5	47.2
45-49.....	12.2	22.3	58.2	28.9
50-54.....	6.8	13.3	37.3	16.0
55-59.....	3.7	8.3	22.4	9.3
60-69.....	1.5	3.4	11.4	3.6
70-79.....	.4	.7	3.9	.8

Source: Derived from special tabulation made for the Office of the Actuary by the Bureau of the Census.

women. Men still marry in appreciable numbers in the sixties, while it is rather rare for women of this age to enter wedlock. The increase in the marriage rate during the recent war years has been greatest at ages under 35.

The marriage rate differs considerably by region. The chances of marriage are greatest in the South where about 8 percent of all eligible persons, male and female aged 15 and over, are wed in the course of the year. In the far Western States this ratio is only 5 percent compared with an average of 6 percent for the country as a whole. Statistics indicate that the highest chances of marriage for women occur in the rural areas.

Table 7 shows the percentage distribution of men and women by marital status and age, both for the 1940 census and for the urban sample of the (Richmond) Family Composition Study,^{25/} 1935-36. The widowed and divorced have been combined into an ex-married group in each case. The ex-married category of the 1940 census excludes, but the Family Composition Study includes persons separated, but not divorced. Since the latter survey defined the separated as any couple that had not been living together for the last 30 days, the proportion of ex-married persons is much higher than that in the census. The ex-married category is relatively twice as high in the Family Composition Study as in the 1940 census for the younger age groups, but for all men it is 7.1 percent against 5.6 percent. For women, the percentages are 17.6 and 13.2, respectively. It will be noted that married women represented only 55 percent in the Family Composition Study as against 61 percent in the 1940 census. For men the percentages are practically identical in the two sets of data. However, the married men of the census are a relatively high proportion of the total in the younger ages, 15-34. The Family Composition Study is an urban sample and therefore is not representative of the country as a whole in enumeration of children, especially in view of the fact that it is also a depression sample taken when younger children were relatively not as numerous as in later years when the birth rate improved. Were only the urban portion of the census data used, the comparison with our present social security coverage might be closer than the urban sample of the Family Composition Study.

The Bureau of the Census has worked out a normal or "expected" number of marriages for future years through 1950.^{26/} It is based on previously reported marriages per 1,000 women in the various age groups,

^{25/}

A study made by the Bureau of Research and Statistics of the Social Security Board, from schedules collected in the National Health Survey of 1935-36. It has been referred to as the Richmond Family Composition Study in previous publications of this office. The term Family Composition Study will be used hereafter in this study.

^{26/}

Bureau of the Census, The Wartime Marriage Surplus, Series FM-1, No. 3, Nov. 12, 1944.

Table 7.--Percentage distribution of men and women by age and marital status

Age	1940 census			Family composition study, 1935-36		
	Single	Married	Ex-married	Single	Married	Ex-married
Men						
Total..	33.2	61.2	5.6	31.3	61.6	7.1
15-19.....	98.3	1.7	0	99.2	.7	.1
20-24.....	72.2	27.3	.4	76.4	22.3	1.4
25-29.....	36.0	62.7	1.3	37.5	59.2	3.2
30-34.....	20.7	77.2	2.1	19.6	76.0	4.3
35-39.....	15.3	81.6	3.1	12.7	81.8	5.5
40-44.....	12.6	83.2	4.1	9.5	84.2	6.3
45-49.....	11.2	83.6	5.2	7.9	84.4	7.7
50-54.....	11.0	81.9	7.1	7.4	82.9	9.7
55-59.....	10.8	79.9	9.3	6.8	81.9	11.4
60-64.....	10.5	76.7	12.8	6.7	78.0	15.3
65-69.....	10.3	71.9	17.8	6.2	72.6	21.2
70-74.....	9.9	64.9	25.1	5.7	65.3	28.9
75-79.....	9.3	56.1	34.4	5.3	56.4	38.2
80-84.....	8.7	45.8	45.5	4.3	45.9	49.7
85 and over.	7.9	33.0	59.1	3.8	32.8	63.3
Women						
Total..	25.8	60.9	13.2	27.0	55.4	17.6
15-19.....	88.1	11.6	.2	91.7	7.1	1.2
20-24.....	47.2	51.3	1.5	54.6	40.6	4.8
25-29.....	22.8	74.1	3.1	26.2	65.6	8.2
30-34.....	14.7	80.3	4.9	15.2	74.2	10.6
35-39.....	11.2	81.5	7.3	10.8	75.7	13.5
40-44.....	9.5	80.6	9.9	9.1	75.3	15.6
45-49.....	8.6	78.3	13.1	8.0	72.2	19.7
50-54.....	8.7	73.3	18.0	8.6	66.1	25.3
55-59.....	8.7	67.2	24.1	7.9	60.3	31.8
60-64.....	9.3	58.0	32.7	8.8	49.9	41.3
65-69.....	9.4	46.5	44.1	8.0	39.5	52.5
70-74.....	9.5	34.3	56.1	8.1	28.7	63.2
75-79.....	9.2	23.0	67.8	7.2	19.0	73.7
80-84.....	9.2	13.5	77.4	6.8	9.4	83.8
85 and over.	8.0	6.7	85.3	6.3	4.1	89.5

Source: U.S. Bureau of the Census, Wartime Marriage Surplus, Series FM-1, No. 3, Nov. 12, 1944.

which, if applied to the female population in these age groups, will produce the total number of marriages that may be "expected" in a normal year. This figures out a little better than 10.0 marriages per year per 1,000 total population. On the basis of this table, we have had an excess of 1,185,000 marriages in the years 1940-44 over the normal. On the other hand, there had been a deficiency of 778,000 marriages during the depression years 1930-34.

Of those marrying, about one-eighth have been married previously, this proportion applying to both brides and grooms. Of the previously married, about three-eighths were previously widowed and five-eighths previously divorced, the proportions applying fairly closely to both brides and grooms. Since there are at least six times as many widows in the United States as divorced women, this means that the rate of remarriage of divorced women is about ten times that of widows. The explanation for this big variation in the two rates is that most widowed women are concentrated in the older age groups, in which marriages are relatively infrequent, while divorced women are relatively more common in the younger age groups in which the marriage rate is higher. Some seek divorce to remarry. On the average, widows have more children than divorcees. Remarriage depends on the attained age and on the duration of widowhood or of the divorced status. The highest rate of remarriage occurs in the second year after termination of the previous marriage. This is true for widows and probably also for divorced.

About 95 percent of the previously married have been married only once before; some 5 percent have been married twice before; while a small fraction of 1 percent has had three or more previous matrimonial ventures. Multiple marriages among the previously widowed are relatively greater than those among previously divorced persons--for one thing, they have lived longer, on the average. The modal age group for widows who remarry is 40-44 years, while that for divorced women is 25-29.^{27/}

Probably the best information on remarriage rates for widows is the American Remarriage Table^{28/} (by duration of widowhood) which was developed from and is frequently used in workmen's compensation. It is possible that remarriage rates under old-age and survivors insurance experience will differ greatly from workmen's compensation experience and from experience for the population as a whole. Benefits under workmen's compensation are generally more liberal than under old-age and survivors insurance. Both types of benefits usually cease on remarriage of the widow. Consequently, the size of the benefit as well as the fact of its termination on remarriage may well have an influence on

^{27/} Statistics derived from special tabulation made for Office of the Actuary by the Bureau of the Census (table 6).

^{28/} Roeber, Wm. F., and Marshall, Ralph M., "An American Remarriage Table," Proceedings, Casualty Actuarial Society, Vol. 19, 1932-33.

remarriage rates. Remarriage rates are probably influenced by the number of dependents, although experience (based on a rather inadequate sample, however) indicates that the widow with one or two children has about the same chance of marriage as one the same age without children. Under the present program, a widow loses her rights to old-age and survivors insurance benefits on remarriage, although her children would continue to receive their allowances. Reliable recorded divorce rates in the United States are lacking. The estimated national rate is based on the divorces occurring in about 30 different States (table 5). It is estimated that 264,000 divorces occurred in the United States in 1940, a rate of 2.0 per 1,000 population and the highest on record. In fact, before World War I we had a rate of 1.0 per 1,000 population, while in 1920, soon after the war, it increased to 1.6 per 1,000. If the divorce rate increases proportionately after this war, we may expect to have a rate of more than 3 per 1,000 population. The prolonged separation and diverging interests of husbands and wives, during wartime, and perhaps also the increasing employment of women may tend to increase the divorce rate. The basic permanent factor tending toward increase in divorce is the changing cultural attitude toward the "sanctity" of marriage and "immorality" of divorce. Within a generation much of the social stigma associated with divorce has disappeared.

At the same time, however, many factors may counterbalance these influences. The large number of births in these years will help to stabilize many families. The considerable number of States which require premarital blood tests and a waiting period for marriage licenses will have the effect of discouraging numerous hasty marriages that might otherwise have ended in divorce. After hardships overseas, many returning servicemen will be glad to found a home and family. Since divorce rates have declined with declining business and increased in prosperous times, we may expect that the divorces in the future will vary according to business conditions. If the course of the divorce rates of the future parallels that in the previous postwar period, we may expect an increased rate for several years, and then a decrease for a short period, followed by an era of increasing divorce rates reaching a new high level. Divorce rates have important connotations in old-age and survivors insurance, since a divorced woman loses her rights to wife's and widow's benefits based on her former husband's wage record; their children, if dependent on the earnings of the father, might be eligible for child's benefits based on that wage record.

In 1940 there was one divorce for every six marriages. If, however, the divorces of a year are related to the average annual number of marriages in the preceding 10 years, one divorce occurred for every five marriages.^{29/}

^{29/}

Metropolitan Life Insurance Company, "Will Divorce Increase in the Postwar Years?", Statistical Bulletin, December 1943.

The fact that divorce precludes old-age and survivors insurance benefits to the divorced wife may influence divorce rates of the future; however, it might also be argued that first-marriage rates might be generally stimulated by the potential benefits. Remarriage, on the other hand, will often terminate widow's benefits but may also be the beginning of a period in which new benefit rights will be acquired as wife of the second husband.

Relative Ages of Husband and Wife

A study of marriage statistics is incomplete without some data on relative ages of husband and wife. Eligibility for wife's benefits is contingent on the ages of both husband and wife. The factor of relative ages of husband and wife is of equal importance in estimating immediate or deferred benefits for widows, since age distributions of widows at time of widowhood must be calculated from the age distributions of wives of deceased male workers at time of the husband's death.

The relationship between the ages of husband and wife at the time of the husband's death or entitlement to primary benefits is a function of (a) the two-dimensional frequency distribution of marriages by ages of groom and bride at date of marriage and (b) the probabilities of termination of marriage (either through divorce or death) for each combination of ages of groom and bride. It would be theoretically correct to compute from these the age distribution of the wives of a cohort of male workers at the time of primary benefit entitlement or the age distribution of widows at time of widowhood. In practice, however, this is not generally done, since (a) this form of computation is most laborious, involving the consideration of numerous actuarial factors and the performance of very complicated computations, (b) data by relative age of groom and bride at time of marriage or remarriage are very incomplete,^{30/} and (c) relative ages of husband and wife at the time of the husband's death or entitlement may be fairly satisfactorily estimated from census or similar data relating to the living population or from actual claims experience under the insurance program.

A special tabulation of married couples in the 1940 population, distributed by age groups of both husband and wife, was prepared by the Bureau of the Census from the Sixteenth Decennial Census, based on the 5-percent sample data. This was the first Nation-wide tabulation of the kind ever made from census data. Table 8 is a percentage distribution of wives by age of husband, based on the 1940 census tabulation and more detailed data by single years of age for husband and wife aged 50 and over.

^{30/}

Data on relative ages of groom and bride at time of marriage are now beginning to be tabulated in a number of States, and some compilations have recently been made by the Bureau of the Census. Even though these data may not be used directly in benefit computations, they indicate trends which should be observed in studying husband-and-wife age relationships.

Table 8.--Percentage distribution of married couples by age,
based on 1940 census 1/

Age of wife	Age of husband								
	Total	Under 20	20-24	25-29	30-34	35-39	40-44	45-49	50-54
All ages.	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Under 20....	1.75	22.27	27.78	4.12	.82	.28	.12	.06	.05
20-24.....	8.83	53.81	63.18	40.38	10.67	2.87	1.00	.45	.23
25-29.....	13.47	19.07	7.22	47.38	41.58	14.10	4.84	1.71	.76
30-34.....	13.86	2.29	.88	6.68	39.80	39.46	14.80	5.32	2.17
35-39.....	13.35	.67	.25	.89	5.78	37.21	36.69	16.09	6.39
40-44.....	12.17	.43	.15	.19	.83	4.70	35.11	35.06	16.41
45-49.....	10.99	.27	.12	.06	.19	.87	5.77	34.63	35.74
50-54.....	8.94	.11	.06	.05	.09	.17	1.03	4.92	31.39
55-59.....	6.62	.20	.07	.04	.04	.06	.29	1.07	5.09
60-64.....	4.61	.28	.07	.02	.02	.06	.05	.26	1.08
65-69.....	3.17	.33	.08	.05	.06	.17	.22	.33	.28
70-74.....	1.49	.27	.07	.07	.06	.03	.06	.08	.07
75-79.....	.75	---	.07	.07	.06	.02	.02	.02	.02
80-84.....	---	---	---	---	---	---	---	---	.05
85-89.....	---	---	---	---	---	---	---	---	.14
90 and over.	---	---	---	---	---	---	---	---	.13
	---	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90 and over
All ages.	---	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Under 20....	---	.04	.05	.03	.04	---	---	---	---
20-24.....	---	.15	.14	.10	.07	.05	---	---	---
25-29.....	---	.39	.36	.18	.14	.14	.12	---	2.88
30-34.....	---	.99	.61	.47	.13	.30	.20	.15	4.00
35-39.....	---	2.64	1.33	.87	.52	.41	.33	.40	6.00
40-44.....	---	6.75	3.10	1.82	.97	.66	.50	.60	8.00
45-49.....	---	18.14	7.47	4.19	2.08	1.52	1.01	1.45	6.82
50-54.....	---	34.89	19.55	9.28	4.93	2.89	2.01	2.72	4.34
55-59.....	---	29.18	34.27	19.99	9.09	5.80	3.86	3.08	4.13
60-64.....	---	5.11	27.01	33.36	20.92	10.78	7.33	5.68	6.20
65-69.....	---	1.11	4.73	24.26	34.41	24.15	15.53	13.10	10.74
70-74.....	---	.22	.83	3.72	22.41	32.47	25.21	15.10	8.47
75-79.....	---	.05	.18	1.21	3.29	17.91	28.80	25.84	10.12
80-84.....	---	.09	.13	.26	.60	1.75	9.05	17.51	12.60
85-89.....	---	.15	.15	.16	.25	.82	3.78	7.97	8.68
90 and over.	---	.10	.09	.11	.15	.35	2.27	6.40	7.02

1/ Families with male head married and wife present, by ages of husband and wife.
Based on 5 percent sample of the 1940 census.

From this latter information a percentage distribution of data by single years for husbands aged 55-73 has been crossed with data for wives aged 51-75 (table 9). These figures, of course, are heaped in accordance with the original data, not only for husbands' ages ending in 0 or 5 but also for wives' ages ending in 0 or 5. On this account, perhaps the better series of percentages is that for the totals.

Various other sample tabulations showing relative ages of husband and wife have also been made on less than a Nation-wide scale. The National Health Survey conducted in 1935-36 made possible the tabulation of such data, which appear in part in the Social Security Bulletin^{31/} but are perhaps rather out of date by this time.

Table 10 gives a percentage distribution by age of wife and husband for the 65,353 married male workers to whom old-age and survivors insurance primary benefits were awarded in 1941.

Tabulations of data on 1941 awards of old-age and survivors insurance benefits also show relative ages of deceased workers and their widows (table 11). Married male workers represented in primary-benefit and death-benefit awards of later years show the same general characteristics as to relative age of husband and wife as those represented in awards in 1940 and 1941. In general, it is found that workers receiving primary-benefit awards show a greater average proximity of the wife's age to that of the husband than is found among either the deceased workers represented in awards or the urban census data of 1940 for married men, wife present, of the same ages. Tables 12 and 13, obtained partly from interpolation of the tabulated data, illustrate this situation. Table 12 makes use of the more recent figures, while table 13 uses data for 1940 throughout.

The greater average proximity of the wife's age to that of the husband found in the primary-benefit data may arise from the fact that some selection in filing primary-benefit claims results from the wife's age. For example, the worker at age 68 with a wife aged 63 will be less likely to file his claim for primary benefits, other factors being equal, than the 68-year-old worker whose wife is 66 and whose primary benefit will usually be supplemented by a wife's benefit. Obviously, no selection of this type arises in death claims. Death claims may eventually prove even more suitable than census data for making benefit estimates, since the death claims represent the insured-worker group and presumably will not be affected by "heaping" or other misstatements of age to the same extent as census data.

All the data indicate increase in average seniority of the husband over the wife with advance in the age of the husband. The older in life a man marries - or remarries - the lower his bride's age is

^{31/}

See Sanders, Barkev S., "Family Composition in the United States," Social Security Bulletin, Vol. 2, No. 4 (April 1939), pp. 9-13, and related articles in subsequent issues.

Table 9.--Percentage distribution of married couples by differential age 1/ of husband and wife, 1940 census

Age <u>1/</u> of husband	Wife younger than husband by--						Same age	Wife older than husband by--	
	6 or more years	5 years	4 years	3 years	2 years	1 year		1 year	2 or more years
Total.	43.0	7.4	7.5	7.8	8.3	7.3	7.5	3.4	7.8
55.....	37.9	9.0	6.5	8.4	8.7	8.3	8.6	3.8	8.8
56.....	39.9	6.3	8.8	7.7	8.6	8.2	8.2	3.7	8.6
57.....	39.3	7.6	7.3	8.5	8.8	7.7	7.9	3.9	9.0
58.....	40.2	6.6	8.1	8.0	8.5	7.1	8.7	4.0	8.8
59.....	40.6	7.4	7.8	7.8	8.4	8.3	7.8	3.9	8.0
60.....	41.6	7.7	7.4	7.7	9.0	7.1	8.3	2.9	8.3
61.....	40.5	7.1	7.3	8.3	8.6	8.8	7.6	3.9	7.9
62.....	43.4	7.1	8.2	7.6	9.1	6.4	7.4	3.1	7.7
63.....	44.4	7.5	7.6	8.3	6.5	7.5	6.9	3.6	7.7
64.....	44.9	7.3	8.4	6.4	7.5	7.0	7.3	3.9	7.3
65.....	45.9	8.7	5.8	7.1	8.2	6.6	7.8	2.5	7.4
66.....	47.4	5.7	6.8	7.8	8.3	7.3	6.0	3.5	7.2
67.....	45.7	7.0	7.8	8.3	8.8	6.1	6.7	2.9	6.7
68.....	47.2	6.7	7.7	8.7	6.5	6.0	6.8	3.3	7.1
69.....	47.1	7.8	8.6	6.0	7.1	7.0	6.3	3.6	6.5
70.....	47.6	8.8	5.9	6.5	8.6	5.9	7.0	2.4	7.3
71.....	47.9	6.5	7.4	8.3	7.6	7.7	5.6	2.9	6.1
72.....	49.4	6.9	7.6	7.0	7.9	5.5	6.3	3.4	5.8
73.....	50.9	7.2	7.8	7.3	6.0	6.6	6.6	2.6	5.0

1/ Age last birthday.

Source: U.S. Bureau of the Census, special tabulation prepared for Office of the Actuary.

Table 10.--Married male workers represented in 1941 awards of primary benefits (1941 entitlements), and percentage distribution by age of husband and wife

Age of worker <u>1/</u>	Total workers	Age of wife <u>1/</u>								
		Under 50	50-54	55-59	60-64	65-69	70-74	75-79	80 and over	Unknown
Total.....	65,353	4.2	6.1	14.9	27.5	27.8	11.2	3.0	0.6	4.7
65.....	21,116	5.9	9.4	22.8	36.8	16.7	2.4	.3	.1	5.6
66.....	6,923	5.2	7.0	19.5	34.3	24.2	3.4	.6	.1	5.7
67.....	5,829	5.1	6.1	16.6	31.0	29.5	4.7	.7	.1	6.2
68.....	5,094	4.1	5.9	13.3	26.2	37.8	6.5	.9	.1	5.2
69.....	4,664	3.6	4.7	11.0	25.6	40.1	9.0	1.2	.3	4.5
70.....	4,570	2.8	4.3	8.8	22.2	41.1	14.8	1.9	.1	4.0
71.....	3,836	2.8	3.6	8.0	19.8	41.4	19.3	1.9	.4	2.8
72.....	3,073	2.6	3.4	6.4	16.6	37.9	25.6	3.6	.5	3.4
73.....	2,520	1.8	3.1	6.0	15.2	35.1	29.8	5.6	.5	2.9
74.....	1,967	2.3	2.5	4.8	12.7	31.6	34.7	7.7	.7	3.0
75-79.....	4,793	1.8	2.0	4.4	10.1	24.3	34.8	17.6	2.6	2.4
80-84.....	882	.8	1.6	2.8	8.0	13.9	26.3	31.7	12.9	2.0
85 and over....	86	2.3	1.2	1.2	7.0	11.6	14.0	23.2	36.0	3.5

1/ Age at birthday preceding or during month of husband's entitlement to primary benefit.

Source: OASI Substantive Statistics, 1941.

Table 11.--Married male workers who died in 1941 and were represented in 1941 awards and percentage distribution by age of worker and widow

Age of worker <u>1/</u>	Total workers	Age of widow <u>1/</u>													
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75 and over	Un-known
Total..	77,492	0.6	3.5	5.3	6.8	8.3	10.6	13.4	14.3	13.2	9.9	6.5	2.8	1.0	3.8
Under 20....	23	52.1	39.1	---	---	---	---	---	---	---	---	---	---	---	8.8
20-24.....	1,125	21.2	62.7	10.7	1.2	.5	.4	.1	.2	.1	.1	---	---	---	2.8
25-29.....	3,105	4.0	40.9	41.5	7.1	1.1	.3	.1	.1	.1	---	---	---	---	4.8
30-34.....	4,336	.9	9.8	35.1	36.6	6.7	1.3	.4	---	---	---	---	---	---	9.2
35-39.....	5,350	.2	3.0	12.3	33.0	32.1	6.5	1.2	.3	.1	.1	---	---	---	11.2
40-44.....	6,962	---	.7	4.2	12.6	32.0	32.5	7.7	1.5	.5	.1	---	---	---	8.2
45-49.....	9,101	---	.3	1.5	4.4	12.8	31.6	34.2	7.9	1.8	.5	.1	---	---	4.9
50-54.....	10,959	---	.1	.6	1.9	4.8	13.9	32.9	32.8	7.7	1.7	.5	.1	---	3.0
55-59.....	11,903	---	.1	.2	.8	2.3	5.9	16.0	33.5	30.9	6.8	1.4	.4	.1	1.6
60-64.....	10,664	---	---	.2	.5	.9	2.7	7.2	17.2	33.5	29.0	6.3	1.1	.3	1.1
65-69.....	8,297	---	---	.2	.1	.6	1.4	3.3	7.8	17.8	33.1	28.9	5.1	1.0	.7
70-74.....	3,708	---	---	---	.1	.2	.7	2.0	4.7	8.9	17.0	37.1	24.4	4.4	.5
75-79.....	1,468	---	---	.1	.2	.5	.4	1.2	2.3	5.6	8.8	22.6	36.1	21.9	.3
80 and over.	491	---	---	---	---	---	.4	.6	1.6	3.7	8.1	14.0	26.5	44.8	.3

1/ Age at birthday preceding or during month of worker's death.

Source: OASI Substantive Statistics, 1941.

Table 12.—Average age of wife, 1940 census, urban areas, and of wife or widow of worker represented in 1941 awards of old-age and survivors insurance benefits, by age of husband aged 65 or over

Age ^{1/} of husband	Average age ^{1/} of wife		Average age ^{1/} of widow of male married workers represented in 1941 awards ^{2/}
	1940 census, urban areas	Male married workers represented in 1941 awards of primary benefits	
65.....	59.2	59.9	59.6
66.....	60.2	61.1	60.5
67.....	61.0	61.8	61.4
68.....	62.1	62.8	62.3
69.....	63.1	63.6	63.1
70-74.....	65.3	65.8	65.5
75-79.....	69.1	69.3	69.1
80-84.....	72.2	72.4	71.3
85 and over..	70.9	74.5	71.8

^{1/} Age at last birthday for census data and age at birthday preceding or during month of husband's entitlement or death for data from old-age and survivors insurance awards.

^{2/} Awards of monthly benefits or lump-sum payments based on wage records of workers who died in 1941.

Source: U.S. Bureau of the Census, 1940 census; OASI Substantive Statistics, 1941.

Table 13.—Percent of aged husbands with wife aged 60 and over and 65 and over, 1940 census, urban areas, ^{1/} and 1940 awards of old-age and survivors insurance benefits ^{2/}

Age ^{3/} of husband	Percent of husbands with--					
	Wife aged 60 and over			Wife aged 65 and over		
	1940 census, urban areas	1940 awards of old-age and survivors insurance benefits		1940 census, urban areas	1940 awards of old-age and survivors insurance benefits	
		Primary benefits	Death claims		Primary benefits	Death claims
65.....	57.0	66.2	{ ^{4/} 66.2	18.7	27.7	{ ^{4/} 31.7
66.....	62.5	71.4		25.6	35.6	
67.....	66.6	75.5		32.9	42.3	
68.....	72.0	80.0		42.2	50.7	
69.....	75.7	85.8	{ 83.5	48.7	60.8	{ 64.6
70-74.....	83.5	89.4		63.2	72.1	
75-79.....	89.5	94.2	87.5	79.1	85.4	74.9
80 and over..	91.0	94.7	94.2	83.9	88.6	83.6

^{1/} 1940 census data (special tabulation) on normal families, by age of husband and wife.

^{2/} OASI Substantive Statistics, 1940, tables 22-24 (unpublished).

^{3/} Age last birthday.

^{4/} Not available by single years of age.

likely to be in comparison with his own. Moreover, for any given age of the husband, the younger the wife the longer the marriage is likely to continue unbroken by death; to illustrate, the probability of joint survival for 30 years (into the future) of a couple consisting of a husband aged 40 and a wife aged 30 is greater than that of a couple with husband and wife both aged 40. There is no known evidence that the husband's own mortality differs from "average" because of the relationship of his wife's age to his own age.

While old-age and survivors insurance death claims will probably eventually become a satisfactory source of information for estimating future age relationships between husband and wife, the data are now too scanty and probably are biased to some extent by conditions peculiar to the early years of the insurance program. Moreover, age relationships between husband and wife in the population as a whole are likely to vary somewhat over the years with changes in mortality rates, changes in differential mortality by marital status, changes in marriage and divorce rates, and changes in relative ages at marriage. As remarked earlier, data on relative ages at marriage should be watched closely for their effect on age relationships in future years; even now a definite new trend seems evident. For example, because of changing concepts regarding marriage, there is said to be a less conscious effort than in the past for men to select wives younger than themselves, at least in first marriages. Moreover, unless divorce increases greatly, remarriage will probably be relatively less frequent because of the improved mortality of husbands and wives. If these assumptions are correct, the average disparity between ages of husband and wife in the older population of the future will tend to decrease.

All these aspects of the progress of the family are pertinent to scientific cost analysis. They help to determine the size of the population and its general make-up, the size of the beneficiary groups, and the productive groups who bear the costs of the program.

Family Composition

The census data of 1940 give an over-all view of marital status. Of the total men age 15 and over, one-third were single, about 61 percent were married, and about 6 percent were widowed or divorced. For women the corresponding distributions were 26 percent single, about 61 percent married, and 13 percent widowed or divorced. At 85 and over, only 8 percent of the men were single, only 33 percent married, and 59 percent widowed and divorced; the corresponding figures for women are 8, 7, and 85 percent. Thus the percentage of persons "ever married" is about the same (92 percent) for the men and women in our population. There are less than half as many ex-married men as ex-married women. This large difference is due not only to higher mortality rates but also to higher remarriage rates of men. The number of widows exceeds the number of widowers by about 3,500,000, while the number of divorced women exceeds only slightly the number of divorced men. Indeed, for ages 50

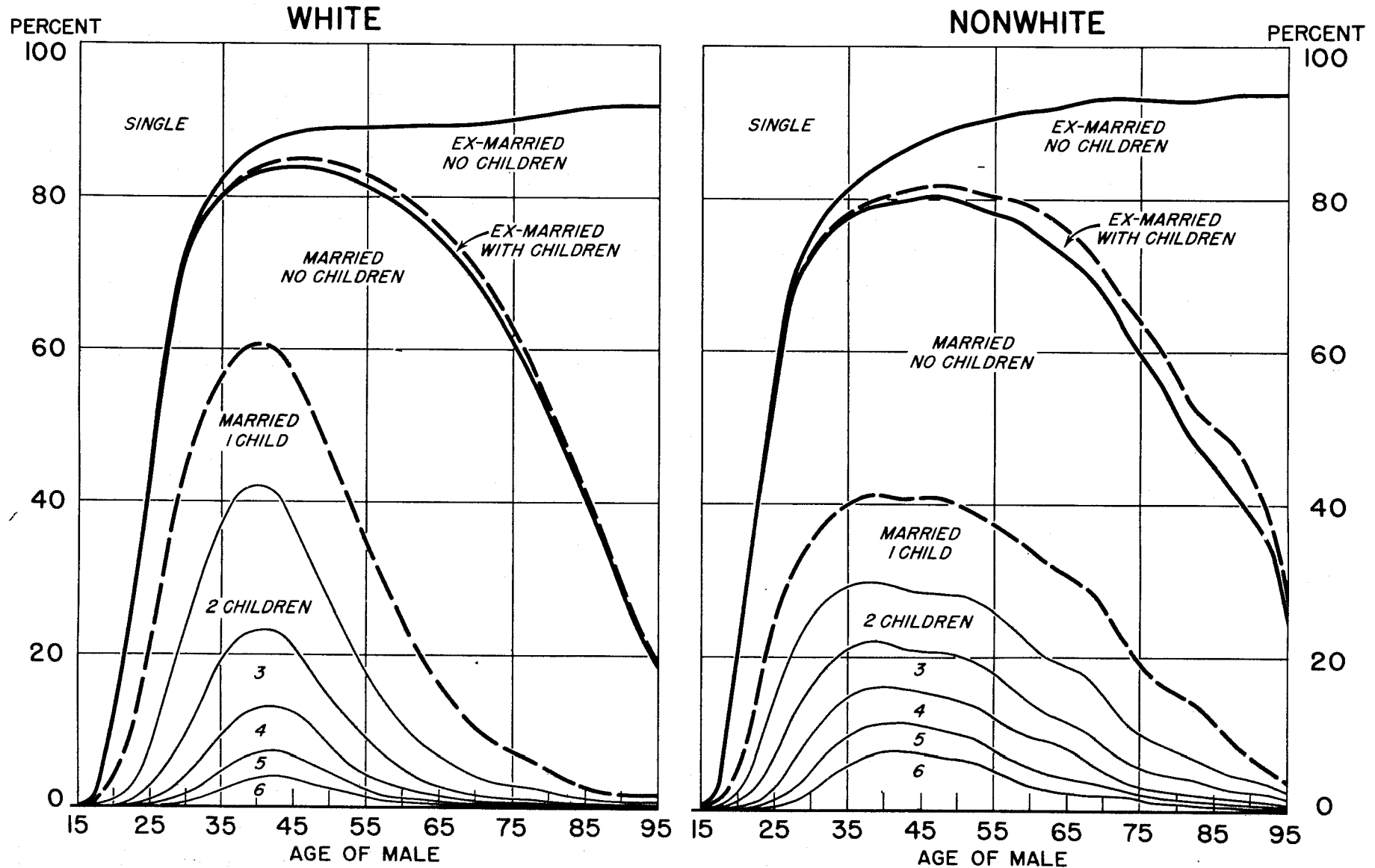
and over, divorced men are more numerous than divorced women. Throughout, the married category is the largest except at the extremes of youth and old age.

The 1940 census has made available a variety of statistics on family composition, making it possible to determine for married, widowed, and divorced persons the number who have no children, those with one child, and those with two, three, four, five, and six or more children. Unfortunately the biological or bio-legal family is not always the basis of the census family, which is defined as follows: "A private family comprises a family head and all other persons in the home who are related to the head by blood, marriage, or adoption, and who live together and share a common housekeeping arrangement. A person living alone is counted as a one-person private family. The family head sharing his living accommodations with one or more unrelated persons is also counted as a one-person private family." According to this definition of a family, it is evident that two bio-legal families living in the same house and sharing common housekeeping arrangements would probably frequently be counted as one family under the census definition. Three generations may live under the same roof; the older generation family may have two children under 18 and the younger generation family, one such child, but the count would probably be one family with three children instead of two families--one with two children and the other with one child. If the individual units were counted, the number of families would be greater and the number of children per family would be less.

With these limitations, charts 16 and 17 are presented to show the percentage distributions of the single, married, and ex-married with dependent children under 18. The percentage distribution by number of children is shown for the married, but the ex-married are divided only by presence or absence of children. For purposes of contrast, data for white and nonwhite men appear in one chart and for white and nonwhite women, in the other. For men, the married groups of the white and nonwhite appear to be almost equal in area, but the single group of nonwhite is probably less and the ex-married group greater than that of the white. Ex-married men with children are relatively more common among nonwhite than white races.

These relationships stand out still more clearly in the chart for women. A relatively larger number of Negro than of white women marry, and at earlier ages. Thus, the single group for nonwhite women at the younger ages is smaller, and the ex-married group is much larger than for white women. This is especially true for women with children, indicating, of course, the much heavier mortality of Negroes. The percentage of white women with children is much higher at age 35 than that for nonwhite women, but at age 55, and particularly at higher ages, it is considerably lower. This appears to be due mainly to the doubling up of families and therefore is not evidence that the nonwhite actually have more children. Perhaps the care of orphans by older people--say grandparents--also contributes to the fact that nonwhite women above

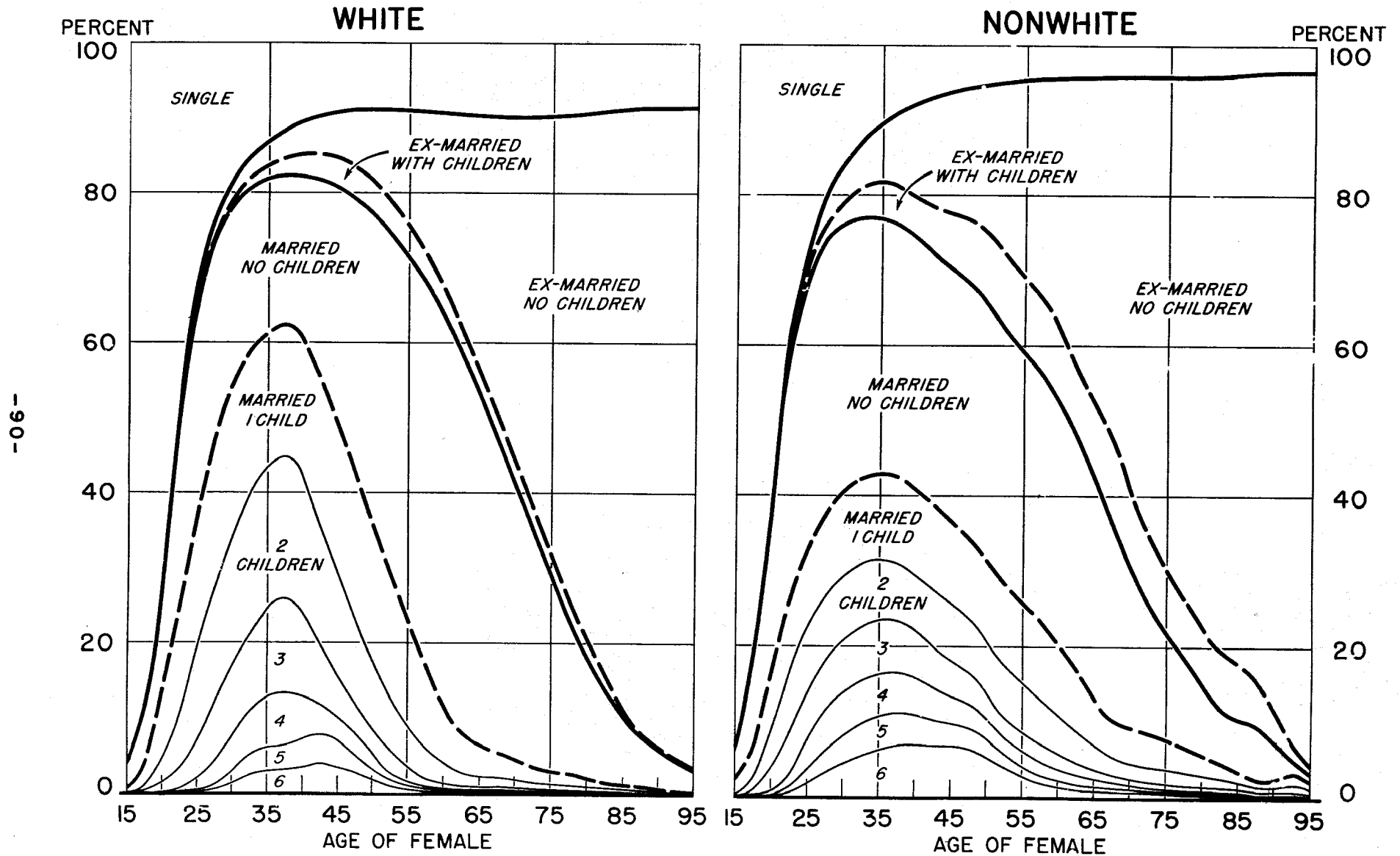
CHART 16.
PERCENTAGE DISTRIBUTION OF MEN BY MARITAL AND PARENTAL STATUS, 1940



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CHART 17.

PERCENTAGE DISTRIBUTION OF WOMEN BY MARITAL AND PARENTAL STATUS, 1940



-06-

age 65 have in charge a relatively large number of children compared to white women. These charts are consistent with the results presented in our previous discussion of mortality and birth rates of the white and nonwhite groups.^{32/} It should be remembered that many of the married and ex-married recorded as childless have children who have passed beyond age 18. Most children reported in the census data are the offspring of their parents; however, a fair proportion are adopted children, step-children, and foster children. These data can be used to estimate the entire number of children under age 18 in the population by sex and race of parents.

The Bureau of the Census has published a tabulation for 1940, giving the number of registered deaths of single, married, widowed, and divorced persons, by sex and race. By combining these data with the percentage distribution of the 1940 population by marital and parental status the number of children who became paternal, maternal, or complete orphans during 1940 has been estimated. There were 400,000 deaths among married men--355,000 white and 45,000 nonwhite. Of this total, 132,000 were fathers who left 294,000 children under age 18, of whom 235,000 were white and 59,000 nonwhite. Deaths of divorced men were relatively few in number--about 19,000 died in 1940, leaving about 2,000 children. Such children become orphans by the death of one parent, but little is known as to whether the other parent was alive at the time. In 1940 there were 152,000 deaths of widowers and 250,000 deaths of widows. Few of these persons left children under age 18; the widowers left only 27,000 children and the widows, 35,000. These 62,000 children would be the minimum number who became complete orphans during the year. A few additional children might have been completely orphaned by the death of the surviving spouse in the divorced category. The nonwhite are much more heavily represented in the deaths than in the population and are also relatively numerous among orphaned children.

The Family Composition Study shows that, on the average, at the death of the father the child has 6.6 years before attaining age 18. This average, however, varies with the father's age at death. With an assumption of the 1940 distribution of ages of fathers at death and 1939-41 mortality rates over the preceding 18 years, there would have been some 2.3 million paternal and complete orphans surviving in 1940. The assumption of 1939-41 mortality rates would be more consistent for a determination of paternal orphans living in, say, 1946.^{33/}

Using a different methodology, Thomas J. Woofter, Jr. in an article in the Social Security Bulletin of October, 1945 estimates the number of paternal orphans as 3.3 million in 1940, 2.8 million in 1945, and 2.5 million in 1950.

^{32/}

See Chart 10 herein.

^{33/}

Shudde, L. O., discussion of "The American Family" by Mortimer Spiegelman, The Record, American Institute of Actuaries, Vol. 34, (June, 1945) pp. 115-119.

Mortimer Spiegelman in a paper published in the 1944 Record of the American Institute of Actuaries estimates the number of paternal orphans (including complete orphans) at about 2.5 million in 1940.

Since death rates have been diminishing over the long range, the relative number of orphans in the population tends to become less year by year. Current experience is not representative, both because of the war-accelerated birth rates and the war losses of fathers.

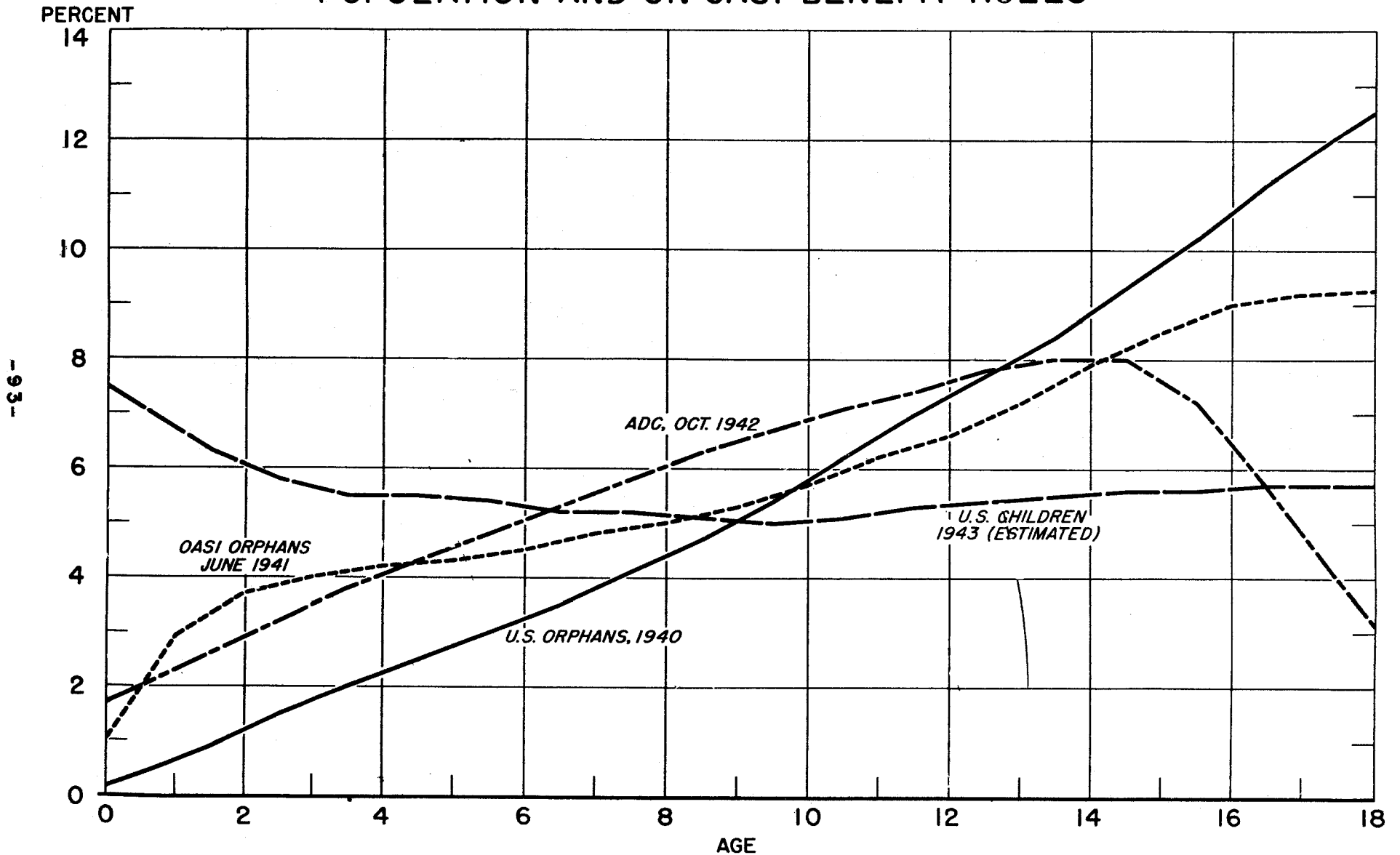
Chart 18 shows four percentage distributions of children under age 18 by age. The most nearly level curve represents the percentage distribution of children in the 1943 population, estimated and adjusted for underenumeration. It shows clearly the effect of the depression on the birth rate and the increasing birth rate in recent years. A somewhat steeper curve is that of children aided under State programs for aid to dependent children in October 1942; after the peak at age 14 the curve declines sharply to age 18, showing that the older children either find employment or become ineligible on other reasons specified in the State law. The curve for orphan beneficiaries under old-age and survivors insurance as of June 1941 reaches its peak at age 17, demonstrating the effect of the higher death rates in the older age groups of insured parents, usually the fathers. The steepest curve is that of the orphans in the population of 1940, exclusive of adopted orphans and those whose surviving parent has remarried. By construction, the area under each curve is 100 percent, but the area for each category is differently distributed according to the attained age of the children at the date of observation. Two of these curves are based on census data (the first and the last), one on public assistance data, while the other is based on a study of child beneficiaries under old-age and survivors insurance. Since the average age of the orphans among these child beneficiaries, as of June 30, 1940, was 11.0 years, the average subsequent potential number of years before age 18 was about 7. The children receiving aid to dependent children averaged 10.2 years of age in October 1942, leaving an average potential dependency period of about 7.8 years, if age 18 be regarded as the limiting age here also. The average age for orphans in the total population is 12.3 years and that of children in the 1943 population, only 8.8 years.

The age distribution of child beneficiaries under old-age and survivors insurance changes rapidly from year to year, moving toward increased concentration in the older ages, and this trend will continue until the orphanhood element of the program has reached maturity. The reason for this trend is obvious--orphans on the rolls at age last birthday 0 must have been orphaned in the current year only, those at age 1 must have been orphaned in either the current or preceding year, etc., while finally those on the roll at age 17 eventually will be children who were orphaned in 18 different calendar years.

Moreover, in each single year's "crop" of orphans, there is considerable concentration at the older ages, since older children have fathers who are older and therefore subject to a higher mortality rate.

CHART 18.

PERCENTAGE DISTRIBUTION, BY AGE, OF CHILDREN IN POPULATION AND ON ROLLS OF ADG AND OF ORPHANED CHILDREN IN POPULATION AND ON OASI BENEFIT ROLLS



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This is offset somewhat by a definitely lower filing rate among orphans just under age 18 who are eligible for old-age and survivors insurance benefits. This lower filing rate results from the fact that these older orphans are frequently at work and so could not draw benefits, or they may have a number of younger brothers and sisters whose claims absorb the total benefit amount available to the family.

Detailed data on workers in 1940 awards of child's benefits furnish interesting comparison with data of the Family Composition Study^{34/} (tables 14 and 15). It should be noted that the data for old-age and survivors insurance relate only to married male workers with at least one child entitled to child's benefits; however, they include all the worker's unmarried children under age 18 whether or not they became entitled to child's benefits. Thus there were 5,311 married male primary beneficiaries with at least one child entitled to child's benefits. These workers had 8,907 unmarried children under age 18, of whom 7,438 became entitled to child's benefits. The remaining 1,469 children, while in families in which some children were entitled to child's benefits, did not become entitled themselves, probably because it was not deemed advantageous to file application in their behalf or because they did not meet some eligibility condition prescribed in the act. The latter cases were generally in families with but one or two children, usually aged 16 or 17 and out of school or earning \$15 or more a month in covered employment. Such exclusion results in an underrepresentation of children receiving benefits at these ages.

Similarly, there were 25,562 married male deceased workers each of whom was survived by at least one child who became entitled to child's benefits. These workers had 51,458 unmarried children under age 18, of whom 46,865 became entitled to child's benefits. Nearly all of the deceased workers who had no unmarried children under age 18 who became entitled to child's benefits were workers whose only unmarried children under that age did not meet the required eligibility conditions.

For the group of married male deceased workers, which is large and embraces a wide range of ages, it is of interest to compare the data on the proportion of workers with children, average number of children, distribution by number of children, and average age of children, with corresponding data derived from the Family Composition Study. Such comparisons show close resemblance in most respects (table 16).

^{34/}

These family composition data have been presented and analyzed in several articles in the Social Security Bulletin. See Sanders, Barkev S., "Family Composition in the United States," Vol. 2, No. 4 (April 1939), pp. 9-13, and related articles in subsequent issues. Only the urban data are used here, since the inclusion of rural data would probably render the study less representative of the population covered by the old-age and survivors insurance program.

Table 14.--Married male workers on whose wages primary and child's benefits were awarded, by number of children ^{1/} and age of worker, and total number of children, by age of worker, 1940 ^{2/}

Age ^{3/} of worker	Total number of workers	Number of workers with--					Total number of children ^{1/}
		1 child ^{1/}	2 children ^{1/}	3 children ^{1/}	4 children ^{1/}	5 or more children ^{1/}	
Total....	5,311	3,260	1,237	423	219	172	8,907
65-69.....	4,950	3,048	1,153	388	200	161	8,287
70-74.....	310	187	68	26	18	11	532
75-79.....	43	23	13	6	1	0	71
80 and over.	8	2	3	3	0	0	17

^{1/} Unmarried children under age 18 regardless of entitlement to child's benefits.

^{2/} Data relate to initial entitlements only and include 52 cases in which wife's benefits as well as primary and child's were awarded.

^{3/} Age at last birthday preceding worker's entitlement to primary benefits.

Source: OASI Substantive Statistics, 1940 (unpublished).

Table 15.--Deceased married male workers on whose wages child's benefits were awarded, by number of children,^{1/} and total number of children, by age of worker, 1940 ^{2/}

Age ^{3/} of worker	Total number of workers	Number of workers with--					Total number of children ^{1/}
		1 child ^{1/}	2 chil-dren ^{1/}	3 chil-dren ^{1/}	4 chil-dren ^{1/}	5 or more chil-dren ^{1/}	
Total...	25,562	11,828	7,236	3,453	1,595	1,450	51,458
Under 20...	14	14	0	0	0	0	14
20-24.....	457	335	93	22	7	0	615
25-29.....	1,792	955	530	228	50	29	3,061
30-34.....	2,676	1,077	886	406	180	127	5,489
35-39.....	3,549	1,246	1,105	614	299	285	8,164
40-44.....	4,087	1,457	1,241	682	330	377	9,519
45-49.....	4,603	2,021	1,320	623	340	299	9,633
50-54.....	4,049	2,078	1,048	485	226	212	7,759
55-59.....	2,683	1,551	662	264	118	88	4,653
60-64.....	1,319	860	288	104	37	30	2,067
65-69.....	292	202	57	22	8	3	431
70 and over	41	32	6	3	0	0	53

^{1/} Unmarried children under age 18 regardless of entitlement to child's benefits.

^{2/} Data relate to initial entitlements only and include cases in which both widow's current (or widow's) and child's benefits were awarded as well as those in which child's benefits only were awarded.

^{3/} Age at last birthday preceding worker's death.

Source: OASI Substantive Statistics, 1940 (unpublished).

Table 16.--Proportion of deceased married male workers represented in 1940 awards of old-age and survivors insurance benefits, and married male family heads in the Family Composition Study ^{1/} with children ^{2/} under age 18, average number of children, distribution by number of children, and average age of children, by age of worker or family head

Age ^{3/} of worker or family head	Percent with children ^{2/}		Workers and family heads with 1 or more children ^{2/}									
			Average number of children		Percent with--						Average age ^{3/} of children	
					1 child		2 children		3 or more children			
	Deceased workers	Family heads	Deceased workers	Family heads	Deceased workers	Family heads	Deceased workers	Family heads	Deceased workers	Family heads	Deceased workers	Family heads
20-24.....	52	46	1.3	1.3	74	76	20	19	6	5	1.7	1.6
25-29.....	62	59	1.7	1.6	53	58	30	29	17	13	3.3	3.3
30-34.....	68	70	2.1	1.9	40	44	33	33	27	23	5.8	5.5
35-39.....	72	74	2.3	2.3	35	34	31	33	34	33	8.3	8.2
40-44.....	66	72	2.3	2.4	36	33	30	31	34	36	10.3	10.1
45-49.....	55	62	2.1	2.3	44	40	29	28	27	32	11.4	11.2
50-54.....	40	46	1.9	2.0	51	48	26	26	23	26	12.2	12.1
55-59.....	25	31	1.7	1.8	58	56	25	24	17	20	12.8	12.7
60-64.....	14	17	1.6	1.7	65	62	22	22	13	16	13.2	13.1
65-69.....	5	9	1.5	1.6	69	65	20	21	11	14	12.9	13.0

^{1/} See footnote 34, p. 94.

^{2/} Includes all unmarried children under age 18 of deceased workers with at least 1 child entitled to child's benefits, and all children under age 18 who were included as regular household members in the Family Composition Study.

^{3/} Age at last birthday.

Source: OASI Substantive Statistics, 1940, and Family Composition Study, Vol. 11.

The most significant difference is the fact that, except at ages under 30, the old-age and survivors insurance data show a smaller proportion of men with children than does the Family Composition Study. The reasons for this difference are not known exactly, but it is believed that the deceased workers represented in old-age and survivors insurance awards are not entirely representative of the urban population. Furthermore, it is probable that married workers with children are subject to a lower rate of mortality than are those without children and are therefore less likely to be included in a group of deceased workers. Long-range and depression trends in birth rates may also have affected the comparisons.

Moreover, it should be remembered that the comparatively small volume of data on deceased workers permits a degree of error in the derived averages and distributions; the Family Composition Study, on the other hand, was the result of less exact methods of enumeration, and it included foster children (not legally adopted) as children of the family head and excluded many children living away from home. The data in table 14 on deceased workers with children are subject to the same exclusions as are the data in table 15. These data for 1940 reflect unduly the peculiarities of an immature program, and their characteristics will change in many respects over the years.

Length of Dependent Childhood

The length of dependent childhood is increasing. The Bureau of the Census formerly began counting the gainfully employed from age 10 while now the tabulation of the labor force begins at age 14. In Great Britain the age of childhood extends to about 14, while in this country this age is generally regarded as 16 with a further extension to 18 if the child continues in school.^{35/} This definition is recognized in the Social Security Act, which sets the limiting age for child's benefits and Federal participation in a payment for aid to dependent children at 16, or at 18 if the child is still in school. In 1920, 22 percent of the boys at age 14 were gainfully employed in contrast to only 6 percent in 1940. For girls the corresponding reduction is from 12 percent to 1 percent. Among nonwhite children 45.3 percent of the boys age 14-19, inclusive, were employed in 1940, as compared with 33 percent for the corresponding age group for white boys. Of the nonwhite girls age 14-19 years, 22 percent were working, while only 18 percent of the white girls in these ages were employed.

Some idea of the significance of the work clause in exclusions of children 14-17 from survivor's benefits may be gained from the 1940 census data. In this age group 7% of the nonwhite and 3% of the white boys in the population attended school and were employed at the same time. For girls the corresponding figures were 3% and 1%. If the working children were limited to the orphans in the population, the percentages would be much higher.

35/

The school attendance requirement for children aged 16 and 17 for OASI child's benefits was removed by the 1946 Amendments.

ACTUARIAL STUDY NO. 21

As the population ages, children will probably constitute a decreasing percentage from year to year. Furthermore, the expected lower mortality rates of the future may reduce the relative number of orphans and the relative costs of child's benefits under old-age and survivors insurance. Paternal half orphans are more numerous than maternal half orphans because of the greater mortality, age for age, among married men than among married women and also because the husband is usually older than his wife.

Maternal half orphans are seldom child beneficiaries of old-age and survivors insurance. In this program a child is presumed dependent on a father in practically all cases in which the father dies and the child files claim on the basis of the father's wage record. In general, however, under the terms of the act a child cannot be deemed dependent on the mother at the time of her death unless the mother had already been widowed or deserted by the father. If the child has been living with both parents but the mother has been the actual support of the child (because, for example, of the father's invalidity or unemployment), the child must nevertheless be deemed dependent only on the father and could not qualify for benefits based on the mother's wage record.

Full orphans--those who have lost both mother and father--are rarer than in the past, but represent a special responsibility of the community since there is no chance of their becoming stepchildren by remarriage of a surviving parent. Moreover, retired fathers have relatively fewer children under age 18 because most children are born of younger fathers than in the past, when large families were more prevalent. All these factors have very significant implications for old-age and survivors insurance.

V. EMPLOYMENT AND UNEMPLOYMENT

Employment Status, by Age, Race, and Sex

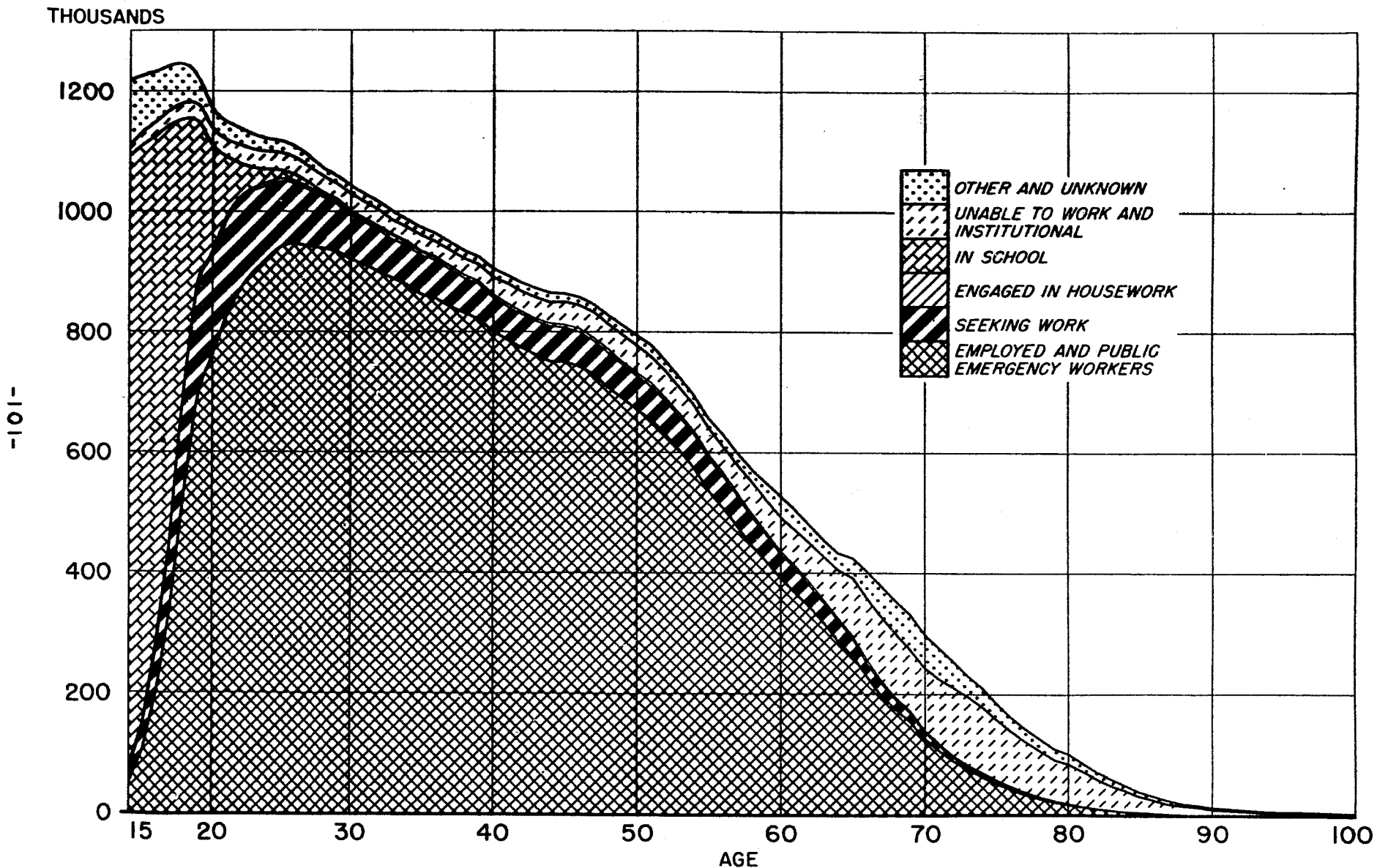
The actuarial assumptions for employment and unemployment are of utmost importance in making cost illustrations for a program in which benefits are as closely geared to employment and wages as in old-age and survivors insurance. Total employment determines the volume of contributions to the system. The pattern of employment and unemployment determines the individual's insured status. Periods of unemployment reduce the average monthly wage. In our limited program, the distribution of employment between covered and non-covered industries must be considered, because periods of non-covered work dilute the legal average monthly wage and may cause the worker to lose his insured status.

The labor force includes persons at work, those with a job but temporarily absent from work, those on public emergency work, and those seeking work in a specified week.

Thus, the labor force, by definition, includes both the employed and the unemployed, that is, persons able to work and seeking work. The "non-labor group" comprises the remainder of the population. Normally, for each person in the labor force there are approximately $2\frac{1}{2}$ persons in the total population. Thus, assuming that the workers support the entire population, a worker has $1\frac{1}{2}$ dependents, on the average. True, there is a small group of persons not in the labor force who support dependents by means of unearned income. The dividing line between the labor force and non-labor group is not distinct. Some persons are not employable or are capable of performing only the most limited tasks, and, although they may seek work, it would hardly be proper to term them unemployed.

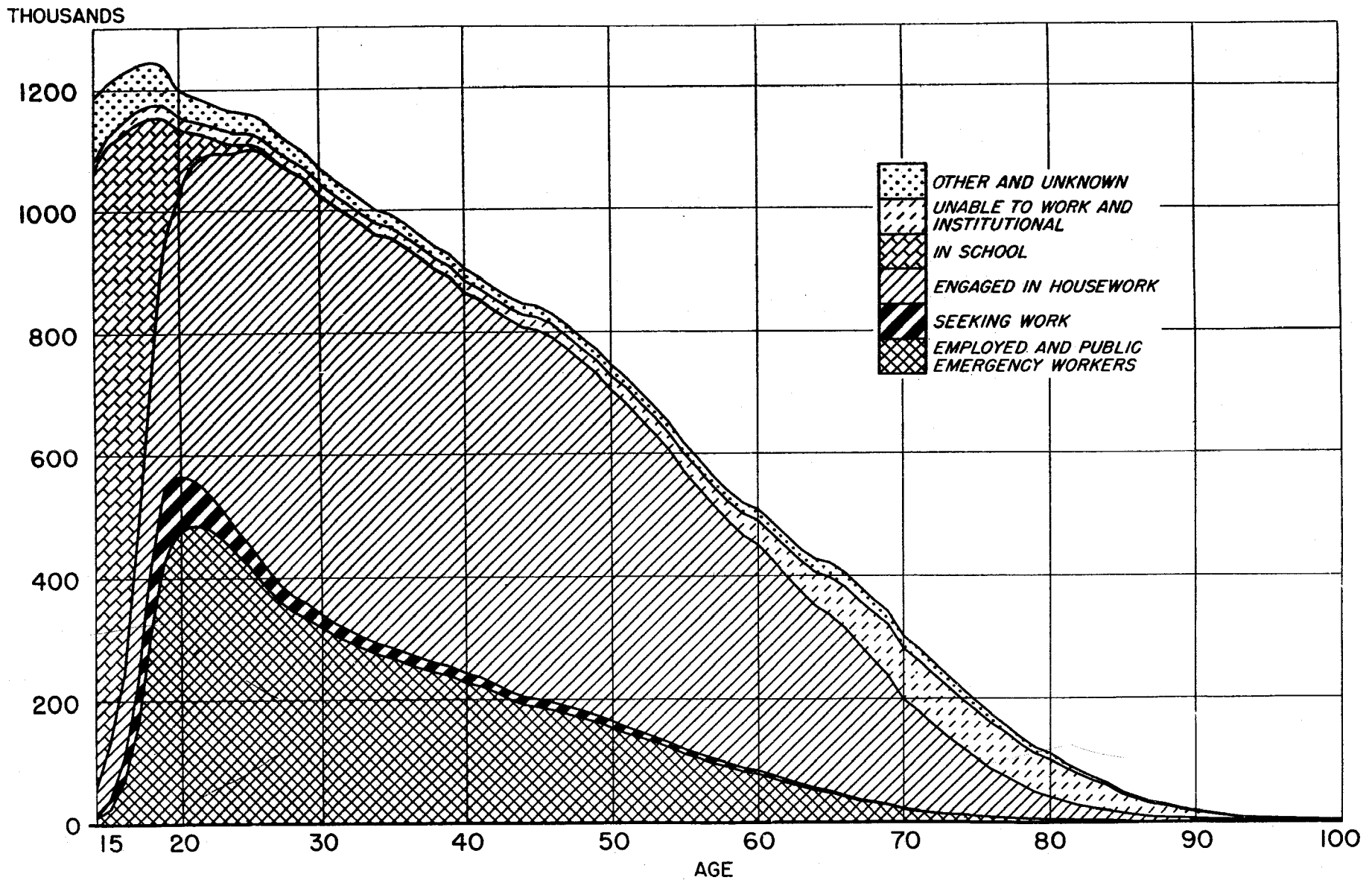
Employment status is shown in charts 19-21, covering the male and female population of the United States age 14 and over, by age and sex, according to the 1940 census for the week of March 24-30, 1940. To conform to the practice of most other countries, public emergency workers were added to the employed rather than to the unemployed, as was the depression procedure in the United States. The non-labor group is subdivided into those doing housework in their own home, those in school, the "unable to work and institutional," and the "other and unknown" class. The "in school" group is somewhat considerably less in number than the total number 14 and over attending school, the difference being those who are working or seeking work. It will be noted that the non-labor group is comparatively small in the male population except at ages below 20 and above 65. On the other hand, the female labor force is comparatively small and the female non-labor group comparatively large, because of the role of women in homemaking. Housewives greatly outnumber women in gainful occupations.

CHART 19.
EMPLOYMENT STATUS OF U.S. MALE POPULATION—1940 CENSUS



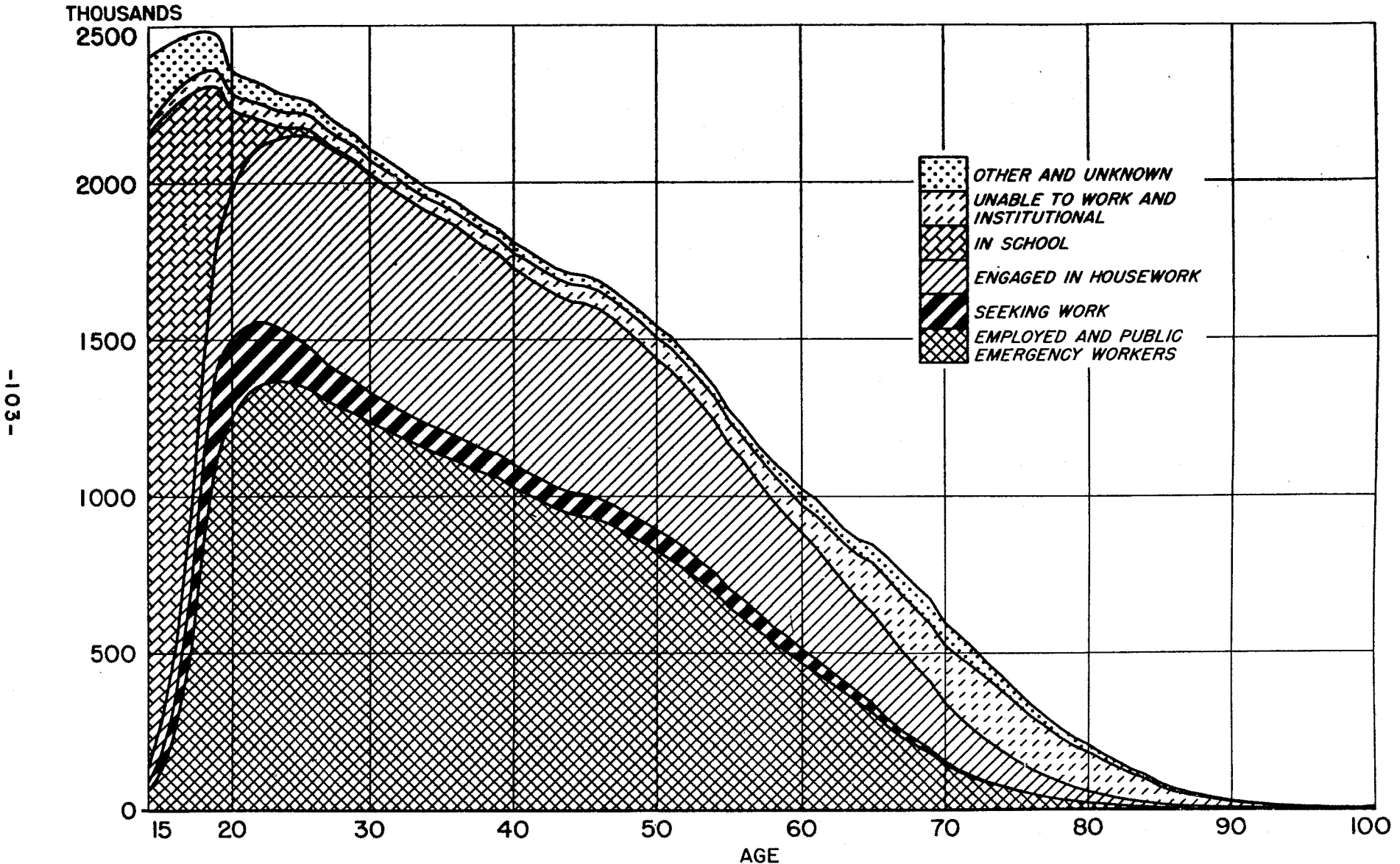
-101-

CHART 20.
EMPLOYMENT STATUS OF U.S. FEMALE POPULATION—1940 CENSUS



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CHART 21.
EMPLOYMENT STATUS OF U.S. TOTAL POPULATION—1940 CENSUS



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The highest number of male workers is found at about age 25, female workers at about age 20. The highest percentages of the population in the labor force are 95 percent at age 30 for men and 48 percent at age 20 for women. The unable-to-work category increases in size with age, particularly for men, since many women in a similar physical condition apparently report themselves as housewives.

Except in the war emergency, employment of children has decreased with time. For example, in 1940 only 5 percent of all children 14-15 were reported in the labor force, whereas in 1930 the percentage was 9 percent and in 1900, as high as 31 percent. Because of a change in definition, data for 1940 are not entirely comparable with those of earlier censuses. For instance in the 1930 census, the term "gainful workers" was used to denote those having a gainful occupation, regardless of whether they were working or seeking work. The trend toward less employment for children has probably come about both through increasing manpower productivity and through child-labor laws of nearly all States.

During the war many women took advantage of the unprecedented demand for labor. Women formed our greatest labor reserve, and this reserve was tapped heavily, although in many localities a fairly large supply of female labor was not used. Many women must work to make a living for themselves and often also for others. Others took wartime jobs for patriotic motives, and still others have been glad to earn and lay aside some savings. Many women who would like to work do not have the opportunity on account of home obligations; most women with young children cannot or do not wish to enter the labor market.

The long-time trend has been to increasing employment of women; in 1900, only 20 percent of the women over 14 years of age were in the labor market, in 1930, 24 percent, and in 1940, 25 percent. As of March 1940, only about one-eighth of the married women were in the labor market, in contrast to about half the single women and one-third of the ex-married. From the peak around age 20, the proportion in the labor force steadily declines with advancing age to a relatively small number at ages 65 and over. The largest percentages of women in the labor market are in urban, the smallest in rural areas. Relatively more non-white than white women are working; particularly is this true at very young and advanced ages.

Unemployment

The census data applying to the week of March 24-30, 1940 indicate that about 13.2 percent of the male wage and salary workers age 14 and over were seeking work (table 17). If this condition had existed throughout the year each unemployed worker was out of work on the average for 4.7 months in the year. On this basis unemployment would average 6 weeks per male wage or salary worker per year in the labor force. The highest percentages of the unemployed were in the younger and older ages. The "hard core" of unemployment, as evidenced by long durations, was most pronounced in the older age groups. Among men age 65 and over, more than

Table 17.--Duration of unemployment of male wage or salary workers seeking work, March 1940

Age	Employed (in thousands)	Unemployed (in thousands)	Percent of unemployed to employed	Percentage distribution of unemployment duration in months										
				Under 1	1	2	3	4-5	6-8	9-11	12-23	24-35	36-59	60 and over
Total....	24,264	3,194	13.2	3.3	9.0	7.4	11.3	13.8	13.9	7.5	15.2	7.6	6.0	5.0
14-15.....	71	11	15.5	7.0	11.0	7.9	14.9	17.5	13.8	10.4	14.6	1.7	.6	.6
16-17.....	275	78	28.4	4.5	8.8	8.0	13.7	16.2	16.8	10.1	16.4	4.0	.9	.4
18-19.....	830	206	24.8	4.3	10.2	8.6	13.7	14.0	16.3	9.6	16.0	4.8	2.2	.2
20-24.....	3,302	569	17.2	4.0	10.7	8.5	12.9	14.7	14.6	7.8	14.7	7.0	4.1	1.0
25-29.....	3,638	426	11.7	4.0	10.6	8.8	12.6	14.7	14.1	6.9	13.6	7.3	4.7	2.5
30-34.....	3,350	328	9.8	3.4	10.3	8.0	11.9	15.1	13.9	6.8	14.5	7.1	5.5	3.4
35-44.....	5,624	551	9.8	3.3	9.2	7.6	11.3	14.0	13.7	7.2	14.9	7.7	6.2	4.8
45-54.....	4,193	514	12.3	2.8	8.0	6.5	10.1	12.9	13.1	7.2	15.5	8.4	7.6	7.8
55-59.....	1,351	226	16.7	2.4	6.2	5.1	9.0	12.0	12.6	7.7	16.7	8.9	8.7	10.6
60-64.....	895	162	18.1	1.8	5.4	4.8	8.3	10.7	12.4	7.6	16.8	9.6	9.7	12.7
65-74.....	661	116	17.5	1.8	4.6	4.4	7.0	11.0	12.4	7.5	18.2	9.7	9.9	13.4
75 and over.	74	7	9.5	1.7	3.1	4.8	9.6	9.6	12.0	6.9	14.8	7.6	9.6	20.3

Source: U.S. Bureau of the Census, Population: The Labor Force (Sample Statistics); Employment and Personal Characteristics, p. 171, table 35 (excluding unreported durations); and Wage Workers at Work, p. 65, table 11, based on 5 percent sample.

half had unemployment of more than a year's duration. During the war years, the hard core of unemployment was reduced to a minimum by exceptional employment opportunities.

Sir William Beveridge in his recommendations for a social security program for Great Britain assumed 8.5 percent unemployment in his cost estimates for unemployment insurance, an average of 1 month per year per worker. He later reduced this percentage in his work on full employment, the assumption being that the effort of the Empire must be devoted to devising means for establishing employment at such a high level that there would be "more vacant jobs than unemployed men."^{1/}

Labor-saving machinery and techniques have been the cause of considerable technological unemployment. In all countries there is always considerable frictional unemployment, that is unemployment resulting from change in jobs and migration between jobs, and there is also a considerable amount of seasonal unemployment, and in some industries, partial unemployment. Besides unemployment, work interruptions are caused by short and long-term disability, vacations, and, in a few instances, sabbaticals. Among women, housekeeping duties may interrupt employment, as does also maternity leave; the latter has been compensated in most social insurance systems.

In a depression such as we had in the 1930's, many experienced workers lose their jobs and other members of their families seek jobs to fill the gap in the family income. Such job seekers, have been estimated to be 30 or 40 percent of the regular workers^{2/} during periods of depression, and a smaller though significant percentage in normal times. During boom times like the recent past, the number of employed workers is greatly increased because there is plenty of employment to be had. At such times there are many "quits" and consequently also many transfers. During depression times there are many lay-offs. Thus, under either extreme, labor turn-over is frequent, so that corresponding to 100 jobs there may be 125 to 150 workers in the course of a year.

When our economy was predominantly agricultural, unemployment was probably less frequent. Its frequency in recent times has been ascribed by many to technological change, which, however, is usually acknowledged to result ultimately in higher real wages and a higher national product. It is now generally accepted that unemployment, and especially the mass unemployment in depressions, is due largely to national or even international economic causes beyond the control of individual workers or their employers.

Covered Employment

All the various factors that determine the pattern of employment have important implications for old-age and survivors insurance. Periods

^{1/} Full Employment in a Free Society - American Edition, p. 19.

^{2/} Woytinsky, W. S., Three Aspects of Labor Dynamics, 1942

of unemployment or non-covered work may make it impossible for some workers to acquire insured status or may cut down a worker's average monthly wage to such an extent that his benefits become very small.

It has been estimated that in 1937, the first year of operation of old-age and survivors insurance, approximately 28 million wage workers were usually in covered jobs and 11 million usually in noncovered industries.^{3/}

From the Department of Commerce estimates of "full-year" jobs in 1937, it would appear that on the average about 23 million would have been in covered, and 9½ million in noncovered, industries. This figure for total covered jobs corresponds well enough with the larger figure of covered workers on account of the seasonal and intermittent nature of much employment. Total covered payrolls in 1937 represented about 65 percent of all wages, in 1941 and 1943 about 69 percent. In 1944 this figure had again dropped to 65 percent.

The percentage distribution of workers with taxable wages in 1942 reveals a heavy concentration of workers in the low wage brackets (table 18). More than 20 percent of the workers had total wage credits of less than \$200 in that year. The percentage decreases regularly for each higher wage bracket of \$200. In 1943 all male workers with wage credits received an average wage credit of \$1,567; however, the female workers received \$780, the Negro male worker \$922 and the Negro female worker \$409.

More than half of all workers received 1942 covered wages of less than \$1,000. In 1943 the concentration in the lower wage brackets was lighter, yet 48 percent of all workers received wages of less than \$1,000. It will be interesting to compare the percentage distribution of workers with taxable wages with that of consumer units (families and single individuals) in the year 1935-36^{4/}, and 1941^{5/} (chart 22). Such a comparison necessarily has its limitations, since family income is compared with covered wages of an individual. In 1935-36, 46.5 percent of the consumer units received less than \$1,000; in 1941, only 28.9 percent. Income was higher in 1942 than in either of these two years; if all income were the basis of contributions, the result would be a much more even distribution with the highest concentration from \$750-1,500 rather than from \$1-600 as in the case of covered wages. The new workers and intermittent workers weight the lower wage brackets heavily.

^{3/} Woytinsky, W. S., Earnings and Social Security in the United States, 1943, Chap. 4, p. 63.

^{4/} National Resources Committee, Consumer Income in the U. S., 1935-36, August 1938.

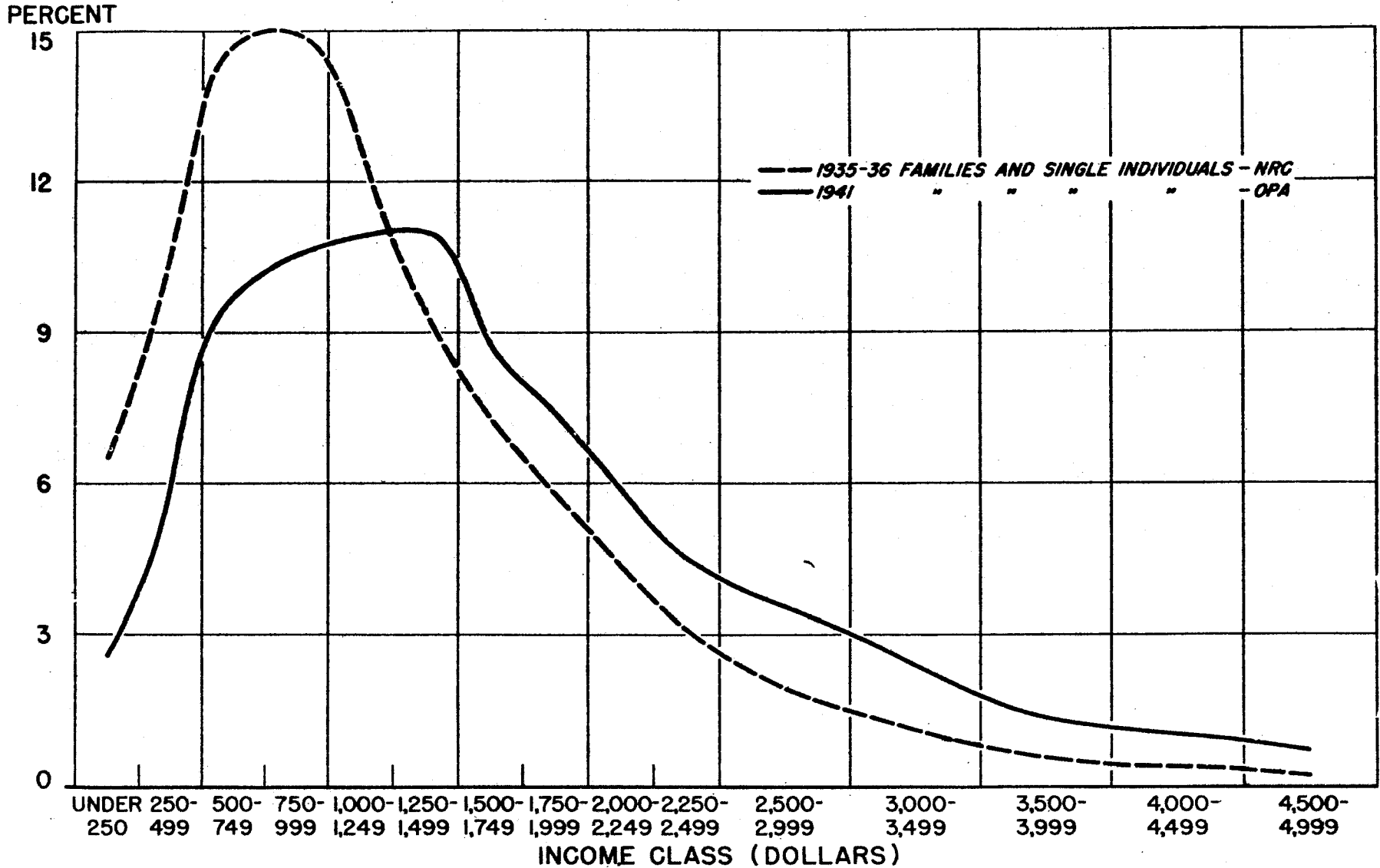
^{5/} From release of the Office of Price Administration, Division of Research, Consumer Income and Demand Branch, "Estimates of the Distribution of Consumer Income in the U. S., 1941," June 27, 1941.

Table 18.--Percentage distribution of workers with taxable wages in 1942 by amount of such wages, by race and sex

Wage group	Total	Total		White		Negro	
		Male	Female	Male	Female	Male	Female
Average wage..	\$1,131	\$1,365	\$616	\$1,432	\$640	\$669	\$292
Total percent.	100.0	100.0	100.0	100.0	100.0	100.0	100.0
\$1-199.....	20.7	15.6	31.8	14.5	30.1	28.1	55.2
200-399.....	10.5	8.7	14.5	8.0	14.2	15.1	19.4
400-599.....	8.0	6.9	10.6	6.3	10.6	12.2	11.0
600-799.....	7.3	6.1	10.0	5.6	10.2	10.5	6.7
800-999.....	7.2	5.7	10.3	5.4	10.7	8.9	}
1,000-1,199.....	6.4	5.5	8.3	5.4	8.7	6.7	
1,200-1,399.....	5.5	5.5	5.6	5.5	6.0	4.9	}
1,400-1,599.....	4.8	5.4	3.5	5.6	3.7	3.8	
1,600-1,799.....	4.4	5.4	2.2	5.7	2.3	3.1	7.7)
1,800-1,999.....	4.1	5.4	1.3	5.7	1.4	}	}
2,000-2,199.....	3.7	5.0	.7	5.4	.8		
2,200-2,399.....	3.1	4.4	.4	4.7	.4	6.7)	}
2,400-2,599.....	2.7	3.8	.2	4.1	.2		
2,600-2,799.....	2.2	3.1	.1	3.4	.2	}	}
2,800-2,999.....	1.9	2.7	.1	2.9	.1		
3,000.....	7.5	10.8	.4	11.8	.4	}	}

Source: Social Security Yearbook, 1943, tables 75-77, pp. 102-104.

CHART 22.
**PERCENTAGE DISTRIBUTIONS OF CONSUMER UNITS BY
 INCOME CLASSES, 1935-36 AND 1941**



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The National Resources Committee income distribution of 1935-36 has been criticized as not being based on a representative sample, as overstating the percentage of income recipients in both the lower and higher income groups at the expense of the middle group (\$2,000-7,500), and as not corresponding to theoretical distribution under Pareto's Law.^{6/} If these criticisms are valid the percentage distribution of 1935-36 should be considerably modified.

The percentage distribution of workers with covered wages is quite different. By the end of 1942 there were 6 years, or 24 quarters, of possible wage credits under old-age and survivors insurance. If the workers are distributed by the number of quarters of coverage to their credit since the beginning of the system through 1942 (table 19), it appears that those with zero quarters of coverage--that is, with wage credits of less than \$50 in any quarter--were 11.6 percent of all workers and as much as 17 percent of Negro male workers and 32 percent of Negro female workers. The 1-quarter workers represent about 10 percent of all workers and as much as 20 percent of the Negro female workers. The largest number of workers with 1 and 2 quarters of coverage were in the younger age groups, under age 20 and 20-24, inclusive, most of whom first entered covered employment in 1942. More than half of all workers with wage credits, however, had only 7 quarters or less of coverage out of a possible 24 quarters. The median male worker had about 9 quarters and the median female worker and Negro worker about 4 quarters. More than half the workers with wage credits had not acquired fully insured status by the end of 1942. This table indicates that the largest concentration of workers has only a few quarters of coverage, which condition is at least partly due to the in-and-out movement.

Chart 23 shows for quinquennial groups of ages from 15 to 70 the male and female population of January 1, 1944, and, on the same scale, the number of workers who received taxable wages at any time in 1937-1942, workers with wage credits in 1942 as of January 1, 1942, and the estimated full-time workers in the covered labor force of April 1, 1940.^{7/} In the lower half of the same chart these four groups are shown as a percent of the population. The percentages of population in covered employment for men are much higher than those for women. The highest percentage is attained in the 25-29 age group for men in most of these four series of data. In fact, the persons with cumulative wage credits are shown to be 101 percent of the population, which would seem to indicate an error either in the census population estimates or a bias in the old-age and survivors insurance sample. The latter is more plausible and could be due to unknown duplicates or the limitation of the sample. The percentages for males hold up well during the working ages, in fact up to about age 65. On the other hand, those for women workers appear

^{6/} Tucker, Rufus S., The Review of Economic Statistics, November 1940 and February 1942, and Journal of the American Statistical Association, December 1942 and June 1943.

^{7/} Bureau of Old-Age and Survivors Insurance, workers with wage credits and insured workers from 1 percent continuous work history sample; full-time workers from Social Security Board Analytical Note No. 11, November 14, 1944, based on census data of April 1, 1940.

Table 19.—Percentage distribution of covered workers,^{1/}
by number of quarters of coverage,^{2/} by race and sex

Quarters of coverage	Total	Total		White		Negre	
		Male	Female	Male	Female	Male	Female
Total...	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0.....	11.6	9.3	16.4	8.4	15.4	16.9	31.8
1.....	9.7	7.9	13.4	7.5	12.9	11.6	20.2
2.....	7.7	6.9	9.2	6.7	9.1	9.0	10.6
3.....	5.3	5.0	6.0	4.8	6.0	6.6	6.0
4.....	4.7	4.5	4.9	4.4	5.0	5.4	4.0
5.....	3.9	3.8	4.2	3.8	4.2	4.5	3.1
6.....	3.8	3.7	4.0	3.6	4.0	4.1	2.8
7.....	3.3	3.3	3.2	3.2	3.3	3.6	2.0
8.....	2.8	2.8	2.7	2.8	2.8	3.0	1.5
9.....	2.6	2.5	2.6	2.5	2.7	2.5	1.8
10.....	2.3	2.3	2.2	2.3	2.3	2.3	1.3
11.....	2.0	2.1	2.0	2.1	2.0	2.0	1.2
12.....	2.1	2.2	2.1	2.2	2.1	1.9	1.1
13.....	1.9	2.0	1.9	2.0	1.9	1.8	1.0
14.....	1.9	1.9	1.7	1.9	1.8	1.7	.8
15.....	1.7	1.8	1.6	1.8	1.7	1.5	.8
16.....	1.9	2.0	1.6	2.0	1.6	1.6	.8
17.....	1.7	1.8	1.5	1.9	1.6	1.6	.7
18.....	1.7	1.8	1.4	1.9	1.5	1.5	.8
19.....	1.7	1.8	1.4	1.9	1.5	1.5	.9
20.....	1.9	2.1	1.5	2.2	1.6	1.5	.7
21.....	2.1	2.3	1.6	2.4	1.7	1.6	.9
22.....	2.7	3.1	2.0	3.2	2.0	2.1	1.2
23.....	3.4	3.9	2.4	4.0	2.4	2.4	1.2
24.....	15.6	19.2	8.5	20.5	8.9	7.8	2.8

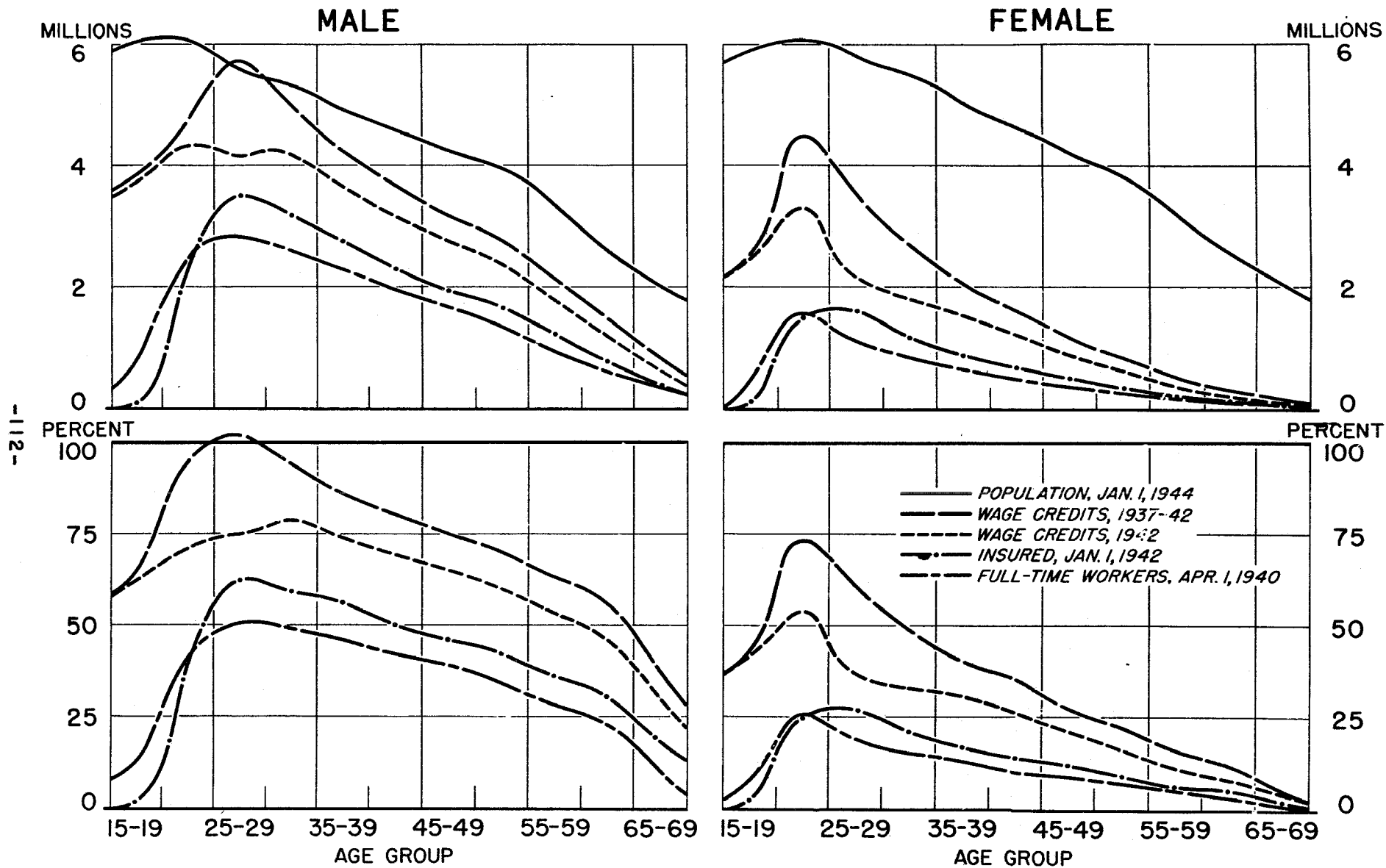
^{1/} Workers with wage credits at some time in 1937-42.

^{2/} A quarter of coverage is in general a calendar quarter in which at least \$50 in wage credits was received.

Source: Social Security Yearbook, 1943, table 87, p. 114.

CHART 23.

OASI STATUS OF WORKERS IN RELATION TO POPULATION



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to have their peak much earlier--ages 20-25. In the percentage curves the top line of 100 percent represents the entire population. Thus the other curves may be read off directly as percentages of this population. Women leave covered employment in large numbers after the modal age of 20-25. The drop starts in about the middle of this age group and is quite abrupt because of the large number of women who enter on matrimony, child-bearing, and homemaking. Relatively few women remain in covered employment after age 65.

Wages and Wage Rates

Income payments to individuals during 1944 totaled \$157 billion including \$137 billion of earnings of individuals (including net income of proprietors).^{8/} Thus, in 1944 we had a per capita income of \$1,120, and per capita earnings of about \$1,000. The corresponding figures per worker (including servicemen), approximately \$2,400 and \$2,100, are less meaningful.

The total taxable wages in 1944 amounted to \$64.4 billion distributed under 30.4 million full-time jobs to 46.3 million workers with wage credits in 1944. The average taxable wage per covered job was about \$2,100, while the average taxable wage per worker with wage credits was about \$1,400. These figures are higher than those for any preceding years, and exceed those for 1945.

Weekly covered wages are not available on account of the quarterly basis of maintaining wage records. However, the weekly wage in manufacturing industries may yield a fair approximation, because it is the largest industry in covered employment and is almost entirely covered. The highest average wage was \$48.82 in 1944 with an average hourly wage of \$1.07. During 1945, the average weekly wage dropped to \$48.46, but with a shorter week the hourly wage increased to \$1.10. The average work week in manufacturing was 45.6 hours in 1944 and 44.2 hours in 1945.^{9/} The work week has been shortened considerably since the end of the war and stood at 40.5 hours in February, 1946.^{10/}

In manufacturing, the total 1944 pay roll was actually three times as high as in 1939. About one-third of the excess resulted from increased employment, another third from higher wage rates, while the remaining third was from additional hours, overtime, and shift of the labor force from low to high-wage industries.^{11/}

^{8/} Department of Commerce, Current Business, February 1946, p. 8.

^{9/} National Industrial Conference Board, Management Record, March 1946 (Statistics on 25 manufacturing industries).

^{10/} Bureau of Labor Statistics (all manufacturing, preliminary).

^{11/} National Industrial Conference Board, Business Record, Vol. 2, No. 5, May 1945, p. 177.

The present benefit formula geared to wages should yield reasonably satisfactory results under stable wage conditions, but the level of wages in the past has been far from stable. To note past variations, the average wage of nonagricultural workers was computed from 1894 through 1943.^{12/} The average annual money wages have actually increased fivefold during the 50-year period. The illustration is somewhat extreme because 1894 was a depression year and 1943 a boom year. Illustrations of average wages are shown in chart 24, together with retirement benefits for retirements in every case on January 1, 1944. The assumptions are that the average wage would be earned and that a benefit formula consistent with the wages of 1894 on the initiation of a hypothetical system would be based on a maximum taxable wage of \$750 a year instead of \$3,000; consequently, the 40-percent bracket of the benefit formula would end at \$12.50 a month, the minimum monthly benefit would be \$2.50; so that both taxable wages and benefits throughout would represent one-fourth of those under the present formula for old-age and survivors insurance. The chart applies to any number of years of covered employment up to 50 years. The monthly benefit is shown at the year of entering covered employment. Thus, every point of the benefit curve represents the monthly retirement benefit for a worker beginning work at that point with continuous work until retirement on January 1, 1944. The chart shows that the retirement benefit payable after January 1, 1944 would be only 4-8 percent of final wage. The resulting primary benefit, though geared to wage under a benefit formula that would have been reasonable in 1894, is entirely inadequate in 1944, even though the individual wage is assumed to be the average wage year by year.

Although recognizing that the trend of wages is upward, the Office of the Actuary in all its cost studies except No. 19(a) has used an assumed constant wage for the purpose of illustrating costs. The strongest objection to the use of an increasing wage assumption is that the resulting picture is one-sided. Benefits that would be reasonable in respect of today's receipts look insignificant in comparison with the huge tax receipts that are anticipated, yet may never be realized. Thus, illustrations with an assumption of a constant wage are more conservative as a guide for a reasonable benefit formula today, and help to guard against the danger of fixing unduly liberal monthly benefit amounts based on contributions that are expected in the future.

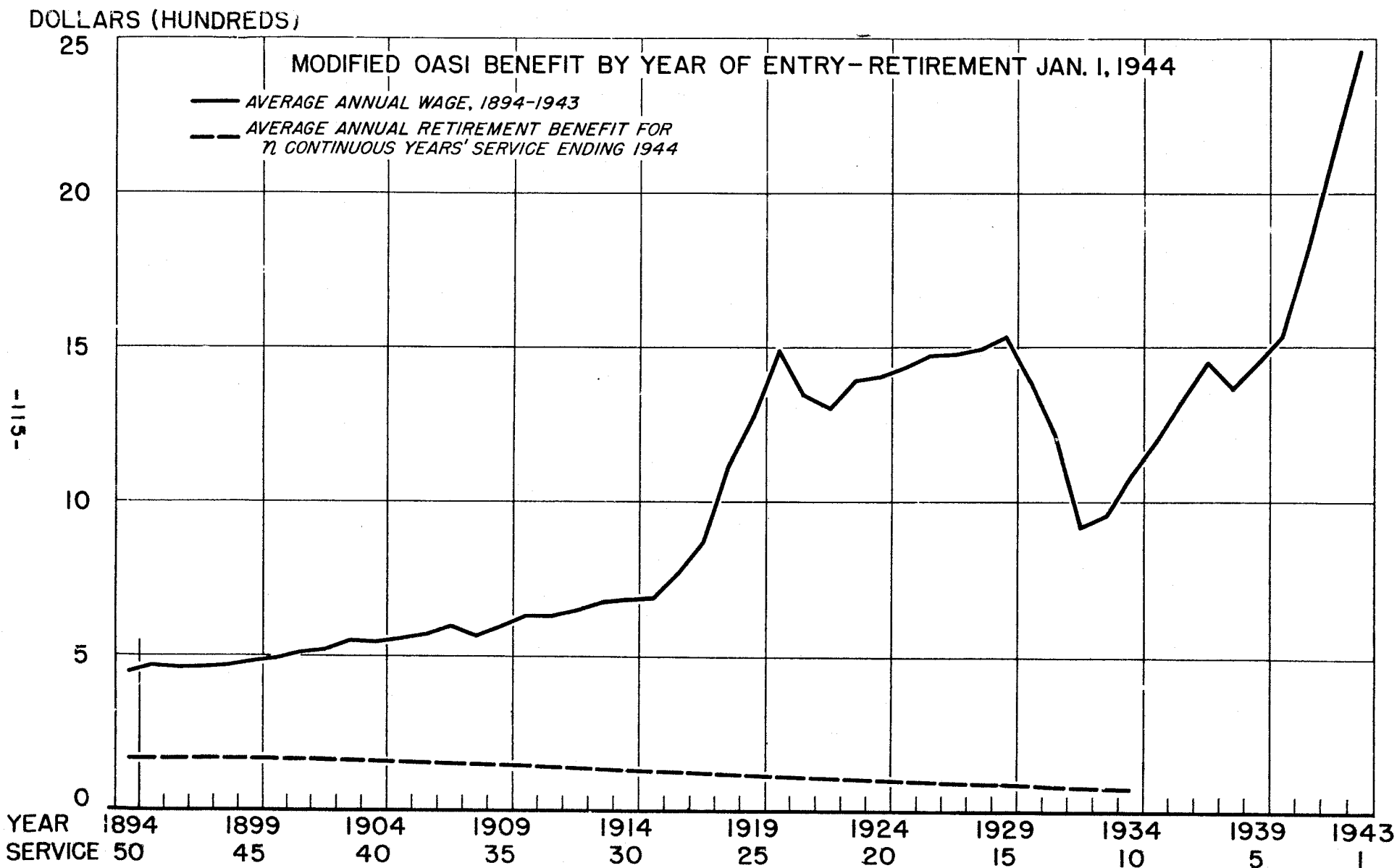
Actuarial Study No. 19(a) showed the relatively small effect, other things being equal, that the increasing wage assumption has on illustrative benefits due to the facts that benefits are a function of wages spread over a long period of time prior to retirement, that the bent formula dampens the effect of the increase in wage, and that the \$3,000 ceiling also holds down the increase in benefits. The effect on illustrative contributions, however, is far greater.

^{12/}

For wages up to 1926, Douglas, Paul, Real Wages in the United States, 1890-1936; for 1927-36, Wages, Hours, and Employment in the United States, National Industrial Conference Board, 1937; and for 1937-43, The Economic Almanac for 1943-44, National Industrial Conference Board.

CHART 24.

AVERAGE ANNUAL WAGE, 1894-1943, AND CORRESPONDING RETIREMENT BENEFIT



As shown in chart 25, the average wage of an individual may well start very low at, say, age 15 and continue at an increasing level until, say, age 65. This again is an extreme case, and it will be noted that the increase in wage has been some thirtyfold over the 50-year period. It will be readily seen that the average wage over a long period in the past may be entirely out of line with the cost of living at the time of retirement. Chart 27 shows the primary benefit amount under old-age and survivors insurance that would become payable for a worker beginning work at the age and year indicated and retiring in 1944 after any number of years of covered employment from 10-50 years. The amount of the retirement benefit has been plotted opposite the year of entry. The benefit formula has been modified as indicated for chart 26. The increment of 1 percent in the benefit formula tends to adjust the monthly benefit so that it will be more in line with current living conditions under an increasing cost-of-living economy. The benefit formula, however, is inflexible and cannot be expected to provide an equitable adjustment under variable conditions, particularly in intermittent covered employment of another worker as indicated by the broken line.^{13/} The benefit actually exceeds the wage earned in the younger ages, but it is only a small percentage (4-8 percent) of recent wages and living costs. The discrepancy in meeting the need is still more apparent if the covered employment had been limited so that many years were credited with zero wages.

The wage of an individual customarily increases with increasing ability and skill, attains a maximum, and then declines during old age. This applies more specifically to the wage workers rather than the salaried and professional workers. The highest median wage or salary in 1939 for men was earned in the age-group 35-44, for women in the age-group 25-34.^{14/} In 1943, the male workers with highest average wage credits were in the 40-44 group; female workers in the 35-39 group.^{15/} Both the arrays from which the above figures were taken are cross-sections applying to one year only. In the consideration of the wages of an individual worker, the cross section does not apply because the earning period extends over many years. Thus, with a secular trend of rising wages, such as we have, the age group in which the highest wage falls is necessarily higher than is the case in a cross section applying to only one year. The significance of such a generation-wage history is apparent in all studies of wage credits in old-age and survivors insurance, which will show maximum earnings at higher ages than those

^{13/}

For a discussion of proposed changes in the benefit formula, see Immerwahr, George E., "Problems in Federal Old-age and Survivors Insurance," Transactions, Actuarial Society of America, Vol. 46, October 1945, pp. 285-291.

^{14/}

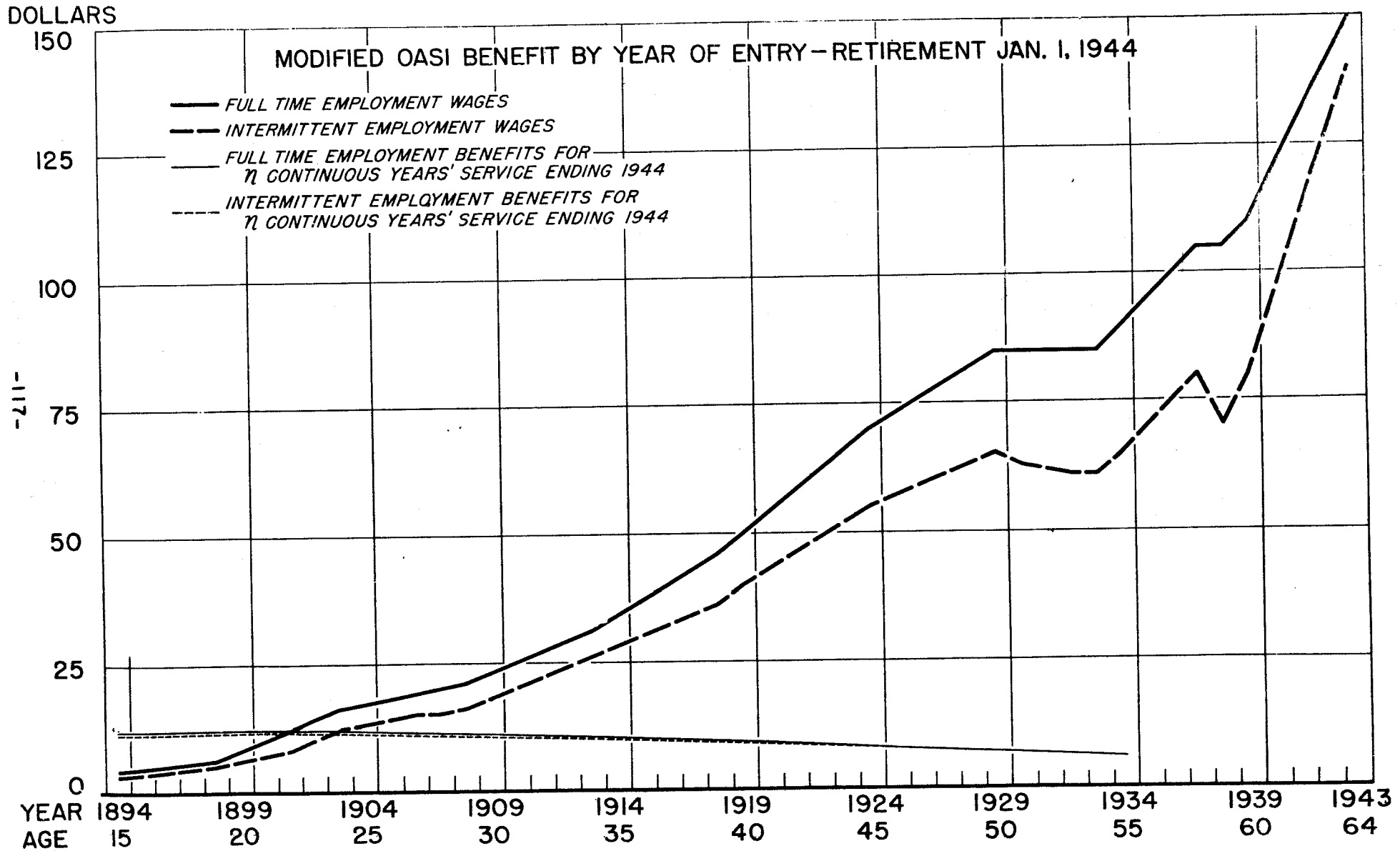
Bureau of the Census, Population, The Labor Force (Sample Statistics), Wage or Salary Income in 1939, p. 99.

^{15/}

Social Security Board, Social Security Yearbook, 1944, p. 52.

CHART 25.

ILLUSTRATIVE MONTHLY WAGES AND RETIREMENT BENEFITS OF TWO LOW WAGE WORKERS



in which the 1939 maxima fell--perhaps at ages above 50. However, at some point in age, increasing unemployment, sickness, and noncovered employment counteract the trend of higher rate of earnings in time.

Employment and Wages in the Future

A recent estimate of the Bureau of the Census^{16/} indicates that our total labor force was 53.3 million in 1940 and may reach 59.2 million in 1950--a net accession of almost 6 million made up of 2.6 million men and 3.3 million women, or a net total increase of about 50,000 per month. The gross increase is a little more than double this figure but is reduced by death, disability, retirements, and withdrawals from the labor force. The estimate for 1950 counts on a relatively greater increase over 1940 in the female labor force than in the male. Such an estimate is in line with long-range trends, as we could lose a large number of women from our present labor force, and still have more in 1950 than we had in 1940 either in absolute numbers or relatively.

The civilian labor force in 1945 was 53.3 million, approximately the same as at the census date in 1940 in spite of the fact that some 9 or 10 million workers had been withdrawn from the civilian labor force into military service. This was made possible by the normal net increase of some 660,000 per year in the labor force plus a net influx of some 6.7 million from the non-labor groups, the latter figure including about 3.3 million young workers who would normally have been in school, aged workers, marginal workers, and married women who would not otherwise be in the labor force.^{17/} The following shows some labor force figures for 1940 and 1945:

	April 1940	October 1945
Total labor force.....	53.3 ^{1/}	64.0
Civilian.....)	53.3 ^{1/}	53.4 ^{2/}
Armed forces.....)		10.6 ^{2/}
Normal labor force.....	53.3 ^{1/}	56.9 ^{1/}
Extra labor force.....	-----	7.1

^{1/} U.S. Bureau of Census, Population, Special Reports, Series P-44 No. 12, June 12, 1944.

^{2/} U.S. Bureau of Census, Monthly Report on the Labor Force, No. 41, November 21, 1945.

In the long run, the labor force should expand slowly but steadily for at least 30 or 40 or perhaps 50 years. Under Thompson and Whelpton's

^{16/} Bureau of the Census, Population, Special Reports, Series P-44, No. 12, June 12, 1944.

^{17/} Clague, Ewan, "Human Aspects of the Transition From War to Peace," Social Security Bulletin, Vol. 8, No. 4, (April 1945) pp. 7-12.

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medium estimate, the population would increase by about 9 percent from 1940 to 1950. If the labor force increases during this decade in this same ratio, such increase would account in general for the 6 million increase above, but perhaps the trend toward earlier retirement and later entry upon work and increasing productivity will reduce somewhat the rate of increase.

Each of the years 1942 and 1943 saw about 7½ million workers apply for social security account numbers. In 1944, the number of applicants fell to 4.5 million and in 1945 to 3.3 million. Beginning with 1942, the new female outnumbered the new male applicants. Many married and to-be-married women among the newly covered workers will, under the present act, doubtless derive most of their social security benefits by virtue of being wives of insured workers rather than through their own primary benefits. On the other hand, women who never marry will have to rely on their own wage credits for old-age benefits.

The measures enacted by Congress for the education of veterans will probably have the effect of increasing the number of part time workers for a number of years. If a veteran is attending school and receiving a subsistence allowance he is expected to give a substantial part of his time to school work, but may supplement his allowance with part time employment. Many of these students will work in covered employment and be able to get an insured status through a few hours of employment per week. Aside from part time employment of veterans, there may be more part time work on account of the increasing employment of women.

The difficulties of administration have been a major obstacle to including domestic workers employed in private homes in the system. However, this type of work is becoming more and more commercialized. In larger cities companies have been organized to furnish domestic service to private homes and janitor and similar services to larger establishments. In organizations where domestics are supervised and paid by the firm, they come under covered employment. In this way many workers formerly outside the system may well enter covered employment.

In the early post war years there will probably be more self-employed than during the war. Government employment will probably fall off considerably, but perhaps not to the prewar levels. The result of these shifts may be to enlarge at least temporarily the number of workers among non-covered groups. The number of covered workers should also increase due largely to corporate trends in business, and the proportion of covered workers and covered pay rolls should expand.

Agriculture will probably show a relative and perhaps an absolute decline in workers.

It is estimated that at the end of 1945 about 900,000 individuals above the age of 65, who were already eligible for retirement have remained at work, thus deferring receipt of their old-age benefits. When employment

opportunities become less plentiful many of them will begin to draw their benefits, which will be higher than otherwise because of high wartime wages and more increments. Although it has not been contemplated that everyone would retire at age 65, there has probably been some additional delay in retirement since the beginning of the war. In the post-war period this backlog of retirements may be somewhat reduced.

Many young workers started work a year or two earlier instead of continuing in school. Most of the remaining half of the emergency war workers, however, would not have had jobs except for the war and have been receiving wage credits that they would not have had otherwise. Thus, probably some 3 million more persons have an insured status at least temporarily than would have had it if these workers had not entered the labor market. Most of them are currently insured, although many of the older workers will become fully insured and even permanently insured. A large proportion of the emergency war workers will lose their insured status again in the course of the next few years. The net result of the covered wartime employment has been a substantial boost in tax receipts, some postponement of benefit payments, and a big increase in wage credits. As a result there should be some increase in future benefits.^{18/}

Some significant influences on wage rates have been cited.^{19/} Examples of changes which have tended to reduce the total average wages are the large increase in the relative number of women workers, whose average rates of pay are 35 to 45 percent less than those of men; the increase in the number of semiskilled workers at the expense of skilled workers; the growth of industry in the South, where rates of pay are lower than in the North and West; and the increase in the relative number of older people in the labor force. The greatest single influence in the direction of higher wage rates is the increase in the number of workers employed by large firms, which generally pay higher wages than do the smaller, more competitive businesses. Institutional changes have had their effect. Of these, the most important are the gain in strength of labor organizations; the increasing participation of the Federal Government in economic policy; and changes in the policies of industrial management from hiring the cheapest labor toward employing more efficient labor at better pay.

Before the war employers were beginning to increase the proportion of compensation paid employees in the form of welfare services. The wage stabilization policy during the war stimulated these welfare supplements to wages. Some labor unions have asked for increases in this form alone since the end of the war and this trend may be expected to continue. The Federal Insurance Contributions Act does not tax as wages any payment by an employer on behalf of an employee on account of retirement, sickness or accident, disability, medical or hospitalization expenses, or death, provided such programs meet certain conditions.

^{18/} Fourth Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance Trust Fund, 1944.

^{19/} Wermel, Michael T., "Economic Factors in Long-Range Cost Estimates of Old-Age and Survivors Insurance", Social Security Bulletin, Vol. 7, No. 4, (April 1944) pp. 5-10.

The relative number of skilled, semiskilled, and unskilled workers in the labor force is an important factor determining average wage rates. Recent trends indicate that the proportion of workers in the semiskilled group will continue to increase and that of unskilled decline. A census study on occupations^{20/} from 1910-1940 suggests that with the probable further mechanization of industry a larger and larger proportion of the manual workers will become machine operators--that the semiskilled group will draw somewhat from the higher paid skilled above and largely from the lower paid unskilled below. The net effect should be to increase wages.

A study of the hourly wage rates of the past reveals an almost uninterrupted advance in recorded earnings. Such an advance does not appear to take place continuously, but rather in jumps. A jump usually occurs during wars or unusual periods of prosperity. After a jump has occurred, wage rates do not fall to their former level, but tend to maintain their new level. We have just ended the war period characterized by unusually high wage rates. If the future can be judged by the past, the current high hourly wage rates may mark a new high level that will be maintained or exceeded for jobs requiring comparable skill. The weekly wage may drop on account of the drop in the work-week and less overtime pay, but will undoubtedly be higher than the pre-war level. The drop in the work-week should result in a better spread of employment and tend to lessen unemployment. Workers in covered employment will benefit by the higher wage rates and higher wage level. This trend will be magnified by any shift from less skilled to more skilled labor.

In the long run, the course of wages will doubtless be upward as in the past. Without additional numbers, the labor force can realize increasing production and increasing wages, and consequently increased consumption and a higher standard of living.

^{20/}

Department of Commerce, Bureau of the Census, Comparative Occupation Statistics for the United States, 1870-1940, 1943, p. 185.

VI. OTHER COST FACTORS

Interest

Interest is an important actuarial factor and deserves a separate section in this study. Interest is a necessary factor in our economy and can hardly be disregarded in the consideration of social security. In OASI interest is more likely to play an important part than in other forms of social insurance. In the last analysis, its importance depends upon the type of financing adopted.

The concept of interest leads back for several thousand years. There are records of interest rates as high as 20 percent per annum in Babylonia, 16 percent in Greece, 10 percent in Rome; the Bank of England charged 8 percent on its initial loans. In this relatively new country with its large actual and potential material resources, its free enterprise and profit economy, interest has assumed increasing importance despite the drop in rates from, say, 10 percent in the early history of the country to less than 2 percent in 1945 for certain first-class investments.

Without going into a detailed philosophy of interest rate changes, this enormous decline may be better explained if we consider interest as the result of supply and demand for money or capital. Gross interest rates may be assumed to represent the element of pure interest for the use of money, the element of risk, and the element of expense. In recent years, as capital has accumulated, as conditions have become more and more stabilized, and as loans have increased in size, these three components of interest have decreased in importance and interest rates have decreased. The magnitude of Government borrowing in recent years has interposed a new force in maintaining the interest rate at low levels.

Trust Fund

In the original old-age benefit system under the Social Security Act of 1935, a 3-percent interest rate for the special obligations of the U.S. Government issued at par was established by law. Under the 1939 amendments, no reference to any minimum was made except as to "special" obligations issued to the fund. The interest rate they are required to bear must equal the multiple of $1/8$ percent next lower than the average rate of interest on the current interest-bearing public debt. Since the average interest rate on the interest-bearing public debt on December 31, 1945, was 1.965 percent, the rate for new "special" obligations issued to the old-age and survivors insurance trust fund (original issues at par) for the succeeding quarter was $1\frac{7}{8}$ percent. On the other hand, the trust fund may purchase outstanding obligations at the market price, and has purchased some Treasury bonds bearing $2\frac{1}{2}$ percent interest. Investments are limited to interest-bearing obligations of the United States or obligations guaranteed as to both principal and interest by the United States.

This same basis and rate of interest are utilized for current investments of the unemployment trust fund. The railroad retirement account, on the other hand, still receives 3 percent on its trust fund investments, according to the provisions of the law. The civil service retirement and disability fund obtains a 4 percent return on nearly all its investments.

As of June 30, 1946, the old-age and survivors insurance trust fund reached a total of \$7,641 million, of which \$7,549 million was invested in securities at an average rate of 2.13 percent. Thus the interest income on an annual basis would be about \$161 million. Under a full actuarial reserve basis this fund could become a large portion of the public debt. However, with a public debt on June 30, 1946 of \$269 billion, it represented only 2.8 percent of the total. This discussion of interest on a large reserve fund may appear rather academic because the intent of the 1939 amendments may perhaps be interpreted to limit the amount of the trust fund generally to a contingency reserve equal to three times the highest annual expenditures anticipated during the ensuing 5 fiscal-year period. The trust fund at the beginning of the fiscal year 1946-47 amounted to 8-10 times the highest expected annual disbursements during the succeeding period of 5 fiscal years. With no clear statement in the amended law as to the duty of Congress in such a case, it is possible that a substantial reserve fund will yet be accumulated.

Old-age and survivors insurance is not a level-premium program. It is a program with rising contribution rates originally scheduled to increase on January 1, 1940, 1943, 1946, and 1949, to a 6-percent total (3-percent each for employers and employees) at the beginning of the latter year. The initial tax rate was 1 percent each payable by employees and by employers. Change in these rates has been postponed at various times by Congress through 1947. By that time a policy determination will probably be made not only as to the status of the fund but on all related matters. There appears to be considerable difference of opinion as to what kind of financing should be adopted. The trust fund now represents a considerable contingency fund. Even under a "pay-as-you-go" system of financing, a considerable contingency reserve fund should be available to allow for wide economic fluctuations.

In the British system of old-age and survivors insurance, it might be noted, the contribution rate was calculated to remain level for successive 10-year periods and to be increased successively at the end of each 10-year period. This means that the British have adopted in part the social-budgeting viewpoint--that is, largely meeting the benefit needs of today by the contributions of today rather than neglecting these needs. The British White Paper of 1944 on social insurance is also based on current funding rather than on advance funding.

1/ On August 2, 1946 the Senate authorized its Finance Committee to conduct studies to investigate the need for new legislation covering this matter. In 1945 and 1946 the House Ways and Means Committee had studied the same general matter, and issued a long, comprehensive research report.

The Interest Factor in Private and Social Insurance

Interest is a very important factor in private life insurance, particularly ordinary insurance for which legal reserve funds reach enormous proportions--some \$40 billion in the United States in 1945. Private life insurance companies have guaranteed rates, closed groups of risks, and policies which on the whole must be self-sustaining. Social insurance does not have guaranteed rates, has open groups, and may be based on current sharing and broad sharing even among successive generations. In social insurance, contributions are compulsory and the system, if not its contributions and benefit rates, is presumably permanent. In private life insurance the company must have sufficient funds on hand at any one time to carry out the terms of its contracts without further receipt of premiums. This it can do by maintaining proper legal reserves. The private life insurance business has adopted the convention of level premiums with consequent overpayment of the current risk in the early years and underpayment in the later years, the premium income being on the whole adequate, with interest, to meet the obligations. On the other hand the United States Government, theoretically, has unlimited taxing power to carry out its commitments to beneficiaries and to dependents and survivors under old-age and survivors insurance. Not only may taxes be increased but benefits may be adjusted downward, if necessary. In the last analysis, the money must be raised from the productive groups and paid to the beneficiary groups.

Under a so-called "pay-as-you-go" system, the interest income to the old-age and survivors insurance trust fund might be negligible. Assuming payroll tax funding, this means that in the long run a higher contribution rate would have to be collected than under a full actuarial reserve plan. Instead of paying a level rate of tax uniformly throughout the years, the contributors would pay a lower tax during the early years and a higher tax during the latter years until maturity of the system. There would be the inequity that the workers of the present generation would be underpaying their just share of the contributions. Moreover, there might be a popular undervaluation of ultimate social insurance costs by the present generation. About the only way to avoid such inequity and still operate a true "pay-as-you-go" plan is to assume immediately the cost of paying benefits to the present generation of the aged.

If benefits to the present generation of aged persons were assumed by the current generation of contributors, the benefits could be fairly sizable at present and would advance only gradually over the future. In this case there would probably be little accumulation in the trust fund, and therefore the question of interest would be of minor importance. It has been frequently held that the initiation of payments to the present generation of aged at an early date in the future would violate the contributory principle but it would conform to broad-sharing insurance principles. We already have a good example of broad-sharing in the financing of the public school system.

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The rate of interest can have a very considerable effect on the cost of deferred benefits under a level contribution rate, particularly because of the long deferment of the bulk of the benefits for any one cohort of workers with respect to the bulk of the contributions paid by that cohort.

Assume, for sake of illustration, that a single year-of-birth cohort, exposed to the program for their entire working lifetime, has the following pay roll and benefit history:

Age interval of cohort (between birthdays)	Taxable pay roll of entire cohort (in millions)	Total benefits paid to members of the cohort and their families (in millions)
Total	\$50,000	\$5,000
15-25	5,000	3
25-35	14,500	37
35-45	13,800	135
45-55	9,400	190
55-65	5,700	145
65-75	1,600	1,610
75-85	---	1,976
85-95	---	797
95-105	---	107

If no interest were earned in this hypothetical situation--which is merely an approximate indication of the general relationship of benefits to pay roll--the total benefits would "cost" exactly 10 percent of pay roll. But with interest earnings of say 2 percent per annum, the benefits would "cost" only 5 percent of pay roll. This is found by interpolating each column in the tabulation into single years of age and then discounting each figure at 2 percent interest to find the present value at age 15, the entry age. The results for 2 percent and for other rates of interest are as follows:

Interest rate (percent)	Pay roll discounted to age 15 (in millions)	Benefits discounted to age 15 (in millions)	Ratio (percent) of discounted value of benefits to discounted value of pay roll
1 $\frac{1}{2}$	\$38,971	\$2,743	7.04 $\frac{1}{2}$
2	30,760	1,538	5.00
2 $\frac{1}{2}$	27,653	1,162	4.20
3	24,850	883	3.55

The substitution of 2-percent interest for zero interest reduces the direct cost of the benefits from 10 percent of pay roll to 5 percent. The substitution of 3 percent interest for 2 percent reduces benefit costs by a further 1.45 points, i.e., from 5 percent to 3.55 percent.

The \$50 billion in pay roll and \$5 billion in benefits represent the totals of pay roll and benefits over a lifetime for a single year-of-birth group. If it is assumed, however, that every year-of-birth group in the entire population has the same pay roll and benefit history, the \$50 billion and \$5 billion figures may also be taken as representing the pay roll and benefits for the entire population in a single calendar year. In any year under a going system, then, \$50 billion of pay roll would be taxed and \$5 billion in benefits would be paid out. Therefore it might be said that if no reserve were built up (i.e., under pure pay-as-you-go), benefits would cost 10 percent of pay roll. If, on the other hand, the system had a mature reserve accumulated and level-premium financing, the amount of that reserve would be as indicated in the following tabulation:

Interest rate (percent)	Contribution rate (percent)	Annual amount of benefits financed from--		Amount of reserve (in millions)
		Contributions (in millions)	Interest (in millions)	
1.0	7.04	\$3,520	\$1,480	\$148,000
2.0	5.00	2,500	2,500	125,000
2.5	4.20	2,100	2,900	116,000
3.0	3.55	1,775	3,225	107,500

If the rate of interest is high the amount of reserve required will be low, and vice versa. Under the theoretical condition in which there was no interest and each year-of-birth group built up its own level-premium reserve, the total reserve amount in the mature system would be about \$178,500 million accumulated solely through contributions.

Trends in Interest Rates

We have seen that interest holds a very important place in the commercial world. Investment yield has averaged about 7 percent of the total national income during recent prewar years and reached a record of 14 percent in 1932 during the depression^{2/}, mainly because of the reduction in total national income during this period. Interest represented only about 4.2 percent of the total national income in the full-employment year of 1944^{3/}.

^{2/} Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1943, p. 384..

^{3/} Department of Commerce, Survey of Current Business, February 1945, p. 5.

By early 1946 the interest rate had fallen lower than ever before in history. This downward course may be observed in chart 28 covering years from 1866 through 1943. This chart shows three curves representing the rate of interest. The curve beginning with the year 1879 shows the average gross interest rate earned on mean invested funds of 94 life insurance companies in the United States. Another curve, beginning with the year 1866, shows the net interest rate earned on mean invested funds of the Northwestern Mutual Life Insurance Company^{4/}, which happens to be one of the 94 companies. The third curve shows the yield rate on railroad bonds, that is, the net interest rate a bond will yield on the market price at the date of purchase. Of course, the yield rate on bonds is very responsive to the market and fluctuates much more widely than the interest rate earned.

Interest rates of 7 percent and 8 percent were quite common in the early years following the Civil War. About 1900, interest rates became uniformly low and the consensus of recognized authorities was that they had fallen permanently to a new low level. After World War I rates increased to about the level of 1880. Since 1924 they dropped markedly, especially during the depression. Whatever the future course of interest rates, it is reasonably certain that rates will fluctuate according to wars, business cycles, and the money market. Temporary and long-range fluctuations combine to produce the resulting rate.

Chart 29 represents the frequency distribution of the 94 life insurance companies according to the gross interest rates earned on mean invested funds, first during the period 1924-28, inclusive, and next during the period 1939-43, inclusive. Here the small company has been given as much weight as the large company. The frequency distributions of this group of companies for different periods of time, however, show definitely the trend from high to low interest rates. Even in this span of 15 years there has been a decline in the interest rate of 1.4 percentage points or about 0.1 percentage points per year—a relative drop of about 2 percent per year. There is a decided lag in the net average interest rate earned by life insurance companies, since the funds continue to earn interest at the rate at which they are invested until repaid and reinvested at a different rate. Thus, even with the firming money market which may be expected in the early postwar period, the interest rate earned by life insurance companies will rise relatively slowly as maturing investments are replaced by new ones at a higher rate.

The order of the future seems to be high wages and low interest rates. With a public debt of about \$280 billion at the end of 1945, it is evident that the Government has a stake in the continuation of low interest rates. Through its taxing powers and the Federal Reserve Board, the Government also has considerable control over interest rates. The enlargement of monetary gold holdings and banking reserves has contributed to the unprecedented decline in interest rates. More recently we have restricted foreign

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Fassel, Elgin G., "Reserve Basis," Transactions, Actuarial Society of America, 1944, p. 277.

CHART 26.

INTEREST RATE TRENDS, 1866-1944

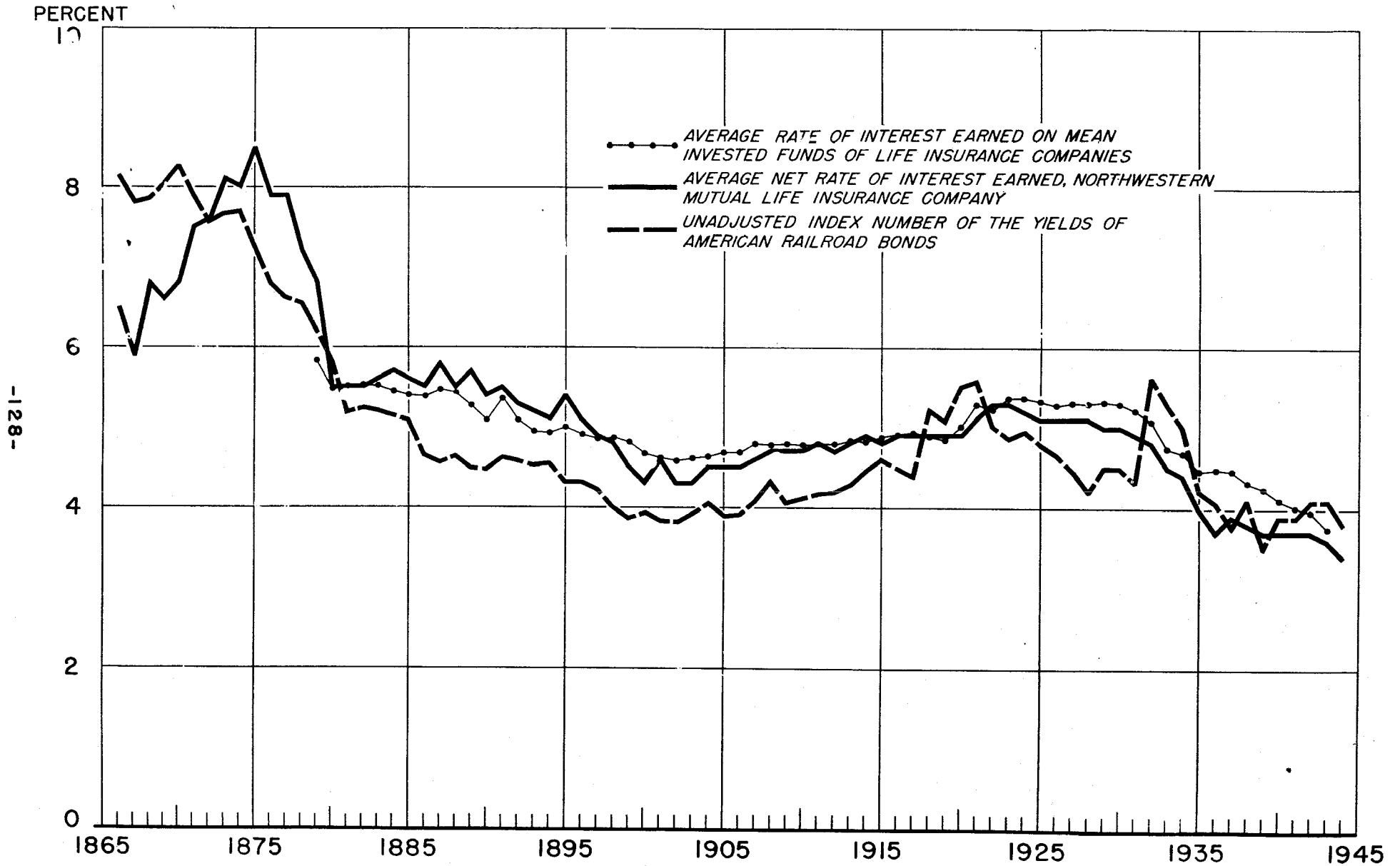
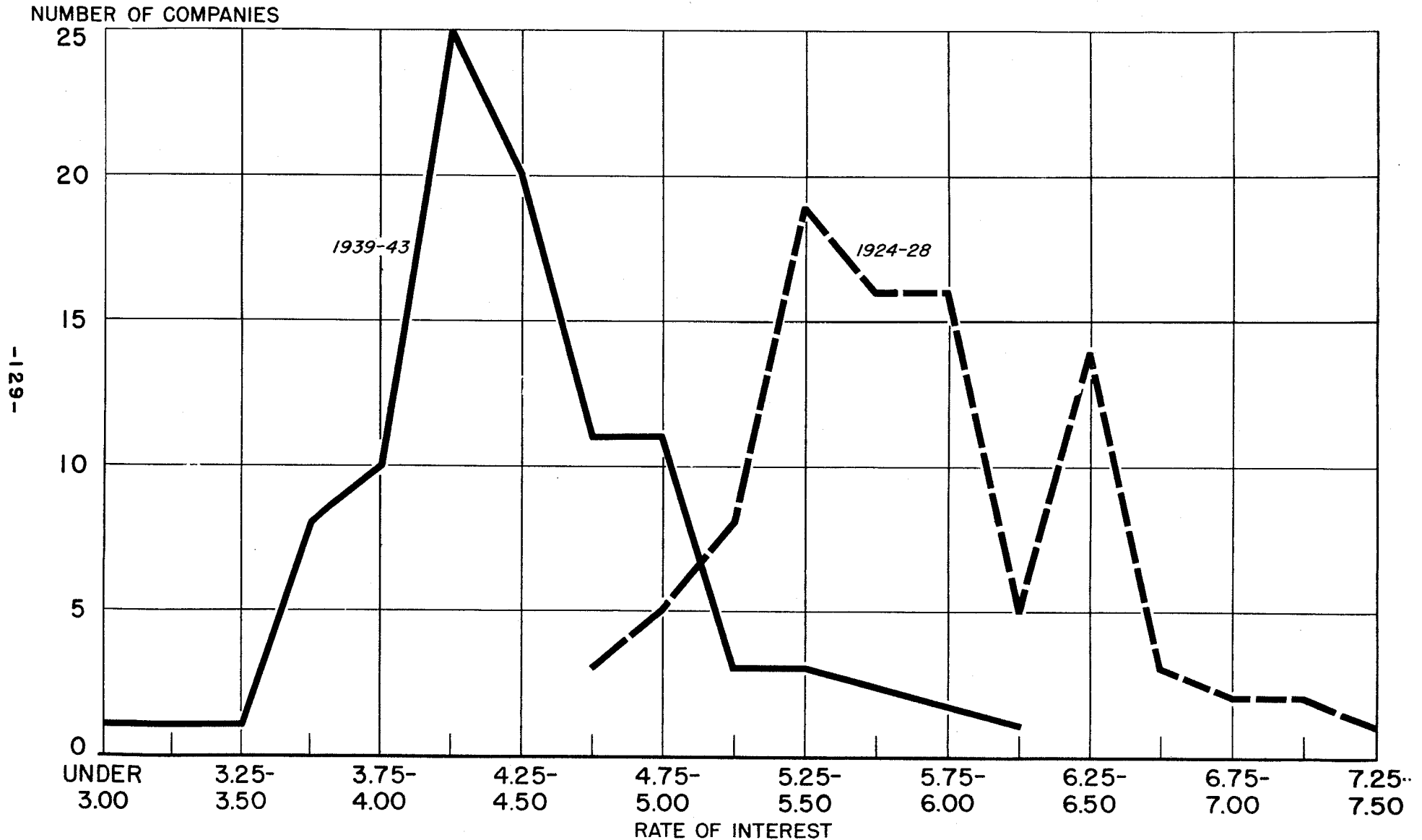


CHART 27.

FREQUENCY DISTRIBUTION OF 94 LIFE INSURANCE COMPANIES BY RATE OF INTEREST EARNED



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financing, and speculative uses of credit, have made more rigorous scrutiny and limitation of security issues, and have regulated business operations, prices, corporate credit, and consumer credit.

Low interest rates have been helpful in refinancing farm debt as well as urban mortgage debt. They have been an inducement to home-building. Savings exercise a very important influence on the interest rate. If savings cannot be absorbed by new investments, the interest rate tends to decline. The unprecedented savings of individuals accumulated during recent years will tend to lower the interest rates. By the end of 1945 personal holdings of liquid assets amounted to \$146 billion, an increase of about \$100 billion since the end of 1940^{5/}. Much of this amount will probably be used for the purchase of consumers goods and will therefore not compete with other capital. Thus, the interest rates may not be affected as much as the magnitude of such savings would lead us to believe. Business savings had accumulated to \$80 billion by the end of 1945, an increase of about \$60 billion during the preceding 5 years. Again a large portion of these savings is retained for inventory and plant expansion and will therefore have only a limited effect on interest rates.

Experience seems to indicate that over a long period the amount of total savings coming into the market each year is fairly constant even in times of booms and depressions. Savings will tend to be maintained by the gradual extension of social insurance such as the old-age and survivors insurance system^{6/}. Thus in the long run interest rates may be expected to continue their decline. On the other hand, there is a good chance that the rates will climb temporarily in the postwar period when capital will be in great demand to catch up on capital outlays, which of necessity have been neglected during the war.

Administration

The Social Security Administration has tried to bring to the public an understanding of its benefits. Generally, the Social Security Act has received the approval of the public, and particularly of labor groups. In general those employments which would cause the greatest administrative expense in crediting wages and collecting taxes have been excluded from the system. However, the detailed exclusions from coverage necessitate many administrative rulings and adjudication of claims. The in-and-out movement increases the ratio of expense to benefit payments.

^{5/} Department of Commerce, Survey of Current Business, February 1946, p. 28.

^{6/} Silberling, Norman J., The Dynamics of Business, 1943, Ch. 16.

Administrative Expenses

When title II was amended in 1939 to establish a trust fund for the old-age and survivors insurance program, into which all employee and employer contributions were to be "appropriated," provision was also made to pay from this fund all expenses of administering the program. Previously expenses had simply been charged as part of all operating expenses of the various Federal agencies responsible for administration, without segregation of these expenses from any other operating expenses. Since 1939, the total administrative expenses of the Bureau of Old-Age and Survivors Insurance have been a charge against the trust fund, from which the disbursing officer of the Treasury Department has been reimbursed for this Bureau's direct expenses. In addition, the various service bureaus within the Social Security Administration and the Federal Security Agency estimate how much of their administrative expenses arise in connection with old-age and survivors insurance and are, therefore, properly chargeable to the trust fund. This is true also of the Bureau of Internal Revenue and other units of the Treasury Department. The Bureau of Internal Revenue is responsible for obtaining employer tax returns and collecting employee and employer contributions, while other units of the Treasury Department issue benefit checks and hold the trust fund securities.

The fact that administrative expenses in connection with the program are all reimbursed from the trust fund does not, however, remove administrative costs from the surveillance of the Bureau of the Budget and the Congress. The administrative budgets of the Bureau of Old-Age and Survivors Insurance and the other participating offices must be approved by the Bureau of the Budget.

Since administrative expenses are charged to and reimbursed by the trust fund and affect the growth of the fund and the amounts left to draw interest, it is desirable that estimates of future administrative expenses be made hand-in-hand with estimates of future benefit costs. Since administrative expense estimates may be partly related to contribution and benefit estimates the problem is relatively simple.

During the fiscal years 1941-45 administrative expenses charged to the trust fund have averaged about \$28 million a year. About three-fourths of these expenses were incurred in the Bureau of Old-Age and Survivors Insurance, about one-fifth in the Bureau of Internal Revenue, and the remainder in several different units. For the Bureau of Old-Age and Survivors Insurance, salaries have been allocated by function, and the entire chargeable expenses of the Bureau of Internal Revenue may be presumed to be tax report and collection expenses, but the expenses charged by the other units have not been allocated according to function. It has been possible, however, to develop the following approximate allocation for the fiscal year 1943:

Function	Total charge (in thousands)	Unit of work load	Number of work-load units (in thousands)	Charge per 100 work-load units
Total	\$27,492	---	---	---
Establishing new employer accounts.....	267	New employer accounts	357	\$75
Establishing new employee accounts.....	3,603	New employee accounts	8,327	43
Collecting taxes and reporting and recording wages.....	12,037	Quarterly wage items	181,410	7
Adjudicating new claims.....	5,654	New benefit claims	433	1,306
Maintaining monthly benefits on the rolls...	1,678	Monthly benefits in force (average)	703	239
General administration and service.....	4,253	---	---	---

Of the six functions shown, the last cannot be directly related to any work load and therefore cannot be estimated by the usual quantitative methods; however, it will probably be relatively constant. The first function would also appear difficult to project into the future since little valid conjecture can be made as to the future extent of employer turn-over; however, the total charge for this work load is relatively small. The second, third, fourth, and fifth functions may very definitely be related to estimates of labor force, employment, and benefits, and may be expressed approximately in terms of work-load units. Administrative costs per work-load unit have been and may continue to be reduced by improved administrative processes.

In the event of extension of coverage, or some other significant changes in the insurance provisions of the program, the administrative costs per work-load unit may change considerably. The cost of collecting taxes and reporting and recording wages, while shown above in terms of number of wage items, is really also a function of the number of employers reporting. At the present time the average quarterly employer report includes about 22 wage items. This average would be materially lowered were coverage extended to agriculture or domestic service for which there is usually

only one employee wage item per employer, with the result that the administrative expense per 100 wage items would increase.

Effect of Administrative Attitude

In a program as broad in scope and as closely associated with many of the contingencies of human life as the old-age and survivors insurance program, it is inevitable that not all the operations and applications of the program can be inflexibly prescribed in legislative provisions. The Congress recognized this situation by setting out various discretionary powers to be exercised by the Social Security Board (now Social Security Administration) in administering the program so as to effect the purposes of the law. For example, section 205 of the Social Security Act provides, in part:

"(a) The Board shall have full power and authority to make rules and regulations and to establish procedures, not inconsistent with the provisions of this title, which are necessary or appropriate to carry out such provisions, and shall adopt reasonable and proper rules and regulations to regulate and provide for the nature and extent of the proofs and evidence and the method of taking and furnishing the same in order to establish the right to benefits hereunder.

"(b) The Board is directed to make findings of fact, and decisions as to the rights of any individual applying for a payment under this title."

Some of the discretionary powers which the Administration may exercise may have an appreciable effect, either directly or indirectly, on the various financial transactions which are the subject of actuarial estimates. Amounts of benefit payments could be particularly affected, since the Administration can determine the extent of proof it will require for the award or continuance of a benefit claim. The amount of contributions may be also affected, since the Commissioner of Internal Revenue, either on his own initiative or as a result of questions raised by the Administration may rule from time to time on the coverage or noncoverage of certain areas of employment.

Lag, Selection, and Immaturity

The deferment of benefits is the most important factor influencing the present and future costs of the old-age and survivors insurance program. The greatest deferment results from the virtual exclusion of the present generation of retired aged from benefits. While many aged workers have had or still have a chance to acquire insured status, many workers aged 65 and over in 1937 have left employment. Most of those 65 and over now employed are in noncovered employment and presumably will remain in such employment during the remainder of their working lifetime.^{7/} When the program has been in force a decade, workers who drop out of covered employment around age 40 or 45 will have had an opportunity to become permanently insured before age 40 or even 30 and their subsequent work history will not affect their right to benefits.

A second type of deferment stems from the fact that benefits are usually not entirely paid until many years have elapsed after contributions are received. Since the longest-deferred benefits are the old-age benefits, reduction in mortality beyond that assumed would still further defer the costs. The period of deferment is accentuated by the fact that, except for certain lump-sum death payments, benefits are paid in monthly installments. This deferment of benefits applies to all workers as a group. Covered workers are concentrated in the younger age groups, and their number decreases relatively more rapidly with increasing age than does the number of noncovered workers. At ages 45 and over, the number of noncovered workers in 1940 seems to have exceeded that of covered workers. Women workers are concentrated in the twenties. For this modal age group there is a deferment of about 40 years in primary benefit payments.

A third type of deferment is due to the increment of 1 percent of the primary benefit for each year credited with at least \$200 in covered wages. Thus other things being equal in 1936 and thereafter, a worker who may have had 50 years of covered employment after 1936, might have a benefit about 40 percent higher than would have been possible in 1945 when only 9 increment years could be counted.

In addition, there is the secular movement toward industrialization and therefore toward covered employment as opposed to noncovered employment. Such a trend carries with it an expanding covered pay roll and consequently also an expanding benefit roll. It also means that each generation of older persons will include a larger proportion who have been in covered employment than the preceding generation.

Finally there is the administrative lag in filing, approving, and paying claims, more fully described in the preceding section.

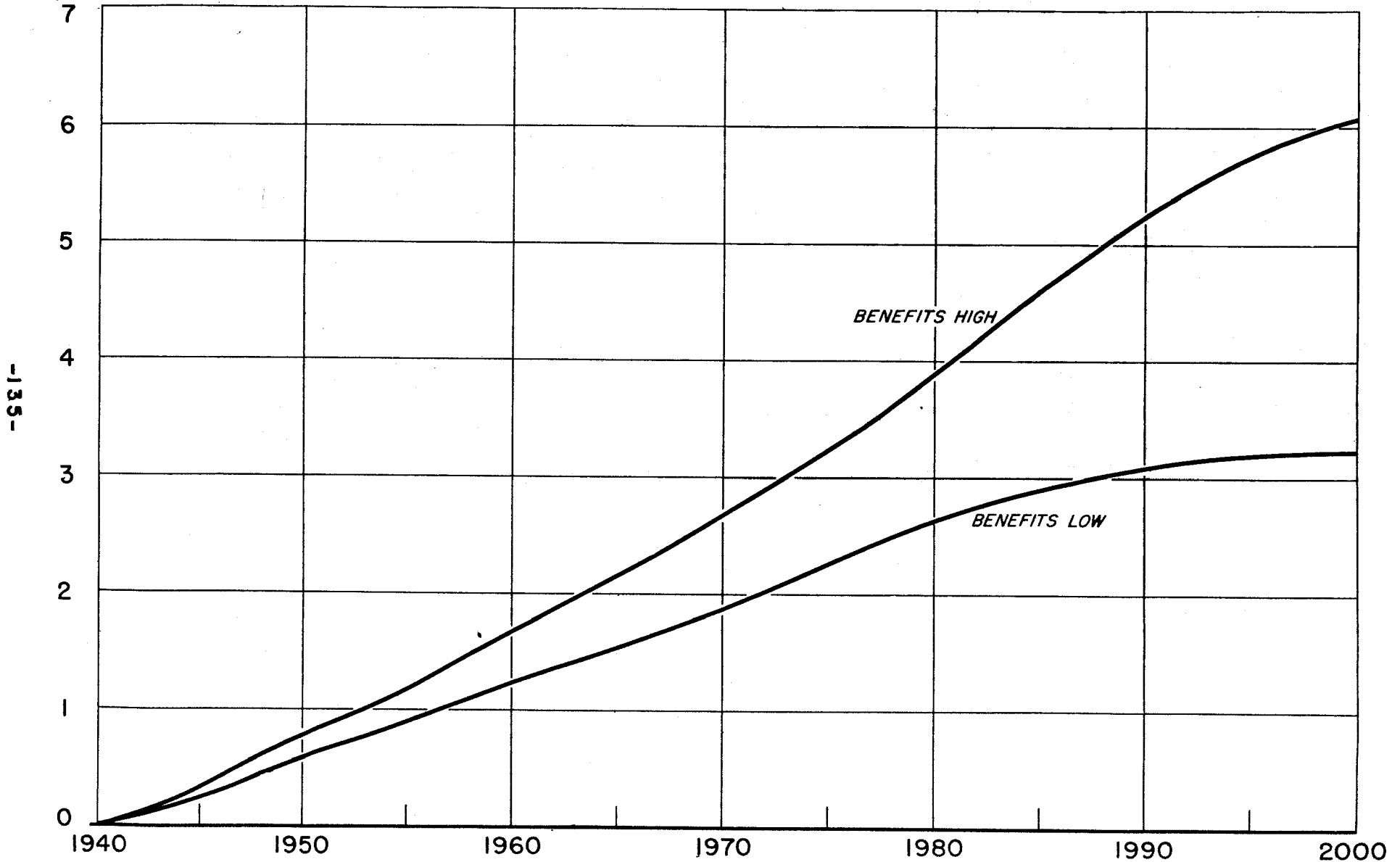
The entire benefit structure of old-age and survivors insurance causes postponement of costs into the future. The combined result of these seven types of deferment cited may best be illustrated by chart 28, which

^{7/} Murray, Merrill G., "Age of Workers in Covered and Noncovered Employment," Analytical Note No. 11, Nov. 14, 1944. Bureau of Old-Age and Survivors Insurance.

CHART 28.

ILLUSTRATIVE BENEFIT TRENDS UNDER PRESENT OASI PROGRAM

BILLIONS OF DOLLARS



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traces the probable course of benefits to the year 2000 according to the assumptions of Actuarial Study No. 19. During 1945 benefits were being paid out at an annual rate of less than \$0.3 billion, while in 2000 the annual expenditure may be 10 or 20 times this amount.

The proportion of the covered population with insured status may ultimately increase to more than 60 percent because, under the formula, the proportion with fully insured status increases with time, particularly by meeting the requirement of 40 quarters of coverage for permanently insured status.

Due to the aging of the population there is another type of deferment which alone causes a steeper slope in the curve for benefit payments than would be the case under a stationary population. For instance, the population aged 65 and over now comprises 7.2 percent of the total population in contrast to 3.4 percent in 1880. For the year 2000, the Thompson-Whelpton medium estimate is 13.0 percent.

Every deferment means lower costs in the present and higher costs in the future. This feature of our old-age and survivors insurance system is of major consequence because, since it is not properly appreciated, the entire benefit structure may be built on the basis of past experience rather than future trends.

Selection in private insurance may be defined as the rejection of undesirable risks and assessment of the correct premium charge for acceptable risks. The purpose of selection is ordinarily to counteract "adverse selection" on the part of applicants.^{8/} Social insurance, by virtue of being compulsory, is not subject to adverse selection because of voluntary action on the part of applicants, nor is there selection of risks in the same sense as in the private business. In compulsory social insurance applications for coverage cannot be rejected, nor can individual applicants be rated. The delay in reaching full benefit rates which accompanies the use of selection is, however, very much in evidence.

Benefits are predicated on wages, subject to a certain minimum and maximum, and a certain amount of employment and wage is a prerequisite of the receipt of benefits. By virtue of the employment requirement, only the healthier persons (current wage earners) are included in the early years and persons in substandard health (invalids and institutionalized persons) are excluded. Age-specific mortality may on this account be expected to be more favorable in the early years of the old-age and survivors insurance system than in later years when this selection gradually wears off. Such automatic selection does not necessarily mean that retirement costs are lower in the long run, but that current costs are likely to be lower and tax yields higher. As time goes on there may be a gradual

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See W. R. Williamson's discussion of paper on selection read at a previous meeting, Transactions, Actuarial Society of America, vol. 45, 1944, p. 33.

wearing off of this selection, benefits may grow, while the relative yield from taxes may decline, because of the growing beneficiary class and the prevalence of invalidity among the insured group.

Our present population has by no means reached maturity. It is still growing, even though at a slower rate than formerly. Over the long range, both fertility and mortality rates have declined greatly. Each of these trends tends to increase the average age of the population. Their combined effect is to intensify this rate of increase; the aging process, moreover, will continue not only during the period of declining rates of natality and mortality but also for three or four generations thereafter.

The maturity of the population is an important factor in increasing costs but the maturity of the old-age and survivors insurance program is a still greater factor. It is believed that in the year 2000, the population at ages 65 and over will be at least twice as great as it is today while the number of beneficiaries at ages 65 and over may increase 15-fold by the end of the century.^{9/}

The old-age and survivors insurance program becomes mature, or any part of it becomes mature, when the oldest year-of-birth group has had the same opportunity of becoming beneficiaries as any younger year-of-birth group that comes afterward. The part of the program which provides survivors benefit to children would, by this definition, reach maturity about 1960 and the other parts about 2000.

There are many orphans under the limiting age for survivor's benefits who might have qualified for benefits if the program had been in operation at the time they were orphaned. Only those children born in 1940 or later can qualify for child's benefits regardless of when they became orphans; around 1958 every year-of-birth cohort will have had an equal opportunity to become beneficiaries.

Old-age benefit payments will require a much longer period. Not until the youngest people who could first acquire old-age benefit rights become the oldest people in the population will the primary benefit portion become mature. Aged widow's benefits may extend the maturing process beyond the end of the century.

Under the assumptions of Actuarial Study No. 19, the percentage increase in costs of old-age benefits from 1980 to 2000 was found to be about 30 percent and 60 percent under the "low" and "high" illustrations, respectively. The benefit curves are still on the increase in the year 2000.

More than likely, stabilized demographic rates and stationary populations will never be realized. A constant study of trends and tendencies is necessary^{10/}.

^{9/} Analytical Note No. 12, Bureau of Old-Age and Survivors Insurance, November 17, 1944.

^{10/} Any assumptions of stationary populations occurring in this study are made for convenience in analysis and not because they are deemed likely.

Intangible Factors

This study has attempted to treat most of the tangible actuarial cost factors, but the many additional intangibles should also be noted. Philosophical, psychological, and political influences on costs depend mainly on human behavior and are difficult to analyze. Many such influences are of compelling importance but cannot be treated on a quantitative basis because of this "human equation."

Through the ages, the mores of a people have largely determined when an individual enters work and when he retires. In the United States, education has assumed increasing importance in recent years, postponing the date of entering work and increasing the length of dependent childhood, so that the age of entering upon work has been postponed first from 10 or 12 years to 14, and now perhaps to 17 or 18 years on the average. This process is continuing and may result in further postponing the age of entering work. On the other hand, the age of retirement from work has been lowered considerably by the trend toward industrialization and to some extent by the initiation of pensions and retirement systems.

The future trend in retirement is more difficult to analyze. With the development of geriatrics, the present trend to lower retirement age may even be reversed. Since the aged are becoming relatively more numerous, there may be considerable economic and sociological pressure to extend the working lifetime of the individual. Again, such an influence will be greatly modified by the type and amount of retirement benefits available to an individual from all sources.

In old-age and survivors insurance, for instance, a distinction must be made between retirement from covered work and retirement from all work. Payment of benefits entails retirement only from covered work. Probably many elderly people will retire from covered employment and take up the work of their choice or their avocation and, with the aid of their old-age and survivors insurance benefits, remain currently self-supporting. Decisions on retirement from work will depend largely on the income and resources of potential claimants. Workers who have made individual savings or are receiving an employer pension may more readily decide to retire than those who do not have such additional income or property. The level of old-age and survivors insurance benefits should not be set so high that they will stimulate retirement or require too heavy rates of contributions, or so low that they will be below the presumptive need of beneficiaries, taking other income into account.