INHERITANCE TAX CALCULATIONS

AN EXPLANATION OF THE UNDERLYING PRINCIPLES WITH TABLES AND INSTRUCTIONS FOR ASCERTAINING THE PRESENT VALUE OF DOWER AND CURTESY RIGHTS, LIFE ESTATES, ANNUITIES, VESTED AND CONTINGENT REMAINDERS

UPON THE

NORTHAMPTON, CARLISLE, AMERICAN AND ACTUARIES' EXPERIENCE TABLES OF MORTALITY AT VARIOUS RATES OF INTEREST, WITH A BRIEF ANALYSIS OF THE INHERITANCE TAX LAWS OF THE VARIOUS STATES AND TERRITORIES

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PREFACE.

The Legislatures of the various States have of late years devoted considerable attention to acts taxing inheritances. At the present time the statute books of nearly all of the larger and wealthier States contain provisions for the levying of a tax of this nature. The number of inquiries which have been directed to the undersigned, has indicated a desire upon the part of the members of the law profession to know something of the principles underlying the necessary calculations which form the basis for the imposition of this form of taxation. To meet this want and to place before the profession generally an inexpensive book free from technical details and yet sufficiently comprehensive to enable one with practically no mathematical attainments to make the necessary calculations, may be briefly stated as the objects of the author. It is not intended as a text-book for actuaries or actuarial students, for they can find these subjects treated in a more thorough and scientific manner in the various text-books pertaining to their profession.

It is to the practicing lawyer, therefore, that I believe this book will prove both useful and attractive. I have spoken with a number of such men, and even those who enjoy large probate practices have admitted their inability to verify the calculations of life estates and remainders which have been made for them by the designated State officers. In many cases these officers themselves admit their ignorance of the subject and are content to give certificates which represent approximations.

The arrangement of the book is simple, and when once understood will enable one to calculate even the most complicated values quickly and with sufficient accuracy for all practical purposes. The advantage of this arrangement may be observed by comparing this with other books equally large and which give the possessor only the necessary tables for the calculations of dower and curtesy rights on one basis of mortality alone. Within these covers will be found the necessary instructions and tables for the calculation of life estates, limited estates and vested remainders, contingent remainders, remainders that may be divested, dower, curtesy, inchoate dower, annuities of all kinds, etc., not only for one life, but for two, and in many cases three lives, on various bases, such as the American Experience Table of Mortality, Combined Experience, Carlisle Experience, and the Northampton Tables.

The first part of the book consists of an exposition of the principles underlying these calculations, explaining the mortality tables, the method of adapting them to our uses and a simple explanation of the derivation of the necessary formulæ. The second part of the book consists of a series of problems which explain in concrete form the application of the formulæ derived in the first part of the book. These actual problems will enable the student to grasp the methods to be applied in a much shorter time than would a mere dealing with the propositions in an abstract manner. The numbers in brackets at the beginning of each problem refer to the numbers opposite the formulæ in the first part of the book, and one is enabled thereby to immediately turn to the explanation relating to the derivation of the particular formula with which he is working. The third part of the book consists of the tables which have been derived and which are to be used according to the requirements of the various State laws. In Michigan, New York, North Carolina, and Wisconsin, for instance, the American Experience Table of Mortality is used. In California, Iowa, Maine, and some other States the Actuaries' or Combined Experience Table is prescribed, while in Pennsylvania, Tennessee, and Virginia the Carlisle Table is still used as a standard. It will be noticed that a number of tables are given on the Northampton basis, which is still apparently used in many localities for the calculation of dower rights. The fourth part of the book consists of a short discussion pertaining to the inheritance tax laws of the various States which will enable the reader to tell at a glance which standards are used in any particular State, so that he need not be in doubt as to the table of mortality which is to be used. It was deemed inexpedient to attempt to give a resume of the laws themselves, as they are constantly being changed with each session of the Legislatures, and each practicing attorney will unquestionably be familiar with or able to ascertain what changes have been recently made.

There is not much that may be termed original in the first part of the book, for these are well-established doctrines and theories which are familiar to every actuary. Many of the tables, however, in the third part have been derived and computed especially for this book, and there is no doubt but that they will prove acceptable additions to the tables now in use in many insurance offices. The graduated Carlisle Table, as set forth in volume XXII of the Journal of the Institute of Actuaries, has been used as a basis for those problems involving the Carlisle Table and more than one life. Similar problems on the American Experience Table have been worked by the Makehamized Experience Table of Mortality, as set forth in a paper presented by Mr. Arthur Hunter to the Actuarial Society of America in May, 1902. Mr. Hunter's paper gave the values only on the 3% and 3½% bases. This book contains the calculations on a 5% basis. Some of the problems involving two and three lives have been adapted from those given in Milne's book. Some of the tables involving the Combined and the Northampton Tables of Mortality have been reproduced from some of the text-books in use in life offices, and from the tables published and distributed by the New York Insurance Department.

I am indebted to Mr. Lee J. Wolfe for his assistance in deriving most of the tables in Part III.

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CHAPTER I.

Tables of Mortality — An Early Roman Table — The Northampton and the Carlisle Tables — Observations of Edward Wigglesworth — Actuaries' or Combined Experience Table — The American Experience Table — The Interest Factor.

The calculations of the values of life estates, vested remainders, contingent remainders, and other problems of a similar nature, the solution of which is rendered necessary by the laws pertaining to collateral inheritance taxes, are primarily dependent upon the application of the probability of life and of death, and secondarily, upon the rate of interest which the statute assumes as a basis. We apply the doctrine of probabilities by means of a table of mortality compiled from actual sources of observation and graduated to eliminate any undue fluctuation due to the peculiar and abnormal conditions affecting the lives under observation. The first mortality table of which we have any record, is the one prepared by the eminent Roman jurist, the Prætorian Præfect Ulpianus, who, without doubt, was actuated by a desire to remedy the defects which existed in the crude method which had been employed prior to his time in the valuation of annuities. It has been said that the first necessity for these judicial valuations was occasioned by the operations of the Falcidian law, by which a testator was prohibited from giving more than three-fourths of his property in legacies. The necessity, therefore, arose for valuing these legacies, which were in effect annuities either for life or for a shorter term. Numerous investigators have since compiled tables of mortality based upon observations in their own localities, but they have more interest for the student of actuarial history than for those for whom this book is intended. There are two tables, however, which, although not employed by insurance companies at the present time to any great extent, must be referred to as marking epochs in the history of annuity calculations. In 1771, Dr. Price published his famous work "Observations on Reversionary Payments; on Schemes for Providing Annuities for Widows, and for Persons in Old Age; on the Method of Calculating the Values of Assurance on Lives, etc." Among the various tables included by the author in that book, was one showing the probability of life at Northampton. This was the famous Northampton Table of Mortality employed for a great number of years by the actuaries of insurance companies and incorporated in the statutes of a number of States as a basis for calculating dower rights. Forty-four years later Joshua Milne produced the Carlisle Table of Mortality. This table was long recognized as a standard, and, in fact, is still designated in this country in the statutes of many of the States as a basis for dower and curtesy rights; but in one State only (Tennessee) is it to-day specified as a basis for computation which must be used in fixing the values of annuities and life estates in collateral or inheritance tax matters.

In 1789, a professor of Harvard University, Edward Wigglesworth, published what is probably the first American observation on mortality. This table was based upon the early Bills of Mortality in the States of Massachusetts and New Hampshire, and it was afterwards adopted by the Supreme Court of the Commonwealth of Massachusetts for estimating the value of life estates. In 1838, a committee of English actuaries started the compilation of a mortality table which represented the experience of seventeen life offices. The result of their investigations is known as the "Actuaries' or Combined Experience Table of Mortality," which for many years has been the standard for valuation purposes in a number of the States. It is specified at the present time as the basis for calculating annuities and reversionary interests in about half of the States whose statutes refer to any particular table of mortality, the balance using the "American Experience Table of Mortality." The latter is the work of Sheppard Homans; it appeared in 1868 and was based upon the experience of the Mutual Life Insurance Company of New York. This table was adopted by the Legislature of the State of New York as a standard for the valuations of the State.

The second factor which enters into the value of life estates and remainders is the interest rate. This is a purely arbitrary quantity, varying with the dictates of the legislators of the various States and based approximately upon the earning power of money at the time of the enactment of the statute. The principal rates used in this country at the present time are 4% and 5%, but in the tables which will be found in the following pages 6% has also been used in order to conform to the statutes of some of the States which still adhere to this high rate.

CHAPTER II.

Expectation of Life — The Method of Deriving it — Compound Interest — Rule for Calculating it for any Period — Discount or Present Values — Rule for Finding Present Value of $1 *Due at Various Periods.*

The American Experience Table of Mortality, referred to in the previous pages, is as follows:

Age.	l_x	d_x	Expectation.
10	100,000	749	48.72
11	99,251	746	48.09
12	98,505	743	47.45
13	97,762	740	46.80
14	97,022	737	46.16
15	96,285	735	45.51
16	95,550	732	44.85
17	94,818	729	44.19
18	94,089	727	43.53
19	93,362	725	42.87
20	92,637	723	42.20
21	91,914	722	41.53
22	91,192	721	40.85
23	90,471	720	40.17
24	89,751	719	39.49
25	89,032	718	38.81
26	88,314	718	38.12
27	87,596	718	37.43
28	86,878	718	36.73
29	86,160	719	36.03
30	85,441	720	35.33
31	84,721	721	34.63
32	84,000	723	33.92

Age.	l_x	d_x	Expectation.
33.................	83,277	726	33.21
34.................	82,551	729	32.50
35.................	81,822	732	31.78
36.................	81,090	737	31.07
37.................	80,353	742	30.35
38.................	79,611	749	29.63
39.................	78,862	756	28.90
40.................	78,106	765	28.18
41.................	77,341	774	27.45
42.................	76,567	785	26.72
43.................	75,782	797	25.99
44.................	74,985	812	25.27
45.................	74,173	828	24.54
46.................	73,345	848	23.81
47.................	72,497	870	23.08
48.................	71,627	896	22.35
49.................	70,731	927	21.63
50.................	69,804	962	20.91
51.................	68,842	1,001	20.20
52.................	67,841	1,044	19.49
53.................	66,797	1,091	18.79
54.................	65,706	1,143	18.09
55.................	64,563	1,199	17.40
56.................	63,364	1,260	16.72
57.................	62,104	1,325	16.05
58.................	60,779	1,394	15.39
59.................	59,385	1,468	14.74
60.................	57,917	1,546	14.10
61.................	56,371	1,628	13.47
62.................	54,743	1,713	12.86
63.................	53,030	1,800	12.26
64.................	51,230	1,889	11.67
65.................	49,341	1,980	11.10
66.................	47,361	2,070	10.54
67.................	45,291	2,158	10.00
68.................	43,133	2,243	9.47
69.................	40,890	2,321	8.97

Age.	l_x	d_x	Expectation.
70................	38,569	2,391	8.48
71................	36,178	2,448	8.00
72................	33,730	2,487	7.55
73................	31,243	2,505	7.11
74................	28,738	2,501	6.68
75................	26,237	2,476	6.27
76................	23,761	2,431	5.88
77................	21,330	2,369	5.49
78................	18,961	2,291	5.11
79................	16,670	2,196	4.75
80................	14,474	2,091	4.39
81................	12;383	1,964	4.05
82................	10,419	1,816	3.71
83................	8,603	1,648	3.39
84................	6,955	1,470	3.08
85................	5,485	1,292	2.77
86................	4,193	1,114	2.47
87................	3,079	933	2.18
88................	2,146	744	1.91
89................	1,402	555	1.66
90................	847	385	1.42
91................	462	246	1.19
92................	216	137	.98
93................	79	58	.80
94................	21	18	.64
95................	3	3	.50

In the above table the first column shows the age of the life or lives under observation; the second column, known as the *l* column, indicates the number living at the various ages; the third column, known as the *d* column, shows the number dying at each age, and it will be apparent to the most casual observer that the value of *d* at any age is equal to the number living at that age, less the number living at the next higher age;

the last column shows the expectation of life at the various ages, and this quantity may be defined as the average number of years which will be lived after a stated age. It is obtained by adding together the number living at the various ages beyond the one under observation, dividing this sum by the number living at the age of observation, and to the quotient adding six months. To find, for instance, the expectation of life at age 88, we would add together the numbers in the l column, beginning with 1,402 and continuing until the end of the table is reached. This sum, 3,030, we divide by the number living at age 88, viz.: 2,146, the quotient being 1.41; adding .5 of a year to this gives the expectation of life as 1.91 years.

It is not an uncommon error for those attempting to ascertain the value of a life estate to simply multiply the annual income by the number of years shown in the expectation of life column. This is absolutely incorrect, and the cause of the error and its magnitude will be appreciated when the manner of correctly computing annuities is explained.

INTEREST.

It has been explained that all annuity and reversionary interest calculations are composed not only of the mortality element, but also of the interest element. It will be apparent that a given sum will produce a much larger life annuity if the calculations are made upon a 5% interest earning basis than upon a 4% assumption. It will be necessary, therefore, for the reader to familiarize himself with certain elementary facts concerning the accumulations of compound interest.

If the amount of the principal be indicated by 1 and the rate of interest by i the value at the end of a year's time will be $1 + i$. At the end of the second year the accumulations will be represented by

$$(1 + i)\ (1 + i) \text{ which equals } (1 + i)^2.$$

At the end of the third year the accumulations will be

$$(1 + i)^2\ (1 + i) \text{ which equals } (1 + i)^3.$$

Suppose we wish to determine the amount of \$1 at 5% compound interest at the end of each year for five years. From the above

At the end of the 1st year	$1 + .05$	= \$1.05
At the end of the 2d year	$(1 + .05)^2$	= 1.1025
At the end of the 3d year	$(1 + .05)^3$	= 1.157625
At the end of the 4th year	$(1 + .05)^4$	= 1.215506
At the end of the 5th year	$(1 + .05)^5$	= 1.276281

This enables us to derive the general rule for compound interest, which is that, at the end of any given number of years the value of the principal may be determined if we add to it the rate of interest and raise this sum to the power equal to the number of years.

The determination of the present value of a sum due at some future period, may be described as the reciprocal operation to the foregoing. If $1 + i$ be taken as the representation of the amount of \$1 at i rate of interest at the end of a year, then $\frac{1}{1+i}$ will represent an amount which accumulated at i rate of interest will exactly equal \$1 at the end of the year. In the same way it can be shown that $\frac{1}{(1+i)^2}$ will equal the present value of

\$1 due at the end of the second year, and $\frac{1}{(1+i)^3}$ will equal the present value of \$1 at the end of the third year. The reader will notice that the denominators of these fractions are identical in form with the quantities representing the values of \$1 accumulating at interest for the corresponding number of years in the preceding paragraph. If we wish to obtain, therefore, the present value of \$1 at 5% compound interest for the various periods up to five years, we would have

Present value of \$1 due in 1 year:

$$\frac{1}{1+.05}=\$.952381$$

Present value of \$1 due in 2 years:

$$\frac{1}{1.1025}=\$.907029$$

Present value of \$1 due in 3 years:

$$\frac{1}{1.157625}=\$.863838$$

Present value of \$1 due in 4 years:

$$\frac{1}{1.215506}=\$.822702$$

Present value of \$1 due in 5 years:

$$\frac{1}{1.276281}=\$.783526$$

The rule, therefore, for determining the present value of any amount due at some future date, is to divide that amount by itself accumulated at the given rate of compound interest for the stated period.

The two rules formulated above are essential to an understanding of the principles outlining the calculations of annuities and insurances.

CHAPTER III.

Probability of Living — Present Value of Amount Payable if a Designated Life Survives a Given Period — Mortality Table Combined with Discount Value to Obtain the Present Value of a Life Estate Arithmetically.

We have already seen that we use the symbol l to indicate the number living, and in the following pages l_{10} will indicate the number living at age 10, l_{11} the number living at age 11, etc. By referring to the American Experience Table of Mortality in Chapter II, it will be seen that

$$l_{10} = 100{,}000$$
$$l_{11} = 99{,}251$$
$$l_{12} = 98{,}505$$

from which it is apparent that the probability of a person aged 10 surviving one year may be represented by the fraction

$$\frac{99{,}251}{100{,}000}$$

and the probability of a person aged 10 surviving two years will be represented by the fraction

$$\frac{98{,}505}{100{,}000}$$

Disregarding for the moment the question of interest, it will be seen from the above that the value of \$1 payable to a person aged 10, if he survives the year, plus the value of \$1 payable to those aged 10 who survive the second year, may be represented by

$$\frac{99{,}251}{100{,}000} + \frac{98{,}505}{100{,}000} = \frac{197{,}756}{100{,}000} = \$1.97$$

In other words, if 100,000 people aged 10 each paid \$1.97 into a fund, it would enable the distributor to pay \$1 to each of the group who lives one year, and \$1 to each of the group who lives two years. In a similar manner the present value of \$1 payable in a similar manner to the end of the mortality table limit, may be expressed

[1] $$\frac{l_{x+1}}{l_x} + \frac{l_{x+2}}{l_x} + \frac{l_{x+3}}{l_x} + \text{etc.}$$

in which l_x represents the number living at any age, and of course l_{x+1} represents the number living at the next higher age.

We must not, however, permit the fact to escape us that a calculation of this kind is incomplete without the interest element. We must, therefore, discount the values of the probabilities expressed in the foregoing analysis by the rate of interest which we assume will be earned. Suppose that we should desire to calculate according to the American Experience Table of Mortality, with 5% interest, the value of a life estate of a beneficiary aged 90, the annual income from the testator's estate being \$1. So advanced an age is assumed in order that we may complete our calculations to the tabular limit without undue repetition. According to the Table of Mortality, we find:

At age 90 there will be 847 living.
At age 91 there will be 462 living.
At age 92 there will be 216 living.
At age 93 there will be 79 living.
At age 94 there will be 21 living.
At age 95 there will be 3 living.

By referring to the preceding chapter on the present values of $1 due at stated periods, we find that the

Present value at 5% of $1 at end of 1 year is .952381

Present value at 5% of $1 at end of 2 years is .907029

Present value at 5% of $1 at end of 3 years is .863838

Present value at 5% of $1 at end of 4 years is .822702

Present value at 5% of $1 at end of 5 years is .783526

Bearing in mind the above data it will be apparent that the present value of a payment of $1 to a person aged 90 surviving one year will be

$$\frac{462 \times .952381}{847}$$

In the same way the present value of $1 payable to a person aged 90, if he survives the second year, will be represented by

$$\frac{216 \times .907029}{847}$$

The present value of the third payment will be

$$\frac{79 \times .863838}{847}$$

The present value of the fourth payment will be

$$\frac{21 \times .822702}{847}$$

and the present value of the fifth payment will be

$$\frac{3 \times .783526}{847}$$

The sum of the series, therefore, which represents the value of the life estate of this beneficiary is expressed

$$\frac{(462 \times .952381) + (216 \times .907029) + (79 \times .863838) + (21 \times .822702) + (3 \times .783526)}{847}$$

[2]

Performing these arithmetical calculations we obtain as a result .8545 which means that according to the American Experience Table of Mortality and 5% interest, the value of a life estate of $1 per annum of a person aged 90 is $.8545.

This analytical method, while giving absolutely correct results, is cumbersome and from a practical standpoint impossible of use when it is desired to obtain the value of life estates of beneficiaries of younger ages. We are enabled, however, by the employment of an arrangement known as the Commutation Columns to materially shorten the calculation and obtain the desired result by one operation. The method of obtaining these columns will be explained in the next chapter.

CHAPTER IV.

Commutation Columns — Method of Derivation — The D *Column — The* N *Column — Formula for Calculating the Present Value of a Life Estate from the Commutation Columns — Application of Formula — Derivation of Formulæ for Temporary Annuity (use of an estate for a limited term) and for Deferred Annuity — Combination of the Foregoing.*

The names of Dale, Morgan, Barrett, and Griffith Davies are all connected with the earlier work of the development of the Commutation Columns, but to Professor John Nicholas Tetens, of the University of Kiel, belongs the credit of publishing what is probably the most lucid description of these aids to actuarial calculations. In 1785 he introduced the method of multiplying the numerator and denominator of the fractions (shown in the preceding chapter) representing the present value of a unit to be paid to a person aged x at the end of the various years, by the discounted value of $1 at a given rate of interest raised to a power equal to the age of the life under observation. Since he multiplied both the numerator and denominator of the fraction, it did not, of course, affect its value. The utility of this method will, however, be observed after the process of calculating these columns has been explained.

Referring to Formula [1] in the preceding chapter, which is

$$\frac{l_{x+1}}{l_x} + \frac{l_{x+2}}{l_x} + \frac{l_{x+3}}{l_x} + \text{etc.}$$

let us put it in the more condensed form of

$$\frac{l_{x+1} + l_{x+2} + l_{x+3} + \text{etc.}}{l_x}$$

It will be recalled that the value of a life estate depends not only upon the mortality element, but also upon the rate of interest which the statute assumes. We must, therefore, introduce the discounted value of $1 as shown in Formula [2]. Representing this discounted value by the symbol v we have

$$\frac{l_{x+1}}{l_x}\, v + \frac{l_{x+2}}{l_x}\, v^2 + \frac{l_{x+3}}{l_x}\, v^3 + \text{etc.}$$

which gives

$$\frac{(l_{x+1})\,(v) + (l_{x+2})\,(v^2) + (l_{x+3})\,(v^3) + \text{etc.}}{l_x}$$

which the reader will recognize as identical in form with Formula [2].

Multiplying the numerator and denominator of a fraction by the same quantity does not change its value. Let us multiply the numerator and denominator of the fraction just obtained by v^x and we have for a result

$$\frac{(l_{x+1})\,(v^{x+1}) + (l_{x+2})\,(v^{x+2}) + (l_{x+3})\,(v^{x+3}) + \text{etc.}}{l_x\, v^x}$$

Representing

$l_x\, v^x$ by D_x

$l_{x+1}\, v^{x+1}$ by D_{x+1}

$l_{x+2}\, v^{x+2}$ by D_{x+2}

$l_{x+3}\, v^{x+3}$ by D_{x+3}

we have

$$\frac{D_{x+1} + D_{x+2} + D_{x+3} + \text{etc.}}{D_x}$$

And if we represent the value of the series

$$D_{x+1} + D_{x+2} + D_{x+3} + \text{etc. by } N_{x+1}$$

we have as the value of the foregoing fraction

[3] $$\frac{N_{x+1}}{D_x}$$

If we, therefore, once work out the values of N and D we will be enabled to immediately calculate the value of an estate for life, an estate for a limited term of years, an estate the value of which will not be enjoyed by the beneficiaries until a certain number of years have elapsed, and the various problems which arise in matters connected with annuities.

The values of the N and D columns have been worked out and will be found under various tables in the second part of this book. To illustrate the manner of applying the formula just arrived at, let us obtain the value of a life estate of a beneficiary aged 90, according to the American Experience Table of Mortality and 5% interest.

$$\frac{N_{x+1}}{D_x} = \frac{N_{90+1}}{D_{90}} = \frac{N_{91}}{D_{90}}$$

By referring to Table XXX we see that

$$N_{91} = 8.96550843 \text{ and}$$
$$D_{90} = 10.49171277$$

Dividing the first by the second we obtain as a result .8545 which will be recognized as the same answer that was obtained by the laborious arithmethical computations performed in the solution of Formula [2].

It must be borne in mind that the Commutation Columns for each table of mortality and each rate of interest are different. To determine the value, therefore, of any life estate, divide the figure found in the N column opposite the age one year higher than the beneficiary's, by the figure found in the D column opposite the age of the beneficiary, being careful to use the Commutation Columns of the correct table of mortality and rate of interest.

To determine the value of a temporary annuity or an estate for a limited number of years, is a comparatively simple matter once the Commutation Columns have been worked out. Instead of carrying the calculations to age 95, which is the limit of the American Experience Table of Mortality, we stop at the end of the number of years for which the beneficiary is to enjoy the estate. Suppose, for instance, we wish to determine the value of a temporary annuity for two years. We may represent this by

$$\frac{(l_{x+1})(v^{x+1})+(l_{x+2})(v^{x+2})}{l_x\, v^x}$$

which the reader will recognize as the beginning of the same process which resulted in Formula [3]. Using the same substituted values, we have for the value of this temporary annuity

$$\frac{D_{x+1} + D_{x+2}}{D_x}$$

Remembering that N_x represents the value of the entire series from age x to the end of the table, it will be apparent that the numerator in this fraction becomes

$$N_{x+1} - N_{x+3}$$

so that the fraction may be expressed as

$$\frac{N_{x+1} - N_{x+3}}{D_x}$$

from which we derive the rule that the value of a temporary annuity may be found by subtracting from the figure in the **N** column opposite the age one year greater than the beneficiary's, the figure in the **N** column opposite the age represented by the beneficiary's age increased by one more year than is contained in the term for which the estate is to be enjoyed, this remainder being divided by the figure in the **D** column opposite the age of the beneficiary. This rule expressed algebraically is

[4] $$\frac{N_{x+1} - N_{x+n+1}}{D_x}$$

in which the n is the number of annual payments which are to be enjoyed by the beneficiary, the first of which is to be made one year after the testator's death.

A deferred annuity may be defined as one which begins at some definite date in the future and continues from that time until the end of the life of the beneficiary.

From the foregoing explanation it will be apparent that this form of annuity may be represented by the fraction

[5] $$\frac{N_{x+n}}{D_x}$$

in which n represents the number of years for which the first payment is to be deferred. A life estate, for instance, the enjoyment of which is not to begin until five years after the death of the testator, would in the case of a beneficiary 40 years old have for its value

$$\frac{N_{45}}{D_{40}}$$

The rule in this case is so obvious that it is unnecessary to formulate one.

It is not an uncommon thing to be called upon to calculate the value of an estate, the terms of which are a combination of Formulæ [4] and [5]. Such a case would be represented by a condition of affairs whereby the beneficiary was to enjoy the estate only after a certain number of years had elapsed and then only for a limited period. To use a concrete illustration, if we were required to ascertain the value of an annuity which a beneficiary age 40 at the time of the death of the testator was to enjoy for a period commencing ten years after the testator's death and to continue for twenty years and no longer, the formula would be

$$\frac{N_{40+10} - N_{40+10+20}}{D_{40}} = \frac{N_{50} - N_{70}}{D_{40}}$$

the general formula for a deferred temporary annuity being

$$[6] \qquad \frac{N_{x+n} - N_{x+n+m}}{D_x}$$

in which the symbol n represents the number of years for which the temporary annuity is deferred, and the symbol m represents the number of years for which the annuity is to continue.

CHAPTER V.

Inchoate Dower Rights — Joint Life Annuities — Derivation of Formula for Obtaining Same — Temporary Joint Life Annuities — Annuities Payable Until the Extinction of the Longer of Two Lives — Other Formulæ Involving Two Lives.

In dealing with the various problems which arise in connection with inchoate dower rights, estates, the enjoyment of which is dependent upon the survivorship of a designated life, and other matters of a similar nature, we employ joint life annuities. A joint life annuity is one which is payable as long as all the parties continue to live, and, therefore, ceases as soon as one of the lives makes its exit. A joint annuity on the lives of x and y would be payable as long as they both lived, but upon the death of either, the annuity payments would cease. The manner in which this form is found useful in calculating inchoate dower rights, is best illustrated by analyzing the conditions which exist in a case of that kind. y, the wife of x, is entitled as a dower right to the annual income which arises from one-third of the estate of x upon his decease. The value of such a life estate would easily be ascertainable from the formula outlined in the preceding chapter, were it not for the fact that her income does not start until the death of x. We must, therefore, decrease the value of the life estate of y by an amount which represents the joint existence of x and y. This latter factor is the joint annuity, and the rule for determining an inchoate dower right is, therefore, to deduct from the value of the annuity on the wife's life (based on an amount equal to one-third of the income of the husband's estate) a sum equal to the joint life annuity of the husband and the wife for the same amount. The manner of obtaining joint life values is as follows:

The probability of two lives surviving a given period is the product of the separate probabilities that each will survive the same period. If, as was pointed out in Chapter II, the probability of x surviving one year be represented by $\frac{l_{x+1}}{l_x}$ and the probability of y surviving the same period be represented by $\frac{l_{y+1}}{l_y}$ the probability of the two lives both surviving one year will be represented by the fraction

$$\frac{(l_{x+1})(l_{y+1})}{l_x\, l_y}$$

It will be unnecessary to go through the various steps similar to those employed in the derivation of formulæ for single lives, for the reader without doubt recognizes that the value of a joint life annuity payable during the existence of x and y, will be

$$\frac{(l_{x+1})(l_{y+1})\ v + (l_{x+2})(l_{y+2})\ v^2 + (l_{x+3})(l_{y+3})\ v^3 + \text{etc.}}{l_x\, l_y}$$

Making similar substitutions, we obtain for the final form of the expression

$$[7] \qquad \frac{N_{x+1 \cdot y+1}}{D_{xy}}$$

It will be apparent likewise that this is a general formula which holds true for any number of lives, and the value of a joint life annuity on three lives would be expressed by

$$\frac{N_{x+1 \cdot y+1 \cdot z+1}}{D_{xyz}}$$

This formula holds true for all ages of x and y, and the great number of combinations which result from giving different values to x and y is responsible for the extensive tables which have been published to enable observers to obtain values on joint lives. It is the intention of the author, however, to obviate this objection as much as possible by employing the Equal Ages method which he has applied to many of the tables of joint life annuities and joint single premiums to be found in the second part of this book. For this purpose he has used the graduated Carlisle Table and the American Experience Table of Mortality as graduated by Mr. Arthur Hunter in accordance with the Makeham formula used by King and Hardy. By referring to the tables showing the Force of Mortality, the reader will find the necessary figures to enable him to obtain the equal ages which are the equivalent of any pair of different ages. By then referring to tables which give the joint life annuity values for two equal ages, we obtain the exact value. The way to use the Force of Mortality Tables is explained in Chapter VI and in the problems in the second part of the book.

In the same manner a temporary joint annuity on two lives to run n years is represented by

$$\frac{N_{x+1 \cdot y+1} - N_{x+1+n \cdot y+1+n}}{D_{xy}}$$

and an annuity deferred for n years on two joint lives may be represented by

$$\frac{N_{x+n \cdot y+n}}{D_{xy}}$$

There are some forms of joint life estates, for the solution of which we require a slightly different formula. We may, for instance, desire to know the value of an annuity of $1 per annum payable to the survivor of two specified lives. Another way of expressing this problem would be to require an annuity of $1 per annum on two lives x and y which is to continue until both have died. It will be evident to the reader that if we add the two single life annuities together and subtract from this sum the value of a joint life annuity, we shall have the required solution; hence

[8] $$a_x + a_y - a_{xy}$$

the symbol a being employed in the above formula for the word " annuity " and as a substitute for the more lengthy form heretofore employed. This formula will, of course, be recognized in its longer form as

$$\frac{N_{x+1}}{D_x} + \frac{N_{y+1}}{D_y} - \frac{N_{x+1 \cdot y+1}}{D_{xy}}$$

Another combination which may sometimes be required is the obtainment of the value of an annuity on the life of y to commence after the death of x. By the same line of reasoning, this value will be found to equal the single annuity on y's life minus the joint annuity on the lives of x and y, or

[9] $$a_y - a_{xy}$$

That this will meet the conditions the reader will be able to observe, for as long as both x and y

live the value of the joint life annuity is equal to the annuity on y's life, and the result is 0. Should x die before y the value of a_{xy} becomes 0 and y enters upon his annuity. Should y die before x both values reduce to 0, so that the conditions of the problem are met in every particular. It is this formula which is used in calculating the present value of inchoate dower rights.

If we should desire to calculate the value of the interest of x in an annuity which is to be equally divided between x and y as long as they both live, and when one of them dies the survivor is to enjoy the entire annuity as long as he lives, we would be able to obtain the result by subtracting from the annuity on the life of x one-half of the joint life annuity. This expressed as a formula would be

[10] $$a_x - \tfrac{1}{2}a_{xy}$$

In the same way the value of y's interest in the foregoing case would be

$$a_y - \tfrac{1}{2}a_{xy}$$

If we desire to find the value of an annuity which is to be payable to the longer lived of two lives, x and y, the annuity payments to commence upon the death of the first one, we would be enabled to do so by applying the formula

[11] $$a_x + a_y - 2a_{xy}$$

It will be observed that this is made up of two factors: First, the value of an annuity on x's life minus the joint life annuity on the lives of x and y, and second, the value of an annuity on the life of y minus the joint life annuity, i. e.,

$$a_x - a_{xy} + a_y - a_{xy} = a_x + a_y - 2a_{xy}$$

CHAPTER VI.

Three Lives — Force of Mortality — Explanation of the Method of Applying this to Problems Involving More Than One Life — The Equal Ages Method — Formulæ for Various Annuity Problems Dealing with Three Lives.

The problems heretofore given have dealt only with the contingencies dependent upon the existence or failure of one or two lives. In practice the necessity arises for securing values on life estates and remainders where three or more lives enter into the computations. The same theories hold good for three lives as for two lives, but the practical application of the formulæ intended for the greater number of lives is naturally more difficult. This may be realized by a comparison of the results obtained by calculating the probability, first, that a person aged 30 will survive one year; second, that two persons aged 30 shall both survive one year, and third, that three persons aged 30 shall all survive one year. Using the American Experience Table of Mortality,

$$\frac{l_{x+1}}{l_x} = \frac{84721}{85441} = .9916$$

$$\frac{l_{x+1 \cdot y+1}}{l_{xy}} = \frac{84721 \times 84721}{85441 \times 85441} = .9832$$

$$[12] \quad \frac{l_{x+1 \cdot y+1 \cdot z+1}}{l_{xyz}} = \frac{84721 \times 84721 \times 84721}{85441 \times 85441 \times 85441} = .9749$$

It will be apparent, therefore, that the calculation of joint life values on three or more lives by preparing tables for every possible combination of ages, would be a stupendous undertaking, the results of which would be beyond the reach of those for whom these calculations are intended.

In Chapter V, a method was pointed out whereby two lives were reduced to the equivalent equal ages, we being, therefore, enabled to obtain all of our values by calculating one set of values only. The same method may be applied to problems involving three or more lives. This is done by means of a table known as the "Force of Mortality." If we add together the force of mortality of the ages under observation and divide by 3, we shall have a practically correct representation of the force of mortality of the equivalent equal ages. To illustrate: If we desire to know the equivalent equal ages of three lives according to the Makehamized American Experience, aged 20, 25, and 30, we find by reference to the table just mentioned (see Table III in the third part of this book) that the force of mortality of each age is as follows:

Age 20..........	.00786
Age 25..........	.00804
Age 30..........	.00835
	.02425

Dividing this by 3 we find that the force of mortality of the equivalent equal ages which we want is .00808. By examining the same table we find that .00808 is situated somewhere between ages 25 and 26. To ascertain its exact point we proceed as follows:

Force of Mortality age 26 = .00809
Force of Mortality age 25 = .00804

Difference = .00005

The difference between the desired equal ages and age 25 is .00004 (found by subtracting .00804 from .00808). The point we desire is, therefore, $\frac{.00004}{.00005}$ or .8 beyond age 25. The equivalent, therefore, of three lives aged 20, 25, and 30, are three lives each aged 25.8 years. Once having found the equivalent equal ages, we proceed to calculate as heretofore, being careful to use only those tables applicable to three lives.

The method having been described of obtaining calculations for three or more lives, we are prepared to start to solve the various problems which arise in connection therewith.

In the preceding chapter the method of obtaining the value of an annuity on two lives, x and y, which is continued until both have died, was explained. (Formula [8].) If instead of two lives we desire to obtain the value of an annuity on the longest of three lives, the result will equal

$$[13] \qquad a_x + a_y + a_z - a_{xy} - a_{xz} - a_{yz} + a_{xyz}$$

To test the correctness of this formula, assume that the annuity is for $1 per annum. As long as x, y, and z are alive it will be seen that according to the formula the net result will be $1. If x then dies a_x, a_{xy}, and a_{xyz} disappear, and the expression then takes the form of

$$a_y + a_z - a_{yz}$$

which will be recognized as identical with Formula [8].

Another problem which may arise is the determination of the present value of an annuity to commence at the present time and end with the next to the last death of three lives, i. e., to continue as long as two of the three lives are in existence. This expression takes the form of

[14] $$a_{xy} + a_{yz} + a_{xz} - 2a_{xyz}$$

Testing this as we did in the previous case, we find that as long as x, y, and z are all alive the value of the formula reduces to 1; but as soon as any one life, x, for instance, disappears, the first, third, and fourth terms of the expression disappear, leaving

$$a_{yz}$$

which will be at once recognized as the expression for a joint life annuity, viz., one that continues until the death of one of the lives, which, it will be observed, meets the requirements of the problem exactly.

If we should be required to determine the value of an annuity on the life of x to commence as soon as y or z dies, we should be able to do so by applying the formula

[15] $$a_x - a_{xyz}$$

for as long as the three lives are in existence the value of the expression will be 0, but as soon as y or z dies the annuity on x would start. If x should die before y or z, the entire expression would be reduced to 0. If, however, the problem takes the form of determining the value of the annuity on the life of x after the death of *both* y and z, we could obtain it by solving the expression

[16] $$a_x - a_{xy} - a_{xz} + a_{xyz}$$

A modification of the foregoing would be to determine the value of an annuity on the joint lives of y and z to commence after the death of x. This it will be readily seen is

[17] $$a_{yz} - a_{xyz}$$

Another form, the solution of which may be found useful in practice, is the value of an annuity to be paid to the survivor of x and y after the third party, z, dies. This expression is

[18] $$a_x + a_y - a_{xy} - a_{xz} - a_{yz} + a_{xyz}$$

Another form, the solution of which may at times be required, is the determination of the value of an annuity which is not to commence until one of three designated lives expires, and is to continue only until the death of one of the remaining two. This would be

[19] $$a_{xy} + a_{xz} + a_{yz} - 3a_{xyz}$$

In one of the problems outlined in the preceding chapter, we have the method to be followed in obtaining the value of the interest of either of the two lives in an annuity which was to be divided equally between them during the joint survivorship and to go to the survivor upon the first death. We may in a similar manner determine the value of an annuity to be divided equally between the survivors of three lives, the expression taking the form of

Value of x's interest $= a_x - \frac{1}{2}a_{xy} - \frac{1}{2}a_{xz} + \frac{1}{3}a_{xyz}$
Value of y's interest $= a_y - \frac{1}{2}a_{xy} - \frac{1}{2}a_{yz} + \frac{1}{3}a_{xyz}$
Value of z's interest $= a_z - \frac{1}{2}a_{xz} - \frac{1}{2}a_{yz} + \frac{1}{3}a_{xyz}$

To prove the correctness of the foregoing, it is only necessary for us to add the interests of x, y, and z together and observe whether we obtain by this sum the whole value of the annuity. Performing the addition the result is

$$a_x + a_y + a_z - a_{xy} - a_{yz} - a_{xz} + a_{xyz}$$

which will be recognized as Formula [13] which represents the value of an annuity on the longest of three lives, the exact conditions of this problem.

Joshua Milne, who has already been referred to as the producer of the Carlisle Table of Mortality, gives a number of interesting problems on the partition of annuities, some of them in this chapter being taken from his book.

Two lives, x and y, are the possessors of an annuity payable to the one who survives the longer. Should, however, a third party, z, be alive at the death of either x or y, he is to share in the annuity which becomes payable to the survivor. The value of the interests of x and y can, of course, be determined from the formulæ already given. The value of z's interest, however, will be

[20] $$\tfrac{1}{2}a_{xz} + \tfrac{1}{2}a_{yz} - a_{xyz}$$

If it should be desired to calculate the value of x's interest in an annuity on the last two survivors of three lives which is to be divided equally among them during their joint existence, and after the death of the first one is to be divided equally between the two remaining ones until one of them shall die, we would be enabled to obtain the value of any life's interest, such as x, as follows:

[21] $$\text{Value of } x\text{'s interest} = \tfrac{1}{2}a_{xy} + \tfrac{1}{2}a_{xz} - \tfrac{2}{3}a_{xyz}$$

Another problem which Milne gives is the calculation of an annuity which after the decease of x is to be divided equally between two other lives, y and z, as long as they shall both live; after the death of either y or z the annuity is then to be paid to the survivor as long as he shall live. y's interest in this case would be

[22] $$a_y - a_{xy} - \tfrac{1}{2}a_{yz} + \tfrac{1}{2}a_{xyz}$$

Another modification of this would be to determine x's interest in an annuity on the last survivor of three lives which is to be divided equally between two of them, x and y, during their joint existence; after the death of either one of them it is to be divided then equally between z, if then living, and the survivor during their joint existence; and if there is but one survivor, he shall receive the whole of the remaining annuity. In this case x's interest equals

[23] $$a_x - \tfrac{1}{2}a_{xy} - \tfrac{1}{2}a_{xz} + \tfrac{1}{2}a_{xyz}$$

These combinations which have been given afford the reader the opportunity of analyzing the conditions of each problem. Actual arithmetical solutions, i. e., the application of these formulæ to actual cases, will be found in the second part of the book preceding the tables.

CHAPTER VII.

Vested Remainders — Probability of Dying — Derivation of the C *and the* M *Columns.*

The present value of a vested remainder from the actuarial standpoint may be defined as that amount which upon the assumed mortality and interest bases will equal the testator's estate at the time of the death of the life tenant.

In Chapter III, we have learned that the probability of a person age 10 surviving one year is represented by the fraction

$$\frac{l_{11}}{l_{10}} = \frac{99{,}251}{100{,}000} = .99251$$

By referring to the American Experience Table of Mortality given in Chapter II, we see that of the 100,000 people living at age 10, there will die during the year 749. The probability of death, therefore, will be

$$\frac{749}{100{,}000} = .00749$$

Since the probability of a thing happening plus the probability of it not happening, must always equal unity, it will be observed that the probability of a person age 10 living one year, or .99251, when added to the probability of the same person dying during the year, or .00749, equals unity.

Indicating the number of persons at age x who will die during the year by the symbol d_x we have

$\dfrac{d_x}{l_x}$ = probability of death during the first year

$\frac{d_{x+1}}{l_x}$ = probability of death during the second year

$\frac{d_{x+2}}{l_x}$ = probability of death during the third year.

The probability, therefore, that a person aged x will die within three years is represented by the sum of these separate probabilities, or

$$\frac{d_x}{l_x}+\frac{d_{x+1}}{l_x}+\frac{d_{x+2}}{l_x}=\frac{d_x+d_{x+1}+d_{x+2}}{l_x}$$

In order to obtain the monetary value, however, we must remember that we must introduce the interest factor. We must, therefore, discount the values of the probabilities of death shown in the foregoing expression by the rate of interest which we assume will be earned. Using the same symbol as in Chapter IV for this discounted value, v, we would have as the representation of the probabilities of the heirs of a person age x receiving $1 if that person should die *within three years.*

$$\frac{(d_x)\ (v)+(d_{x+1})\ (v^2)+(d_{x+2})\ (v^3)}{l_x}$$

and in the same way the value of the probability of the heirs of a person aged x receiving $1 upon the death of that person, would be represented by the same expression carried out to the limits of the mortality table, or

$$\frac{(d_x)(v)+(d_{x+1})\ (v^2)+(d_{x+2})(v^3)+(d_{x+3})\ (v^4)+\text{etc.}}{l_x}$$

Multiplying the numerator and denominator of this fraction by v^x which does not change its value, we have

$$\frac{(d_x)(v^{x+1})+(d_{x+1})(v^{x+2})+(d_{x+2})(v^{x+3})+(d_{x+3})(v^{x+4})+\text{etc.}}{(l_x)(v^x)}$$

It has already been pointed out that calculations of this nature can be greatly shortened by means of the arrangement known as the Commutation Columns. By reference to Chapter IV it will be seen that we represented $l_x\, v^x$ by $\mathbf{D}_x$ and $l_{x+1}\, v^{x+1}$ by $\mathbf{D}_{x+1}$. In the same manner let us represent $d_x\, v^{x+1}$ by $\mathbf{C}_x$ and $d_{x+1}\, v^{x+2}$ by $\mathbf{C}_{x+1}$. Substituting these values in the fraction we have just derived, we have

$$\frac{\mathbf{C}_x + \mathbf{C}_{x+1} + \mathbf{C}_{x+2} + \mathbf{C}_{x+3} + \text{etc.}}{\mathbf{D}_x}$$

We have already represented $\mathbf{D}_x + \mathbf{D}_{x+1} + \mathbf{D}_{x+2}$ + the rest of the series by the symbol $\mathbf{N}_x$ and in the same manner we will represent the values of the series $\mathbf{C}_x + \mathbf{C}_{x+1} + \mathbf{C}_{x+2}$ to the tabular limit by the symbol $\mathbf{M}_x$. The fraction stated above, therefore, reduces itself to the form

$$[24] \qquad \frac{\mathbf{M}_x}{\mathbf{D}_x}$$

The values of $\mathbf{M}_x$ and $\mathbf{D}_x$ have already been worked out for all ages, so that in order to obtain the value of $1 payable when a person aged x dies, it will simply be necessary to divide the figure found opposite that age in the **M** column by the figure found opposite the same age in the **D** column.

CHAPTER VIII.

Joint Life Insurance — Remainders which Vest upon the Death of Either of Two Designated Lives—Remainders which Vest upon the Death of the Longer Lived of Two Designated Individuals — Contingent Remainders — Formula for Determining the Same.

The reader by this time is familiar enough with the general subject to appreciate that the joint life insurance on two lives, x and y, payable at the death of the first life, will be represented by

$$[25] \qquad \frac{M_{xy}}{D_{xy}}$$

It must be borne in mind that a difference exists between a joint life annuity and a joint life insurance. In the former the payments are made *during* the joint existence of the two lives, while in the latter case the amount does not become payable until one of the lives has ceased.

The simplest way of dealing with joint lives is by the Equal Ages method which has already been explained. To recapitulate: Add together the force of mortality (being careful to use the proper mortality experience) as shown in Table III, divide by the number of lives and ascertain the equivalent age at which this new force of mortality will be found. This age will represent the equal ages, and the final result may be obtained either directly from the single premiums for joint lives, which have already been worked out, or by direct reference to the M_{xx} and D_{xx} commutation columns.

There is not as great a variety of problems involving values of remainders as there are involving the values of life, future, and limited estates. It may sometimes be necessary, however, to determine the value of a remainder (or insurance) payable not upon the death of the first of a designated pair of lives, but payable upon the death of the longer lived of the two. In this case it will be apparent that the value desired will be the sum of the single premiums on each of the individual lives less the premium for their joint life insurance. The expression, therefore, becomes

$$[26] \qquad \frac{M_x}{D_x} + \frac{M_y}{D_y} - \frac{M_{xy}}{D_{xy}}$$

By referring to the chapters on annuities, it will be noted that we used the symbol a to designate the word "annuity." In the same way let us use the symbol A to designate the single premium or the value of the remainder, in which case the foregoing expression takes the form of

$$A_x + A_y - A_{xy}$$

Mr. Arthur Hunter has pointed out an excellent way of using his Makehamized American Experience Table in the solution of many of the complicated problems which arise in connection with contingent insurances. Since all of the tables of mortality have not been graduated by the Makeham method, it is, therefore, not possible to apply the Equal Ages method in all cases. There will be found in the back of the book tables derived from the graduated Carlisle and American tables. An illustration of the adaptability of these modifications to contingent insurances may be observed from the following problem.

If, for instance, we should require the premium to insure \$1 receivable at the end of the year in which x dies, provided another life, y, be then living, we should be able to obtain it by means of the formula shown below. It may be mentioned in passing that it is this problem which is involved in the determination of the value of many contingent estates where, for instance, a testator gives his widow his estate for life with the remainder over to a daughter, if she be living at the death of her mother, or in the event of her prior death the remainder to pass to the child of the daughter (the grandchild of the testator). This form is frequently termed "The Insurance of x against y." The value of the contingent remainder of the testator's daughter in the above case is the premium necessary to secure the value of the estate (as appraised at time of the testator's death) when the widow (x) dies, providing the daughter (y) is living at that time. The formula by which a value of this kind may be determined is

[27] $v^{1/2}\left[\mu_x\ (a_{xy}+\frac{1}{2})+\frac{1}{2}\ (a_{x-1\cdot y}-a_{x+1\cdot y})\right]$

The practical application of a problem of this kind will be found in the second part of the book.

The problems involving three lives are not met with so frequently in the determination of remainders for inheritance tax purposes. The same principles which are applicable to three lives in calculating the life estates are, when modified, used in obtaining formulæ for contingent remainders. The author does not deem it necessary or advisable, however, to take up those problems at this time.

CHAPTER IX.

Reasons for Calculating Life Estates and Remainders in the Same Manner that Premiums for Insurances and Annuities are Determined — Remainders Payable Immediately Upon the Death of the Life Tenant — Curtate and Complete Annuities — Formulæ for Ascertaining Present Value of Life Estates Payable in Installments during the Year.

In the preceding chapters it will be noticed that the life estates have been calculated as though they were annuities issued by insurance companies, and remainders have been calculated as though they were insurances granted by the same class of corporations. This method was adopted purposely, as such was unquestionably the intent of the legislators when they enacted the Inheritance Tax Laws. In some of the States the directions are specific. In Wisconsin, for instance, it is provided that "The value of every future or limited estate, income, interest, or annuity dependent upon any life or lives in being, shall be determined by the rule, method, and standard of mortality and value employed by the commissioner of insurance in ascertaining the value of policies of life insurance and annuities for the determination of liabilities of life insurance companies except that the rate of interest for making such computation shall be at the rate of five per centum per annum." In New York "The superintendent of insurance shall, on application of any surrogate, determine the value of any such future contingent estate, income or interest therein, limited, dependent, contingent or determinable upon the life or lives of the persons in being, upon the facts contained in any such appraiser's report, and certify the same to the surrogate, and his certificate shall be conclusive evidence that the method of computation adopted therein is correct." The Superintendent of Insurance in New York has not published any rules, standards of mortality, or methods indicating the ones employed by him in making these computations for the surrogates. If we take the value of a life estate and a vested remainder, as set forth in any certificate issued by this officer, and compare the values given therein with those obtained by means of the formulæ in the preceding chapters, it will be seen that the results are identical. It will likewise be noted that the value of the vested remainder plus the present value of the life estate will not exactly equal the appraised value of the testator's property at the time of his death. It is but natural that the reader should desire an explanation of what may appear to him an error. The explanation, however, is comparatively simple and will be readily understood from the following:

The basis upon which life insurance premiums are calculated contemplates the payment of the premium *in advance* at each anniversary of the policy and the payment of the death loss *at the end of* the policy year in which death occurs. As an actual fact modern business conditions are such that the average claim is paid in less than thirty days after receipt of satisfactory proofs of death. Although an estate passes to the remainderman immediately upon the death of the life tenant, the same method of calculation (being prescribed by statute) is followed, and in consequence there will always be this slight difference between the present value of the life estate plus the present value of the remainder and the appraised value of the testator's estate. Roughly speaking, it may be placed at about five months' interest on the estate. There is, of course, a mathematical expression which will enable us to find the present value of a remainder payable immediately upon the decease of the life tenant. This expression is

$$A_x\ (1+i)^{1/2}.$$

Although this will have practically no effect on the amount of the inheritance tax imposed, it has been the practice of some calculators to determine the present value of the life estate and deduct this value from the testator's estate, calling the balance the remainder. In this method, of course, no discrepancy such as referred to above occurs.

There is another matter, however, which should be called to the attention of the student, as the terms of some of the wills which may come before him may provide for payments to the life tenant monthly or quarterly.

By turning to the chapter on annuities, it will be seen that we provide for the payment only to those annuitants or life tenants who survive completed periods, *i. e.*, if a life tenant should die one year and six months after the testator, she would receive but one year's income from the testator's estate, the assumption being that the last sum payable would be the periodic sum which the life tenant or annuitant would be alive to receive.

It may become necessary, however, to incorporate in the present value of a life estate such additional fractional parts of a year's income as will be due the life tenant from the time that the last periodical payment was made until her death. This would seem to be the rule in England, for Mr. George King in Part II of the Text-Book of the Institute of Actuaries (page 185) says: "In 1738, by 2 Geo. II., c. 19, annuities arising out of rents and profits from real estate were made apportionable; and in 1834, by 4 & 5 Wm. IV., c. 22, and again in 1870, by 33 & 34 Vict., c. 35, the rule was extended to all other annuities, except such annual sums as are made payable under policies of assurance." In New York a somewhat similar statute has been enacted, although the Superintendent of Insurance, in the calculations which he makes for inheritance tax purposes, takes no cognizance of the existence of such a statute, which is as follows:

"Sec. 2720. (Added 1893.) Apportionment of rents, annuities and dividends.

All rents reserved on any lease made after June seventh, 1875, and all annuities, dividends and other payments of every description made payable or becoming due at fixed periods under any instrument executed after such date, or, being a last will and testament that takes effect after such date, shall be apportioned so that on the death of any person interested in such rents, annuities, dividends or other such payments, or in the estate or fund from or in respect to which the same issues or is derived, or on the determination by any other means of the interest of any such person, he, or his executors, administrators or assigns, shall be entitled to a proportion of such rents, annuities, dividends and other payments according to the time which shall have elapsed from the commencement or last period of payment thereof, as the case may be, including the day of the death of such person, or of the determination of his or her interest, after making allowance and deductions on account of charges on such rents, annuities, dividends and other payments. Every such person or his executors, administrators or assigns shall have the same remedies at law and in equity for recovering such apportioned parts of such rents, annuities, dividends and other payments, when the entire amounts of which such apportioned form part, become due and payable and not before, as he or they would have had for recovering and obtaining such entire rents, annuities, dividends and other payments, if entitled thereto; but the person liable to pay rents reserved by any lease or demise, or the real property comprised therein shall not be resorted to for such apportioned parts, but the entire rents of which such apportioned parts form parts, must be collected and recovered by the person or persons who, but for this section or chapter 542 of the laws of 1875, would have been entitled to the entire rents; and such portions shall be recoverable from such person or persons by the parties entitled to the same under this section. This section shall not apply to any case in which it shall be expressly stipulated that no apportionment be made, or to any sums made payable in policies of insurance of any description. Added by L. 1893, c. 686. From L. 1875, c. 542."

Similar statutes may have been enacted in other States, and the reader, therefore, should ascertain before making the calculations whether the laws contemplate a *complete* or a *curtate* life estate. By the latter term is meant a life estate, the payments under which are made to the beneficiary at periodic times with no allowance or apportionment of profits or rents for such periods as may elapse between the periodic payment and the death of the life tenant. In none of the tables of annuity values issued by the various departments for the purpose of calculating inheritance taxes, is to be found any allowance for the difference between the complete and the curtate values of life estates.

We have designated the curtate present value of a life annuity or life estate by a_x. We shall designate the complete value of the same quantities by $\mathring{a}_x$. A moment's thought will enable the reader to appreciate that the only difference between these quantities is the present value of that portion of the annual income from the estate which is earned between the last periodical payment and the beneficiary's death; in other words, upon the assumption that the deaths in a year occur at equal intervals, it will be equal to the value of the single premium of an insurance on the life of the beneficiary having a face value equal to one-half of the annual periodical payment to the life tenant. Since this insurance, however, is payable at the moment of the death of the beneficiary and not at the end of the policy year, we must discount it by half a year's interest. Expressed as a formula we have

$$\mathring{a}_x = a_x + \tfrac{1}{2}A_x(1+i)^{1/2}$$

If by the terms of the will the life tenant is to receive the income from the estate semi-annually, the value of the complete annuity would be

$$\mathring{a}^{(2)}_x = a^{(2)}_x + \tfrac{1}{4}A_x(1+i)^{1/2}$$

while if the life tenant enjoys a quarterly income the expression resolves itself into

$$\mathring{a}^{(4)}_x = a^{(4)}_x + \tfrac{1}{8}A_x(1+i)^{1/2}$$

These formulæ deal with the adjustments which must be made when annuities are to be paid up to the time of the death of the life tenant, and they carry with them the consideration of another feature, viz.: annuities payable at fractional periods throughout the year. The consideration of this aspect is rendered necessary for a correct determination of the values of $a_x^{(2)}$ and $a_x^{(4)}$, by which symbols we designate annuities which are payable semi-annually and quarterly respectively.

It has been pointed out in various actuarial text-books that an approximate formula for finding the addition which must be made to the value of an annuity in order to obtain the increase made necessary by proportional payments, is

$$\frac{m-1}{2m}$$

in which m represents the number of installments at equal intervals throughout the year. If, for instance, the annuity were payable twice during the year (semi-annually), this fraction would become

$$\frac{2-1}{4}=\frac{1}{4}$$

If the annuity, however, is payable four times a year (quarterly) the fraction would become

$$\frac{4-1}{8}=\frac{3}{8}$$

It must be borne in mind, however, that this is not the exact formula, but is an approximation which is very commonly used in practice and which is accurate enough for all matters pertaining to inheritance tax calculations.

Directions to be Followed in Working Out the Problems on the Following Pages.

The numbers in brackets at the beginning of each problem have been placed there for the purpose of referring the reader to the formula in the first part of the book, which is applicable to the solution of each particular problem, and it is urgently recommended that before attempting to work out any problem the reader familiarize himself with the explanations in the first part. The Equal Ages method is applicable to the problems involving the American and the Carlisle Tables of Mortality. Should the reader, however, desire to work out a joint life problem on the Combined Table of Mortality or the Northampton Table, he must employ the figures applicable to those tables, and which have been worked out for the various combinations of ages. If, for instance, the age of the younger life is 30 and that of the older is 40, he can obtain the figure by direct reference to the table. If, however, the exact age is not given, he must obtain his figures by finding the place in the table which such arrangement of ages would occupy. To illustrate: If the younger age be 20 and the older 37, he would find that these combinations would not be given. He has, however, the combinations for ages 20 and 35 and ages 20 and 40. He knows, therefore, that the combination of 20 and 37 must lie between the other two combinations, and by simply adding or subtracting (as the case may be) two-fifths of the difference to the 20–35 combination, the desired result is easily obtained. Problem 9a has been worked out by this method and clearly explains the system.

A few general rules for the guidance of those working out problems similar to the ones to be found on the following pages, may prove useful.

First: Carefully note the table of mortality and the rate of interest which are to be used, and ascertain the location of such tables in the third part of this book.

Second: After finding the formula which is applicable to your purpose, be sure that you understand the method of using it. The explanation in the first part of the book will enable you to readily accomplish this.

Third: Be sure of the accuracy of your arithmetical operations.

Fourth: Compare the solution of your problem with the result obtained by the solution of the similar problem given in this book. If, for instance, ages 20 and 30 have been used in the problem worked out on the following pages, and the ages in the problem which you desire to solve are 20 and 35, the results obtained should be relatively close. The ages given in the problems cited have been selected with the view of setting forth conditions which are likely to occur in practice, and the results obtained will, therefore, serve as standards of comparison.

It is thought the explanations given will enable the reader to successfully obtain the solution of any problem which may arise in his general practice. If, however, a difficulty should be met, the writer will be pleased, upon receipt of inquiries, to offer such suggestions as will clear up such difficulties.

[3] *Problem* 1. To determine the value of a life estate.

A dies leaving a widow whose age at the time of his death is 49. The report of the appraisers shows that the testator's estate at the time of his death was $12,500, and by the terms of his will his widow is to have the use of this estate for life. What is the value of said life estate on the basis of the American Experience Table of Mortality with 5% interest?

Solution.

The annual income from the estate is

$$\$12{,}500 \times .05 = \$625$$

Applying Formula [3] we have

$$\frac{N_{x+1}}{D_x} = \frac{N_{50}}{D_{49}}$$

From Table XXX we obtain the necessary values to substitute

$$\frac{77074.1779}{6476.4069} = 11.90076$$

∴ The present value of $625 per annum during the lifetime of a person aged 49 is

$$11.90076 \times \$625 = \$7{,}437.98$$

Note. The same result may be obtained in a shorter manner by direct reference to Table XXXI which shows the present value of an annuity of $1 at various ages.

[4] *Problem* 2. To determine the value of an estate for a term of years.

A desires to provide an income of $500 a year for his daughter B for 10 years after his death, the income to cease in the event of her death prior to the completion of that period. B is 20 years old at the time of A's death. Required the present value of B's estate according to the American Experience Table of Mortality with 5% interest.

Solution.

Applying Formula [4]

$$\frac{N_{x+1} - N_{x+1+n}}{D_x} = \frac{N_{21} - N_{31}}{D_{20}}$$

Obtaining the necessary values from Table XXX we have

$$\frac{557106.5542 - 298202.3543}{34913.9107} = \frac{258904.1999}{34913.9107} = 7.415$$

$\therefore$ The present value of an annuity of \$500 per annum for 10 years on a person aged 20 is

$$\$500 \times 7.415 = \$3,707.50$$

N. B. The attention of the student is directed to the difference between the term "annuity" as employed in this book and the term "annuity certain" frequently used by writers on financial subjects. The latter term involves no mortality factor and is merely "an obligation to pay a definite amount of money each year for a fixed period of time," while the former implies a contract which is terminated or modified by the death of the recipient of the annual payments.

[5.] *Problem* 3. To determine the value of a life estate, the enjoyment of which is postponed until a certain number of years have elapsed after the testator's death.

A dies leaving a will which provides that when his daughter B reaches the age of 20, she is to receive the sum of \$750, and on each succeeding anniversary of that date she is to receive a similar sum as long as she shall live. B is 15 years old at the time of the death of the testator. Required the present value of B's estate according to the American Experience Table of Mortality with 5% interest.

Solution.

Applying Formula [5]

$$\frac{N_{x+n}}{D_x} = \frac{N_{20}}{D_{15}}$$

Obtaining the necessary values from Table XXX we have

$$\frac{592020.4649}{46314.7314} = 12.782552$$

∴ The present value of a deferred annuity of $750 per annum payable as above is

$$\$750 \times 12.782552 = \$9{,}586.91$$

[6.] *Problem* 4. To determine the present value of an estate, the enjoyment of which is postponed until a certain number of years after the death of the testator and is then to continue only for a limited period.

A dies leaving to his daughter B an annuity of $500 a year, the first payment of which is not to be made until 5 years after his death, and the succeeding payments are to be made only for 20 years if B shall survive that period; otherwise the payments are to cease with her death. B is 30 years old at the time of the death of the testator. Required the present value of B's estate according to the American Experience Table of Mortality with 5% interest.

Solution.

Applying Formula [6]

$$\frac{N_{x+n} - N_{x+n+m}}{D_x} = \frac{N_{35} - N_{55}}{D_{30}}$$

Obtaining the necessary values from Table XXX we have

$$\frac{229545.7567-50157.8888}{19769.1207}=\frac{179387.8679}{19769.1207}=9.0741448$$

∴ The present value of a deferred temporary annuity of $500 per annum payable as above is

$$\$500 \times 9.0741448=\$4{,}537.07$$

[3] *Problem* 5. To determine the present value of a wife's dower.

A dies intestate. The net income arising from his real estate is $9,000 per annum. At the time of his death his widow B is 47 years old. Required the present value of B's dower according to the Carlisle Table of Mortality with 5% interest.

Solution.

B has a one-third dower right in the income of $9,000, or $3,000.

Applying Formula [3]

$$\frac{N_{x+1}}{D_x}=\frac{N_{48}}{D_{47}}$$

Obtaining the necessary values from Table X, we have

$$\frac{5697.0710}{463.1550}=12.301$$

∴ The present value of B's dower right is

$$\$3{,}000 \times 12.301=\$36{,}903.00$$

Note.— The same result may be obtained in a shorter manner by direct reference to Table XI where the various combinations of $\frac{N_{x+1}}{D_x}$ have been worked out.

[3] *Problem* 6. To determine the present value of a husband's estate by curtesy.

B dies intestate. The net income arising from her real estate is $5,000 per annum. At the time of her death her husband A is 38 years old. Required the present value of A's estate by curtesy, according to the Carlisle Table of Mortality, with 5% interest.

Solution.

Using the same formula as in the preceding problem

$$\frac{N_{x+1}}{D_x} = \frac{N_{39}}{D_{38}}$$

Obtaining the necessary values from Table X we have

$$\frac{11139.0985}{813.4082} = 13.695$$

∴ The present value of A's estate by curtesy is

$$\$5,000 \times 13.695 = \$68,475.00$$

See the note in the preceding problem.

[7] *Problem* 7. To determine the value of an estate, the enjoyment of which is to cease upon the first death of two beneficiaries.

A dies leaving an estate worth $100,000. By the terms of his will his two sons B and C are to share equally in the income from his estate until one of them dies. At the time of A's death B is 28 and C is 32. Required the present value of the joint estate of B and C according to the American Experience Table of Mortality with 5% interest.

Solution.

The first thing to do is to determine the equal ages which are the equivalent of the two ages 28 and 32. From Table III we find that

The force of mortality at age 28 = .00821
The force of mortality at age 32 = .00853

$$\begin{array}{r} 2)\overline{.01674} \\ .00837 \end{array}$$

By consulting the same table we see that .00837 lies between ages 30 and 31, for at age 30 the force of mortality is .00835 and at age 31 it is .00843, or a difference of .00008 for the year.

$\therefore$ .000837 = age 30 + .00002, the latter quantity representing $\frac{.00002}{.00008}$ or $\frac{1}{4}$ of a year.

The equivalent equal ages of ages 28 and 32 are therefore ages 30.25 and 30.25.

The income from the estate is $5,000 per annum. By reference to Table XXXIII we find that the present value of an annuity of $1 per annum payable during the joint existence of two lives aged 30 is $12.984788, and where the two lives are aged 31 the value is $12.864782, the difference being $.120006. $\therefore$ For two lives aged 30¼ years the value must be $12.984788 — .030001 = $12.954787 for each dollar of annuity and for an annuity of $5,000 it will be $64,773.93.

[8] *Problem* 8. To determine the value of a joint life estate the enjoyment of which is to continue until the last survivor dies.

A dies leaving an estate of $75,000. By the terms of his will his two sons B and C are to enjoy the income arising from this estate, share and share alike during their joint lives, and when one of them dies the survivor is to enjoy the entire income as long as he shall live. At the time of their father's death B is 25 and C is 30. Required the present value of this bequest according to the American Experience Table of Mortality with 5% interest.

Solution.

By referring to the discussion prior to the derivation of Formula [8] we find that the value sought is the sum of the two annuities on the single lives minus the joint life annuity. From Table XXXI we find that at age 25 the value of an annuity of $1 on a single life is $15.57033, and at age 30 it is $15.08425. By a similar process to that outlined in Problem 7 we ascertain that the equivalent equal ages of 25 and 30 are $27\frac{6}{7}$ and $27\frac{6}{7}$. From Table XXXIII we derive the value of an annuity of $1 payable during the joint existence of two lives aged $27\frac{6}{7}$ which is $13.223267. Therefore an annuity of $1 payable under the conditions mentioned in the problem would be $15.57033 + $15.08425 — $13.223267, which equals $17.431313. As the annual income from the estate, however, is $3,750 we must multiply that figure by 17.431313 in order to obtain the answer to the problem, $65,367.42.

[9] *Problem* 9. To determine the value of a life estate, the enjoyment of which is to begin after the death of a certain individual.

A dies providing in his will that his son Y is to receive $500 per annum as long as he shall live, the first payment, however, not to be made until one year after X, the testator's widow, shall die. At the time of A's death X is 52 years old and Y is 31 years old. Required the present value of Y's estate according to the Carlisle Table of Mortality with 6% interest.

Solution.

From Formula [9] we learn that the value of Y's interest may be represented by

$$a_y - a_{xy}$$

By referring to Table XVII

$$a_y = 12.942$$

and by using the Equal Ages Method, as explained in preceding problems, we find that

$$a_{xy} = 9.1683$$

The present value of an annuity of \$1, therefore, payable as long as Y shall live, the first payment of which shall not begin until one year after X shall die, is

$$\$12.942 - \$9.1683 = \$3.7737$$

And an annuity of \$500 is, therefore, worth

$$\$3.7737 \times 500 = \$1{,}886.85$$

Problem 9a. In order to explain the method which is to be followed in problems employing the Actuaries' (or Combined) and the Northampton Tables of Mortality, the above problem is worked on the basis of the Actuaries' Table of Mortality with 4% interest, all the other conditions remaining the same.

Solution.

We apply the same formula $a_y - a_{xy}$
From Table XXIV we find that

$$a_y = 16.872$$

From Table XXV we find that the present value of a joint life annuity for $1 for two lives aged 52 and 27 is $10.849, and for two lives aged 52 and 32 it is $10.708.

$$a_{52 \text{ and } 27} = 10.849$$
$$a_{52 \text{ and } 32} = 10.708$$

The difference equals .141

To get the combination of ages (52 and 31) in the problem we must add $\frac{1}{5}$ of the difference to $a_{52 \text{ and } 32}$. $\frac{1}{5}$ of .141 = .028, and adding this to 10.708 we obtain 10.736 as the approximate value of

$$a_{52 \text{ and } 31}$$

Proceeding as before

$$16.872 - 10.736 = 6.136$$

and for an annuity of $500 it will, therefore, be

$$6.136 \times \$500 = \$3{,}068.00$$

N. B.— The difference between the results of problems 9 and 9a is due to the fact that the former is on a 6% basis while the latter is on a 4% basis.

[10] *Problem* 10. To determine the present value of each beneficiary's share in a joint estate the income of which is to be divided equally between them during their joint existence, the entire income to go to the survivor as long as he shall live.

A dies leaving an estate of $75,000. By the terms of his will his two sons X and Y are to enjoy the income arising from this estate, share and share alike during their joint existence, and when one of them dies the survivor is to enjoy the entire income as long as he shall live. At the time of their father's death X is 25 and Y is 30. Required the present value of X's interest in this estate and of Y's interest according to the American Experience Table of Mortality with 5% interest.

Solution.

From the Formula we learn that X's interest in the above annuity would be the difference between the single annuity on his life and one-half the joint annuity on his life and Y's. From Table XXXI the present value of an annuity of $1 on a life aged 25 is $15.57033, and deriving the joint life annuity in the method outlined in Problem 7 we find that one-half of it equals $6.611633. The annual income of the estate is 5% of $75,000, or $3,750. We must multiply this figure by the difference between the two annuities.

∴ X's interest = $3750 (15.57033 — 6.611633) = $33,595.11.

And by a similar process of reasoning we can ascertain that Y's interest = $3750 (15.08425 — 6.611633) = $31,772.31.

It will be apparent that the terms of this problem are similar to those of Problem 8, and the proof will be, therefore, in ascertaining whether the interest of X plus the interest of Y will equal the entire value of the estate. We have seen that

X's interest =	$33,595.11
Y's interest =	31,772.31
Total =	$65,367.42

which is the exact result obtained in the solution of Problem 8.

[11] *Problem* 11. To determine the present value of an estate the income of which is to be paid to the survivor of two designated individuals so long as he shall live.

F dies leaving an estate worth $25,000 and a will providing that the income therefrom is to go to a charitable organization until one of his two sons X and Y dies. When that event occurs the survivor is to enjoy the entire proceeds of the estate until his death. The age of X at the time of the testator's decease is 30 years and the age of Y is 25 years. Required the present value of the bequest according to the American Experience Table of Mortality with 5% interest.

Solution.

By referring to Formula [11] we learn that this present value is equal to the single annuity on X's life plus the single annuity on Y's life minus *twice* their joint life annuity. The derivation of these values has been explained in the preceding problems, so the outline of the work only will be given.

Annuity on X's life for $1 = $15.08425
Annuity on Y's life for $1 = $15.57033
Joint annuity on X and Y
for $1 = $13.223267

The annual income of the estate is 5% of $25,000, or $1,250. We must, therefore, multiply this figure by the sum of the single annuities diminished by twice the joint annuity.

The solution of the problem, therefore is

$$\$1250(15.57033+15.08425-26.446534)=\$5,260.06$$

[9] *Problem* 12. To determine the present value of an inchoate right of dower.

X, aged 40, is the owner of real estate value at $150,000. His wife, Y, is aged 38. Required the present value of Y's inchoate dower right according to the Carlisle Table of Mortality with 5% interest.

Solution.

This is practically the same as Problem 9 and can be solved by the same formula.

$$a_y - a_{xy}$$

From Table XI we find that $a_y =$ 13.695, and applying the Equal Ages Method we obtain from Table XIII the value of a_{xy} as 11.2291.

Therefore $13.695 - 11.2291 = 2.4659$ or the present value of 1 unit payable in the manner indicated above. As this problem involves dower rights we must take $\frac{1}{3}$ of the income on the estate of $150,000 which is $2,500 per annum and multiply this by 2.4659 in order to obtain the answer $6,164.75.

[13] *Problem* 13. To determine the value of a life estate, the income of which is to be divided share and share alike among three designated beneficiaries until one only shall survive, when the entire income is to go to him until his death.

F dies leaving an estate of $200,000. Each of his three sons, X, Y, and Z, is to get $\frac{1}{3}$ of the net annual income of this estate until one of them shall die, at which time the two survivors are each to receive $\frac{1}{2}$ of said income. After the second of these designated individuals dies, the entire net income is to be enjoyed by the survivor until his death. X, Y, and Z are 30, 28, and 23 years of age respectively. Required the present value of this estate according to the American Experience Table of Mortality with 5% interest.

Solution.

An annuity on the longest of three lives may be determined from Formula [13].

$$a_x + a_y + a_z - a_{xy} - a_{xz} - a_{yz} + a_{xyz}$$

Proceeding as in the other problems we find the following values for each of the quantities:

$a_x = \$150{,}842.50$ $\quad a_{xy} = \$130{,}847.29$
$a_y = 152{,}921.00$ $\quad a_{xz} = 132{,}975.38$
$a_z = 157{,}355.20$ $\quad a_{yz} = 134{,}301.15$
$a_{xyz} = 117{,}684.39$

Substituting these values in the above formula the final result will be $180,-679.27.

[14] *Problem* 14. To determine the present value of an estate to be enjoyed as long as two of three designated individuals are living.

F dies leaving an estate of $100,000. His three sons, X, Y, and Z, are to share equally in the income arising from this estate until there is but one of them surviving, when the annuity ceases. X, Y, and Z are 40, 37, and 30 years of age respectively. Required the present value of this estate according to the American Experience Table of Mortality with 5% interest.

Solution.

Applying Formula [14]

$$a_{xy} + a_{yz} + a_{xz} - 2a_{xyz}$$

will give the desired result.

Proceeding as in the other problems, we obtain the following values for each of the quantities:

$$a_{xy} = \$58,773.73$$
$$a_{yz} = 62,293.25$$
$$a_{xz} = 60,684.80$$
$$2a_{xyz} = 106,179.73$$

Substituting these values in the above formula, we obtain the final result \$75,572.05.

[15] *Problem* 15. To determine the value of an estate, the enjoyment of which by a designated individual is not to take place until the first death between two other designated individuals.

K dies leaving an estate appraised at \$500,000. One of the terms of his will is that the net income from this estate shall be paid to the two brothers of the testator, Y and Z, until one of them shall die. When that event occurs the testator's son X, if then living, shall receive the net income from the estate for the balance of his life. At the time of K's death X was 30, Y was 54, and Z was 58. Required the value of X's contingent life estate according to the American Experience Table of Mortality with 5% interest.

Solution.

Applying Formula [15], which is

$$a_x - a_{xyz}$$

we are enabled to obtain the value of a_x directly from Table XXXI. The value of a_{xyz} must be worked out in the manner already described to obtain the equivalent equal ages, and the value of the annuity can then be obtained by inspection from Table XXXV.

$$a_x = 15.08425$$
$$a_{xyz} = 7.303537$$
$$\therefore \quad a_x - a_{xyz} = 15.08425 - 7.303537 = 7.780713$$

And since the income on $500,000 at 5% is $25,000, the final result is

$$7.780713 \times \$25{,}000 = \$194{,}517.83$$

[16] *Problem* 16. To determine the value of an estate, the enjoyment of which by a designated individual is not to take place until the death of both of two other designated individuals.

K dies leaving an estate appraised at $500,000. One of the terms of his will is that the net income arising therefrom shall be paid each year to the testator's two brothers, Y and Z, share and share alike. After the death of one of these brothers, the entire income is to go to the survivor until his death. When both Y and Z are dead the net income is to go each year to the testator's son X, if he be then alive. At the time of K's death X, Y, and Z are aged 30, 54, and 58 years respectively. Required the present value of the estate of X according to the American Experience Table of Mortality with 5% interest.

Solution.

This being a little more complicated problem every step will be worked out.

To this problem Formula [16] is applicable:

$$a_x - a_{xy} - a_{xz} + a_{xyz}$$

The first step is to find the equivalent equal ages. From Table III we find the

$$
\begin{array}{r}
\text{force of mortality at age } 30 = .00835 \\
\text{and the force of mortality at age } 54 = .01712 \\
\hline
2)\,.02547 \\
\hline
.01273
\end{array}
$$

Inspecting Table III we see that the nearest approach to .01273 is at age 48, where the force of mortality is .01265, or a difference of .00008. Now inasmuch as the difference between the force of mortality at ages 48 and 49 is .00056, it follows that .00008 is $\frac{1}{7}$ of the difference, and therefore .01273 represents the force of mortality at age $48\frac{1}{7}$, from which we are enabled to state that two lives aged 30 and 54 are the equivalent of two lives both aged $48\frac{1}{7}$ years. From Table XXXIII we see that the present value of an annuity of \$1 on two lives aged 48 is 9.856660, while the present value at age 49 is 9.620863., .235797 is the difference for 1 year and the difference for $\frac{1}{7}$ of a year is .033685, which, subtracted from 9.856660, gives 9.822975 as the present value of a joint life annuity on two lives both aged $48\frac{1}{7}$ years.

$$\therefore \quad a_{xy} = 9.822975$$

The derivation of the value of a_{xz} is done in a similar manner, and there will be no necessity for explaining each step.

$$
\begin{array}{r}
\text{Force of mortality at age } 30 = .00835 \\
\text{Force of mortality at age } 58 = .02212 \\
\hline
2)\,.03047 \\
\hline
.01523
\end{array}
$$

.01523 equals the force of mortality at age $51\frac{70}{78}$ or $51\frac{9}{10}$ approximately. Therefore the value of

$$a_{xz} = 8.902938$$

We obtain the value on three lives in a similar way.

Force of mortality at age 30 = .00835
Force of mortality at age 54 = .01712
Force of mortality at age 58 = .02212

$$3\overline{).04759}$$
$$.01586$$

which equals the force of mortality at age $52\frac{55}{86}$ or age 52.64 approximately. To obtain the value of the annuity on three lives we must use Table XXXV, from which we find that at age 52.64 the value of

$$a_{xyz} = 7.303537$$

The value of a_x is obtained directly from Table XXXI, and substituting these values in the formula, we have

$$15.08425 - 9.822975 - 8.902938 + 7.303537$$

which gives \$3.661874 as the present value of an annuity of \$1 on X's life payable as stated. For an annual income of \$25,000, therefore, it will be

$$\$25,000 \times 3.661874 = \$91,546.85$$

[17] *Problem* 17. To determine the present value of an estate the enjoyment of which by two designated individuals is not to commence until after the death of a third designated individual.

G dies leaving an estate of \$25,000. By the terms of his will his two daughters, Y and

Z, are to receive the income from the estate during their joint existence, no payments, however, to be made until after the death of the testator's son X. X, Y, and Z are 40, 30, and 28 years of age respectively. Required the present value of this estate according to the American Experience Table of Mortality with 5% interest.

Solution.

The present value of this estate is

$a_{yz} - a_{xyz}$ (Formula [17])

Solving this as in the preceding problem we find

$a_{yz} = 13.084729$ and $a_{xyz} = 10.963674$

Substituting these values

$$13.084729 - 10.963674 = 2.121055$$

and multiplying this by the annual income from the estate, we have for our final result

$$2.121055 \times \$1,250 = \$2,651.32$$

[18] *Problem* 18. To determine the value of an estate to be enjoyed by the survivor of two designated individuals after the death of a third designated individual.

H dies leaving an estate of $100,000, and a widow Z, a son X, and a daughter Y. On the death of Z the income thereof is to be divided equally between X and Y if both survive Z, and on the death of either of them the entire income is to go to the survivor. If but one survive Z the entire income is to go to such survivor. X, Y, and Z are 28, 20, and 54 years of age, respectively. Required the present value of the estate of X and Y according to the Carlisle Experience Table of Mortality with 6% interest.

Solution.

These conditions may be solved by applying Formula [18].

$$a_x + a_y - a_{xy} - a_{xz} - a_{yz} + a_{xyz}$$

Proceeding as in previous problems we find from Table XVII

$$a_x = 13.182 \text{ and } a_y = 13.835$$

and by the Equal Ages Method (being sure to use the tables derived from the Carlisle Experience) we have

$$\begin{aligned} a_{xy} &= 11.7688 \\ a_{xz} &= 8.9077 \\ a_{yz} &= 9.3229 \\ a_{xyz} &= 8.5369 \end{aligned}$$

Substituting these values we have

$$13.182 + 13.835 - 11.7688 - 8.9077 - 9.3229 + 8.5369 = 5.5545$$

Multiplying this by the yearly annuity, we have

$$5.5545 \times \$6,000 = \$33,327.00$$

N. B.— In finding the equivalent equal ages be sure to use that portion of Table III derived from the Carlisle Mortality Table.

[19] *Problem* 19. To determine the value of an estate, the income of which is to be divided equally between the two survivors of three designated individuals and is to continue during their joint existence only.

H dies leaving an estate of $200,000, the annual income of which is, on the first death among his three children, X, Y, and Z, to be divided between the two survivors of them, said survivors to receive such income until either one of them dies. X, Y, and Z are aged 40, 38, and 36 years respectively. Required the present value of the estate according to the American Experience Table of Mortality with 5% interest.

Solution.

Formula [19] applies to this case:

$$a_{xy} + a_{xz} + a_{yz} - 3a_{xyz}$$

Deriving these values we have

$$a_{xy} = 11.678982$$
$$a_{xz} = 11.822495$$
$$a_{yz} = 12.019470$$
$$a_{xyz} = 10.354367$$

Substituting in the formula

$$11.678982 + 11.822495 + 12.019470 - 31.063101$$

which equals 4.457846, and multiplying this by the annual income from the estate we have

$$4.457846 \times \$10{,}000 = \$44{,}578.46$$

[20] *Problem* 20. To determine the interest which a third designated individual has in an estate of two other designated individuals.

F dies leaving an estate of $100,000. By the terms of his will his two sons, X and Y, are to receive an annuity amounting to the income from his estate. If either of them dies before the testator's sister, Z, the survivor is to share the annuity with her as long as she shall live. X, Y, and Z are 21, 26, and 50 years of age respectively. Required the present value of Z's interest in this estate according to the American Experience Table of Mortality with 5% interest.

Solution.

By reference to Formula [20] we find that Z's interest is represented by

$$\tfrac{1}{2}a_{xz} + \tfrac{1}{2}a_{yz} - a_{xyz}$$

Proceeding as before we find that

$$a_{xz} = 10.768059$$
$$a_{yz} = 10.708773$$
$$a_{xyz} = 9.917408$$

Substituting these values in the formula we have

$$5.384029 + 5.354386 - 9.917408 = .821007$$

Multiplying this by the amount of the annuity we have

$$.821007 \times \$5,000 = \$4,105.04$$

[21] *Problem* 21. To determine the present value of the interest which a designated individual has in an estate, the income of which is to be divided equally among three designated individuals so long as they are all living, and after the decease of any one of them, is to be divided equally between the two survivors as long as they shall both be alive.

H dies leaving an estate of $50,000, the income of which is to be divided equally between his three daughters, X, Y, and Z, as long as they shall all be alive. Upon the death of any one, the remaining two shall divide the income from the estate between them as long as they shall both be alive, i. e., during their joint existence. X, Y, and Z, are 35, 32, and 27 years of age respectively. Required the value of X's interest in this estate according to the American Experience Table of Mortality with 5% interest.

Solution.

The solution of this will depend upon the application of Formula [21].

$$\tfrac{1}{2}a_{xy} + \tfrac{1}{2}a_{xz} - \tfrac{2}{3}a_{xyz}$$

Proceeding as before we find these quantities to be

$$a_{xy} = 12.527095$$
$$a_{xz} = 12.764094$$
$$a_{xyz} = 11.274784$$

Substituting

$$6.263547 + 6.382047 - 7.516522 = 5.129072$$

and multiplying this by the income we get for X's share

$$5.129072 \times \$2,500 = \$12,822.68$$

[22] *Problem* 22. To determine the present value of the interest of one of two designated individuals in an estate, the enjoyment of which is to be postponed until a third designated individual's death, after which the income from the estate is to be divided equally between the two individuals as long as they shall both live, and then to go to the survivor as long as he shall live.

F dies leaving an estate of $75,000. Upon the death of his widow X the income from his estate is to be divided equally between his two sons, Y and Z, as long as they shall both live, and to the survivor of these two shall be paid the entire income as long as he shall live. X, Y, and Z are 60, 35, and 31 years of age respectively. Required the present value of Y's interest in this estate according to the Carlisle Experience Table of Mortality with 5% interest.

Solution.

We may obtain a solution by applying Formula [22].

$$a_y - a_{xy} - \tfrac{1}{2}a_{yz} + \tfrac{1}{2}a_{xyz}$$

From Table XI we obtain

$$a_y = 14.127$$

Obtaining the other values as before, we have

$$a_{xy} = 8.2775$$
$$a_{xz} = 12.1185$$
$$a_{xyz} = 7.6498$$

Substituting these values in the formula, we have

$$14.127 - 8.2775 - 6.0592 + 3.8249 = 3.6152$$

Multiplying this by the income from the estate we shall have

$$3.6152 \times \$3,750 = \$13,557.00$$

which is the value of Y's interest.

[23] *Problem* 23. To determine the present value of the interest of a designated individual in an estate which is to be divided equally between two designated individuals during their joint existence; after the first death between them said income is to be divided equally between the survivor of them and a third designated individual (if the latter be then living) during their joint existence; at the first death of the latter two the entire income is to go to the survivor of them. If said third designated individual be not living at the first death between the first two designated individuals, then the entire income of the estate is to go to the survivor of said first two for life.

G dies leaving an estate of $100,000. The income from this estate is to go to his two sons, X and Y, as long as they shall both be living, share and share alike, and after the first death between them the income from the estate is to be divided equally between the survivor and Z, the testator's adopted daughter, if the latter be then living, and the entire income is to go to the survivor of the latter two. If Z be not then living the entire income is to go to the survivor of X and Y for life. X, Y, and Z are 33, 30, and 20 years of age respectively. Required the value of X's interest in this estate according to the American Experience Table of Mortality with 5% interest.

Solution.

This may be solved by means of Formula [23] which is.

$$a_x - \tfrac{1}{2}a_{xy} - \tfrac{1}{2}a_{xz} + \tfrac{1}{2}a_{xyz}$$

Proceeding as in the former problems, we find

$$\begin{aligned} a_x &= 14.73492 \\ a_{xy} &= 12.789266 \\ a_{xz} &= 13.153709 \\ a_{xyz} &= 11.589646 \end{aligned}$$

Substituting these values in the formula

$$14.73492 - 6.394633 - 6.576854 + 5.794823 = 7.558256$$

and the value of X's interest is, therefore,

$$7.558256 \times \$5{,}000 = \$37{,}791.28$$

[24] *Problem* 24. To determine the value of a vested remainder.

F dies leaving an estate worth $25,000 which he devises to his widow X for life, with the remainder over to his son. At the time of the testator's death X is 53 years old. Required the present value of the remainder according to the Combined or Actuaries' Experience Table of Mortality with 4% interest.

Solution.

Applying Formula [24] we have

$$\frac{M_x}{D_x} = \frac{M_{53}}{D_{53}} = \frac{4262.71828}{8261.89245} = .51595$$

the figures being obtained from Table XXIII.

This is the value of $1 payable when X dies, and the value of the remainder is, therefore,

$$\$25{,}000 \times .51595 = \$12{,}898.75$$

Note.— The same result could have been obtained in a shorter manner by direct reference to Table XXIV, where all the values of $\frac{M_x}{D_x}$ will be found worked out.

[24] *Problem* 25. To determine the value of a legacy payable upon the death of the life tenant.

G dies leaving an estate to his widow X for life. His will likewise provides that upon X's death her niece shall receive $5,000. At the time of the testator's death X is 48 years old. Required the present value of the legacy left to X's niece according to the Combined Experience Table of Mortality with 4% interest.

Solution.

This is similar to Problem 24 and will be worked out by the short method.

From Table XXIV we learn that the present value of $1 payable upon the death of a person aged 48 is $.46002. The present value of the legacy mentioned above is, therefore, $2,300.10.

[25] *Problem* 26. To determine the value of a remainder payable on the first death of two designated individuals.

K dies leaving an estate of $100,000. By the terms of his will his two daughters, X and Y, are to receive the income of this estate during their joint existence. At the first death between them the entire estate is to go to a charitable institution. At the time of their father's death the ages of X and Y are 30 and 20 years respectively. Required the present value of the remainder according to the American Experience Table of Mortality with 5% interest.

Solution.

First determine the equal ages corresponding to 20 and 30 in a similar manner to that followed in Problem 7, viz.:

Force of Mortality at age 20 = .00786
Force of Mortality at age 30 = .00835

2) .01621
.008105

.008105 = the force of mortality at age 26.3.

From Table XXXIII we find the value of a remainder of $1 payable upon the first death of two lives aged 26 is $.3137482, and at age 27 it is $.3184575. At age 26.3, therefore, it is $.315161, and for an estate of $100,000 it is $31,516.10.

This could also have been worked out by applying the commutation columns to the formula.

$$\frac{M_{xy}}{D_{xy}}$$

but Table XXXIII affords us a shorter

method, as we have the various values of this formula already worked out.

[26] *Problem* 27. To determine the value of a remainder payable on the death of both of two designated individuals.

B dies leaving an estate of $250,000. The income therefrom is to be divided equally between his two sons, X and Y, as long as they both shall live, and upon the death of one the entire income shall be paid to the other as long as he shall live. When both X and Y have died the estate is to pass to a charitable institution. At the time of the testator's death the ages of X and Y are 42 and 38 years respectively. Required the present value of the remainder according to the American Experience Table of Mortality with 5% interest.

Solution.

From Formula [26] we can see that the solution of this problem resolves itself into finding the sum of the remainders on each of the individual lives and subtracting therefrom the value of the remainder payable upon the first death.

From Table XXXI the remainder at age 38 of an estate of $250,000 is found to be $70,964.60, and at age 42 it is $78,984.83. Their sum is $149,949.43. By applying the Equal Age Method we learn that the equivalent equal ages of 42 and 38 are $40\frac{1}{6}$. From Table XXXIII we learn that the value of $1 payable upon the first death of two lives aged $40\frac{1}{6}$ is $.4057102, and for an estate of $250,000 it is, therefore, \$101,427.55. The solution of the problem is found, therefore, to be

$$\$149{,}949.43 - \$101{,}427.55 = \$48{,}521.88$$

[27] *Problem* 28. To determine the value of a vested remainder which may be divested.

B dies leaving an estate of \$100,000 to his wife X for life with the remainder over to her daughter Y, if Y be living at the death of X; otherwise the remainder to go to the children of Y. X is 63 years of age and Y is 37. Required the value of Y's remainder according to the American Experience Table of Mortality with 5% interest.

Solution.

It will be seen that this may be solved by Formula [27].

$$v^{\frac{1}{2}}[\mu_x(a_{xy} + \tfrac{1}{2}) + \tfrac{1}{2}(a_{x-1\cdot y} - a_{x+1\cdot y})]$$

From Table II we find that $v^{\frac{1}{2}} = .97590$

From Table III we find that $\mu_{63} = .03220$

In the manner indicated in the preceding problems we can find the equal ages which are equivalent to

$$a_{xy},\ a_{x-1\cdot y} \text{ and } a_{x+1\cdot y}$$

Applying Table XXXIII we obtain for these values

$$a_{xy} = 7.539171$$
$$a_{x-1\cdot y} = 7.797691$$
$$a_{x+1\cdot y} = 7.281828$$

Substituting these values in the formula, we have

$$.97590[.03220(7.539171 + \tfrac{1}{2}) + \tfrac{1}{2}(7.797691 - 7.281828)]$$

Combining we have

.97590[.03220(8.039171)+½(.515863)] which equals
.97590[.2588613+.2579315] which equals
.97590(.5167928) which equals
.504338 which represents the present value of a unit payable at the death of a person aged 63 if another person aged 37 should then be alive.

The present value of an estate of $100,000 is, therefore,

.504338 × $100,000 = $50,433.80

TABLES

OF

Interest, Discount and Mortality.

COMMUTATION COLUMNS — SINGLE PREMIUMS AND ANNUITIES.

INDEX TO TABLES.

Table I — Interest Tables.

Amount of $1 at 4%, 5%, and 6% at the End of Various Periods.

Years.	4%	5%	6%
1	1.0400	1.0500	1.0600
2	1.0816	1.1025	1.1236
3	1.1249	1.1576	1.1910
4	1.1699	1.2155	1.2625
5	1.2167	1.2763	1.3382
6	1.2653	1.3401	1.4185
7	1.3159	1.4071	1.5036
8	1.3686	1.4775	1.5938
9	1.4233	1.5513	1.6895
10	1.4802	1.6289	1.7908
11	1.5395	1.7103	1.8983
12	1.6010	1.7959	2.0122
13	1.6651	1.8856	2.1329
14	1.7317	1.9799	2.2609
15	1.8009	2.0789	2.3966
16	1.8730	2.1829	2.5404
17	1.9479	2.2920	2.6928
18	2.0258	2.4066	2.8543
19	2.1068	2.5270	3.0256
20	2.1911	2.6533	3.2071
21	2.2788	2.7860	3.3996
22	2.3699	2.9253	3.6035
23	2.4647	3.0715	3.8197
24	2.5633	3.2251	4.0489
25	2.6658	3.3864	4.2919
26	2.7725	3.5557	4.5494
27	2.8834	3.7335	4.8223
28	2.9987	3.9201	5.1117
29	3.1187	4.1161	5.4184
30	3.2434	4.3219	5.7435
31	3.3731	4.5380	6.0881
32	3.5081	4.7649	6.4534

Table I — (*Continued*).

Years.	4%	5%	6%
33.............	3.6484	5.0032	6.8406
34.............	3.7943	5.2533	7.2510
35.............	3.9461	5.5160	7.6861
36.............	4.1039	5.7918	8.1473
37.............	4.2681	6.0814	8.6361
38.............	4.4388	6.3855	9.1543
39.............	4.6164	6.7048	9.7035
40.............	4.8010	7.0400	10.2857
41.............	4.9931	7.3920	10.9029
42.............	5.1928	7.7616	11.5570
43.............	5.4005	8.1497	12.2505
44.............	5.6165	8.5572	12.9855
45.............	5.8412	8.9850	13.7646
46.............	6.0748	9.4343	14.5905
47.............	6.3178	9.9060	15.4659
48.............	6.5705	10.4013	16.3939
49.............	6.8333	10.9213	17.3775
50.............	7.1067	11.4674	18.4202
51.............	7.3910	12.0408	19.5254
52.............	7.6866	12.6428	20.6969
53.............	7.9941	13.2749	21.9387
54.............	8.3138	13.9387	23.2550
55.............	8.6464	14.6356	24.6503
56.............	8.9922	15.3674	26.1293
57.............	9.3519	16.1358	27.6971
58.............	9.7260	16.9426	29.3589
59.............	10.1150	17.7897	31.1205
60.............	10.5196	18.6792	32.9877
61.............	10.9404	19.6131	34.9670
62.............	11.3780	20.5938	37.0650
63.............	11.8332	21.6235	39.2889
64.............	12.3065	22.7047	41.6462
65.............	12.7987	23.8399	44.1450
66.............	13.3107	25.0319	46.7937
67.............	13.8431	26.2835	49.6013
68.............	14.3968	27.5977	52.5774

TABLE I — (*Concluded*).

Years.	4%	5%	6%
69............	14.9727	28.9775	55.7320
70............	15.5716	30.4264	59.0759
71............	16.1945	31.9477	62.6205
72............	16.8423	33.5451	66.3777
73............	17.5160	35.2224	70.3604
74............	18.2166	36.9835	74.5820
75............	18.9453	38.8327	79.0569
76............	19.7031	40.7743	83.8003
77............	20.4912	42.8130	88.8284
78............	21.3108	44.9537	94.1581
79............	22.1633	47.2014	99.8075
80............	23.0498	49.5614	105.7960
81............	23.9718	52.0395	112.1438
82............	24.9307	54.6415	118.8724
83............	25.9279	57.3736	126.0047
84............	26.9650	60.2422	133.5650
85............	28.0436	63.2544	141.5789
86............	29.1653	66.4171	150.0736
87............	30.3320	69.7379	159.0781
88............	31.5452	73.2248	168.6227
89............	32.8071	76.8861	178.7401
90............	34.1193	80.7304	189.4645
91............	35.4841	84.7669	200.8324
92............	36.9035	89.0052	212.8823
93............	38.3796	93.4555	225.6553
94............	39.9148	98.1283	239.1946
95............	41.5114	103.0347	253.5463
96............	43.1718	108.1864	268.7590
97............	44.8987	113.5957	284.8846
98............	46.6947	119.2755	301.9776
99............	48.5625	125.2393	320.0963
100............	50.5049	131.5013	339.3021

Table II — Discount Tables.

Present Value of $1 at 4%, 5%, and 6% at the End of Various Periods.

Years.	4%	5%	6%
½	.980588	.975906	.971286
1	.961538	.952381	.943396
2	.924556	.907029	.889996
3	.888996	.863838	.839619
4	.854804	.822702	.792094
5	.821927	.783526	.747258
6	.790315	.746215	.704961
7	.759918	.710681	.665057
8	.730690	.676839	.627412
9	.702587	.644609	.591898
10	.675564	.613913	.558395
11	.649581	.584679	.526788
12	.624597	.556837	.496969
13	.600574	.530321	.468839
14	.577475	.505068	.442301
15	.555265	.481017	.417265
16	.533908	.458112	.393646
17	.513373	.436297	.371364
18	.493628	.415521	.350344
19	.474642	.395734	.330513
20	.456387	.376889	.311805
21	.438834	.358942	.294155
22	.421955	.341850	.277505
23	.405726	.325571	.261797
24	.390121	.310068	.246979
25	.375117	.295303	.232999
26	.360689	.281241	.219810
27	.346817	.267848	.207368
28	.333477	.255094	.195630
29	.320651	.242946	.184557
30	.308319	.231377	.174110
31	.296460	.220359	.164255
32	.285058	.209866	.154957

TABLE II — (*Continued*).

Years.	4%	5%	6%
33	.274094	.199873	.146186
34	.263552	.190355	.137912
35	.253415	.181290	.130105
36	.243669	.172657	.122741
37	.234297	.164436	.115793
38	.225285	.156605	.109239
39	.216621	.149148	.103056
40	.208289	.142046	.097222
41	.200278	.135282	.091719
42	.192575	.128840	.086527
43	.185168	.122704	.081630
44	.178046	.116861	.077009
45	.171198	.111297	.072650
46	.164614	.105997	.068538
47	.158283	.100949	.064658
48	.152195	.096142	.060998
49	.146341	.091564	.057546
50	.140713	.087204	.054288
51	.135301	.083051	.051215
52	.130097	.079096	.048316
53	.125093	.075330	.045582
54	.120282	.071743	.043001
55	.115656	.068326	.040567
56	.111207	.065073	.038271
57	.106930	.061974	.036105
58	.102817	.059023	.034061
59	.098863	.056212	.032133
60	.095060	.053536	.030314
61	.091404	.050986	.028598
62	.087889	.048558	.026980
63	.084508	.046246	.025453
64	.081258	.044044	.024012
65	.078133	.041946	.022653
66	.075128	.039949	.021370
67	.072238	.038047	.020161
68	.069460	.036235	.019020

Table II — (*Concluded*).

Years.	4%	5%	6%
69	.066788	.034509	.017943
70	.064219	.032866	.016927
71	.061749	.031301	.015969
72	.059374	.029811	.015065
73	.057091	.028391	.014213
74	.054895	.027039	.013408
75	.052784	.025752	.012649
76	.050754	.024525	.011933
77	.048801	.023357	.011258
78	.046924	.022245	.010620
79	.045120	.021186	.010019
80	.043384	.020177	.009452
81	.041716	.019216	.008917
82	.040111	.018301	.008412
83	.038569	.017430	.007936
84	.037085	.016600	.007487
85	.035659	.015809	.007063
86	.034287	.015056	.006663
87	.032969	.014339	.006286
88	.031701	.013657	.005930
89	.030481	.013006	.005595
90	.029309	.012387	.005278
91	.028182	.011797	.004979
92	.027098	.011235	.004697
93	.026056	.010700	.004432
94	.025053	.010191	.004181
95	.024090	.009705	.003944
96	.023163	.009243	.003721
97	.022272	.008803	.003510
98	.021416	.008384	.003312
99	.020592	.007985	.003124
100	.019800	.007604	.002947
101	.019038	.007242	.002780
102	.018306	.006897	.002623
103	.017602	.006569	.002474
104	.016925	.006256	.002334
105	.016274	.005958	.002202

Table III.

Force of Mortality.

Age.	Makehamized American. μ_x	Makehamized Carlisle. μ_x
10	.00768	.00495
11	.00769	.00507
12	.00770	.00519
13	.00772	.00533
14	.00773	.00548
15	.00775	.00565
16	.00776	.00583
17	.00778	.00602
18	.00781	.00624
19	.00783	.00648
20	.00786	.00674
21	.00788	.00702
22	.00792	.00733
23	.00795	.00767
24	.00799	.00804
25	.00804	.00894
26	.00809	.00902
27	.00814	.00910
28	.00821	.00920
29	.00827	.00930
30	.00835	.00942
31	.00843	.00955
32	.00853	.00968
33	.00863	.00983
34	.00875	.01000
35	.00888	.01018
36	.00902	.01038
37	.00918	.01060
38	.00935	.01082
39	.00955	.01109
40	.00977	.01137
41	.01001	.01168

TABLE III — (*Continued*).

Age.	Makehamized AMERICAN. μ_x	Makehamized CARLISLE. μ_x
42	*.01028*	.01202
43	*.01058*	.01239
44	*.01091*	.01280
45	*.01128*	.01324
46	*.01169*	.01373
47	*.01215*	.01426
48	*.01265*	.01484
49	*.01321*	.01548
50	*.01384*	.01618
51	*.01453*	.01694
52	*.01531*	.01778
53	*.01617*	.01870
54	*.01712*	.01970
55	*.01818*	.02079
56	*.01936*	.02199
57	*.02066*	.02331
58	*.02212*	.02475
59	*.02373*	.02632
60	*.02553*	.02804
61	*.02752*	.02993
62	*.02974*	.03199
63	*.03220*	.03425
64	*.03494*	.03672
65	*.03798*	.03942
66	*.04136*	.04238
67	*.04512*	.04562
68	*.04929*	.04917
69	*.05393*	.05305
70	*.05908*	.05730
71	*.06481*	.06195
72	*.07117*	.06703
73	*.07824*	.07260
74	*.08610*	.07870
75	*.09483*	.08537
76	*.10453*	.09267

TABLE III — (*Concluded*).

Age.	Makehamized AMERICAN. μ_x	Makehamized CARLISLE. μ_x
77	*.11531*	.10066
78	*.12729*	.10941
79	*.14060*	.11898
80	*.15540*	.12945
81	*.17183*	.14092
82	*.19010*	.15347
83	*.21040*	.16720
84	*.23295*	.18223
85	*.25801*	.19869
86	*.28586*	.21669
87	*.31681*	.23640
88	*.35120*	.25797
89	*.38941*	.28158
90	*.43187*	.30742
91	*.47905*	.33569
92	*.53149*	.36665
93	*.58975*	.40053
94	*.65449*	.43760
95	*.72643*	.47818
96	*.80637*	.52258
97	*.89521*	.57120
98	*.99392*	.62440
99	......	.68262
100	......	.74635
101	......	.81611
102	......	.89243
103	......	.97599
104	......	1.06742
105	......	1.16751

TABLE IV.

NORTHAMPTON *Table of Mortality.*

Age.	l_x	d_x	Expectation.
0	11,650	3,000	25.18
1	8,650	1,367	32.74
2	7,283	502	37.79
3	6,781	335	39.55
4	6,446	197	40.58
5	6,249	184	40.84
6	6,065	140	41.07
7	5,925	110	41.03
8	5,815	80	40.79
9	5,735	60	40.36
10	5,675	52	39.78
11	5,623	50	39.14
12	5,573	50	38.49
13	5,523	50	37.83
14	5,473	50	37.17
15	5,423	50	36.51
16	5,373	53	35.85
17	5,320	58	35.20
18	5,262	63	34.58
19	5,199	67	33.99
20	5,132	72	33.43
21	5,060	75	32.90
22	4,985	75	32.39
23	4,910	75	31.88
24	4,835	75	31.36
25	4,760	75	30.85
26	4,685	75	30.33
27	4,610	75	29.82
28	4,535	75	29.30
29	4,460	75	28.79
30	4,385	75	28.27
31	4,310	75	27.76
32	4,235	75	27.24
33	4,160	75	26.72

TABLE IV—(*Continued*).

Age.	l_x	d_x	Expectation.
34	4,085	75	26.20
35	4,010	75	25.68
36	3,935	75	25.16
37	3,860	75	24.64
38	3,785	75	24.12
39	3,710	75	23.60
40	3,635	76	23.08
41	3,559	77	22.56
42	3,482	78	22.04
43	3,404	78	21.54
44	3,326	78	21.03
45	3,248	78	20.52
46	3,170	78	20.02
47	3,092	78	19.51
48	3,014	78	19.00
49	2,936	79	18.49
50	2,857	81	17.99
51	2,776	82	17.50
52	2,694	82	17.02
53	2,612	82	16.54
54	2,530	82	16.06
55	2,448	82	15.58
56	2,366	82	15.10
57	2,284	82	14.63
58	2,202	82	14.15
59	2,120	82	13.68
60	2,038	82	13.21
61	1,956	82	12.75
62	1,874	81	12.28
63	1,793	81	11.81
64	1,712	80	11.35
65	1,632	80	10.88
66	1,552	80	10.42
67	1,472	80	9.96
68	1,392	80	9.50
69	1,312	80	9.05

TABLE IV — (*Concluded*).

Age.	l_x	d_x	Expectation.
70	1,232	80	8.60
71	1,152	80	8.17
72	1,072	80	7.74
73	992	80	7.33
74	912	80	6.92
75	832	80	6.54
76	752	77	6.18
77	675	73	5.83
78	602	68	5.48
79	534	65	5.11
80	469	63	4.75
81	406	60	4.41
82	346	57	4.09
83	289	55	3.80
84	234	48	3.58
85	186	41	3.37
86	145	34	3.19
87	111	28	3.01
88	83	21	2.86
89	62	16	2.66
90	46	12	2.41
91	34	10	2.09
92	24	8	1.75
93	16	7	1.37
94	9	5	1.05
95	4	3	.75
96	1	1	.50

TABLE V — SINGLE LIFE.

ANNUITIES AND SINGLE PREMIUMS PER $1.

NORTHAMPTON *Table of Mortality, with Interest at 5% Per Annum.*

Age.	Annuity.	Single Premium.
10	15.139	.23148
11	15.043	.23605
12	14.937	.24110
13	14.826	.24638
14	14.710	.25191
15	14.588	.25771
16	14.460	.26381
17	14.334	.26981
18	14.217	.27538
19	14.108	.28057
20	14.007	.28538
21	13.917	.28967
22	13.833	.29367
23	13.746	.29781
24	13.658	.30200
25	13.567	.30633
26	13.473	.31081
27	13.377	.31538
28	13.278	.32010
29	13.177	.32491
30	13.072	.32991
31	12.965	.33500
32	12.854	.34029
33	12.740	.34571
34	12.623	.35129
35	12.502	.35705
36	12.377	.36300
37	12.249	.36910
38	12.116	.37543
39	11.979	.38195
40	11.837	.38871

TABLE V — (*Continued*).

Age.	Annuity.	Single Premium.
41	11.695	.39548
42	11.551	.40233
43	11.407	.40919
44	11.258	.41629
45	11.105	.42357
46	10.947	.43110
47	10.784	.43886
48	10.616	.44686
49	10.443	.45510
50	10.269	.46338
51	10.097	.47157
52	9.925	.47976
53	9.748	.48819
54	9.567	.49681
55	9.382	.50562
56	9.193	.51462
57	8.999	.52386
58	8.801	.53329
59	8.599	.54291
60	8.392	.55276
61	8.181	.56281
62	7.966	.57305
63	7.742	.58371
64	7.514	.59457
65	7.276	.60591
66	7.034	.61748
67	6.787	.62919
68	6.536	.64114
69	6.281	.65329
70	6.023	.66557
71	5.764	.67791
72	5.504	.69029
73	5.245	.70262
74	4.990	.71476
75	4.744	.72648
76	4.511	.73757

TABLE V — (*Concluded*).

Age.	Annuity.	Single Premium.
77	4.277	.74871
78	4.035	.76024
79	3.776	.77257
80	3.515	.78500
81	3.263	.79700
82	3.020	.80857
83	2.797	.81919
84	2.627	.82729
85	2.471	.83471
86	2.328	.84152
87	2.193	.84795
88	2.080	.85333
89	1.924	.86076
90	1.723	.87033
91	1.447	.88348
92	1.153	.89748
93	.816	.91353
94	.524	.92743
95	.238	.94105

N. B.— The column headed "Annuity" in the above table is the one which is used in the calculation of life estates and dower rights. The column headed "Single Premium" is the one which is used in the calculation of the present value of remainders.

TABLE VI — TWO LIVES.

ANNUITIES AND SINGLE PREMIUMS PER $1.

NORTHAMPTON *Table of Mortality, with Interest at 5% Per Annum.*

Ages. Older.	Younger.	Annuity.	Single Premium.
10	10................	12.665	.34928
11	11................	12.546	.35495
12	12................	12.411	.36138
13	13................	12.268	.36819
14	14................	12.118	.37533
15	10................	12.302	.36657
	15................	11.960	.38286
16	11................	12.158	.37343
	16................	11.793	.39081
17	12................	12.009	.38052
	17................	11.630	.39857
18	13................	11.864	.38743
	18................	11.483	.40557
19	14................	11.723	.39415
	19................	11.351	.41185
20	10................	11.906	.38542
	15................	11.585	.40071
	20................	11.232	.41752
21	11................	11.797	.39062
	16................	11.452	.40704
	21................	11.131	.42233
22	12................	11.686	.39590
	17................	11.327	.41300
	22................	11.042	.42657
23	13................	11.570	.40143
	18................	11.209	.41862
	23................	10.951	.43090
24	14................	11.450	.40714
	19................	11.096	.42400
	24................	10.858	.43533
25	10................	11.627	.39872

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
25	15	11.324	.41314
	20	10.989	.42909
	25	10.764	.43981
26	11	11.519	.40386
	16	11.193	.41938
	21	10.890	.43381
	26	10.667	.44443
27	12	11.402	.40942
	17	11.063	.42557
	22	10.796	.43828
	27	10.567	.44919
28	13	11.280	.41524
	18	10.939	.43147
	23	10.699	.44290
	28	10.466	.45400
29	14	11.153	.42129
	19	10.820	.43714
	24	10.600	.44762
	29	10.362	.45895
30	10	11.304	.41410
	15	11.021	.42757
	20	10.707	.44253
	25	10.499	.45243
	30	10.255	.46405
31	11	11.188	.41962
	16	10.883	.43415
	21	10.600	.44762
	26	10.396	.45733
	31	10.146	.46923
32	12	11.062	.42561
	17	10.746	.44066
	22	10.498	.45248
	27	10.289	.46243
	32	10.034	.47457
33	13	10.932	.43180
	18	10.613	.44700

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
33	23	10.393	.45748
	28	10.181	.46757
	33	9.919	.48005
34	14	10.796	.43828
	19	10.486	.45304
	24	10.285	.46262
	29	10.069	.47290
	34	9.801	.48566
35	10	10.916	.43257
	15	10.655	.44500
	20	10.363	.45891
	25	10.175	.46786
	30	9.954	.47838
	35	9.680	.49143
36	11	10.788	.43867
	16	10.507	.45205
	21	10.246	.46447
	26	10.062	.47323
	31	9.837	.48396
	36	9.555	.49738
37	12	10.651	.44519
	17	10.358	.45914
	22	10.132	.46990
	27	9.946	.47876
	32	9.716	.48971
	37	9.427	.50348
38	13	10.509	.45195
	18	10.214	.46600
	23	10.015	.47547
	28	9.826	.48447
	33	9.591	.49566
	38	9.294	.50981
39	14	10.360	.45905
	19	10.074	.47267
	24	9.895	.48119
	29	9.703	.49034

Table VI — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
39	34	9.463	.50176
	39	9.158	.51629
40	10	10.442	.45514
	15	10.205	.46643
	20	9.937	.47919
	25	9.771	.48709
	30	9.576	.49638
	35	9.331	.50805
	40	9.016	.52304
41	11	10.302	.46180
	16	10.046	.47400
	21	9.809	.48528
	26	9.647	.49300
	31	9.448	.50248
	36	9.198	.51438
	41	8.876	.52971
42	12	10.156	.46876
	17	9.889	.48147
	22	9.685	.49119
	27	9.522	.49895
	32	9.320	.50857
	37	9.062	.52085
	42	8.737	.53634
43	13	10.007	.47586
	18	9.739	.48862
	23	9.562	.49704
	28	9.396	.50495
	33	9.190	.51476
	38	8.927	.52729
	43	8.599	.54290
44	14	9.852	.48323
	19	9.592	.49561
	24	9.435	.50309
	29	9.267	.51110
	34	9.058	.52105
	39	8.787	.53396

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
44	44	8.457	.54967
45	10	9.900	.48095
	15	9.690	.49095
	20	9.448	.50248
	25	9.304	.50933
	30	9.135	.51738
	35	8.921	.52757
	40	8.643	.54081
	45	8.312	.55657
46	11	9.774	.48695
	16	9.522	.49895
	21	9.310	.50905
	26	9.170	.51571
	31	8.998	.52391
	36	8.781	.53424
	41	8.497	.54777
	46	8.162	.56371
47	12	9.592	.49561
	17	9.353	.50700
	22	9.173	.51557
	27	9.032	.52228
	32	8.858	.53057
	37	8.636	.54114
	42	8.350	.55476
	47	8.008	.57105
48	13	9.425	.50357
	18	9.186	.51495
	23	9.031	.52233
	28	8.890	.52905
	33	8.714	.53743
	38	8.487	.54824
	43	8.200	.56190
	48	7.849	.57862
49	14	9.252	.51180
	19	9.021	.52281
	24	8.886	.52923

TABLE VI — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
49	29	8.744	.53600
	34	8.565	.54452
	39	8.333	.55557
	44	8.046	.56923
	49	7.686	.58638
50	10	9.260	.51143
	15	9.076	.52019
	20	8.861	.53043
	25	8.739	.53624
	30	8.596	.54304
	35	8.415	.55166
	40	8.177	.56300
	45	7.891	.57662
	50	7.522	.59419
51	11	9.100	.51905
	16	8.899	.52862
	21	8.712	.53752
	26	8.595	.54309
	31	8.451	.54995
	36	8.267	.55872
	41	8.025	.57024
	46	7.737	.58396
	51	7.366	.60161
52	12	8.934	.52695
	17	8.724	.53695
	22	8.568	.54438
	27	8.451	.54995
	32	8.306	.55685
	37	8.119	.56576
	42	7.875	.57738
	47	7.582	.59133
	52	7.213	.60891
53	13	8.763	.53510
	18	8.552	.54514
	23	8.421	.55138
	28	8.304	.55695

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
53	33................	8.157	.56396
	38................	7.966	.57304
	43................	7.724	.58457
	48................	7.424	.59886
	53................	7.056	.61638
54	14................	8.586	.54352
	19................	8.383	.55319
	24................	8.270	.55857
	29................	8.153	.56415
	34................	8.005	.57119
	39................	7.810	.58048
	44................	7.569	.59195
	49................	7.262	.60657
	54................	6.897	.62396
55	10................	8.560	.54476
	15................	8.403	.55224
	20................	8.216	.56114
	25................	8.116	.56590
	30................	7.999	.57147
	35................	7.849	.57862
	40................	7.651	.58805
	45................	7.411	.59947
	50................	7.098	.61438
	55................	6.735	.63166
56	11................	8.386	.55304
	16................	8.214	.56124
	21................	8.053	.56891
	26................	7.958	.57343
	31................	7.841	.57900
	36................	7.690	.58619
	41................	7.489	.59576
	46................	7.249	.60719
	51................	6.936	.62209
	56................	6.571	.63947
57	12................	8.203	.56176
	17................	8.024	.57029

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
57	22................	7.891	.57662
	27................	7.797	.58110
	32................	7.680	.58607
	37................	7.527	.59396
	42................	7.326	.60352
	47................	7.084	.61505
	52................	6.774	.62981
	57................	6.404	.64743
58	13................	8.015	.57071
	18................	7.835	.57928
	23................	7.725	.58452
	28................	7.632	.58895
	33................	7.515	.59452
	38................	7.360	.60190
	43................	7.162	.61133
	48................	6.915	.62309
	53................	6.609	.63767
	58................	6.234	.65552
59	14................	7.821	.57995
	19................	7.648	.58819
	24................	7.556	.59257
	29................	7.464	.59695
	34................	7.346	.60257
	39................	7.189	.61005
	44................	6.994	.61933
	49................	6.742	.63133
	54................	6.442	.64561
	59................	6.062	.66371
60	10................	7.750	.58333
	15................	7.622	.58942
	20................	7.463	.59700
	25................	7.383	.60081
	30................	7.292	.60514
	35................	7.174	.61076
	40................	7.015	.61833
	45................	6.822	.62752

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
60	50	6.568	.63962
	55	6.272	.65371
	60	5.888	.67200
61	11	7.557	.59253
	16	7.416	.59923
	21	7.281	.60566
	26	7.207	.60919
	31	7.116	.61352
	36	6.998	.61914
	41	6.838	.62676
	46	6.648	.63581
	51	6.395	.64786
	56	6.100	.66190
	61	5.712	.68038
62	12	7.357	.60205
	17	7.208	.60914
	22	7.100	.61429
	27	7.027	.61777
	32	6.937	.62205
	37	6.819	.62767
	42	6.660	.63524
	47	6.469	.64433
	52	6.222	.65609
	57	5.925	.67024
	62	5.533	.68891
63	13	7.147	.61205
	18	6.998	.61914
	23	6.910	.62333
	28	6.839	.62671
	33	6.750	.63095
	38	6.631	.63662
	43	6.477	.64396
	48	6.283	.65319
	53	6.042	.66466
	58	5.744	.67886
	63	5.347	.69777

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
64	14	6.931	.62233
	19	6.789	.62909
	24	6.717	.63253
	29	6.648	.63581
	34	6.559	.64005
	39	6.440	.64571
	44	6.289	.65290
	49	6.093	.66224
	54	5.860	.67333
	59	5.561	.68757
	64	5.158	.70676
65	10	6.803	.62843
	15	6.705	.63309
	20	6.576	.63923
	25	6.515	.64214
	30	6.447	.64538
	35	6.360	.64952
	40	6.240	.65524
	45	6.094	.66219
	50	5.897	.67157
	55	5.671	.68233
	60	5.372	.69657
	65	4.960	.71619
66	11	6.581	.63900
	16	6.472	.64419
	21	6.364	.64933
	26	6.309	.65195
	31	6.243	.65510
	36	6.156	.65923
	41	6.037	.66491
	46	5.894	.67171
	51	5.701	.68090
	56	5.479	.69147
	61	5.180	.70571
	66	4.759	.72576
67	12	6.351	.64995

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
67	17	6.236	.65542
	22	6.151	.65947
	27	6.098	.66200
	32	6.033	.66510
	37	5.948	.66914
	42	5.831	.67471
	47	5.690	.68143
	52	5.504	.69029
	57	5.283	.70081
	62	4.986	.71495
	67	4.555	.73547
68	13	6.116	.66114
	18	6.001	.66662
	23	5.934	.66981
	28	5.883	.67224
	33	5.820	.67524
	38	5.735	.67928
	43	5.622	.68466
	48	5.481	.69138
	53	5.303	.69986
	58	5.084	.71029
	63	4.786	.72447
	68	4.348	.74533
69	14	5.876	.67257
	19	5.766	.67781
	24	5.713	.68034
	29	5.664	.68267
	34	5.603	.68557
	39	5.518	.68962
	44	5.411	.69471
	49	5.268	.70152
	54	5.100	.70952
	59	4.883	.71986
	64	4.585	.73405
	69	4.140	.75524
70	10	5.700	.68095

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
70	15	5.631	.68424
	20	5.532	.68895
	25	5.489	.69100
	30	5.442	.69323
	35	5.382	.69609
	40	5.298	.70010
	45	5.195	.70500
	50	5.054	.71171
	55	4.893	.71938
	60	4.680	.72952
	65	4.378	.74391
	70	3.930	.76524
71	11	5.460	.69238
	16	5.382	.69609
	21	5.300	.70000
	26	5.263	.70176
	31	5.218	.70391
	36	5.159	.70671
	41	5.076	.71066
	46	4.978	.71533
	51	4.841	.72185
	56	4.685	.72928
	61	4.476	.73923
	66	4.169	.75386
	71	3.719	.77528
72	12	5.216	.70400
	17	5.133	.70796
	22	5.070	.71095
	27	5.035	.71262
	32	4.992	.71466
	37	4.934	.71743
	42	4.854	.72124
	47	4.758	72581
	52	4.630	73190
	57	4.477	.73919
	62	4.272	.74895

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
72	67	3.960	.76381
	72	3.510	.78524
73	13	4.972	.71561
	18	4.889	.71957
	23	4.841	.72185
	28	4.808	.72343
	33	4.766	.72542
	38	4.710	.72810
	43	4.634	.73171
	48	4.539	.73624
	53	4.417	.74205
	58	4.269	.74909
	63	4.066	.75876
	68	3.752	.77371
	73	3.304	.79505
74	14	4.731	.72709
	19	4.651	.73090
	24	4.615	.73262
	29	4.583	.73415
	34	4.543	.73605
	39	4.488	.73867
	44	4.417	.74205
	49	4.322	.74657
	54	4.208	.75200
	59	4.064	.75886
	64	3.864	.76838
	69	3.547	.78348
	74	3.105	.80452
75	10	4.522	.73704
	15	4.495	.73833
	20	4.424	.74171
	25	4.396	.74304
	30	4.365	.74452
	35	4.327	.74634
	40	4.272	.74895
	45	4.206	.75209

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
75	50	4.112	.75657
	55	4.006	.76161
	60	3.866	.76828
	65	3.665	.77786
	70	3.347	.79300
	75	2.917	.81348
76	11	4.301	.74757
	16	4.270	.74905
	21	4.212	.75180
	26	4.188	.75295
	31	4.160	.75429
	36	4.123	.75605
	41	4.069	.75862
	46	4.006	.76161
	51	3.916	.76590
	56	3.815	.77071
	61	3.679	.77719
	66	3.477	.78681
	71	3.159	.80195
	76	2.750	.82143
77	12	4.195	.75262
	17	4.045	.75976
	22	4.001	.76185
	27	3.979	.76290
	32	3.952	.76419
	37	3.916	.76590
	42	3.865	.76833
	47	3.805	.77119
	52	3.720	.77524
	57	3.623	.77986
	62	3.492	.78609
	67	3.289	.79576
	72	2.971	.81090
	77	2.583	.82938
78	13	3.871	.76805
	18	3.815	.77071

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
78	23	3.783	.77224
	28	3.762	.77323
	33	3.737	.77443
	38	3.702	.77609
	43	3.655	.77833
	48	3.596	.78114
	53	3.518	.78486
	58	3.424	.78933
	63	3.297	.79538
	68	3.095	.80500
	73	2.780	.82000
	78	2.410	.83762
79	14	3.624	.77981
	19	3.571	.78233
	24	3.548	.78343
	29	3.528	.78438
	34	3.505	.78547
	39	3.471	.78709
	44	3.428	.78914
	49	3.369	.79195
	54	3.299	.79528
	59	3.210	.79952
	64	3.088	.80533
	69	2.887	.81419
	74	2.580	.82952
	79	2.217	.84681
80	10	3.395	.79071
	15	3.372	.79180
	20	3.325	.79405
	25	3.308	.79486
	30	3.290	.79571
	35	3.268	.79676
	40	3.236	.79828
	45	3.197	.80015
	50	3.140	.80286
	55	3.076	.80590

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
80	60	2.992	.80990
	65	2.873	.81557
	70	2.675	.82500
	75	2.381	.83900
	80	2.018	.85629
81	11	3.156	.80209
	16	3.128	.80343
	21	3.091	.80519
	26	3.077	.80586
	31	3.060	.80667
	36	3.040	.80762
	41	3.009	.80909
	46	2.973	.81081
	51	2.920	.81333
	56	2.861	.81614
	61	2.782	.81990
	66	2.664	.82552
	71	2.470	.83476
	76	2.195	.84786
	81	1.827	.86538
82	12	2.924	.81314
	17	2.893	.81462
	22	2.865	.81595
	27	2.853	.81653
	32	2.838	.81724
	37	2.818	.81819
	42	2.789	.81957
	47	2.756	.82114
	52	2.707	.82348
	57	2.651	.82614
	62	2.578	.82962
	67	2.461	.83519
	72	2.271	.84424
	77	2.013	.85653
	82	1.642	.87419
83	13	2.709	.82338

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
83	18	2.677	.82491
	23	2.657	.82586
	28	2.646	.82638
	33	2.632	.82704
	38	2.613	.82796
	43	2.587	.82919
	48	2.554	.83076
	53	2.510	.83286
	58	2.457	.83538
	63	2.387	.83872
	68	2.272	.84419
	73	2.085	.85309
	78	1.838	.86486
	83	1.472	.88228
84	14	2.545	.83119
	19	2.513	.83272
	24	2.499	.83338
	29	2.489	.83386
	34	2.476	.83447
	39	2.457	.83538
	44	2.433	.83653
	49	2.400	.83810
	54	2.360	.84000
	59	2.310	.84238
	64	2.242	.84561
	69	2.126	.85114
	74	1.941	.85995
	79	1.750	.86905
	84	1.357	.88777
85	15	2.393	.83843
	20	2.364	.83981
	25	2.354	.84029
	30	2.344	.84076
	35	2.331	.84138
	40	2.313	.84224
	45	2.291	.84328

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
85	50................	2.258	.84486
	55................	2.222	.84657
	60................	2.174	.84886
	65................	2.107	.85205
	70................	1.991	.85757
	75................	1.811	.86614
	80................	1.573	.87748
	85................	1.256	.89257
86	16................	2.253	.84510
	21................	2.229	.84624
	26................	2.221	.84662
	31................	2.212	.84704
	36................	2.200	.84762
	41................	2.182	.84847
	46................	2.162	.84942
	51................	2.131	.85090
	56................	2.097	.85253
	61................	2.051	.85471
	66................	1.984	.85791
	71................	1.867	.86348
	76................	1.699	.87147
	81................	1.447	.88348
	86................	1.171	.89662
87	17................	2.121	.85138
	22................	2.104	.85219
	27................	2.096	.85257
	32................	2.088	.85295
	37................	2.077	.85348
	42................	2.060	.85429
	47................	2.041	.85519
	52................	2.012	.85657
	57................	1.980	.85810
	62................	1.937	.86015
	67................	1.870	.86333
	72................	1.753	.86891
	77................	1.597	.87634

TABLE VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
87	82................	1.329	.88909
	87................	1.098	.90010
88	18.	2.012	.85657
	23................	1.999	.85719
	28................	1.992	.85752
	33................	1.985	.85786
	38............ ...	1.974	.85838
	43...............	1.959	.85909
	48................	1.941	.85995
	53...........	1.914	.86124
	58................	1.883	.86272
	63......	1.843	.86462
	68................	1.777	.86777
	73................	1.660	.87333
	78................	1.514	.88029
	83................	1.235	.89357
	88................	1.063	.90176
89	19................	1.862	.86371
	24..	1.854	.86410
	29................	1.848	.86438
	34................	1.841	.86471
	39................	1.832	.86514
	44................	1.818	.86581
	49................	1.800	.86667
	54................	1.778	.86772
	59................	1.750	.86905
	64................	1.714	.87076
	69................	1.650	.87381
	74................	1.538	.87914
	79................	1.400	.88571
	84................	1.145	.89786
	89...	1.001	.90471
90	20................	1.670	.87286
	25................	1.665	.87309
	30................	1.660	.87333
	35................	1.654	.87362

TABLE VI — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
90	40	1.646	.87400
	45	1.635	.87452
	50	1.619	.87528
	55	1.601	.87614
	60	1.577	.87729
	65	1.544	.87886
	70	1.486	.88161
	75	1.387	.88634
	80	1.255	.89262
	85	1.038	.90295
	90	.909	.90909
91	21	1.407	.88538
	26	1.404	.88552
	31	1.400	.88571
	36	1.395	.88595
	41	1.388	.88629
	46	1.380	.88667
	51	1.367	.88729
	56	1.353	.88796
	61	1.334	.88886
	66	1.307	.89015
	71	1.259	.89243
	76	1.180	.89619
	81	1.061	.90185
	86	.892	.90990
	91	.748	.91676
92	22	1.124	.89886
	27	1.122	.89895
	32	1.119	.89909
	37	1.116	.89923
	42	1.111	.89947
	47	1.105	.89976
	52	1.095	.90024
	57	1.085	.90071
	62	1.071	.90138
	67	1.050	.90238

Table VI — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
92	72................	1.012	.90419
	77................	.955	.90690
	82................	.852	.91180
	87................	.734	.91743
	92................	.576	.92495
93	23................	.798	.91438
	28................	.797	.91443
	33................	.795	.91452
	38................	.793	.91462
	43................	.790	.91476
	48................	.786	.91495
	53................	.780	.91524
	58................	.773	.91557
	63................	.764	.91600
	68................	.750	.91667
	73................	.723	.91796
	78................	.688	.91962
	83................	.606	.92352
	88................	.547	.92634
	93................	.361	.93519
94	24................	.514	.92791
	29................	.513	.92796
	34................	.512	.92800
	39................	.511	.92805
	44................	.509	.92814
	49................	.507	.92824
	54................	.503	.92843
	59................	.499	.92862
	64................	.494	.92886
	69................	.485	.92928
	74................	.469	.93005
	79................	.448	.93105
	84................	.398	.93338
	89................	.369	.93481
	94................	.199	.94290
95	25................	.234	.94124

TABLE VI — (*Concluded*).

Ages. Older.	Younger.	Annuity.	Single Premium.
95	30	.234	.94124
	35	.233	.94129
	40	.233	.94129
	45	.232	.94133
	50	.231	.94138
	55	.230	.94143
	60	.228	.94152
	65	.226	.94161
	70	.222	.94180
	75	.215	.94214
	80	.206	.94257
	85	.185	.94357
	90	.175	.94405
	95	.059	.94957

Table VII — Single Life.

ANNUITIES AND SINGLE PREMIUMS PER $1.

NORTHAMPTON *Table of Mortality, with Interest at 6% Per Annum.*

Age.	Annuity.	Single Premium.
10	13.285	.19142
11	13.212	.19555
12	13.130	.20019
13	13.044	.20506
14	12.953	.21021
15	12.857	.21564
16	12.755	.22142
17	12.655	.22708
18	12.562	.23234
19	12.477	.23716
20	12.398	.24162
21	12.329	.24553
22	12.265	.24915
23	12.200	.25283
24	12.132	.25668
25	12.063	.26059
26	11.992	.26461
27	11.917	.26885
28	11.841	.27315
29	11.763	.27757
30	11.682	.28215
31	11.598	.28691
32	11.512	.29177
33	11.423	.29681
34	11.331	.30202
35	11.236	.30740
36	11.137	.31300
37	11.035	.31877
38	10.929	.32477
39	10.819	.33100
40	10.705	.33745

Table VII — (*Continued*).

Age.	Annuity.	Single Premium.
41..................	10.589	.34402
42..................	10.473	.35059
43..................	10.356	.35721
44..................	10.235	.36406
45..................	10.110	.37113
46..................	9.980	.37849
47..................	9.846	.38608
48..................	9.707	.39394
49..................	9.563	.40209
50..................	9.417	.41036
51..................	9.273	.41851
52..................	9.129	.42666
53..................	8.980	.43509
54..................	8.827	.44375
55..................	8.670	.45264
56..................	8.509	.46175
57..................	8.343	.47115
58..................	8.173	.48077
59..................	7.999	.49062
60..................	7.820	.50075
61..................	7.637	.51111
62..................	7.449	.52175
63..................	7.253	.53285
64..................	7.052	.54423
65..................	6.841	.56617
66..................	6.625	.56840
67..................	6.405	.58085
68..................	6.179	.59364
69..................	5.949	.60666
70..................	5.716	.61985
71..................	5.479	.63326
72..................	5.241	.64674
73..................	5.004	.66015
74..................	4.769	.67345
75..................	4.542	.68631
76..................	4.326	.69853

TABLE VII — (*Concluded*).

Age.	Annulty.	Single Premium.
77..................	4.109	.71082
78..................	3.884	.72355
79..................	3.641	.73730
80..................	3.394	.75128
81..................	3.156	.76475
82..................	2.926	.77777
83..................	2.713	.78983
84..................	2.551	.79900
85..................	2.402	.80743
86..................	2.266	.81513
87..................	2.138	.82238
88..................	2.031	.82843
89..................	1.882	.83687
90..................	1.689	.84779
91..................	1.422	.86291
92..................	1.136	.87909
93..................	.806	.89777
94..................	.518	.91408
95..................	.236	.93004

N. B.— See foot-note at bottom of table V.

TABLE VIII — TWO LIVES.

ANNUITIES AND SINGLE PREMIUMS PER $1.

NORTHAMPTON *Table of Mortality, with Interest at 6% Per Annum.*

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
10	10	11.345	.30123
11	11	11.249	.30666
12	12	11.139	.31289
13	13	11.023	.31945
14	14	10.899	.32647
15	10	11.048	.31804
	15	10.767	.33394
16	11	10.929	.32477
	16	10.626	.34192
17	12	10.805	.33180
	17	10.489	.34968
18	13	10.685	.33859
	18	10.365	.35670
19	14	10.568	.34521
	19	10.255	.36293
20	10	10.719	.33666
	15	10.453	.35172
	20	10.156	.36853
21	11	10.631	.34164
	16	10.342	.35800
	21	10.074	.37317
22	12	10.541	.34673
	17	10.239	.36383
	22	10.002	.37725
23	13	10.446	.35211
	18	10.140	.36943
	23	9.928	.38144
24	14	10.348	.35766
	19	10.048	.37465
	24	9.853	.38568
25	10	10.497	.34922

TABLE VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
25	15	10.244	.36354
	20	9.960	.37962
	25	9.776	.39004
26	11	10.410	.35415
	16	10.135	.36972
	21	9.879	.38421
	26	9.697	.39451
27	12	10.314	.35958
	17	10.027	.37583
	22	9.803	.38851
	27	9.616	.39909
28	13	10.215	.36519
	18	9.924	.38166
	23	9.724	.39298
	28	9.533	.40379
29	14	10.110	.37113
	19	9.826	.38721
	24	9.643	.39757
	29	9.448	.40861
30	10	10.239	.36383
	15	10.001	.37730
	20	9.732	.39253
	25	9.561	.40220
	30	9.360	.41358
31	11	10.144	.36920
	16	9.886	.38381
	21	9.644	.39751
	26	9.476	.40702
	31	9.270	.41868
32	12	10.042	.37499
	17	9.771	.39032
	22	9.561	.40220
	27	9.389	.41194
	32	9.178	.42389
33	13	9.934	.38109
	18	9.660	.39660

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
33	23	9.474	.40713
	28	9.299	.41704
	33	9.082	.42932
34	14	9.822	.38744
	19	9.554	.40260
	24	9.386	.41211
	29	9.207	.42224
	34	8.984	.43486
35	10	9.925	.38161
	15	9.703	.39417
	20	9.451	.40843
	25	9.295	.41727
	30	9.112	.42763
	35	8.883	.44058
36	11	9.820	.38755
	16	9.579	.40119
	21	9.354	.41392
	26	9.201	.42258
	31	9.014	.43317
	36	8.778	.44653
37	12	9.707	.39394
	17	9.454	.40826
	22	9.260	.41925
	27	9.105	.42802
	32	8.913	.43889
	37	8.670	.45264
38	13	9.588	.40068
	18	9.333	.41511
	23	9.163	.42474
	28	9.005	.43368
	33	8.808	.44483
	38	8.558	.45898
39	14	9.464	.40769
	19	9.215	.42180
	24	9.063	.43040
	29	8.902	.43951

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
39	34	8.701	.45088
	39	8.442	.46555
40	10	9.537	.40356
	15	9.333	.41511
	20	9.100	.42830
	25	8.960	.43623
	30	8.795	.44557
	35	8.589	.45723
	40	8.322	.47234
41	11	9.420	.41019
	16	9.198	.42276
	21	8.992	.43442
	26	8.855	.44217
	31	8.688	.45163
	36	8.476	.46362
	41	8.202	.47914
42	12	9.298	.41710
	17	9.065	.43029
	22	8.889	.44024
	27	8.751	.44805
	32	8.580	.45774
	37	8.362	.47003
	42	8.083	.48587
43	13	9.173	.42417
	18	8.938	.43747
	23	8.785	.44614
	28	8.645	.45406
	33	8.471	.46390
	38	8.246	.47664
	43	7.965	.49255
44	14	9.042	.43159
	19	8.814	.44459
	24	8.670	.45264
	29	8.536	.46023
	34	8.358	.47030
	39	8.127	.48337

TABLE VIII — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
44	44	7.843	.49945
45	10	9.088	.42898
	15	8.905	.43934
	20	8.692	.45140
	25	8.569	.45836
	30	8.424	.46656
	35	8.242	.47687
	40	8.003	.49040
	45	7.718	.50653
46	11	8.962	.43612
	16	8.762	.44744
	21	8.574	.45807
	26	8.455	.46481
	31	8.309	.47307
	36	8.122	.48366
	41	7.878	.49747
	46	7.589	.51383
47	12	8.827	.44375
	17	8.617	.45564
	22	8.458	.46464
	27	8.338	.47144
	32	8.189	.47987
	37	7.998	.49068
	42	7.751	.50466
	47	7.455	.52142
48	13	8.686	.45174
	18	8.473	.46379
	23	8.338	.47144
	28	8.217	.47828
	33	8.066	.48683
	38	7.870	.49792
	43	7.621	.51202
	48	7.316	.52928
49	14	8.538	.46012
	19	8.332	.47178
	24	8.214	.47845

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
49	29	8.092	.48536
	34	7.938	.49408
	39	7.737	.50545
	44	7.488	.51955
	49	7.173	.53738
50	10	8.548	.45955
	15	8.386	.46872
	20	8.195	.47953
	25	8.089	.48553
	30	7.966	.49249
	35	7.809	.50138
	40	7.602	.51310
	45	7.353	.52719
	50	7.030	.54547
51	11	8.411	.46730
	16	8.234	.47732
	21	8.067	.48677
	26	7.966	.49249
	31	7.841	.49956
	36	7.681	.50862
	41	7.470	.52057
	46	7.219	.53477
	51	6.893	.55323
52	12	8.270	.47528
	17	8.083	.48587
	22	7.944	.49373
	27	7.842	.49951
	32	7.716	.50664
	37	7.553	.51587
	42	7.340	.52792
	47	7.084	.54241
	52	6.758	.56087
53	13	8.123	.48360
	18	7.934	.49430
	23	7.818	.50087
	28	7.716	.50664

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
53	33	7.588	.51389
	38	7.421	.52334
	43	7.208	.53540
	48	6.945	.55029
	53	6.620	.56868
54	14	7.970	.49226
	19	7.788	.50257
	24	7.688	.50823
	29	7.586	.51400
	34	7.457	.52130
	39	7.286	.53098
	44	7.073	.54304
	49	6.802	.55838
	54	6.480	.57660
55	10	7.951	.49334
	15	7.812	.50121
	20	7.643	.51077
	25	7.555	.51576
	30	7.453	.52153
	35	7.322	.52895
	40	7.146	.53891
	45	6.935	.55085
	50	6.658	.56603
	55	6.336	.58475
56	11	7.801	.50183
	16	7.648	.51049
	21	7.502	.51876
	26	7.419	.52345
	31	7.316	.52928
	36	7.183	.53681
	41	7.005	.54689
	46	6.793	.55889
	51	6.515	.57463
	56	6.190	.59302
57	12	7.643	.51077
	17	7.481	.51994

TABLE VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
57	22	7.362	.52668
	27	7.279	.53138
	32	7.175	.53727
	37	7.041	.54485
	42	6.862	.55498
	47	6.648	.56710
	52	6.371	.58277
	57	6.041	.60145
58	13	7.479	.52006
	18	7.316	.52928
	23	7.218	.53483
	28	7.135	.53953
	33	7.031	.54541
	38	6.894	.55317
	43	6.718	.56313
	48	6.498	.57559
	53	6.225	.59104
	58	5.890	.61000
59	14	7.310	.52962
	19	7.153	.53851
	24	7.070	.54321
	29	6.988	.54785
	34	6.884	.55373
	39	6.744	.56166
	44	6.570	.57151
	49	6.344	.58430
	54	6.076	.59947
	59	5.735	.61878
60	10	7.250	.53302
	15	7.135	.53953
	20	6.990	.54774
	25	6.919	.55175
	30	6.837	.55639
	35	6.732	.56234
	40	6.590	.57038
	45	6.418	.58012

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
60	50	6.189	.59307
	55	5.924	.60807
	60	5.579	.62760
61	11	7.081	.54258
	16	6.953	.54983
	21	6.830	.55679
	26	6.764	.56052
	31	6.682	.56517
	36	6.577	.57111
	41	6.434	.57920
	46	6.263	.58889
	51	6.035	.60180
	56	5.770	.61679
	61	5.420	.63660
62	12	6.905	.55255
	17	6.770	.56019
	22	6.670	.56585
	27	6.605	.56953
	32	6.524	.57411
	37	6.418	.58012
	42	6.276	.58815
	47	6.104	.59788
	52	5.880	.61057
	57	5.613	.62568
	62	5.259	.64572
63	13	6.719	.56307
	18	6.583	.57077
	23	6.503	.57530
	28	6.439	.57892
	33	6.359	.58345
	38	6.252	.58951
	43	6.112	.59744
	48	5.937	.60734
	53	5.719	.61968
	58	5.450	.63491
	63	5.089	.65534

TABLE VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
64	14................	6.527	.57394
	19................	6.396	.58136
	24................	6.331	.58503
	29................	6.268	.58861
	34................	6.189	.59307
	39................	6.081	.59919
	44................	5.944	.60694
	49................	5.767	.61696
	54................	5.555	.62897
	59................	5.284	.64430
	64................	4.917	.66507
65	10................	6.414	.58034
	15................	6.325	.58538
	20................	6.205	.59217
	25................	6.151	.59522
	30................	6.089	.59874
	35................	6.010	.60321
	40................	5.901	.60937
	45................	5.769	.61685
	50................	5.590	.62698
	55................	5.384	.63864
	60................	5.112	.65404
	65................	4.736	.67532
66	11................	6.215	.59161
	16................	6.115	.59727
	21................	6.015	.60293
	26................	5.966	.60570
	31................	5.905	.60915
	36................	5.827	.61356
	41................	5.718	.61974
	46................	5.588	.62710
	51................	5.412	.63706
	56................	5.209	.64855
	61................	4.938	.66389
	66................	4.551	.68579
67	12................	6.009	.60326

TABLE VIII — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
67	17	5.903	.60926
	22	5.824	.61373
	27	5.776	.61645
	32	5.717	.61979
	37	5.639	.62421
	42	5.532	.63027
	47	5.403	.63757
	52	5.233	.64719
	57	5.031	.65862
	62	4.760	.67396
	67	4.363	.69643
68	13	5.796	.61532
	18	5.689	.62138
	23	5.628	.62483
	28	5.581	.62749
	33	5.524	.63071
	38	5.446	.63513
	43	5.343	.64096
	48	5.213	.64832
	53	5.050	.65755
	58	4.849	.66892
	63	4.576	.68438
	68	4.171	.70730
69	14	5.578	.62766
	19	5.476	.63343
	24	5.427	.63620
	29	5.383	.63870
	34	5.326	.64192
	39	5.249	.64628
	44	5.150	.65189
	49	5.019	.65930
	54	4.864	.66807
	59	4.665	.67924
	64	4.390	.69491
	69	3.977	.71828
70	10	5.418	.63672

TABLE VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
70	15	5.355	.64029
	20	5.262	.64555
	25	5.223	.64775
	30	5.180	.65019
	35	5.125	.65330
	40	5.047	.65771
	45	4.953	.66304
	50	4.822	.67046
	55	4.674	.67883
	60	4.478	.68993
	65	4.199	.70572
	70	3.781	.72937
71	11	5.199	.64911
	16	5.127	.65318
	21	5.050	.65755
	26	5.016	.65947
	31	4.974	.66185
	36	4.920	.66491
	41	4.844	.66920
	46	4.753	.67436
	51	4.626	.68155
	56	4.482	.68970
	61	4.289	.70062
	66	4.005	.71670
	71	3.584	.74052
72	12	4.976	.66174
	17	4.899	.66609
	22	4.840	.66943
	27	4.807	.67130
	32	4.767	.67356
	37	4.714	.67656
	42	4.640	.68075
	47	4.551	.68579
	52	4.430	.69264
	57	4.289	.70062
	62	4.099	.71138

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
72	67	3.811	.72768
	72	3.387	.75168
73	13	4.751	.67447
	18	4.673	.67889
	23	4.628	.68144
	28	4.597	.68318
	33	4.559	.68534
	38	4.507	.68828
	43	4.436	.69230
	48	4.348	.69729
	53	4.234	.70373
	58	4.096	.71155
	63	3.908	.72219
	68	3.616	.73872
	73	3.193	.76266
74	14	4.528	.68710
	19	4.453	.69134
	24	4.419	.69326
	29	4.390	.69491
	34	4.353	.69700
	39	4.301	.69994
	44	4.235	.70368
	49	4.146	.70872
	54	4.040	.71472
	59	3.906	.72230
	64	3.719	.73289
	69	3.423	.74964
	74	3.005	.77330
75	10	4.350	.69717
	15	4.310	.69943
	20	4.242	.70329
	25	4.216	.70475
	30	4.188	.70634
	35	4.152	.70838
	40	4.101	.71126
	45	4.040	.71472

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
75	50	3.951	.71975
	55	3.852	.72536
	60	3.721	.73277
	65	3.533	.74341
	70	3.236	.76023
	75	2.827	.78337
76	11	4.148	.70861
	16	4.101	.71126
	21	4.046	.71438
	26	4.024	.71562
	31	3.997	.71715
	36	3.962	.71914
	41	3.912	.72197
	46	3.853	.72530
	51	3.768	.73012
	56	3.674	.73543
	61	3.546	.74268
	66	3.357	.75337
	71	3.059	.77024
	76	2.668	.79238
77	12	3.943	.72021
	17	3.892	.72310
	22	3.850	.72547
	27	3.829	.72666
	32	3.804	.72807
	37	3.770	.73000
	42	3.722	.73272
	47	3.666	.73589
	52	3.586	.74041
	57	3.494	.74562
	62	3.371	.75258
	67	3.180	.76340
	72	2.882	.78027
	77	2.511	.80126
78	13	3.729	.73232
	18	3.677	.73526

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
78	23................	3.646	.73702
	28................	3.626	.73815
	33................	3.602	.73951
	38................	3.570	.74132
	43................	3.525	.74387
	48................	3.469	.74704
	53................	3.396	.75117
	58................	3.308	.75615
	63................	3.188	.76295
	68................	2.996	.77381
	73................	2.701	.79051
	78................	2.346	.81060
79	14................	3.497	.74545
	19................	3.447	.74828
	24................	3.424	.74958
	29................	3.406	.75060
	34................	3.384	.75185
	39................	3.352	.75366
	44................	3.312	.75593
	49................	3.256	.75909
	54................	3.189	.76289
	59................	3.105	.76764
	64................	2.990	.77415
	69................	2.799	.78496
	74................	2.511	.80126
	79................	2.161	.82107
80	10................	3.281	.75768
	15................	3.259	.75892
	20................	3.214	.76147
	25................	3.198	.76238
	30................	3.181	.76334
	35................	3.160	.76453
	40................	3.130	.76623
	45................	3.093	.76832
	50................	3.039	.77138
	55................	2.978	.77483

TABLE VIII — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
80	60	2.899	.77930
	65	2.786	.78570
	70	2.598	.79634
	75	2.323	.81191
	80	1.969	.83194
81	11	3.054	.77052
	16	3.028	.77200
	21	2.992	.77404
	26	2.979	.77477
	31	2.963	.77568
	36	2.944	.77675
	41	2.914	.77845
	46	2.881	.78032
	51	2.829	.78326
	56	2.774	.78637
	61	2.699	.79062
	66	2.587	.79696
	71	2.402	.80744
	76	2.147	.82186
	81	1.786	.84230
82	12	2.833	.78304
	17	2.804	.78468
	22	2.777	.78620
	27	2.765	.78689
	32	2.751	.78768
	37	2.733	.78870
	42	2.705	.79029
	47	2.673	.79209
	52	2.627	.79469
	57	2.574	.79769
	62	2.504	.80166
	67	2.393	.80794
	72	2.211	.81824
	77	1.975	.83161
	82	1.606	.85249
83	13	2.628	.79464

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
83	18	2.598	.79634
	23	2.579	.79741
	28	2.568	.79804
	33	2.555	.79878
	38	2.537	.79979
	43	2.511	.80126
	48	2.481	.80296
	53	2.438	.80540
	58	2.388	.80823
	63	2.321	.81202
	68	2.211	.81824
	73	2.032	.82838
	78	1.810	.84094
	83	1.441	.86183
84	14	2.472	.80347
	19	2.442	.80517
	24	2.429	.80591
	29	2.418	.80653
	34	2.406	.80721
	39	2.388	.80823
	44	2.365	.80953
	49	2.334	.81128
	54	2.295	.81349
	59	2.247	.81620
	64	2.182	.81989
	69	2.071	.82617
	74	1.894	.83619
	79	1.672	.84876
	84	1.330	.86811
85	15	2.327	.81168
	20	2.299	.81326
	25	2.290	.81377
	30	2.280	.81434
	35	2.268	.81502
	40	2.251	.81598
	45	2.230	.81717

Table VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
85	50	2.198	.81898
	55	2.164	.82090
	60	2.118	.82351
	65	2.053	.82719
	70	1.941	.83352
	75	1.769	.84326
	80	1.539	.85628
	85	1.232	.87366
86	16	2.194	.81920
	21	2.171	.82051
	26	2.163	.82096
	31	2.154	.82147
	36	2.143	.82209
	41	2.126	.82306
	46	2.107	.82413
	51	2.077	.82583
	56	2.044	.82769
	61	2.000	.83019
	66	1.936	.83381
	71	1.823	.84021
	76	1.661	.84937
	81	1.417	.86318
	86	1.149	.87836
87	17	2.069	.82628
	22	2.051	.82730
	27	2.044	.82769
	32	2.036	.82815
	37	2.026	.82872
	42	2.009	.82968
	47	1.991	.83069
	52	1.963	.83228
	57	1.932	.83404
	62	1.891	.83636
	67	1.826	.84004
	72	1.713	.84643
	77	1.562	.85498

TABLE VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
87	82................	1.303	.86964
	87................	1.078	.88238
88	18................	1.965	.83217
	23................	1.953	.83285
	28................	1.946	.83324
	33................	1.939	.83364
	38................	1.929	.83421
	43................	1.914	.83505
	48................	1.895	.83614
	53................	1.870	.83755
	58................	1.841	.83919
	63................	1.802	.84140
	68................	1.737	.84507
	73................	1.625	.85142
	78................	1.483	.85945
	83................	1.212	.87480
	88................	1.044	.88430
89	19................	1.822	.84027
	24................	1.814	.84071
	29................	1.808	.84106
	34................	1.802	.84140
	39................	1.792	.84197
	44................	1.779	.84270
	49................	1.761	.84371
	54................	1.740	.84491
	59................	1.713	.84643
	64................	1.678	.84842
	69................	1.616	.85192
	74................	1.508	.85804
	79................	1.373	.86568
	84................	1.124	.87977
	89................	.984	.88769
90	20................	1.638	.85068
	25................	1.633	.85096
	30................	1.628	.85125
	35................	1.622	.85159

TABLE VIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
90	40	1.614	.85203
	45	1.604	.85260
	50	1.590	.85340
	55	1.570	.85453
	60	1.547	.85583
	65	1.515	.85764
	70	1.459	.86081
	75	1.361	.86636
	80	1.234	.87354
	85	1.021	.88560
	90	.895	.89274
91	21	1.382	.86517
	26	1.379	.86534
	31	1.376	.86551
	36	1.371	.86579
	41	1.364	.86619
	46	1.356	.86664
	51	1.343	.86738
	56	1.330	.86811
	61	1.311	.86919
	66	1.285	.87066
	71	1.238	.87332
	76	1.160	.87774
	81	1.044	.88430
	86	.879	.89364
	91	.737	.90168
92	22	1.107	.88073
	27	1.105	.88085
	32	1.102	.88102
	37	1.099	.88119
	42	1.094	.88147
	47	1.089	.88175
	52	1.079	.88232
	57	1.069	.88289
	62	1.055	.88368
	67	1.035	.88481

Table VIII — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
92	72	.997	.88696
	77	.942	.89008
	82	.840	.89585
	87	.725	.90236
	92	.569	.91119
93	23	.788	.89880
	28	.786	.89891
	33	.785	.89897
	38	.783	.89908
	43	.779	.89930
	48	.776	.89947
	53	.770	.89981
	58	.763	.90021
	63	.754	.90071
	68	.740	.90151
	73	.714	.90298
	78	.679	.90496
	83	.599	.90949
	88	.541	.91277
	93	357	.92318
94	24	.508	.91464
	29	.507	.91469
	34	.506	.91475
	39	.505	.91481
	44	.503	.91492
	49	.501	.91503
	54	.498	.91521
	59	.494	.91543
	64	.489	.91572
	69	.480	.91623
	74	.464	.91713
	79	.443	.91832
	84	.394	.92109
	89	.365	.92274
	94	.197	.93224
95	25	.232	.93027

Table VIII — (*Concluded*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
95	30	.231	.93032
	35	.231	.93032
	40	.231	.93032
	45	.230	.93038
	50	.229	.93043
	55	.228	.93049
	60	.226	.93060
	65	.224	.93071
	70	.220	.93094
	75	.213	.93134
	80	.204	.93185
	85	.183	.93304
	90	.174	.93354
	95	.058	.94012

TABLE IX.

CARLISLE *Table of Mortality.*

Age.	l_x	d_x	Expectation.
0	10,000	1,539	38.72
1	8,461	682	44.68
2	7,779	505	47.55
3	7,274	276	49.82
4	6,998	201	50.76
5	6,797	121	51.25
6	6,676	82	51.17
7	6,594	58	50.80
8	6,536	43	50.24
9	6,493	33	49.57
10	6,460	29	48.82
11	6,431	31	48.04
12	6,400	32	47.27
13	6,368	33	46.51
14	6,335	35	45.75
15	6,300	39	45.00
16	6,261	42	44.27
17	6,219	43	43.57
18	6,176	43	42.87
19	6,133	43	42.17
20	6,090	43	41.46
21	6,047	42	40.75
22	6,005	42	40.04
23	5,963	42	39.31
24	5,921	42	38.59
25	5,879	43	37.86
26	5,836	43	37.14
27	5,793	45	36.41
28	5,748	50	35.69
29	5,698	56	35.00
30	5,642	57	34.34
31	5,585	57	33.68
32	5,528	56	33.03

TABLE IX — (*Continued*).

Age.	l_x	d_x	Expectation.
33	5,472	55	32.36
34	5,417	55	31.68
35	5,362	55	31.00
36	5,307	56	30.32
37	5,251	57	29.64
38	5,194	58	28.96
39	5,136	61	28.28
40	5,075	66	27.61
41	5,009	69	26.97
42	4,940	71	26.34
43	4,869	71	25.71
44	4,798	71	25.09
45	4,727	70	24.46
46	4,657	69	23.82
47	4,588	67	23.17
48	4,521	63	22.50
49	4,458	61	21.81
50	4,397	59	21.11
51	4,338	62	20.39
52	4,276	65	19.68
53	4,211	68	18.97
54	4,143	70	18.28
55	4,073	73	17.58
56	4,000	76	16.89
57	3,924	82	16.21
58	3,842	93	15.55
59	3,749	106	14.92
60	3,643	122	14.34
61	3,521	126	13.82
62	3,395	127	13.31
63	3,268	125	12.81
64	3,143	125	12.30
65	3,018	124	11.79
66	2,894	123	11.27
67	2,771	123	10.75
68	2,648	123	10.23

TABLE IX — (*Concluded*).

Age.	l_x	d_x	Expectation.
69	2,525	124	9.70
70	2,401	124	9.18
71	2,277	134	8.65
72	2,143	146	8.16
73	1,997	156	7.72
74	1,841	166	7.33
75	1,675	160	7.01
76	1,515	156	6.69
77	1,359	146	6.40
78	1,213	132	6.12
79	1,081	128	5.80
80	953	116	5.51
81	837	112	5.21
82	725	102	4.93
83	623	94	4.65
84	529	84	4.39
85	445	78	4.12
86	367	71	3.90
87	296	64	3.71
88	232	51	3.59
89	181	39	3.47
90	142	37	3.28
91	105	30	3.26
92	75	21	3.37
93	54	14	3.48
94	40	10	3.53
95	30	7	3.53
96	23	5	3.46
97	18	4	3.28
98	14	3	3.07
99	11	2	2.77
100	9	2	2.28
101	7	2	1.79
102	5	2	1.30
103	3	2	.83
104	1	1	.50

TABLE X — SINGLE LIFE — COMMUTATION COLUMNS.

CARLISLE *Table of Mortality, with Interest at* **5%** *Per Annum.*

Age.	D_x.	N_x.	M_x.
0	10000.0000	130830.3190	3769.989540
1	8058.1952	120830.3190	2304.275259
2	7055.7823	112772.1238	1685.681154
3	6283.5547	105716.3415	1249.443166
4	5757.2719	99432.7868	1022.377285
5	5325.6273	93675.5149	864.888527
6	4981.7340	88349.8876	774.596464
7	4686.2327	83368.1536	716.320595
8	4423.8221	78681.9209	677.063912
9	4185.4457	74258.0989	649.345728
10	3965.8796	70072.6532	629.086591
11	3760.0725	66106.7736	612.130892
12	3563.7595	62346.7011	594.868932
13	3377.0864	58782.9416	577.898649
14	3199.6055	55405.8552	561.231407
15	3030.4077	52206.2497	544.395808
16	2868.2362	49175.8420	526.529459
17	2713.3291	46307.6058	508.204998
18	2566.2555	43594.2767	490.337610
19	2427.0364	41028.0212	473.321050
20	2295.2569	38600.9848	457.114802
21	2170.5244	36305.7278	441.680280
22	2052.8085	34135.2034	427.322585
23	1941.3817	32082.3949	413.648590
24	1835.9121	30141.0132	400.625738
25	1736.0850	28305.1011	388.223022
26	1641.3209	26569.0161	376.129671
27	1551.6453	24927.6952	364.612193
28	1466.2782	23376.0499	353.132979
29	1384.3081	21909.7717	340.985663
30	1305.4316	20525.4636	328.028526
31	1230.7076	19220.0320	315.468036

TABLE X — (*Continued*).

Age.	D_x.	N_x.	M_x.
32	1160.1402	17989.3244	303.505664
33	1093.7025	16829.1842	292.312802
34	1031.1520	15735.4816	281.843288
35	972.0785	14704.3297	271.872322
36	916.2929	13732.2512	262.376164
37	863.4515	12815.9583	253.167770
38	813.4082	11952.5068	244.241264
39	766.0240	11139.0985	235.590682
40	720.8818	10373.0746	226.925895
41	677.6255	9652.1928	217.997309
42	636.4677	8974.5672	209.107375
43	597.4477	8338.0995	200.395363
44	560.7007	7740.6518	192.098209
45	526.0986	7179.9511	184.196157
46	493.6265	6653.8525	176.776389
47	463.1550	6160.2260	169.810893
48	434,6585	5697.0710	163.369372
49	408.1919	5262.4125	157.600846
50	383.4348	4854.2206	152.281418
51	360.2760	4470.7858	147.381399
52	338.2160	4110.5099	142.477425
53	317.2140	3772.2939	137.580984
54	297.2301	3455.0798	132.702479
55	278.2934	3157.8498	127.919631
56	260.2910	2879.5563	123.169319
57	243.1862	2619.2653	118.459290
58	226.7660	2376.0791	113.619411
59	210.7399	2149.3131	108.391667
60	195.0299	1938.5731	102.716902
61	179.5225	1743.5432	96.496585
62	164.8554	1564.0208	90.378240
63	151.1319	1399.1654	84.504998
64	138.4297	1248.0334	78.999522
65	126.5945	1109.6037	73.756212
66	115.6125	983.0093	68.802532
67	105.4274	867.3968	64.122788

TABLE X — (*Concluded*).

Age.	D_x.	N_x.	M_x.
68	95.95014	761.9694	59.665889
69	87.13644	666.0192	55.421223
70	78.91168	578.8828	51.345819
71	71.27263	499.9711	47.464482
72	63.88407	428.6985	43.469865
73	56.69689	364.8144	39.324775
74	49.77894	308.1175	35.106679
75	43.13377	258.3386	30.831930
76	37.15574	215.2048	26.907892
77	31.74266	178.0491	23.264142
78	26.98333	146.3064	20.016354
79	22.90187	119.32308	17.219825
80	19.22866	96.42121	14.637172
81	16.08393	77.19255	12.408096
82	13.26831	61.10861	10.358372
83	10.85866	47.84031	8.580550
84	8.781214	36.98165	7.020183
85	7.035090	28.20043	5.692211
86	5.525687	21.16534	4.517814
87	4.244462	15.63966	3.499717
88	3.168324	11.39519	2.625696
89	2.354133	8.226869	1.962377
90	1.758941	5.872736	1.479288
91	1.238691	4.113795	1.042796
92	.8426475	2.875104	.705737
93	.5778151	2.032457	.481032
94	.4076296	1.454642	.338361
95	.2911641	1.047012	.241306
96	.2125961	.7558478	.176603
97	.1584567	.5432517	.132588
98	.1173753	.3847950	.099052
99	.0878318	.2674197	.075098
100	.0684404	.1795879	.059889
101	.0506966	.1111474	.045404
102	.0344875	.0604509	.031609
103	.0197071	.0259634	.018471
104	.0062562	.0062562	.005958

TABLE XI — SINGLE LIFE.

ANNUITIES AND SINGLE PREMIUMS PER $1.

CARLISLE *Table of Mortality, with Interest at* **5%** *Per Annum.*

Age.	Annuity.	Single Premium.
0	12.083	.37700
1	13.995	.28595
2	14.983	.23891
3	15.824	.19886
4	16.271	.17757
5	16.590	.16238
6	16.735	.15548
7	16.790	.15286
8	16.786	.15305
9	16.742	.15514
10	16.669	.15862
11	16.581	.16281
12	16.494	.16695
13	16.406	.17114
14	16.316	.17543
15	16.227	.17967
16	16.144	.18362
17	16.066	.18733
18	15.987	.19110
19	15.904	.19505
20	15.817	.19919
21	15.726	.20352
22	15.628	.20819
23	15.525	.21310
24	15.417	.21824
25	15.303	.22367
26	15.187	.22919
27	15.065	.23500
28	14.942	.24086
29	14.827	.24633
30	14.723	.25129
31	14.617	.25633

TABLE XI — (*Continued*).

Age.	Annuity.	Single Premium.
32	14.506	.26162
33	14.387	.26729
34	14.260	.27333
35	14.127	.27967
36	13.987	.28633
37	13.843	.29319
38	13.695	.30024
39	13.542	.30752
40	13.390	.31477
41	13.245	.32167
42	13.101	.32852
43	12.957	.33538
44	12.806	.34257
45	12.648	.35010
46	12.480	.35810
47	12.301	.36662
48	12.107	.37586
49	11.892	.38610
50	11.660	.39714
51	11.410	.40905
52	11.154	.42124
53	10.892	.43371
54	10.624	.44648
55	10.347	.45967
56	10.063	.47319
57	9.771	.48710
58	9.478	.50105
59	9.199	.51433
60	8.940	.52667
61	8.712	.53752
62	8.487	.54824
63	8.258	.55914
64	8.016	.57067
65	7.765	.58262
66	7.503	.59510
67	7.227	.60824

Table XI — (*Concluded*).

Age.	Annuity.	Single Premium.
68	6.941	.62186
69	6.643	.63605
70	6.336	.65067
71	6.015	.66595
72	5.711	.68043
73	5.435	.69357
74	5.190	.70524
75	4.989	.71481
76	4.792	.72419
77	4.609	.73291
78	4.422	.74181
79	4.210	.75191
80	4.015	.76119
81	3.799	.77148
82	3.606	.78067
83	3.406	.79019
84	3.211	.79948
85	3.009	.80910
86	2.830	.81762
87	2.685	.82452
88	2.597	.82870
89	2.495	.83357
90	2.339	.84103
91	2.321	.84186
92	2.412	.83752
93	2.518	.83248
94	2.569	.83005
95	2.596	.82876
96	2.555	.83071
97	2.428	.83676
98	2.278	.84391
99	2.045	.85500
100	1.624	.87505
101	1.192	.89562
102	0.753	.91653
103	0.317	.93728

Table XII — Two Lives — Commutation Columns.

CARLISLE *Table of Mortality, with Interest at* **5%** *Per Annum (Makehamized).*

Equal Ages.	D_{xx}.	N_{xx}.
10....	2561930000	40416200000
11....	2415560000	37854270000
12....	2277030000	35438710000
13....	2145950000	33161680000
14....	2021760000	31015730000
15....	1904240000	28993970000
16....	1792880000	27089730000
17....	1687420000	25296850000
18....	1587500000	23609430000
19....	1492730000	22021930000
20....	1402990000	20529200000
21....	1318030000	19126210000
22....	1237410000	17808180000
23....	1160980000	16570770000
24....	1088470000	15409790000
25....	1018380000	14321320000
26....	952616000	13302943000
27....	890982000	12350327000
28....	833182000	11459345000
29....	778950000	10626163000
30....	728117000	9847213000
31....	680412000	9119096000
32....	635687000	8438684000
33....	593709000	7802997000
34....	554350000	7209288000
35....	517410000	6654938000
36....	482753000	6137528000
37....	450232000	5654775000
38....	419708000	5204543000
39....	391072000	4784835000
40....	364190000	4393763000

Table XII — (*Continued*).

Equal Ages.	D_{xx}.	N_{xx}.
41....	338953000	4029573000
42....	315246000	3690620000
43....	293009000	3375374000
44....	272051000	3082365000
45....	252501000	2810314000
46....	234084000	2557813000
47....	216792000	2323729000
48....	200555000	2106937000
49....	185304000	1906382000
50....	170984000	1721078000
51....	157538000	1550094000
52....	144923000	1392556000
53....	133084000	1247633000
54....	121977000	1114549000
55....	111565000	992572000
56....	101803000	881007000
57....	92668000	779204300
58....	84116400	686536300
59....	76129200	602419900
60....	68669200	526290700
61....	61721000	457621500
62....	55256600	395900500
63....	49255400	340643900
64....	43700400	291388500
65....	38572400	247688100
66....	33852200	209115700
67....	29526900	175263500
68....	25580400	145736600
69....	21997800	120156200
70....	18764200	98158400
71....	15864300	79394200
72....	13282200	63529900
73....	11002700	50247700
74....	9009320	39245010
75....	7283550	30235690
76....	5806490	22952140

TABLE XII — (*Concluded*).

Equal Ages.	D_{xx}.	N_{xx}.
77....	4558940	17145650
78....	3520100	12586710
79....	2668730	9066610
80....	1983150	6397880
81....	1441740	4414730
82....	1023280	2972990
83....	707470	1949711
84....	475290	1242241
85....	309407	766951
86....	194608	457544
87....	117883	262936
88....	68520.7	145053.4
89....	38070.8	76532.7
90....	20133.7	38461.9
91....	10087.3	18328.2
92....	4763.49	8240.93
93....	2108.51	3477.44
94....	869.452	1368.932
95....	331.770	499.480
96....	116.292	167.710
97....	37.1483	51.4188
98....	10.7189	14.2705
99....	2.76719	3.55160
100....	.63245	.78441
101....	.12644	.15196
102....	.02186	.02552
103....	.00322	.00366
104....	.00040	.00044
105...	.00004	.00004

Table XIII — Two Lives.

ANNUITIES AND SINGLE PREMIUMS PER $1.

CARLISLE *Table of Mortality, with Interest at* **5%** *Per Annum (Makehamized).*

Equal Ages.	Annuity.	Single Premium.
10	14.7757	.24876
11	14.6710	.25376
12	14.5636	.25886
13	14.4531	.26415
14	14.3410	.26947
15	14.2260	.27495
16	14.1096	.28048
17	13.9914	.28614
18	13.8721	.29180
19	13.7528	.29748
20	13.6325	.30319
21	13.5112	.30900
22	13.3915	.31466
23	13.2731	.32034
24	13.1573	.32586
25	13.0628	.33034
26	12.9646	.33500
27	12.8615	.33990
28	12.7537	.34505
29	12.6416	.35038
30	12.5242	.35600
31	12.4023	.36180
32	12.2749	.36786
33	12.1428	.37415
34	12.0049	.38071
35	11.8620	.38752
36	11.7136	.39457
37	11.5597	.40190
38	11.4004	.40952
39	11.2352	.41738
40	11.0645	.42547

Table XIII — (*Continued*).

Equal Ages.	Annuity.	Single Premium.
41	10.8883	.43391
42	10.7071	.44253
43	10.5197	.45143
44	10.3301	.46048
45	10.1299	.47000
46	9.9269	.47967
47	9.7187	.48957
48	9.5055	.49971
49	9.2879	.51010
50	9.0657	.52066
51	8.8395	.53143
52	8.6089	.54243
53	8.3748	.55357
54	8.1374	.56491
55	7.8968	.57634
56	7.6540	.58791
57	7.4086	.59957
58	7.1617	.61133
59	6.9131	.62319
60	6.6641	.63505
61	6.4144	.64695
62	6.1648	.65881
63	5.9159	.67066
64	5.6679	.68248
65	5.4214	.69424
66	5.1773	.70586
67	4.9357	.71733
68	4.6972	.72872
69	4.4622	.73990
70	4.2312	.75090
71	4.0046	.76166
72	3.7831	.77224
73	3.5669	.78253
74	3.3560	.79257
75	3.1512	.80233
76	2.9528	.81176

Table XIII — (*Concluded*).

Equal Ages.	Annuity.	Single Premium.
77	2.7609	.82090
78	2.5757	.82971
79	2.3974	.83824
80	2.2261	.84638
81	2.0621	.85419
82	1.9054	.86166
83	1.7559	.86876
84	1.6136	.87552
85	1.4788	.88195
86	1.3511	.88805
87	1.2305	.89376
88	1.1169	.89919
89	1.0103	.90429
90	.9103	.90905
91	.8170	.91348
92	.7300	.91762
93	.6492	.92147
94	.5745	.92500
95	.5055	.92828
96	.4422	.93133
97	.3841	.93410
98	.3313	.93662
99	.2834	.93891
100	.2402	.94095

Table XIV — Three Lives — Commutation Columns.

CARLISLE *Table of Mortality, with Interest at* **5%** *Per Annum (Makehamized).*

Equal Ages.	D_{xxx}.	N_{xxx}.
10	165500000000000	2377904000000000
11	155263000000000	2212404000000000
12	145609000000000	2057141000000000
13	136509000000000	1911532000000000
14	127915000000000	1775023000000000
15	119812000000000	1647108000000000
16	112161000000000	1527296000000000
17	104940000000000	1415135000000000
18	98123500000000	1310195500000000
19	91679600000000	1212072000000000
20	85600000000000	1120392400000000
21	79868400000000	1034792400000000
22	74448300000000	954924000000000
23	69329200000000	880475700000000
24	64490700000000	811146500000000
25	59803700000000	746655800000000
26	55441900000000	686852100000000
27	51387700000000	631410200000000
28	47616800000000	580022500000000
29	44107200000000	532405700000000
30	40845200000000	488298500000000
31	37808700000000	447453300000000
32	34985900000000	409644600000000
33	32358100000000	374658700000000
34	29915300000000	342300600000000
35	27641700000000	312385300000000
36	25526700000000	284743600000000
37	23558900000000	259216900000000
38	21727900000000	235658000000000
39	20025100000000	213930100000000
40	18440700000000	193905000000000

TABLE XIV — (*Continued*).

Equal Ages.	$D_{xxx.}$	$N_{xxx.}$
41	16966400000000	175464300000000
42	15593700000000	158497900000000
43	14318300000000	142904200000000
44	13127800000000	128585900000000
45	12026900000000	115458100000000
46	11000500000000	103431200000000
47	10046500000000	92430700000000
48	9159980000000	82384250000000
49	8336120000000	73224270000000
50	7571200000000	64888150000000
51	6861300000000	57316950000000
52	6203340000000	50455650000000
53	5593800000000	44252310000000
54	5029540000000	38658510000000
55	4508160000000	33628970000000
56	4026610000000	29120810000000
57	3583360000000	25094200000000
58	3175490000000	21510840000000
59	2801630000000	18335350000000
60	2459360000000	15533720000000
61	2147450000000	13074360000000
62	1863990000000	10926910000000
63	1607470000000	9062920000000
64	1376530000000	7455450000000
65	1169680000000	6078920000000
66	985430000000	4909243000000
67	822558000000	3923813000000
68	679670000000	3101255000000
69	555390000000	2421585000000
70	448352000000	1866195000000
71	357149000000	1417843000000
72	280363000000	1060694000000
73	216601000000	780331000000
74	164453000000	563730000000
75	122493000000	399277000000
76	89343500000	276784500000

TABLE XIV — (*Concluded*).

Equal Ages.	D_{xxx}.	N_{xxx}.
77	63691900000	187441000000
78	44280800000	123749100000
79	29952600000	79468300000
80	19661000000	49515700000
81	12488100000	29854700000
82	7651680000	17366670000
83	4507320000	9714990000
84	2543250000	5207670000
85	1368800000	2664420000
86	699648000	1295626000
87	337995000	595978000
88	153484000	257983000
89	65134700	104499800
90	25668600	39365100
91	9327680	13696510
92	3101660	4368830
93	935976	1267175
94	253961	331199
95	61340.4	77238.5
96	13043.9	15898.1
97	2413.17	2854.28
98	383.265	441.116
99	51.5144	57.8518
100	5.7678	6.3374
101	.5283	.5696
102	.0389	.0413
103	.0023	.0024
104	.0001	.0001

Table XV — Three Lives.

ANNUITIES AND SINGLE PREMIUMS PER $1.

CARLISLE *Table of Mortality, with Interest at* 5% *Per Annum (Makehamized).*

Equal Ages.	Annuity.	Single Premium.
10	13.3680	.31581
11	13.2494	.32147
12	13.1278	.32724
13	13.0030	.33319
14	12.8766	.33919
15	12.7474	.34538
16	12.6170	.35157
17	12.4852	.35786
18	12.3525	.36415
19	12.2207	.37043
20	12.0887	.37671
21	11.9562	.38304
22	11.8267	.38919
23	11.6999	.39524
24	11.5777	.40105
25	11.4851	.40547
26	11.3887	.41005
27	11.2872	.41491
28	11.1810	.41995
29	11.0707	.42519
30	10.9549	.43071
31	10.8347	.43643
32	10.7088	.44243
33	10.5785	.44862
34	10.4423	.45514
35	10.3012	.46185
36	10.1547	.46881
37	10.0029	.47605
38	9.8459	.48352
39	9.6831	.49129
40	9.5151	.49928

TABLE XV — (*Continued*).

Equal Ages.	Annuity.	Single Premium.
41	9.3419	.50752
42	9.1642	.51600
43	8.9805	.52471
44	8.7949	.53357
45	8.6000	.54286
46	8.4024	.55228
47	8.2003	.56190
48	7.9939	.57171
49	7.7840	.58171
50	7.5704	.59190
51	7.3537	.60219
52	7.1336	.61267
53	6.9110	.62328
54	6.6863	.63400
55	6.4596	.64476
56	6.2321	.65561
57	6.0030	.66653
58	5.7740	.67743
59	5.5445	.68833
60	5.3162	.69923
61	5.0883	.71010
62	4.8621	.72085
63	4.6380	.73152
64	4.4161	.74209
65	4.1971	.75253
66	3.9818	.76276
67	3.7703	.77286
68	3.5629	.78272
69	3.3602	.79238
70	3.1623	.80180
71	2.9699	.81095
72	2.7833	.81986
73	2.6026	.82843
74	2.4279	.83676
75	2.2596	.84476
76	2.0980	.85248

TABLE XV — (*Concluded*).

Equal Ages.	Annuity.	Single Premium.
77	1.9429	.85986
78	1.7946	.86690
79	1.6531	.87367
80	1.5185	.88005
81	1.3907	.88614
82	1.2697	.89190
83	1.1554	.89738
84	1.0476	.90248
85	.9465	.90729
86	.8518	.91180
87	.7633	.91605
88	.6809	.91995
89	.6044	.92362
90	.5336	.92695
91	.4684	.93010
92	.4085	.93290
93	.3539	.93552
94	.3041	.93791
95	.2592	.94005
96	.2188	.94195
97	.1828	.94367
98	.1509	.94519
99	.1230	.94653
100	.0987	.94767

Table XVI — Single Life — Commutation Columns.

CARLISLE *Table of Mortality, with Interest at* **6%** *Per Annum.*

Equal Ages.	D_x.	N_x	M_x.
0	10000.0000	114397.1220	3524.691199
1	7982.0755	104397.1220	2072.804399
2	6923.2823	96415.0465	1465.826827
3	6107.3906	89491.7642	1041.819091
4	5543.0714	83384.3735	823.201241
5	5079.1138	77841.3021	673.002349
6	4706.3166	72762.1884	587.702123
7	4385.3866	68055.8718	533.167440
8	4100.7673	63670.4852	496.777522
9	3843.1967	59569.7180	471.325888
10	3607.2303	55726.5213	452.898860
11	3387.7706	52119.2910	437.622022
12	3180.6039	48731.5204	422.215972
13	2985.5669	45550.9165	407.213123
14	2801.9766	42565.3496	392.617191
15	2628.7699	39763.3730	378.012914
16	2464.6194	37134.6031	362.660709
17	2309.5153	34669.9838	347.063403
18	2163.7232	32360.4685	331.998620
19	2027.0363	30196.7452	317.786561
20	1898.8908	28169.7089	304.378958
21	1778.7577	26270.8181	291.730276
22	1666.4181	24492.0604	280.075062
23	1561.0971	22825.6423	269.079577
24	1462.3600	21264.5452	258.706478
25	1369.7989	19802.1852	248.920535
26	1282.8113	18432.3863	239.468704
27	1201.2825	17149.5750	230.551882
28	1124.4820	15948.2925	221.748526
29	1051.6043	14823.8104	212.520689
30	982.3294	13772.2061	202.770522
31	917.3633	12789.8768	193.407996

TABLE XVI — (*Continued*).

Equal Ages.	D_x.	N_x.	M_x.
32	856.6045	11872.5135	184.575424
33	799.9310	11015.9090	176.388996
34	747.0668	10215.9780	168.803862
35	697.6242	9468.9112	161.648075
36	651.3853	8771.2871	154.897333
37	608.0301	8119.9018	148.412915
38	567.3866	7511.8717	142.186300
39	529.2932	6944.4851	136.209080
40	493.4026	6415.1920	130.278526
41	459.4207	5921.7894	124.225069
42	427.4454	5462.3686	118.254678
43	397.4546	5034.9233	112.458975
44	369.4896	4637.4687	106.991330
45	343.4169	4267.9791	101.833175
46	319.1806	3924.5622	97.035528
47	296.6523	3605.3816	92.574105
48	275.7738	3308.7293	88.487212
49	256.5385	3032.9556	84.861835
50	238.7059	2776.4170	81.550245
51	222.1726	2537.7111	78.528534
52	206.6011	2315.5385	75.532914
53	191.9440	2108.9374	72.570113
54	178.1551	1916.9934	69.646013
55	165.2311	1738.8383	66.806294
56	153.0846	1573.6072	64.012500
57	141.6755	1420.5226	61.268531
58	130.8631	1278.8472	58.475513
59	120.4674	1147.9841	55.487125
60	110.4351	1027.5167	52.273805
61	100.6951	917.0816	48.784796
62	91.59500	816.3865	45.385360
63	83.17877	724.7906	42.152892
64	75.46905	641.6118	39.151418
65	68.36567	566.1428	36.319838
66	61.84597	497.7771	33.669907
67	55.86549	435.9312	31.190133

TABLE XVI — (*Concluded*).

Equal Ages.	D_x.	N_x.	M_x.
68	50.36386	380.0657	28.850723
69	45.30611	329.7018	26.643733
70	40.64262	284.3957	24.544740
71	36.36188	243.7531	22.564558
72	32.28494	207.3912	20.545808
73	28 38244	175.1063	18.470777
74	24.68424	146.7238	16.379120
75	21.18727	122.0396	14.279367
76	18.07870	100.8523	12.370066
77	15.29916	82.77360	10.613869
78	12.88259	67.47444	9.063285
79	10.83084	54.59185	7.740740
80	9.007899	43.76101	6.530865
81	7.463638	34.75311	5.496478
82	6.098976	27.28948	4.554291
83	4.944259	21.19050	3.744798
84	3.960617	16.24624	3.041021
85	3.143124	12.28562	2.447712
86	2.445468	9.142500	1.927967
87	1.860721	6.697032	1.481645
88	1.375853	4.836311	1.102099
89	1.012645	3.460458	.816768
90	.749480	2.447813	.610925
91	.522824	1.698333	.426692
92	.352307	1.175509	.285769
93	.239303	.823202	.192707
94	.167228	.583898	.134177
95	.118322	.416670	.094736
96	.085579	.298349	.068690
97	.063183	.212770	.051139
98	.046361	.149587	.037893
99	.034365	.103226	.028521
100	.026525	.068861	.022627
101	.019463	.042336	.017066
102	.013115	.022873	.011820
103	.007424	.009758	.006871
104	.002334	.002334	.002202

TABLE XVII — SINGLE LIFE.

ANNUITIES AND SINGLE PREMIUMS PER $1.

CARLISLE *Table of Mortality, with Interest at 6% Per Annum.*

Age.	Annuity.	Single Premium.
0	10.439	.35251
1	12.078	.25974
2	12.925	.21179
3	13.652	.17065
4	14.042	.14857
5	14.325	.13255
6	14.460	.12491
7	14.518	.12163
8	14.526	.12117
9	14.500	.12264
10	14.448	.12558
11	14.384	.12921
12	14.321	.13277
13	14.257	.13640
14	14.191	.14013
15	14.126	.14381
16	14.067	.14715
17	14.012	.15026
18	13.956	.15343
19	13.897	.15677
20	13.835	.16028
21	13.769	.16402
22	13.697	.16809
23	13.621	.17240
24	13.541	.17692
25	13.456	.18174
26	13.368	.18672
27	13.275	.19198
28	13.182	.19725
29	13.096	.20211
30	13.020	.20642
31	12.942	.21083

TABLE XVII — (*Continued*).

Age.	Annuity.	Single Premium.
32	12.860	.21547
33	12.771	.22051
34	12.675	.22594
35	12.573	.23172
36	12.465	.23783
37	12.354	.24411
38	12.239	.25062
39	12.120	.25736
40	12.002	.26404
41	11.890	.27038
42	11.779	.27666
43	11.668	.28294
44	11.551	.28957
45	11.428	.29653
46	11.296	.30400
47	11.154	.31204
48	10.998	.32087
49	10.823	.33077
50	10.631	.34164
51	10.422	.35347
52	10.208	.36558
53	9.988	.37804
54	9.761	.39089
55	9.524	.40431
56	9.280	.41812
57	9.027	.43243
58	8.772	.44687
59	8.529	.46062
60	8.304	.47336
61	8.108	.48445
62	7.913	.49549
63	7.714	.50676
64	7.502	.51875
65	7.281	.53126
66	7.049	.54440
67	6.803	.55832

TABLE XVII — (*Concluded*).

Age.	Annuity.	Single Premium.
68	6.546	.57287
69	6.277	.58809
70	5.998	.60389
71	5.704	.62053
72	5.424	.63638
73	5.170	.65075
74	4.944	.66355
75	4.760	.67396
76	4.579	.68421
77	4.410	.69377
78	4.238	.70351
79	4.040	.71472
80	3.858	.72502
81	3.656	.73645
82	3.474	.74675
83	3.286	.75740
84	3.102	.76781
85	2.909	.77874
86	2.739	.78836
87	2.599	.79628
88	2.515	.80101
89	2.417	.80658
90	2.266	.81513
91	2.248	.81615
92	2.337	.81111
93	2.440	.80528
94	2.492	.80234
95	2.522	.80064
96	2.486	.80268
97	2.368	.80936
98	2.227	.81734
99	2.004	.82996
100	1.596	.85306
101	1.175	.87689
102	0.744	.90128
103	0.314	.92562

TABLE XVIII — TWO LIVES — COMMUTATION COLUMNS.

CARLISLE *Table of Mortality, with Interest at* **6%** *Per Annum (Makehamized).*

Equal Ages.	D_{xx}.	N_{xx}.
10......	2330240000	32654970000
11......	2176390000	30324730000
12......	2032220000	28148340000
13......	1897160000	26116120000
14......	1770510000	24218960000
15......	1651860000	22448450000
16......	1540590000	20796590000
17......	1436280000	19256000000
18......	1338490000	17819720000
19......	1246720000	16481230000
20......	1160710000	15234510000
21......	1080130000	14073800000
22......	1004500000	12993670000
23......	933566000	11989175000
24......	867000000	11055609000
25.....	803513000	10188609000
26......	744540000	9385096000
27......	689798000	8640556000
28......	638968000	7950758000
29......	591739000	7311795000
30......	547904000	6720056000
31......	507175000	6172152000
32......	469367000	5664977000
33......	434237000	5195610000
34......	401625000	4761373000
35......	371326000	4359748000
36......	343185000	3988422000
37......	317046000	3645237000
38......	292763000	3328191000
39......	270216000	3035428000
40......	249267000	2765212000

TABLE XVIII — (*Continued*).

Equal Ages.	D_{xx}.	N_{xx}.
41......	229805000	2515945000
42......	211716000	2286140000
43......	194925000	2074424000
44......	179317000	1879499000
45......	164822000	1700182000
46......	151360000	1535360000
47......	138856000	1384000000
48......	127244000	1245144000
49.....	116459000	1117900000
50......	106445000	1001441000
51......	97149600	894996100
52......	88526800	797846500
53......	80528400	709319700
54......	73111000	628791300
55......	66239500	555680300
56......	59873100	489440800
57......	53986600	429567700
58......	48542200	375581100
59......	43518500	327038900
60......	38883700	283520400
61......	34619600	244636700
62......	30701200	210017100
63......	27108900	179315900
64......	23824600	152207000
65......	20830500	128382400
66......	18109000	107551900
67......	15646100	89442900
68......	13427100	73796800
69......	11437600	60369700
70......	9664300	48932100
71......	8093640	39267800
72......	6712400	31174160
73......	5507980	24461760
74......	4467510	18953780
75......	3577670	14486270
76......	2825230	10908600

Table XVIII — (*Concluded*).

Equal Ages.	D_{xx}.	N_{xx}.
77......	2197300	8083370
78......	1680600	5886070
79.....	1262110	4205470
80......	929033	2943366
81......	669029	2014333
82......	470369	1345304
83......	322131	874935
84......	214372	552804
85......	138236	338432
86......	86126.4	200196.7
87......	51678.5	114070.3
88......	29755.3	62391.8
89......	16376.4	32636.5
90......	8578.90	16260.10
91......	4257.62	7681.20
92......	1991.59	3423.58
93......	873.242	1431.997
94......	356.689	558.755
95......	134.822	202.066
96......	46.8121	67.2444
97......	14.8126	20.4323
98......	4.2338	5.6197
99......	1.0827	1.3859
100......	.2451	.3032
101......	.0485	.0581
102......	.0083	.0096
103......	.0012	.0013
104......	.0001	.0001

TABLE XIX — TWO LIVES.

ANNUITIES AND SINGLE PREMIUMS PER $1.

CARLISLE *Table of Mortality, with Interest at* **6%** *Per Annum* (*Makehamized*).

Equal Ages.	Annuity.	Single Premium.
10	13.0136	.20675
11	12.9335	.21128
12	12.8510	.21598
13	12.7659	.22079
14	12.6791	.22572
15	12.5898	.23075
16	12.4991	.23591
17	12.4069	.24111
18	12.3133	.24643
19	12.2197	.25170
20	12.1252	.25708
21	12.0297	.26245
22	11.9355	.26777
23	11.8423	.27310
24	11.7516	.27819
25	11.6801	.28226
26	11.6052	.28651
27	11.5262	.29098
28	11.4432	.29568
29	11.3565	.30054
30	11.2650	.30576
31	11.1697	.31113
32	11.0694	.31685
33	10.9649	.32274
34	10.8553	.32897
35	10.7410	.33541
36	10.6218	.34215
37	10.4975	.34917
38	10.3682	.35653
39	10.2333	.36417
40	10.0934	.37209

TABLE XIX — (*Continued*).

Equal Ages.	Annuity.	Single Premium.
41	9.9482	.38030
42	9.7981	.38880
43	9.6422	.39763
44	9.4814	.40673
45	9.3153	.41614
46	9.1438	.42581
47	8.9672	.43583
48	8.7855	.44608
49	8.5991	.45666
50	8.4081	.46747
51	8.2126	.47851
52	8.0125	.48983
53	7.8083	.50144
54	7.6005	.51315
55	7.3890	.52515
56	7.1746	.53727
57	6.9569	.55960
58	6.7372	.56205
59	6.5149	.57463
60	6.2915	.58725
61	6.0664	.60004
62	5.8407	.61277
63	5.6147	.62557
64	5.3886	.63836
65	5.1632	.65115
66	4.9391	.66383
67	4.7166	.67639
68	4.4961	.68891
69	4.2782	.70125
70	4.0632	.71341
71	3.8517	.72536
72	3.6443	.73713
73	3.4411	.74862
74	3.2426	.75983
75	3.0491	.77081
76	2.8611	.78146

TABLE XIX — (*Concluded*).

Equal Ages.	Annuity.	Single Premium.
77	2.6788	.79175
78	2.5024	.80178
79	2.3321	.81140
80	2.1682	.82068
81	2.0108	.82956
82	1.8601	.83811
83	1.7161	.84626
84	1.5787	.85402
85	1.4482	.86144
86	1.3245	.86840
87	1.2073	.87507
88	1.0968	.88130
89	.9929	.88719
90	.8954	.89274
91	.8041	.89788
92	.7190	.90270
93	.6399	.90717
94	.5665	.91130
95	.4988	.91515
96	.4365	.91866
97	.3794	.92194
98	.3273	.92488
99	.2800	.92755
100	.2370	.92998

TABLE XX — THREE LIVES — COMMUTATION COLUMNS.

CARLISLE *Table of Mortality, with Interest at* **6%** *Per Annum (Makehamized).*

Equal Ages.	$D_{xxx.}$	$N_{xxx.}$
10	150533000000000	1943189000000000
11	139890000000000	1792656000000000
12	129954000000000	1652766000000000
13	120683000000000	1522812000000000
14	112018000000000	1402129000000000
15	103933000000000	1290111000000000
16	96377600000000	1186178400000000
17	89322400000000	1089800800000000
18	82732000000000	1000478400000000
19	76570000000000	917746400000000
20	70817800000000	841176400000000
21	65452600000000	770358600000000
22	60435300000000	704906000000000
23	55748800000000	644470700000000
24	51368800000000	588721900000000
25	47186000000000	537353100000000
26	43331900000000	490167100000000
27	39784400000000	446835200000000
28	36517100000000	407050800000000
29	33506500000000	370533700000000
30	30735800000000	337027200000000
31	28182400000000	306291400000000
32	25832200000000	278109000000000
33	23666700000000	252276800000000
34	21673600000000	228610100000000
35	19837400000000	206936500000000
36	18146800000000	187099100000000
37	16589900000000	168952300000000
38	15156100000000	152362400000000
39	13836600000000	137206300000000
40	12621600000000	123369700000000
41	11503000000000	110748100000000

TABLE XX — (*Continued*).

Equal Ages.	$D_{xxx.}$	$N_{xxx.}$
42	10472600000000	99245100000000
43	9525280000000	88772560000000
44	8652900000000	79247280000000
45	7850660000000	70594380000000
46	7112950000000	62743720000000
47	6434790000000	55630770000000
48	5811630000000	49195980000000
49	5239060000000	43384350000000
50	4713430000000	38145290000000
51	4231170000000	33431860000000
52	3789350000000	29200690000000
53	3384770000000	25411340000000
54	3014620000000	22026570000000
55	2676620000000	19011950000000
56	2368170000000	16335330000000
57	2087600000000	13967160000000
58	1832530000000	11879560000000
59	1601530000000	10047030000000
60	1392610000000	8445500000000
61	1204510000000	7052890000000
62	1035660000000	5848380000000
63	884710000000	4812723000000
64	750455000000	3928013000000
65	631669000000	3177558000000
66	527149000000	2545889000000
67	435870000000	2018740000000
68	356756000000	1582870000000
69	288772000000	1226114000000
70	230919000000	937342000000
71	182211000000	706423000000
72	141686000000	524212000000
73	108431000000	382526000000
74	81548500000	274095400000
75	60168600000	192546900000
76	43471400000	132378300000
77	30697900000	88906900000

TABLE XX — (*Concluded*).

Equal Ages.	D_{xxx}.	N_{xxx}.
78	21140900000	58209000000
79	14165300000	37068100000
80	9210460000	22902830000
81	5795030000	13692370000
82	3517220000	7897340000
83	2052310000	4380120000
84	1147090000	2327810000
85	611550000	1180725000
86	309639000	569175000
87	148173000	259536000
88	66650600	111363000
89	28018100	44712400
90	10937400	16694300
91	3937020	5756940
92	1296790	1819920
93	387637	523137
94	104186	135500
95	24927.1	31314
96	5250.71	6386.93
97	962.235	1136.226
98	151.382	173.991
99	20.1553	22.6091
100	2.2354	2.4538
101	.2028	.2184
102	.0148	.0156
103	.0008	.0008

TABLE XXI — THREE LIVES.

ANNUITIES AND SINGLE PREMIUMS PER $1.

CARLISLE *Table of Mortality, with Interest at* **6%** *Per Annum (Makehamized).*

Equal Ages.	Annuity.	Single Premium.
10	11.9087	.26930
11	11.8148	.27463
12	11.7181	.28012
13	11.6183	.28578
14	11.5170	.29149
15	11.4129	.29738
16	11.3076	.30332
17	11.2008	.30937
18	11.0930	.31549
19	10.9857	.32155
20	10.8780	.32766
21	10.7697	.33377
22	10.6638	.33977
23	10.5603	.34566
24	10.4607	.35126
25	10.3880	.35540
26	10.3119	.35970
27	10.2314	.36428
28	10.1469	.36903
29	10.0586	.37402
30	9.9653	.37934
31	9.8682	.38483
32	9.7660	.39060
33	9.6596	.39660
34	9.5479	.40295
35	9.4316	.40951
36	9.3103	.41642
37	9.1840	.42354
38	9.0529	.43096
39	8.9162	.43872
40	8.7745	.44670

TABLE XXI — (*Continued*).

Equal Ages.	Annuity.	Single Premium.
41	8.6278	.45502
42	8.4766	.46356
43	8.3197	.47245
44	8.1585	.48157
45	7.9922	.49102
46	7.8211	.50069
47	7.6453	.51066
48	7.4651	.52085
49	7.2809	.53126
50	7.0929	.54191
51	6.9013	.55277
52	6.7060	.56381
53	6.5076	.57502
54	6.3066	.58639
55	6.1030	.59794
56	5.8979	.60955
57	5.6905	.62126
58	5.4826	.63304
59	5.2734	.64492
60	5.0645	.65670
61	4.8554	.66859
62	4.6470	.68035
63	4.4399	.69208
64	4.2342	.70373
65	4.0304	.71528
66	3.8295	.72660
67	3.6315	.73781
68	3.4368	.74885
69	3.2460	.75966
70	3.0592	.77024
71	2.8770	.78054
72	2.6998	.79057
73	2.5278	.80030
74	2.3611	.80975
75	2.2001	.81887
76	2.0452	.82764

Table XXI — (*Concluded*).

Equal Ages.	Annuity.	Single Premium.
77	1.8962	.83608
78	1.7534	.84417
79	1.6168	.85186
80	1.4866	.85922
81	1.3628	.86625
82	1.2453	.87293
83	1.1342	.87920
84	1.0293	.88515
85	.9307	.89069
86	.8382	.89597
87	.7516	.90083
88	.6708	.90541
89	.5958	.90966
90	.5264	.91362
91	.4623	.91725
92	.4034	.92058
93	.3496	.92358
94	.3006	.92636
95	.2562	.92891
96	.2164	.93117
97	.1808	.93315
98	.1494	.93496
99	.1217	.93649
100	.0977	.93785

Table XXII.

COMBINED EXPERIENCE *Table of Mortality.*

Age.	l_x	d_x	Expectation.
10	100,000	676	48.36
11	99,324	674	47.68
12	98,650	672	47.01
13	97,978	671	46.33
14	97,307	671	45.64
15	96,636	671	44.96
16	95,965	672	44.27
17	95,293	673	43.58
18	94,620	675	42.88
19	93,945	677	42.19
20	93,268	680	41.49
21	92,588	683	40.79
22	91,905	686	40.09
23	91,219	690	39.39
24	90,529	694	38.68
25	89,835	698	37.98
26	89,137	703	37.27
27	88,434	708	36.56
28	87,726	714	35.86
29	87,012	720	35.15
30	86,292	727	34.43
31	85,565	734	33.72
32	84,831	742	33.01
33	84,089	750	32.30
34	83,339	758	31.58
35	82,581	767	30.87
36	81,814	776	30.15
37	81,038	785	29.44
38	80,253	795	28.72
39	79,458	805	28.00
40	78,653	815	27.28
41	77,838	826	26.56
42	77,012	839	25.84

TABLE XXII — (*Continued*).

Age.	l_x	d_x	Expectation.
43	76,173	857	25.12
44	75,316	881	24.40
45	74,435	909	23.69
46	73,526	944	22.97
47	72,582	981	22.27
48	71,601	1,021	21.56
49	70,580	1,063	20.87
50	69,517	1,108	20.18
51	68,409	1,156	19.50
52	67,253	1,207	18.82
53	66,046	1,261	18.16
54	64,785	1,316	17.50
55	63,469	1,375	16.86
56	62,094	1,436	16.22
57	60,658	1,497	15.59
58	59,161	1,561	14.97
59	57,600	1,627	14.37
60	55,973	1,698	13.77
61	54,275	1,770	13.18
62	52,505	1,844	12.61
63	50,661	1,917	12.05
64	48,744	1,990	11.51
65	46,754	2,061	10.97
66	44,693	2,128	10.46
67	42,565	2,191	9.96
68	40,374	2,246	9.47
69	38,128	2,291	9.00
70	35,837	2,327	8.54
71	33,510	2,351	8.10
72	31,159	2,362	7.67
73	28,797	2,358	7.26
74	26,439	2,339	6.86
75	24,100	2,303	6.48
76	21,797	2,249	6.11
77	19,548	2,179	5.76
78	17,369	2,092	5.42

Table XXII — (*Concluded*).

Age.	l_x	d_x	Expectation.
79	15,277	1,987	5.09
80	13,290	1,866	4.78
81	11,424	1,730	4.48
82	9,694	1,582	4.18
83	8,112	1,427	3.90
84	6,685	1,268	3.63
85	5,417	1,111	3.36
86	4,306	958	3.10
87	3,348	811	2.84
88	2,537	673	2.59
89	1,864	545	2.35
90	1,319	427	2.11
91	892	322	1.89
92	570	231	1.67
93	339	155	1.47
94	184	95	1.28
95	89	52	1.12
96	37	24	.99
97	13	9	.89
98	4	3	.75
99	1	1	.50

Table XXIII — Single Life — Commutation Columns.

COMBINED EXPERIENCE *Table of Mortality, with Interest at* **4%** *Per Annum.*

Age.	D_x.	N_x.	M_x.
10..	67556.41688	1381771.33883	14411.36539
11..	64518.97645	1314214.92194	13972.24868
12..	61616.49894	1249695.94550	13551.27027
13..	58843.04781	1188079.44656	13147.68448
14..	56192.36788	1129236.39875	12760.19870
15..	53658.54048	1073044.03086	12387.61622
16..	51236.49808	1019385.49038	12029.36383
17..	48920.87672	968148.99230	11684.37701
18..	46707.09281	919228.11558	11352.16529
19..	44590.28253	872521.02277	11031.78165
20..	42566.29770	827930.74024	10722.80769
21..	40630.72555	785364.44255	10424.40084
22..	38779.80981	744733.71699	10136.20531
23..	37009.95040	705953.90718	9857.87705
24..	35317.30695	668943.95678	9588.69323
25..	33698.61793	633626.64983	9328.36217
26..	32150.75616	599928.03190	9076.60108
27..	30670.37656	567777.27575	8832.78903
28..	29254.64465	537106.89918	8596.68698
29..	27900.52090	507852.25454	8367.74187
30..	26605.43450	479951.73364	8145.75243
31..	25366.62195	453346.29915	7930.22583
32..	24181.75011	427979.67720	7720.99330
33..	23048.30493	403797.92708	7517.61542
34..	21964.16759	380749.62216	7319.95135
35..	20927.30299	358785.45457	7127.86243
36..	19935.51281	337858.15158	6940.96852
37..	18986.94796	317922.63877	6759.15416
38..	18079.83167	298935.69081	6582.30510
39..	17212.24015	280855.85914	6410.09172
40..	16382.55823	263643.61899	6242.41904

TABLE XXIII — (*Continued*).

Age.	D_x.	N_x.	M_x.
41..	15589.23333	247261.06076	6079.19253
42..	14830.58054	231671.82743	5920.12563
43..	14104.81747	216841.24690	5764.76951
44..	13409.73877	202736.42943	5612.18379
45..	12743.15379	189326.69066	5461.35799
46..	12103.39849	176583.53687	5311.72400
47..	11488.46443	164480.13838	5162.30526
48..	10897.29735	152991.67395	5013.00220
49.	10328.75625	142094.37660	4863.58792
50..	9781.91888	131765.62035	4714.01040
51..	9255.77818	121983.70147	4564.09735
52..	8749.39490	112727.92330	4413.70554
53..	8261.89245	103978.52840	4262.71828
54..	7792.45209	95716.63595	4111.04302
55..	7340.53974	87924.18386	3958.84036
56..	6905.30136	80583.64411	3805.93043
57..	6486.16133	73678.34276	3652.37892
58..	6082.77604	67192.18143	3498.46137
59..	5694.49826	61109.40538	3344.13652
60..	5320.81583	55414.90712	3189.47324
61.	4960.96468	50094.09129	3034.26886
62.	4614.59537	45133.12661	2878.70589
63.	4281.27754	40518.53124	2722.87249
64.	3960.84138	36237.25370	2567.10085
65..	3653.01721	32276.41233	2411.61673
66..	3357.67853	28623.39512	2256.77872
67..	3074.81439	25265.71659	2103.05606
68..	2804.36609	22190.90220	1950.86985
69..	2546.49961	19386.53611	1800.86360
70.	2301.43067	16840.03651	1653.73695
71..	2069.22319	14538.60584	1510.04605
72..	1850.04836	12469.38265	1370.45672
73..	1644.04416	10619.33428	1235.60822
74..	1451.36925	8975.29013	1106.16578
75..	1272.08636	7523.92088	982.70479
76..	1106.27459	6251.83452	865.81942

Table XXIII — (*Concluded*).

Age.	D_x.	N_x.	M_x.
77..	953.97107	5145.55993	756.06492
78..	815.03142	4191.58886	653.81646
79..	689.29364	3376.55745	559.42605
80..	576.57769	2687.26380	473.22139
81..	476.56014	2110.68611	395.37990
82..	388.83844	1634.12597	325.98744
83..	312.86774	1245.28753	264.97206
84..	247.91392	932.41979	212.05162
85..	193.16347	684.50587	166.83632
86..	147.64096	491.34241	128.74317
87..	110.37861	343.70145	97.15933
88.	80.42417	233.32284	71.45022
89..	56.81705	152.89866	50.93634
90..	38.65843	96.08161	34.96299
91..	25.13801	57.42318	22.92943
92..	15.44570	32.28516	14.20396
93..	8.83282	16.83946	8.18514
94..	4.60982	8.00665	4.30187
95..	2.14399	3.39683	2.01334
96..	.85704	1.25284	.80885
97..	.28954	.39580	.27432
98..	.08566	.10625	.08158
99..	.02059	.02059	.01980

Table XXIV — Single Life.

ANNUITIES AND SINGLE PREMIUMS PER $1.

COMBINED EXPERIENCE *Table of Mortality, with Interest at* **4%** *Per Annum.*

Age.	Annuity.	Single Premium.
10	19.454	.21332
11	19.369	.21656
12	19.282	.21993
13	19.191	.22344
14	19.096	.22708
15	18.998	.23086
16	18.896	.23478
17	18.790	.23884
18	18.681	.24305
19	18.568	.24740
20	18.450	.25191
21	18.329	.25656
22	18.204	.26138
23	18.075	.26636
24	17.941	.27150
25	17.803	.27682
26	17.660	.28231
27	17.512	.28799
28	17.360	.29386
29	17.202	.29991
30	17.040	.30617
31	16.872	.31262
32	16.698	.31929
33	16.520	.32617
34	16.335	.33327
35	16.144	.34060
36	15.948	.34817
37	15.744	.35599
38	15.534	.36407
39	15.317	.37241
40	15.093	.38104

Table XXIV — (*Continued*).

Age.	Annuity.	Single Premium.
41	14.861	.38996
42	14.621	.39918
43	14.374	.40871
44	14.119	.41852
45	13.857	.42857
46	13.590	.43886
47	13.317	.44935
48	13.039	.46002
49	12.757	.47088
50	12.470	.48191
51	12.179	.49311
52	11.884	.50446
53	11.585	.51595
54	11.283	.52757
55	10.978	.53931
56	10.670	.55116
57	10.359	.56310
58	10.046	.57514
59	9.731	.58726
60	9.415	.59943
61	9.098	.61163
62	8.781	.62383
63	8.464	.63600
64	8.149	.64812
65	7.836	.66017
66	7.525	.67212
67	7.217	.68396
68	6.913	.69565
69	6.613	.70719
70	6.317	.71857
71	6.026	.72976
72	5.740	.74077
73	5.459	.75157
74	5.184	.76215
75	4.915	.77251
76	4.651	.78264

Table XXIV — (*Concluded*).

Age.	Annuity.	Single Premium.
77	4.394	.79254
78	4.143	.80220
79	3.899	.81159
80	3.661	.82074
81	3.429	.82965
82	3.203	.83836
83	2.980	.84691
84	2.761	.85534
85	2.544	.86371
86	2.328	.87200
87	2.114	.88024
88	1.901	.88842
89	1.691	.89650
90	1.485	.90441
91	1.284	.91214
92	1.090	.91961
93	0.906	.92667
94	0.737	.93320
95	0.584	.93906
96	0.462	.94378
97	0.367	.94742
98	0.240	.95229

Table XXV — Two Lives.

ANNUITIES AND SINGLE PREMIUMS PER $1.

COMBINED EXPERIENCE *Table of Mortality, with Interest at* **4%** *Per Annum.*

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
10	10	16.832	.31415
11	11	16.744	.31754
12	12	16.652	.32107
13	13	16.556	.32477
14	14	16.456	.32862
15	10	16.578	.32392
	15	16.353	.33257
16	11	16.480	.32769
	16	16.246	.33669
17	12	16.378	.33161
	17	16.135	.34096
18	13	16.272	.33569
	18	16.020	.34538
19	14	16.162	.33992
	19	15.901	.34996
20	10	16.243	.33680
	15	16.048	.34431
	20	15.778	.35469
21	11	16.133	.34103
	16	15.930	.34885
	21	15.651	.35958
22	12	16.018	.34546
	17	15.808	.35354
	22	15.520	.36462
23	13	15.899	.35003
	18	15.682	.35838
	23	15.384	.36985
24	14	15.776	.35477
	19	15.552	.36338
	24	15.244	.37523

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
25	10................	15.811	.35342
	15................	15.649	.35965
	20................	15.417	.36858
	25................	15.100	.38077
26	11................	15.685	.35827
	16................	15.517	.36473
	21................	15.278	.37392
	26................	14.951	.38650
27	12................	15.554	.36331
	17................	15.381	.36996
	22................	15.134	.37947
	27................	14.797	.39242
28	13................	15.419	.36850
	18................	15.240	.37538
	23................	14.986	.38515
	28................	14.638	.39854
29	14................	15.279	.37388
	19................	15.094	.38100
	24................	14.833	.39103
	29................	14.474	.40485
30	10................	15.270	.37423
	15................	15.134	.37947
	20................	14.944	.38677
	25................	14.675	.39712
	30................	14.305	.41135
31	11................	15.125	.37981
	16................	14.984	.38523
	21................	14.789	.39273
	26................	14.512	.40338
	31................	14.131	.41804
32	12................	14.975	.38558
	17................	14.829	.39119
	22................	14.629	.39888
	27................	14.344	.40985
	32................	13.952	.42492
33	13................	14.819	.39157

Table XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
33	18	14.669	.39734
	23	14.464	.40523
	28	14.171	.41650
	33	13.767	.43204
34	14	14.658	.39777
	19	14.504	.40370
	24	14.294	.41177
	29	13.992	.42338
	34	13.577	.43935
35	10	14.600	.40000
	15	14.491	.40419
	20	14.333	.41026
	25	14.118	.41854
	30	13.808	.43046
	35	13.381	.44688
36	11	14.431	.40650
	16	14.318	.41084
	21	14.157	.41704
	26	13.936	.42554
	31	13.618	.43777
	36	13.178	.45469
37	12	14.255	.41327
	17	14.139	41773
	22	13.975	.42404
	27	13.749	.43273
	32	13.422	.44530
	37	12.969	.46273
38	13	14.073	42026
	18	13.954	.42485
	23	13.787	.43127
	28	13.555	.44019
	33	13.220	.45308
	38	12.753	.47103
39	14	13.884	.42754
	19	13.763	.43219
	24	13.592	.43877

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
39	29.................	13.355	.44789
	34.................	13.011	.46111
	39.................	12.530	.47962
40	10.................	13.772	.43184
	15.................	13.688	.43507
	20.................	13.565	.43981
	25.................	13.391	.44650
	30.................	13.148	.45584
	35.................	12.795	.46943
	40.................	12.299	.48850
41	11.................	13.571	.43958
	16.................	13.485	.44289
	21.................	13.360	.44769
	26.................	13.183	.45450
	31.................	12.934	.46408
	36.................	12.572	.47800
	41.................	12.060	.49769
42	12.................	13.363	.44757
	17.................	13.275	.45096
	22.................	13.148	.45584
	27.................	12.968	.46277
	32.................	12.713	.47257
	37.................	12.342	.48684
	42.................	11.813	.50719
43	13.................	13.147	.45588
	18.................	13.057	.45935
	23.................	12.928	.46431
	28.................	12.745	.47135
	33.................	12.485	.48135
	38.................	12.104	.49600
	43.................	11.558	.51700
44	14.................	12.924	.46447
	19.................	12.832	.46800
	24.................	12.702	.47300
	29.................	12.516	.48015
	34.................	12.250	.49038

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
44	39	11.859	.50542
	44	11.295	.52712
45	10	12.761	.47073
	15	12.695	.47327
	20	12.601	.47688
	25	12.470	.48192
	30	12.281	.48919
	35	12.009	.49965
	40	11.607	.51511
	45	11.027	.53742
46	11	12.527	.47973
	16	12.460	.48231
	21	12.364	.48600
	26	12.232	.49107
	31	12.040	.49846
	36	11.762	.50915
	41	11.349	.52503
	46	10.753	.54796
47	12	12.288	.48892
	17	12.219	.49157
	22	12.123	.49526
	27	11.989	.50042
	32	11.794	.50793
	37	11.510	.51885
	42	11.085	.53519
	47	10.476	.55862
48	13	12.043	.49834
	18	11.974	.50100
	23	11.877	.50473
	28	11.741	.50996
	33	11.544	.51754
	38	11.253	.52873
	43	10.815	.54558
	48	10.196	.56939
49	14	11.794	.50793
	19	11.724	.51062

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
49	24	11.626	.51439
	29	11.489	.51965
	34	11.289	.52734
	39	10.991	.53881
	44	10.540	.55615
	49	9.913	.58026
50	10	11.588	.51584
	15	11.540	.51769
	20	11.469	.52042
	25	11.371	.52419
	30	11.233	.52950
	35	11.030	.53731
	40	10.724	.54908
	45	10.261	.56688
	50	9.627	.59127
51	11	11.330	.52577
	16	11.281	.52765
	21	11.210	.53038
	26	11.112	.53415
	31	10.973	.53950
	36	10.766	.54746
	41	10.452	.55954
	46	9.978	.57777
	51	9.339	.60234
52	12	11.068	.53584
	17	11.018	.53776
	22	10.947	.54050
	27	10.849	.54427
	32	10.708	.54969
	37	10.498	.55777
	42	10.175	.57019
	47	9.693	.58873
	52	9.049	.61350
53	13	10.801	.54611
	18	10.751	.54804
	23	10.680	.55077

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
53	28	10.582	.55454
	33	10.440	.56000
	38	10.226	.56823
	43	9.894	.58100
	48	9.405	.59981
	53	8.758	.62469
54	14	10.531	.55650
	19	10.481	.55842
	24	10.410	.56115
	29	10.312	.56492
	34	10.169	.57042
	39	9.950	.57885
	44	9.609	.59196
	49	9.116	.61092
	54	8.466	.63592
55	10	10.294	.56562
	15	10.257	.56704
	20	10.207	.56896
	25	10.136	.57169
	30	10.038	.57546
	35	9.894	.58100
	40	9.671	.58958
	45	9.321	.60304
	50	8.825	.62212
	55	8.174	.64716
56	11	10.017	.57627
	16	9.980	.57769
	21	9.930	.57961
	26	9.859	.58234
	31	9.761	.58611
	36	9.616	.59169
	41	9.388	.60046
	46	9.031	.61419
	51	8.533	.63334
	56	7.882	.65838
57	12	9.737	.58704

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
57	17	9.700	.58846
	22	9.650	.59038
	27	9.580	.59308
	32	9.482	.59684
	37	9.336	.60246
	42	9.102	.61146
	47	8.740	.62538
	52	8.241	.64458
	57	7.590	.66962
58	13	9.454	.59793
	18	9.417	.59935
	23	9.367	.60127
	28	9.299	.60388
	33	9.200	.60769
	38	9.052	.61338
	43	8.813	.62257
	48	8.447	.63665
	53	7.948	.65584
	58	7.298	.68084
59	14	9.168	.60892
	19	9.131	.61034
	24	9.082	.61223
	29	9.014	.61485
	34	8.916	.61862
	39	8.766	.62439
	44	8.521	.63381
	49	8.154	.64793
	54	7.655	.66712
	59	7.007	.69204
60	10	8.905	.61904
	15	8.880	.62000
	20	8.844	.62139
	25	8.795	.62327
	30	8.728	.62584
	35	8.630	.62962
	40	8.477	.63550

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
60	45	8.227	.64511
	50	7.860	.65923
	55	7.362	.67838
	60	6.717	.70319
61	11	8.615	.63019
	16	8.590	.63115
	21	8.555	.63250
	26	8.507	.63435
	31	8.440	.63692
	36	8.343	.64065
	41	8.187	.64665
	46	7.933	.65642
	51	7.566	.67054
	56	7.071	.68958
	61	6.429	.71427
62	12	8.325	.64135
	17	8.300	.64231
	22	8.265	.64366
	27	8.218	.64546
	32	8.152	.64800
	37	8.055	.65173
	42	7.896	.65785
	47	7.639	.66773
	52	7.274	.68177
	57	6.782	.70069
	62	6.145	.72519
63	13	8.035	.65250
	18	8.010	.65346
	23	7.976	.65477
	28	7.930	.65654
	33	7.865	.65904
	38	7.767	.66281
	43	7.605	.66904
	48	7.347	.67896
	53	6.984	.69293
	58	6.495	.71173

Table XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
63	63	5.864	.73600
64	14	7.745	.66366
	19	7.720	.66462
	24	7.687	.66588
	29	7.641	.66765
	34	7.577	.67011
	39	7.479	.67388
	44	7.313	.68026
	49	7.056	.69015
	54	6.696	.70400
	59	6.210	.72269
	64	5.588	.74661
65	10	7.473	.67411
	15	7.456	.67477
	20	7.432	.67569
	25	7.399	.67696
	30	7.354	.67870
	35	7.291	.68111
	40	7.192	.68492
	45	7.024	.69139
	50	6.768	.70123
	55	6.410	.71500
	60	5.929	.73350
	65	5.317	.75704
66	11	7.185	.68519
	16	7.168	.68584
	21	7.145	.68673
	26	7.113	.68796
	31	7.069	.68965
	36	7.007	.69204
	41	6.907	.69588
	46	6.736	.70246
	51	6.482	.71223
	56	6.129	.72580
	61	5.653	.74411
	66	5.051	.76727

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
67	12	6.900	.69615
	17	6.883	.69680
	22	6.860	.69769
	27	6.829	.69888
	32	6.786	.70054
	37	6.725	.70289
	42	6.623	.70680
	47	6.451	.71342
	52	6.200	.72308
	57	5.851	.73650
	62	5.381	.75458
	67	4.792	.77723
68	13	6.617	.70704
	18	6.601	.70765
	23	6.578	.70854
	28	6.548	.70969
	33	6.507	.71127
	38	6.445	.71366
	43	6.342	.71761
	48	6.170	.72423
	53	5.922	.73377
	58	5.578	.74700
	63	5.114	.76485
	68	4.539	.78696
69	14	6.337	.71781
	19	6.321	.71842
	24	6.300	.71923
	29	6.270	.72038
	34	6.230	.72192
	39	6.169	.72427
	44	6.063	.72834
	49	5.893	.73488
	54	5.649	.74427
	59	5.309	.75734
	64	4.854	.77485
	69	4.293	.79642

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
70	10	6.071	.72804
	15	6.061	.72842
	20	6.045	.72904
	25	6.024	.72985
	30	5.996	.73092
	35	5.957	.73242
	40	5.896	.73477
	45	5.788	.73892
	50	5.620	.74538
	55	5.380	.75462
	60	5.045	.76750
	65	4.599	.78465
	70	4.054	.80562
71	11	5.799	.73850
	16	5.788	.73892
	21	5.773	.73950
	26	5.753	.74026
	31	5.725	.74135
	36	5.687	.74281
	41	5.626	.74515
	46	5.518	.74931
	51	5.352	.75569
	56	5.116	.76477
	61	4.787	.77742
	66	4.351	.79419
	71	3.822	.81454
72	12	5.530	.74885
	17	5.520	.74923
	22	5.505	.74981
	27	5.485	.75058
	32	5.459	.75157
	37	5.422	.75300
	42	5.360	.75538
	47	5.251	.75958
	52	5.089	.76580
	57	4.858	.77469

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
72	62	4.534	.78716
	67	4.110	.80346
	72	3.597	.82319
73	13	5.266	.75900
	18	5.255	.75943
	23	5.241	.75996
	28	5.222	.76069
	33	5.197	.76165
	38	5.161	.76304
	43	5.098	.76546
	48	4.990	.76962
	53	4.832	.77569
	58	4.605	.78443
	63	4.288	.79661
	68	3.876	.81246
	73	3.380	.83154
74	14	5.006	.76900
	19	4.996	.76939
	24	4.982	.76992
	29	4.964	.77062
	34	4.940	.77154
	39	4.904	.77293
	44	4.841	.77534
	49	4.735	.77943
	54	4.580	.78538
	59	4.358	.79392
	64	4.048	.80584
	69	3.649	.82119
	74	3.170	.83962
75	10	4.757	.77858
	15	4.751	.77881
	20	4.741	.77919
	25	4.728	.77969
	30	4.711	.78034
	35	4.688	.78123
	40	4.653	.78257

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
75	45	4.588	.78507
	50	4.485	.78904
	55	4.333	.79488
	60	4.116	.80323
	65	3.815	.81481
	70	3.430	.82962
	75	2.967	.84742
76	11	4.508	.78815
	16	4.501	.78842
	21	4.492	.78877
	26	4.480	.78923
	31	4.463	.78988
	36	4.441	.79073
	41	4.406	.79208
	46	4.341	.79458
	51	4.240	.79846
	56	4.093	.80411
	61	3.881	.81227
	66	3.589	.82350
	71	3.218	.83777
	76	2.773	.85488
77	12	4.263	.79757
	17	4.257	.79781
	22	4.248	.79815
	27	4.236	.79862
	32	4.220	.79923
	37	4.199	.80003
	42	4.164	.80139
	47	4.100	.80385
	52	4.002	.80761
	57	3.859	.81311
	62	3.653	.82103
	67	3.371	.83188
	72	3.013	.84565
	77	2.585	.86212
78	13	4.024	.80677

Table XXV — (*Continued*).

Ages. Older	Younger.	Annuity.	Single Premium.
78	18................	4.018	.80700
	23................	4.010	.80731
	28................	3.998	.80777
	33................	3.983	.80834
	38................	3.963	.80911
	43................	3.928	.81046
	48................	3.865	.81289
	53................	3.770	.81654
	58................	3.631	.82188
	63................	3.431	.82958
	68................	3.159	.84003
	73................	2.816	.85323
	78................	2.405	.86904
79	14................	3.791	.81573
	19................	3.785	.81596
	24................	3.777	.81627
	29................	3.766	.81669
	34................	3.752	.81723
	39................	3.733	.81796
	44................	3.697	.81935
	49................	3.636	.82169
	54................	3.544	.82523
	59................	3.410	.83038
	64................	3.216	.83785
	69................	2.956	.84785
	74................	2.626	.86054
	79................	2.234	.87562
80	10................	3.567	.82435
	15................	3.563	.82450
	20................	3.558	.82469
	25................	3.550	.82500
	30................	3.540	.82538
	35................	3.527	.82588
	40................	3.508	.82661
	45................	3.473	.82796
	50................	3.413	.83026

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium
80	55	3.325	.83366
	60	3.195	.83866
	65	3.009	.84580
	70	2.759	.85542
	75	2.445	.86750
	80	2.069	.88196
81	11	3.345	.83289
	16	3.341	.83304
	21	3.336	.83323
	26	3.329	.83350
	31	3.320	.83385
	36	3.307	.83435
	41	3.289	.83503
	46	3.253	.83642
	51	3.196	.83862
	56	3.112	.84184
	61	2.987	.84665
	66	2.808	.85354
	71	2.570	.86269
	76	2.270	.87423
	81	1.913	.88796
82	12	3.127	.84127
	17	3.124	.84139
	22	3.119	.84157
	27	3.112	.84184
	32	3.104	.84216
	37	3.092	.84261
	42	3.074	.84331
	47	3.039	.84465
	52	2.984	.84677
	57	2.904	.84985
	62	2.784	.85447
	67	2.614	.86100
	72	2.388	.86969
	77	2.103	.88065
	82	1.762	.89377

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
83	13	2.913	.84950
	18	2.910	.84962
	23	2.906	.84977
	28	2.899	.85003
	33	2.891	.85034
	38	2.881	.85073
	43	2.863	.85142
	48	2.829	.85273
	53	2.777	.85473
	58	2.700	.85769
	63	2.586	.86208
	68	2.425	.86827
	73	2.211	.87650
	78	1.941	.88688
	83	1.618	.89931
84	14	2.702	.85761
	19	2.699	.85773
	24	2.695	.85789
	29	2.689	.85811
	34	2.682	.85838
	39	2.672	.85877
	44	2.654	.85947
	49	2.622	.86069
	54	2.573	.86257
	59	2.500	.86538
	64	2.392	.86954
	69	2.240	.87538
	74	2.039	.88311
	79	1.785	.89289
	84	1.477	.90473
85	15	2.492	.86569
	20	2.489	.86580
	25	2.485	.86596
	30	2.480	.86615
	35	2.473	.86642
	40	2.464	.86677

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity	Single Premium.
85	45	2.447	.86742
	50	2.416	.86862
	55	2.370	.87038
	60	2.302	.87300
	65	2.201	.87688
	70	2.059	.88234
	75	1.871	.88958
	80	1.633	.89873
	85	1.339	.91003
86	16	2.283	.87373
	21	2.280	.87385
	26	2.277	.87396
	31	2.272	.87415
	36	2.266	.87439
	41	2.258	.87469
	46	2.241	.87534
	51	2.212	.87646
	56	2.170	.87808
	61	2.106	.88054
	66	2.012	.88415
	71	1.881	.88919
	76	1.707	.89588
	81	1.486	.90439
	86	1.205	.91503
87	17	2.075	.88173
	22	2.073	.88180
	27	2.070	.88192
	32	2.065	.88212
	37	2.060	.88231
	42	2.052	.88261
	47	2.036	.88323
	52	2.010	.88423
	57	1.971	.88573
	62	1.912	.88800
	67	1.825	.89135
	72	1.705	.89596

TABLE XXV — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
87	77	1.545	.90212
	82	1.342	.90992
	87	1.072	.92030
88	18	1.868	.88969
	23	1.866	.88977
	28	1.863	.88988
	33	1.860	.89000
	38	1.855	.89019
	43	1.848	.89046
	48	1.832	.89107
	53	1.809	.89196
	58	1.774	.89331
	63	1.720	.89538
	68	1.641	.89842
	73	1.533	.90257
	78	1.387	.90819
	83	1.202	.91530
	88	0.942	.92530
89	19	1.664	.89754
	24	1.662	.89761
	29	1.659	.89773
	34	1.656	.89785
	39	1.652	.89800
	44	1.645	.89827
	49	1.631	.89881
	54	1.610	.89962
	59	1.579	.90080
	64	1.530	.90269
	69	1.460	.90538
	74	1.363	.90911
	79	1.232	.91415
	84	1.064	.92062
	89	0.815	.93019
90	20	1.463	.90526
	25	1.461	.90534
	30	1.459	.90542

TABLE XXV — (*Concluded*).

Ages. Older.	Younger.	Annuity.	Single Premium.
90	35	1.456	.90554
	40	1.453	.90565
	45	1.446	.90592
	50	1.434	.90639
	55	1.415	.90712
	60	1.388	.90815
	65	1.345	.90981
	70	1.283	.91219
	75	1.197	.91550
	80	1.082	.91992
	85	0.930	.92577
	90	0.692	.93492

Table XXVI — Single Life — Commutation Columns.

COMBINED EXPERIENCE *Table of Mortality, with Interest at 5% Per Annum.*

Age.	D_x.	N_x.	M_x.
10..	61391.325	1077778.215	10068.5529
11..	58072.686	1016386.890	9673.3097
12..	54932.011	958314.204	9298.0013
13..	51959.825	903382.193	8941.6254
14..	49146.647	851422.368	8602.7248
15..	46483.568	802275.721	8279.9623
16..	43962.672	755792.153	7972.5695
17..	41576.020	711829.481	7679.3781
18..	39316.564	670253.461	7399.7327
19..	37177.227	630936.897	7132.6123
20..	35151.728	593759.670	6877.4581
21..	33233.755	558607.942	6633.3773
22..	31417.712	525374.187	6399.8938
23..	29698.288	493956.475	6176.5519
24..	28070.138	464258.187	5962.6050
25.	26528.524	436188.049	5757.6649
26..	25068.955	409659.525	5561.3589
27..	23686.898	384590.570	5373.0615
28..	22378.345	360903.672	5192.4552
29..	21139.245	338525.327	5018.9915
30..	19966.023	317386.082	4852.3997
31..	18855.058	297420.059	4692.1984
32..	17803.157	278565.001	4538.1566
33..	16807.082	260761.844	4389.8512
34..	15863.979	243954.762	4247.0851
35..	14971.133	228090.783	4109.6671
36..	14125.793	213119.650	3977.2389
37..	13325.535	198993.857	3849.6369
38..	12568.050	185668.322	3726.7017
39..	11850.999	173100.272	3608.1291
40..	11172.319	161249.273	3493.7823
41..	10530.049	150076.954	3383.5278

TABLE XXVI — (*Continued*).

Age.	D_x.	N_x.	M_x.
42.	9922.197	139546.905	3277.1063
43..	9346.762	129624.708	3174.1573
44..	8801.528	120277.946	3074.0071
45..	8284.356	111476.418	2975.9549
46..	7793.511	103192.062	2879.6039
47..	7327.096	95398.551	2784.3078
48..	6883.871	88071.455	2689.9924
49..	6462.581	81187.584	2596.5056
50..	6062.142	74725.003	2503.8080
51..	5681.447	68662.861	2411.7873
52..	5319.467	62981.414	2320.3519
53.	4975.236	57661.947	2229.4288
54..	4647.852	52686.711	2138.9612
55..	4336.608	48038.859	2049.0437
56..	4040.628	43702.251	1959.5687
57..	3759.223	39661.623	1870.5739
58..	3491.854	35902.400	1782.2166
59..	3237.828	32410.546	1694.4692
60..	2996.544	29172.718	1607.3669
61..	2767.277	26176.174	1520.7923
62..	2549.554	23408.897	1434.8441
63.	2342.869	20859.343	1349.5665
64..	2146.871	18516.474	1265.1345
65..	1961.166	16369.603	1181.6610
66..	1785.442	14408.437	1099.3260
67..	1619.458	12622.995	1018.3626
68..	1462.950	11003.537	938.9718
69.	1315.777	9540.587	861.4635
70..	1177.825	8224.810	786.1671
71..	1048.900	7046.985	713.3294
72..	928.868	5998.085	643.2447
73..	817.576	5069.217	576.1851
74.	714.886	4251.641	512.4269
75..	620.611	3536.755	452.1941
76..	534.577	2916.144	395.7125
77..	456.590	2381.567	343.1818

TABLE XXVI — (*Concluded*).

Age.	D_x.	N_x.	M_x.
78..	386.375	1924.977	294.7097
79..	323.656	1538.602	250.3890
80..	268.152	1214.946	210.2974
81..	219.526	946.794	174.4400
82..	177.411	727.268	142.7791
83..	141.389	549.857	115.2054
84..	110.969	408.468	91.5177
85..	85.6383	297.4993	71.4716
86..	64.8327	211.8610	54.7440
87..	48.0083	147.0283	41.0069
88..	34.6467	99.0200	29.93146
89..	24.2437	64.3733	21.17825
90..	16.3383	40.1296	14.42738
91.	10.5230	23.7913	9.39004
92..	6.40412	13.26836	5.77228
93..	3.62739	6.86424	3.30052
94..	1.87510	3.23685	1.720962
95..	.863787	1.361751	.798942
96..	.342002	.497964	.318290
97..	.114441	.155962	.107014
98..	.033536	.041521	.031558
99..	.007985	.007985	.0076045

Table XXVII — Single Life.

ANNUITIES AND SINGLE PREMIUMS PER $1.

COMBINED EXPERIENCE *Table of Mortality, with Interest at* **5%** *Per Annum.*

Age.	Annuity.	Single Premium.
10	16.5559	.164006
11	16.5020	.166572
12	16.4455	.169264
13	16.3862	.172087
14	16.3241	.175042
15	16.2593	.178127
16	16.1917	.181349
17	16.1212	.184707
18	16.0476	.188209
19	15.9711	.191854
20	15.8913	.195651
21	15.8085	.199598
22	15.7222	.203703
23	15.6325	.207977
24	15.5392	.212418
25	15.4422	.217037
26	15.3414	.221842
27	15.2364	.226837
28	15.1274	.232030
29	15.0141	.237425
30	14.8963	.243033
31	14.7740	.248856
32	14.6469	.254907
33	14.5150	.261191
34	14.3779	.267719
35	14.2354	.274506
36	14.0873	.281559
37	13.9333	.288892
38	13.7730	.296522
39	13.6064	.304458
40	13.4329	.312718

TABLE XXVII — (*Continued*).

Age.	Annuity.	Single Premium.
41	13.2523	.321321
42	13.0641	.330280
43	12.8684	.339600
44	12.6656	.349258
45	12.4562	.359226
46	12.2408	.369487
47	12.0200	.380002
48	11.7939	.390767
49	11.5627	.401775
50	11.3265	.413024
51	11.0855	.424502
52	10.8398	.436200
53	10.5898	.448105
54	10.3357	.460204
55	10.0775	.472499
56	9.8157	.484966
57	9.5505	.497596
58	9.2818	.510393
59	9.0100	.523335
60	8.7355	.536407
61	8.4592	.549563
62	8.1816	.562782
63	7.9033	.576032
64	7.6249	.589292
65	7.3469	.602530
66	7.0700	.615716
67	6.7946	.628829
68	6.5215	.641834
69	6.2509	.654718
70	5.9831	.667473
71	5.7185	.680077
72	5.4574	.692504
73	5.2003	.704748
74	4.9473	.716795
75	4.6988	.728627
76	4.4550	.740235

Table XXVII — (*Concluded*).

Age.	Annuity.	Single Premium.
77	4.2160	.751619
78	3.9821	.762756
79	3.7538	.773626
80	3.5308	.784247
81	3.3129	.794621
82	3.0993	.804793
83	2.8890	.814812
84	2.6809	.824714
85	2.4739	.834575
86	2.2678	.844389
87	2.0626	.854163
88	1.8580	.863905
89	1.6553	.873557
90	1.4562	.883040
91	1.2609	.892335
92	1.0718	.901339
93	.8923	.909888
94	.7262	.917797
95	.5765	.924929
96	.4560	.930667
97	.3628	.935102
98	.2381	.941019

Table XXVIII — Two Lives.

COMBINED EXPERIENCE *Table of Mortality, with Interest at* 5% *Per Annum.*

Ages. Older.	Younger.	Annuity.	Single Premium.
10	10.	14.602	.25704
11	11..............	14.542	.25990
12	12..............	14.478	.26295
13	13..............	14.411	.26614
14	14..............	14.341	.26947
15	10..............	14.426	.26542
	15..............	14.268	.27295
16	11..............	14.357	.26872
	16..............	14.192	.27657
17	12..............	14.285	.27214
	17..............	14.112	.28038
18	13..............	14.210	.27571
	18..............	14.029	.28433
19	14..............	14.131	.27947
	19..............	13.943	.28843
20	10..............	14.190	.27667
	15..............	14.049	.28338
	20..............	13.853	.29272
21	11..............	14.111	.28043
	16..............	13.964	.28743
	21..............	13.760	.29714
22	12..............	14.029	.28433
	17..............	13.875	.29166
	22..............	13.664	.30171
23	13..............	13.943	.28843
	18..............	13.783	.29605
	23..............	13.564	.30648
24	14..............	13.853	.29272
	19..............	13.687	.30062
	24..............	13.460	.31143
25	10..............	13.881	.29138
	15..............	13.760	.29714

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
25	20	13.587	.30538
	25	13.352	.31657
26	11	13.789	.29576
	16	13.663	.30176
	21	13.484	.31029
	26	13.240	.32190
27	12	13.693	.30034
	17	13.562	.30657
	22	13.377	.31538
	27	13.124	.32743
28	13	13.593	.30510
	18	13.457	.31157
	23	13.266	.32066
	28	13.003	.33319
29	14	13.489	.31005
	19	13.348	.31676
	24	13.151	.32614
	29	12.878	.33914
30	10	13.484	.31029
	15	13.381	.31519
	20	13.235	.32214
	25	13.031	.33185
	30	12.749	.34528
31	11	13.376	.31542
	16	13.269	.32052
	21	13.118	.32772
	26	12.907	.33777
	31	12.615	.35166
32	12	13.263	.32081
	17	13.152	.32609
	22	12.996	.33352
	27	12.778	.34391
	32	12.476	.35828
33	13	13.145	.32643
	18	13.031	.33185
	23	12.870	.33952

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
33	28	12.645	.35024
	33	12.332	.36514
34	14	13.023	.33224
	19	12.905	.33786
	24	12.739	.34576
	29	12.507	.35681
	34	12.183	.37224
35	10	12.978	.33438
	15	12.896	.33828
	20	12.774	.34410
	25	12.603	.35224
	30	12.363	.36367
	35	12.028	.37962
36	11	12.848	.34057
	16	12.763	.34462
	21	12.638	.35057
	26	12.462	.35895
	31	12.214	.37076
	36	11.867	.38729
37	12	12.713	.34700
	17	12.625	.35119
	22	12.497	.35729
	27	12.315	.36595
	32	12.060	.37810
	37	11.700	.39524
38	13	12.572	.35371
	18	12.481	.35805
	23	12.350	.36429
	28	12.163	.37319
	33	11.900	.38571
	38	11.526	.40352
39	14	12.425	.36071
	19	12.331	.36519
	24	12.197	.37157
	29	12.005	.38071
	34	11.734	.39362

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium
39	39................	11.346	.41209
40	10................	12.341	.36471
	15................	12.271	.36805
	20................	12.175	.37262
	25................	12.038	.37914
	30................	11.841	.38852
	35................	11.561	.40185
	40................	11.158	.42105
41	11................	12.183	.37224
	16................	12.111	.37566
	21................	12.012	.38038
	26................	11.872	.38704
	31................	11.670	.39667
	36................	11.381	.41043
	41................	10.963	.43034
42	12................	12.018	.38010
	17................	11.944	.38362
	22................	11.843	.38843
	27................	11.699	.39528
	32................	11.492	.40514
	37................	11.194	.41932
	42................	10.759	.44005
43	13................	11.845	.38833
	18................	11.770	.39190
	23................	11.667	.39681
	28................	11.519	.40386
	33................	11.307	.41396
	38................	10.999	.42862
	43................	10.547	.45015
44	14................	11.665	.39690
	19................	11.589	.40052
	24................	11.484	.40552
	29................	11.333	.41272
	34................	11.116	.42304
	39................	10.797	.43824
	44................	10.328	.46057

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
45	10	11.533	.40319
	15	11.479	.40576
	20	11.402	.40942
	25	11.295	.41452
	30	11.141	.42185
	35	10.918	.43248
	40	10.588	.44819
	45	10.103	.47129
46	11	11.343	.41224
	16	11.287	.41491
	21	11.209	.41862
	26	11.100	.42381
	31	10.943	.43129
	36	10.714	.44219
	41	10.373	.45843
	46	9.872	.48228
47	12	11.147	.42157
	17	11.090	.42429
	22	11.011	.42805
	27	10.900	.43333
	32	10.740	.44095
	37	10.505	.45214
	42	10.152	.46895
	47	9.637	.49348
48	13	10.946	.43114
	18	10.888	.43391
	23	10.808	.43772
	28	10.695	.44309
	33	10.532	.45085
	38	10.291	.46233
	43	9.925	.47976
	48	9.399	.50481
49	14	10.740	.44095
	19	10.681	.44376
	24	10.600	.44762
	29	10.486	.45304

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium
49	34	10.319	.46100
	39	10.072	.47276
	44	9.692	.49085
	49	9.156	.51638
50	10	10.570	.44905
	15	10.529	.45100
	20	10.469	.45386
	25	10.388	.45772
	30	10.272	.46323
	35	10.102	.47133
	40	9.847	.48348
	45	9.454	.50219
	50	8.910	.52810
51	11	10.355	.45928
	16	10.313	.46129
	21	10.253	.46415
	26	10.171	.46805
	31	10.053	.47367
	36	9.880	.48190
	41	9.617	.49443
	46	9.212	.51371
	51	8.661	.53995
52	12	10.135	.46976
	17	10.092	.47180
	22	10.032	.47466
	27	9.950	.47857
	32	9.830	.48429
	37	9.653	.49272
	42	9.381	.50566
	47	8.966	.52542
	52	8.409	.55195
53	13	9.911	.48043
	18	9.867	.48253
	23	9.807	.48538
	28	9.724	.48933
	33	9.603	.49510

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
53	38	9.422	.50371
	43	9.140	.51714
	48	8.718	.53724
	53	8.156	.56400
54	14	9.682	.49133
	19	9.638	.49343
	24	9.578	.49629
	29	9.494	.50029
	34	9.372	.50609
	39	9.187	.51491
	44	8.895	.52881
	49	8.467	.54919
	54	7.900	.57619
55	10	9.479	.50100
	15	9.449	.50243
	20	9.405	.50452
	25	9.345	.50738
	30	9.260	.51143
	35	9.137	.51729
	40	8.947	.52634
	45	8.646	.54066
	50	8.214	.56124
	55	7.642	.58847
56	11	9.243	.51224
	16	9.212	.51371
	21	9.168	.51581
	26	9.108	.51867
	31	9.023	.52272
	36	8.899	.52862
	41	8.703	.53796
	46	8.394	.55267
	51	7.958	.57343
	56	7.384	.60076
57	12	9.003	.52367
	17	8.971	.52519
	22	8.928	.52724

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
57	27	8.868	.53010
	32	8.783	.53415
	37	8.656	.54019
	42	8.455	.54976
	47	8.140	.56476
	52	7.701	.58566
	57	7.124	.61314
58	13	8.759	.53528
	18	8.727	.53681
	23	8.683	.53891
	28	8.624	.54171
	33	8.539	.54576
	38	8.410	.55190
	43	8.203	.56176
	48	7.883	.57700
	53	7.442	.59800
	58	6.864	.62552
59	14	8.511	.54709
	19	8.479	.54862
	24	8.436	.55066
	29	8.377	.55348
	34	8.292	.55752
	39	8.161	.56376
	44	7.947	.57396
	49	7.624	.58933
	54	7.182	.61038
	59	6.603	.63796
60	10	8.282	.55800
	15	8.260	.55905
	20	8.229	.56052
	25	8.186	.56257
	30	8.127	.56538
	35	8.041	.56947
	40	7.908	.57581
	45	7.689	.58624
	50	7.364	.60171

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
60	55	6.921	.62281
	60	6.342	.65038
61	11	8.029	.57005
	16	8.007	.57110
	21	7.976	.57257
	26	7.933	.57462
	31	7.875	.57738
	36	7.789	.58147
	41	7.653	.58796
	46	7.429	.59862
	51	7.103	.61415
	56	6.661	.63519
	61	6.083	.66272
62	12	7.774	.58219
	17	7.752	.58323
	22	7.721	.58471
	27	7.679	.58671
	32	7.621	.58947
	37	7.535	.59357
	42	7.396	.60019
	47	7.168	.61105
	52	6.843	.62653
	57	6.401	.64757
	62	5.825	.67500
63	13	7.518	.59438
	18	7.496	.59542
	23	7.465	.59690
	28	7.424	.59886
	33	7.367	.60157
	38	7.280	.60571
	43	7.137	.61253
	48	6.907	.62348
	53	6.582	.63895
	58	6.142	.65990
	63	5.569	.68719
64	14	7.261	.60662

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
64	19	7.239	.60767
	24	7.209	.60909
	29	7.168	.61105
	34	7.112	.61371
	39	7.025	.61786
	44	6.877	.62491
	49	6.647	.63586
	54	6.323	.65129
	59	5.884	.67219
	64	5.316	.69923
65	10	7.019	.61814
	15	7.004	.61886
	20	6.982	.61990
	25	6.953	.62129
	30	6.913	.62319
	35	6.857	.62586
	40	6.768	.63010
	45	6.618	.63724
	50	6.388	.64819
	55	6.065	.66357
	60	5.628	.68438
	65	5.068	.71105
66	11	6.762	.63038
	16	6.747	.63110
	21	6.726	.63209
	26	6.697	.63348
	31	6.658	.63533
	36	6.602	.63800
	41	6.512	.64228
	46	6.359	.64957
	51	6.130	.66048
	56	5.810	.67571
	61	5.376	.69638
	66	4.823	.72272
67	12	6.506	.64257
	17	6.491	.64328

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
67	22	6.470	.64429
	27	6.442	.64561
	32	6.404	.64743
	37	6.348	.65010
	42	6.257	.65443
	47	6.102	.66180
	52	5.874	.67267
	57	5.557	.68777
	62	5.126	.70828
	67	4.583	.73415
68	13	6.251	.65471
	18	6.236	.65542
	23	6.216	.65638
	28	6.189	.65767
	33	6.151	.65947
	38	6.096	.66209
	43	6.003	.66653
	48	5.847	.67396
	53	5.622	.68466
	58	5.307	.69967
	63	4.881	.71995
	68	4.349	.74528
69	14	5.999	.66671
	19	5.984	.66743
	24	5.964	.66838
	29	5.937	.66967
	34	5.901	.67138
	39	5.846	.67400
	44	5.750	.67857
	49	5.595	.68595
	54	5.372	.69657
	59	5.060	.71143
	64	4.641	.73138
	69	4.120	.75619
70	10	5.757	.67824
	15	5.748	.67867

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium
70	20	5.733	.67938
	25	5.714	.68029
	30	5.688	.68152
	35	5.652	.68323
	40	5.597	.68586
	45	5.500	.69048
	50	5.346	.69781
	55	5.126	.70828
	60	4.817	.72300
	65	4.405	.74262
	70	3.897	.76681
71	11	5.509	.69005
	16	5.499	.69052
	21	5.485	.69119
	26	5.466	.69209
	31	5.441	.69328
	36	5.407	.69491
	41	5.351	.69757
	46	5.252	.70228
	51	5.100	.70952
	56	4.883	.71986
	61	4.579	.73433
	66	4.175	.75357
	71	3.680	.77714
72	12	5.263	.70176
	17	5.254	.70219
	22	5.240	.70286
	27	5.222	.70371
	32	5.198	.70486
	37	5.164	.70648
	42	5.108	.70914
	47	5.008	.71391
	52	4.858	.72105
	57	4.645	.73119
	62	4.345	.74547
	67	3.950	.76429

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
72	72	3.469	.73719
73	13	5.021	.71328
	18	5.011	.71376
	23	4.998	.71438
	28	4.981	71519
	33	4.957	.71634
	38	4.924	.71791
	43	4.867	.72062
	48	4.767	.72538
	53	4.621	73233
	58	4.411	.74233
	63	4.116	.75638
	68	3.731	.77471
	73	3.264	.79695
74	14	4.782	.72466
	19	4.772	.72514
	24	4.760	.72571
	29	4.743	.72653
	34	4.720	.72762
	39	4.688	.72914
	44	4.629	.73195
	49	4.531	.73662
	54	4.387	.74348
	59	4.181	.75328
	64	3.892	76704
	69	3.518	.78486
	74	3.066	.80638
75	10	4.552	.73561
	15	4.546	.73590
	20	4.537	.73634
	25	4.525	.73690
	30	4.509	.73767
	35	4.487	.73872
	40	4.455	.74024
	45	4.395	.74309
	50	4.299	.74767

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
75	55	4.158	.75438
	60	3.956	.76400
	65	3.674	.77743
	70	3.311	.79471
	75	2.874	.81552
76	11	4.321	.74662
	16	4.315	.74690
	21	4.306	.74733
	26	4.295	.74786
	31	4.279	.74862
	36	4.258	.74962
	41	4.226	.75114
	46	4.166	.75400
	51	4.072	.75847
	56	3.934	.76505
	61	3.736	.77447
	66	3.462	.78752
	71	3.111	.80424
	76	2.689	.82433
77	12	4.093	.75748
	17	4.087	.75777
	22	4.079	.75814
	27	4.068	.75867
	32	4.053	.75938
	37	4.034	.76029
	42	4.001	.76185
	47	3.941	.76471
	52	3.849	.76909
	57	3.716	.77542
	62	3.522	.78466
	67	3.256	.79733
	72	2.918	.81343
	77	2.511	.83281
78	13	3.870	.76810
	18	3.865	.76833
	23	3.857	.76872

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
78	28	3.846	.76923
	33	3.832	.76990
	38	3.813	.77081
	43	3.780	.77238
	48	3.721	.77519
	53	3.632	.77942
	58	3.502	.78561
	63	3.313	.79462
	68	3.056	.80685
	73	2.731	.82233
	78	2.339	.84100
79	14	3.652	.77847
	19	3.647	.77872
	24	3.639	.77909
	29	3.629	.77957
	34	3.616	.78019
	39	3.598	.78105
	44	3.564	.78267
	49	3.506	.78542
	54	3.420	.78952
	59	3.294	.79552
	64	3.111	.80424
	69	2.863	.81605
	74	2.550	.83095
	79	2.175	.84881
80	10	3.442	.78847
	15	3.439	.78862
	20	3.433	.78891
	25	3.426	.78923
	30	3.417	.78967
	35	3.404	.79029
	40	3.387	.79110
	45	3.353	.79272
	50	3.297	.79538
	55	3.213	.79938
	60	3.091	.80519

TABLE XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium
80	65	2.914	.81362
	70	2.677	.82491
	75	2.377	.83919
	80	2.017	.85634
81	11	3.233	.79843
	16	3.230	.79857
	21	3.225	.79881
	26	3.218	.79914
	31	3.209	.79957
	36	3.197	.80015
	41	3.180	.80095
	46	3.146	.80257
	51	3.092	.80514
	56	3.012	.80895
	61	2.894	.81457
	66	2.724	.82267
	71	2.497	.83348
	76	2.210	.84714
	81	1.867	.86348
82	12	3.028	.80819
	17	3.025	.80833
	22	3.020	.80857
	27	3.013	.80891
	32	3.005	.80928
	37	2.994	.80981
	42	2.977	.81062
	47	2.944	.81219
	52	2.892	.81466
	57	2.815	.81833
	62	2.701	.82376
	67	2.539	.83147
	72	2.323	.84176
	77	2.050	.85476
	82	1.722	.87038
83	13	2.825	.81786
	18	2.822	.81800

Table XXVIII — (*Continued*).

Ages. Older.	Younger.	Annuity.	Single Premium.
83	23	2.818	.81819
	28	2.812	.81847
	33	2.804	.81886
	38	2.794	.81933
	43	2.777	.82015
	48	2.745	.82166
	53	2.695	.82405
	58	2.622	.82752
	63	2.513	.83272
	68	2.359	.84005
	73	2.154	.84981
	78	1.894	.86219
	83	1.582	.87704
84	14	2.624	.82743
	19	2.621	.82757
	24	2.617	.82777
	29	2.612	.82800
	34	2.605	.82833
	39	2.595	.82881
	44	2.579	.82957
	49	2.548	.83105
	54	2.501	.83328
	59	2.432	.83657
	64	2.328	.84152
	69	2.182	.84847
	74	1.989	.85867
	79	1.744	.86933
	84	1.447	.88348
85	15	2.424	.83695
	20	2.421	.83709
	25	2.418	.83724
	30	2.413	.83748
	35	2.406	.83781
	40	2.398	.83819
	45	2.381	.83900
	50	2.352	.84038

Table XXVIII — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
85	55	2.308	.84248
	60	2.242	.84561
	65	2.145	.85024
	70	2.008	.85676
	75	1.828	.86533
	80	1.598	.87629
	85	1.313	.88986
86	16	2.225	.84643
	21	2.222	.84657
	26	2.219	.84671
	31	2.214	.84695
	36	2.208	.84724
	41	2.200	.84762
	46	2.184	.84838
	51	2.157	.84967
	56	2.116	.85161
	61	2.055	.85452
	66	1.964	.85886
	71	1.837	.86491
	76	1.669	.87290
	81	1.456	.88304
	86	1:182	.89609
87	17	2.025	.85595
	22	2.023	.85605
	27	2.020	.85619
	32	2.016	.85638
	37	2.011	.85662
	42	2.003	.85700
	47	1.987	.85777
	52	1.962	.85895
	57	1.925	.86071
	62	1.868	.86343
	67	1.784	.86743
	72	1.668	.87295
	77	1.513	.88034
	82	1.316	.88971

Table XXVIII — (*Continued*).

Ages. Older.	Ages. Younger.	Annuity.	Single Premium.
87	87	1.054	.90219
88	18	1.826	.86542
	23	1.824	.86552
	28	1.822	.86561
	33	1.818	.86581
	38	1.813	.86605
	43	1.806	.86638
	48	1.791	.86709
	53	1.769	.86814
	58	1.735	.86976
	63	1.683	.87224
	68	1.607	.87586
	73	1.501	.88090
	78	1.360	.88762
	83	1.180	.89619
	88	0.927	.90824
89	19	1.629	.87481
	24	1.627	.87491
	29	1.625	.87500
	34	1.621	.87519
	39	1.617	.87538
	44	1.611	.87566
	49	1.597	.87634
	54	1.577	.87729
	59	1.546	.87876
	64	1.499	.88100
	69	1.431	.88424
	74	1.337	.88872
	79	1.210	.89476
	84	1.046	.90257
	89	0.802	.91419
90	20	1.434	.88410
	25	1.433	.88415
	30	1.431	.88424
	35	1.428	.88438
	40	1.424	.88457

Table XXVIII — (*Concluded*).

Ages. Older.	Younger.	Annuity.	Single Premium
90	45	1.418	.88486
	50	1.406	.88542
	55	1.388	.88629
	60	1.361	.88757
	65	1.320	.88920
	70	1.259	.89243
	75	1.176	.89638
	80	1.063	.90176
	85	0.915	.90881
	90	0.682	.91990

Table XXIX.

AMERICAN EXPERIENCE *Table of Mortality.*

Age.	l_x	d_x	Expectation.
10	100,000	749	48.72
11	99,251	746	48.09
12	98,505	743	47.45
13	97,762	740	46.80
14	97,022	737	46.16
15	96,285	735	45.51
16	95,550	732	44.85
17	94,818	729	44.19
18	94,089	727	43.53
19	93,362	725	42.87
20	92,637	723	42.20
21	91,914	722	41.53
22	91,192	721	40.85
23	90,471	720	40.17
24	89,751	719	39.49
25	89,032	718	38.81
26	88,314	718	38.12
27	87,596	718	37.43
28	86,878	718	36.73
29	86,160	719	36.03
30	85,441	720	35.33
31	84,721	721	34.63
32	84,000	723	33.92
33	83,277	726	33.21
34	82,551	729	32.50
35	81,822	732	31.78
36	81,090	737	31.07
37	80,353	742	30.35
38	79,611	749	29.63
39	78,862	756	28.90
40	78,106	765	28.18
41	77,341	774	27.45
42	76,567	785	26.72

TABLE XXIX — (*Continued*).

Age.	l_x	d_x	Expectation.
43................	75,782	797	25.99
44................	74,985	812	25.27
45................	74,173	828	24.54
46................	73,345	848	23.81
47................	72,497	870	23.08
48................	71,627	896	22.35
49................	70,731	927	21.63
50................	69,804	962	20.91
51................	68,842	1,001	20.20
52................	67,841	1,044	19.49
53................	66,797	1,091	18.79
54................	65,706	1,143	18.09
55................	64,563	1,199	17.40
56................	63,364	1,260	16.72
57................	62,104	1,325	16.05
58................	60,779	1,394	15.39
59................	59,385	1,468	14.74
60................	57,917	1,546	14.10
61................	56,371	1,628	13.47
62................	54,743	1,713	12.86
63................	53,030	1,800	12.26
64................	51,230	1,889	11.67
65................	49,341	1,980	11.10
66................	47,361	2,070	10.54
67................	45,291	2,158	10.00
68................	43,133	2,243	9.47
69................	40,890	2,321	8.97
70................	38,569	2,391	8.48
71................	36,178	2,448	8.00
72................	33,730	2,487	7.55
73................	31,243	2,505	7.11
74................	28,738	2,501	6.68
75................	26,237	2,476	6.27
76................	23,761	2,431	5.88
77................	21,330	2,369	5.49
78................	18,961	2,291	5.11

TABLE XXIX — (*Concluded*).

Age.	l_x	d_x	Expectation.
79	16,670	2,196	4.75
80	14,474	2,091	4.39
81	12,383	1,964	4.05
82	10,419	1,816	3.71
83	8,603	1,648	3.39
84	6,955	1,470	3.08
85	5,485	1,292	2.77
86	4,193	1,114	2.47
87	3,079	933	2.18
88	2,146	744	1.91
89	1,402	555	1.66
90	847	385	1.42
91	462	246	1.19
92	216	137	.98
93	79	58	.80
94	21	18	.64
95	3	3	.50

TABLE XXX — SINGLE LIFE — COMMUTATION COLUMNS.

AMERICAN EXPERIENCE *Table of Mortality, with Interest at 5% Per Annum.*

Age.	D_x.	N_x.	M_x.
10..........	61391.32500000	1074639.54587172	10218.01327733
11..........	58030.00421179	1013248.22087172	9780.08848912
12..........	54851.27005710	955218.21665993	9364.68777380
13..........	51845.27581870	900366.94660283	8970.65901075
14..........	49002.70264490	848521.67078413	8596.90872775
15..........	46314.73147350	799518.96813923	8242.39912505
16..........	43772.55573600	753204.23666573	7905.68715785
17..........	41368.77955242	709431.68092973	7586.31798077
18..........	39095.92243785	668062.90137731	7283.40342692
19..........	36946.51397352	628966.97893946	6995.70483800
20..........	34913.91075876	592020.46496594	6722.45996500
21..........	32991.82807704	557106.55420718	6462.94463872
22..........	31173.97334504	524114.72613014	6216.12903258
23..........	29454.76108230	492940.75278510	5981.39212528
24..........	27828.90499041	463485.99170280	5758.14323008
25..........	26291.39621864	435657.08671239	5545.82053845
26..........	24837.49382922	409365.69049375	5343.88969431
27..........	23462.44143872	384528.19666453	5151.57460055
28..........	22162.02525592	361065.75522581	4968.41736703
29..........	20932.25493120	338903.72996989	4793.98190927
30..........	19769.12070545	317971.47503869	4627.62152272
31..........	18669.07465787	298202.35433324	4468.96270432
32..........	17628.75828000	279533.27967537	4317.64919575
33..........	16644.78551358	261904.52139537	4173.14134933
34..........	15713.97909480	245259.73588179	4034.94376453
35..........	14833.53329016	229545.75678699	3902.78315041
36..........	14000.78937690	214712.22349683	3776.39792629
37..........	13212.89617739	200711.43411993	3655.20886698
38..........	12467.50931496	187498.53794254	3539.00768986
39..........	11762.10721014	175031.02862758	3427.29586033
40..........	11094.61988208	163268.92141744	3319.90932625
41..........	10462.81422560	152174.30153536	3216.41890225
42..........	9864.86318454	141711.48730976	3116.69703637
43..........	9298.78484080	131846.62412522	3020.37408237
44..........	8762.84683005	122547.83928442	2927.23560236
45..........	8255.19603623	113784.99245437	2836.86283624
46..........	7774.32576115	105529.79641814	2749.09759348

TABLE XXX — (*Continued*).

Age.	D_x.	N_x.	M_x.
47..........	7318.51487737	97755.47065699	2663.49266340
48..........	6886.37091297	90436.95577962	2579.84902770
49..........	6476.40691821	83550.58486665	2497.80776434
50..........	6087.16916892	77074.17794844	2416.96990663
51..........	5717.40864514	70987.00877952	2337.07468109
52..........	5365.97548035	65269.60013438	2257.89923474
53..........	5031.80865842	59903.62465403	2179.25486090
54..........	4713.92716032	54871.81599561	2100.98355338
55..........	4411.35736320	50157.88883529	2022.88647818
56..........	4123.27036464	45746.53147209	1944.86423894
57..........	3848.83702224	41623.26110745	1866.77692334
58..........	3587.35344689	37774.42408521	1788.57156759
59..........	3338.16743550	34187.07063832	1710.21162139
60..........	3100.61671184	30848.90320282	1631.62147803
61..........	2874.14364391	27748.28649098	1552.79679737
62..........	2658.22701690	24874.14284707	1473.74388497
63..........	2452.42538000	22215.91583017	1394.52448697
64..........	2256.36438630	19763.49045017	1315.24562897
65..........	2069.68126968	17507.12606387	1236.00872825
66..........	1892.02600983	15437.44479419	1156.90964885
67..........	1723.17308970	13545.41878436	1078.15297985
68..........	1562.92209835	11822.24569466	999.95795775
69..........	1411.09263720	10259.32359631	922.55319411
70..........	1267.61531073	8848.23095911	846.27081354
71..........	1132.41155758	7580.61564838	771.42985953
72..........	1005.51086340	6448.20409080	698.45355969
73..........	887.02095029	5442.69322740	627.84506808
74..........	777.04908104	4555.67227711	560.11217268
75..........	675.64210550	3778.62319607	495.70767118
76..........	582.74422764	3102.98109057	434.98317694
77..........	498.21270210	2520.23686293	378.20141047
78..........	421.78953071	2022.02416083	325.50274488
79..........	353.16761940	1600.23463012	276.96603126
80..........	292.04146378	1247.06701072	232.65740514
81..........	237.95383311	955.02554694	192.47639367
82..........	190.67926509	717.07171383	156.53301363
83..........	149.94710689	526.39244874	124.88080555
84..........	115.45056575	376.44534185	97.52458235
85..........	86.71340715	260.99477610	74.28507305
86..........	63.13135941	174.28136895	54.83224301
87..........	44.15101260	111.15000954	38.85815141
88..........	29.30699922	66.99899694	26.11657160
89..........	18.23477652	37.69199772	16.43991416

Table XXX — (*Concluded*).

Age.	D_x.	N_x.	M_x.
90..........	10.49171277	19.45722120	9.56517911
91..........	5.45024172	8.96550843	5.02331101
92..........	2.42682264	3.51526671	2.25942967
93..........	.84532212	1.08844407	.79349131
94..........	.21400554	.24312195	.20242839
95..........	.02911641	.02911641	.02772993

TABLE XXXI — SINGLE LIFE.

ANNUITIES AND SINGLE PREMIUMS PER $1.

AMERICAN EXPERIENCE *Table of Mortality, with Interest at 5% Per Annum.*

Age.	Annuity.	Single Premium.
10	16.50475	.1664407
11	16.46076	.1685351
12	16.41469	.1707287
13	16.36642	.1730276
14	16.31581	.1754375
15	16.26274	.1779650
16	16.20722	.1806083
17	16.14896	.1833827
18	16.08779	.1862957
19	16.02372	.1893469
20	15.95658	.1925439
21	15.88620	.1958953
22	15.81257	.1994013
23	15.73552	.2030705
24	15.65484	.2069124
25	15.57033	.2109368
26	15.48176	.2151541
27	15.38910	.2195669
28	15.29210	.2241862
29	15.19051	.2290238
30	15.08425	.2340834
31	14.97307	.2393780
32	14.85666	.2449208
33	14.73492	.2507176
34	14.60774	.2567742
35	14.47479	.2631055
36	14.33572	.2697275
37	14.19057	.2766394
38	14.03897	.2838584
39	13.88092	.2913845
40	13.71604	.2992359

Table XXXI — (*Continued*).

Age.	Annuity.	Single Premium.
41	13.54430	.3074145
42	13.36528	.3159393
43	13.17891	.3248138
44	12.98494	.3340508
45	12.78344	.3436458
46	12.57414	.3536124
47	12.35728	.3639390
48	12.13275	.3746311
49	11.90076	.3856781
50	11.66175	.3970598
51	11.41594	.4087648
52	11.16361	.4207810
53	10.90499	.4330958
54	10.64036	.4456972
55	10.37017	.4585633
56	10.09472	.4716801
57	9.81450	.4850235
58	9.52988	.4985768
59	9.24127	.5123205
60	8.94928	.5262248
61	8.65445	.5402642
62	8.35742	.5544086
63	8.05876	.5686310
64	7.75900	.5829048
65	7.45885	.5971978
66	7.15921	.6114659
67	6.86074	.6256789
68	6.56420	.6398004
69	6.27048	.6537863
70	5.98022	.6676088
71	5.69422	.6812272
72	5.41286	.6946255
73	5.13592	.7078131
74	4.86279	.7208198
75	4.59264	.7336839
76	4.32477	.7464392

TABLE XXXI — (*Concluded*).

Age.	Annuity.	Single Premium.
77	4.05856	.7591162
78	3.79392	.7717182
79	3.53109	.7842337
80	3.27017	.7966584
81	3.01349	.8088814
82	2.76062	.8209229
83	2.51052	.8328324
84	2.26066	.8447301
85	2.00986	.8566738
86	1.76061	.8685428
87	1.51750	.8801201
88	1.28611	.8911386
89	1.06704	.9015688
90	0.85453	.9116885
91	0.64497	.9216672
92	0.44851	.9310234
93	0.28761	.9386849
94	0.13605	.9459024

TABLE XXXII — TWO LIVES — COMMUTATION COLUMNS.

AMERICAN EXPERIENCE *Table of Mortality, with Interest at* **5%** *Per Annum (Makehamized).*

Equal Ages.	D_{xx}.	N_{xx}.	M_{xx}.
10........	6149081923	95044723464	1623143208
11........	5766966183	88895641541	1533840850
12........	5408391362	83128675358	1449883457
13........	5072023946	77720283996	1371058510
14........	4756496579	72648260050	1297056116
15........	4460442902	67891763470	1227492231
16........	4182642793	63431320568	1162103724
17........	3922008530	59248677776	1100642888
18........	3677479822	55326669246	1042876556
19........	3447996613	51649189423	988511367
20........	3232714110	48201192810	937419228
21........	3030695553	44968478700	889339454
22........	2841133832	41937783146	844096540
23........	2663211370	39096649314	801466205
24........	2496280800	36433437944	761355182
25........	2339618910	33937157144	723563817
26........	2192554707	31597538234	687910065
27........	2054512207	29404983528	654274888
28........	1924949215	27350471320	622545796
29........	1803355631	25425522105	592616488
30........	1689132981	23622166474	564267898
31........	1581924052	21933033494	537493919
32........	1481274079	20351109442	512173604
33........	1386727080	18869835363	488103487
34........	1297959069	17483108283	465430098
35........	1214540181	16185149214	443818824
36........	1136192225	14970609033	423306095
37........	1062594514	13834416808	403812765
38........	993423802	12771822294	385241804
39........	928383295	11778398492	367507141
40........	867266582	10850015198	350599192
41........	809790539	9982748616	334421558
42........	755757096	9172958078	318949563
43........	704903701	8417200982	304084602
44........	657082070	7712297280	289829832
45........	612065025	7055215211	276102380
46........	569679391	6443150186	262862734
47........	529780268	5873470795	250091198

Table XXXII — (*Continued*).

Equal Ages.	D_{xx}.	N_{xx}.	M_{xx}.
48........	492203916	5343690527	237742451
49........	456788372	4851486611	225765211
50........	423436938	4394698239	214165573
51........	391998599	3971261300	202890905
52........	362360883	3579262701	191919800
53........	334411123	3216901818	181225307
54........	308066815	2882490695	170805355
55........	283224591	2574423879	160632979
56........	259809304	2291199289	150704586
57........	237736714	2031389984	141003856
58........	216939407	1793653270	131527361
59........	197356776	1576713863	122275161
60........	178927879	1379357087	113244218
61........	161610480	1200429208	104447193
62........	145349245	1038818728	95881680
63........	130120795	893469483	87574623
64........	115882543	763348689	79532597
65........	102609172	647466146	71777459
66........	90271676	544856974	64326110
67........	78856225	454585297	57209299
68........	68341944	375729072	50450081
69........	58708649	307387129	44071158
70........	49943311	248678479	38101472
71........	42026002	198735168	32562423
72........	34939050	156709166	27476710
73........	28661413	121770116	22862835
74........	23163687	93108703	18729934
75........	18411656	69945017	15080941
76........	14367710	51533361	11913739
77........	10985578	37165651	9215784
78........	8209836	26180073	6963167
79........	5983046	17970237	5127321
80........	4239283	11987191	3668465
81........	2911470	7747908	2542522
82........	1931399	4836438	1701093
83........	1232765	2905039	1094430
84........	753859	1672274	674226
85........	439734	918416	396000
86........	243196	478682	220402
87........	126827	235486	115614
88........	61958	108659	56784
89........	28143	46700	25920
90........	11799	18557	10916

TABLE XXXII — (*Concluded*).

Equal Ages.	$D_{xx.}$	$N_{xx.}$	$M_{xx.}$
91........	4520.2	6757.1	4198.4
92........	1571.5	2236.9	1465.0
93........	490.03	665.40	458.34
94........	134.77	175.37	126.42
95........	32.649	40.595	30.716
96........	6.7384	7.9457	6.3600
97........	1.0652	1.2073	1.0077
98........	.13414	.14213	.12738
99........	.00798	.00798	.00760

TABLE XXXIII — TWO LIVES.

ANNUITIES AND SINGLE PREMIUMS PER $1.

AMERICAN EXPERIENCE *Table of Mortality, with Interest at* **5%** *Per Annum (Makehamized).*

Equal Ages.	Annuity.	Single Premium.
10	14.456734	.2639651
11	14.414628	.2659701
12	14.370314	.2680803
13	14.323328	.2703178
14	14.273481	.2726915
15	14.220857	.2751951
16	14.165369	.2778396
17	14.106718	.2806325
18	14.044724	.2835846
19	13.979478	.2866915
20	13.910441	.2899790
21	13.837676	.2934440
22	13.760932	.2970985
23	13.680265	.3009398
24	13.595088	.3049958
25	13.505421	.3092657
26	13.411288	.3137482
27	13.312392	.3184575
28	13.208412	.3234089
29	13.099006	.3286188
30	12.984788	.3340577
31	12.864782	.3397723
32	12.738922	.3457656
33	12.607461	.3520256
34	12.469691	.3585861
35	12.326154	.3654213
36	12.176124	.3725656
37	12.019470	.3800253
38	11.856368	.3877920
39	11.687000	.3958571

Table XXXIII—(*Continued*).

Equal Ages.	Annuity.	Single Premium.
40	11.510588	.4042577
41	11.327569	.4129729
42	11.137442	.4220266
43	10.940923	.4313846
44	10.737190	.4410862
45	10.526905	.4510998
46	10.310134	.4614222
47	10.086617	.4720659
48	9.856660	.4830162
49	9.620863	.4942447
50	9.378637	.5057791
51	9.130805	.5175807
52	8.877619	.5296372
53	8.619602	.5419237
54	8.356706	.5544426
55	8.089691	.5671576
56	7.818773	.5800585
57	7.544705	.5931093
58	7.267992	.6062862
59	6.989155	.6195640
60	6.709012	.6329043
61	6.427917	.6462835
62	6.147053	.6596641
63	5.866462	.6730256
64	5.587262	.6863208
65	5.310022	.6995228
66	5.035747	.7125835
67	4.764736	.7254887
68	4.497782	.7382009
69	4.235807	.7506757
70	3.979215	.7628944
71	3.728862	.7748161
72	3.485215	.7864155
73	3.248573	.7976869
74	3.019598	.8085904
75	2.798953	.8190974

Table XXXIII—(*Concluded*).

Equal Ages.	Annuity.	Single Premium.
76	2.586748	.8292023
77	2.383131	.8388984
78	2.188867	.8481493
79	2.003527	.8569750
80	1.827646	.8653503
81	1.661167	.8732775
82	1.504111	.8807568
83	1.356524	.8877847
84	1.218287	.8943672
85	1.088572	.9005441
86	0.968297	.9062715
87	0.856744	.9115835
88	0.753732	.9164891
89	0.659357	.9209827
90	0.572663	.9251114
91	0.494880	.9288149
92	0.423403	.9322192
93	0.357871	.9353393
94	0.301210	.9380380
95	0.243365	.9407926
96	0.179169	.9438488
97	0.133431	.9460267
98	0.059524	.9495460

TABLE XXXIV — THREE LIVES — COMMUTATION COLUMNS.

AMERICAN EXPERIENCE *Table of Mortality, with Interest at* 5% *Per Annum (Makehamized).*

Equal Ages.	D_{xxx}.	N_{xxx}.	M_{xxx}.
10..	615410000000000	8556570000000000	207954200000000
11..	572750000000000	7941160000000000	194599400000000
12..	533010000000000	7368410000000000	182133200000000
13..	496020000000000	6835400000000000	170524700000000
14..	461590000000000	6339380000000000	159714700000000
15..	429520000000000	5877790000000000	149625200000000
16..	399660000000000	5448270000000000	140218500000000
17..	371850000000000	5048610000000000	131439900000000
18..	345960000000000	4676760000000000	123257100000000
19..	321850000000000	4330800000000000	115621400000000
20..	299390000000000	4008950000000000	108487600000000
21..	278480000000000	3709560000000000	101834200000000
22..	259010000000000	3431080000000000	95625200000000
23..	240870000000000	3172070000000000	89819010000000
24..	223980000000000	2931200000000000	84399010000000
25..	208250000000000	2707220000000000	79334730000000
26..	193590000000000	2498970000000000	74591400000000
27..	179940000000000	2305380000000000	70159970000000
28..	167220000000000	2125440000000000	66008550000000
29..	155370000000000	1958220000000000	62121400000000
30..	144320000000000	1802850000000000	58469980000000
31..	134030000000000	1658530000000000	55052360000000
32..	124450000000000	1524500000000000	51854740000000
33..	115510000000000	1400050000000000	48840940000000
34..	107180000000000	1284540000000000	46011410000000
35..	99410000000000	1177360000000000	43345220000000
36..	92169000000000	1077950000000000	40834030000000
37..	85419000000000	985785000000000	38476850000000
38..	79122000000000	900366000000000	36247420000000
39..	73246000000000	821244000000000	34139130000000
40..	67766000000000	747998000000000	32147040000000
41..	62653000000000	680232000000000	30260990000000
42..	57883000000000	617579000000000	28474470000000
43..	53427000000000	559696000000000	26774800000000
44..	49271000000000	506269000000000	25162950000000
45..	45390000000000	456998000000000	23628180000000
46..	41764000000000	411608000000000	22163610000000

Table XXXIV — (*Continued*).

Equal Ages.	D_{xxx}.	N_{xxx}.	M_{xxx}.
47..	38379000000000	369844000000000	20767380000000
48..	35218000000000	331465000000000	19433950000000
49..	32263000000000	296247000000000	18156000000000
50..	29506000000000	263984000000000	16935330000000
51..	26931000000000	234478000000000	15765380000000
52..	24526000000000	207547000000000	14642810000000
53..	22281000000000	183021000000000	13565710000000
54..	20187000000000	160740000000000	12532710000000
55..	18235000000000	140553000000000	11542000000000
56..	16417000000000	122318000000000	10592330000000
57..	14724000000000	105901000000000	9680894000000
58..	13152000000000	91177200000000	8810227000000
59..	11694000000000	78025200000000	7978513000000
60..	10344000000000	66331200000000	7185371000000
61..	9098700000000	55987200000000	6432642000000
62..	7952200000000	46888500000000	5719414000000
63..	6902100000000	38936300000000	5047990000000
64..	5944100000000	32034200000000	4419662000000
65..	5074900000000	26090100000000	3832514000000
66..	4291200000000	21015200000000	3290476000000
67..	3590000000000	16724000000000	2793619000000
68..	2968000000000	13134000000000	2342571000000
69..	2421500000000	10166000000000	1937355000000
70..	1946900000000	7744550000000	1578112000000
71..	1539900000000	5797650000000	1263821000000
72..	1196100000000	4257750000000	993349900000
73..	910660000000	3061650000000	764867100000
74..	677980000000	2150990000000	575551900000
75..	492310000000	1473010000000	422160600000
76..	347760000000	980706000000	301059700000
77..	238240000000	632946000000	208099700000
78..	157720000000	394706000000	138924500000
79..	100550000000	236986000000	89264950000
80..	61448000000	136436000000	54951050000
81..	35837000000	74988000000	32266140000
82..	19841000000	39151000000	17976670000
83..	10368000000	19310000000	9448076000
84..	5080300000	8942400000	4654471000
85..	2319200000	3862100000	2135220000
86..	977400000	1542970000	903925200
87..	377180000	565570000	350244900
88..	131970000	188393216	122998900
89..	41399000	56423216	38712180

Table XXXIV — (*Concluded*).

Equal Ages.	D_{xxx}.	N_{xxx}.	M_{xxx}.
90..	11516000	15024216	10800560
91..	2798000	3508216	2630942
92..	587760	710216	553940
93..	104870	122456	99038.8
94..	15499	17586	14660.8
95..	1893.6	2087.80155	1794.18
96..	181.94	194.20155	172.691
97..	11.717	12.26155	11.1331
98..	.53657	.54455	.51064
99..	.00798	.00798	.007600

TABLE XXXV — THREE LIVES.

ANNUITIES AND SINGLE PREMIUMS PER $1.

AMERICAN EXPERIENCE *Table of Mortality, with Interest at* **5%** *Per Annum (Makehamized).*

Equal Ages.	Annuity.	Single Premium.
10	12.903853	.3379116
11	12.864967	.3397632
12	12.824150	.3417069
13	12.780493	.3437859
14	12.733790	.3460099
15	12.684555	.3483544
16	12.632262	.3508445
17	12.577007	.3534756
18	12.518210	.3562756
19	12.455958	.3592400
20	12.390394	.3623621
21	12.320741	.3656787
22	12.246902	.3691950
23	12.169220	.3728941
24	12.086883	.3768149
25	11.999856	.3809591
26	11.908570	.3853061
27	11.811937	.3899076
28	11.710441	.3947408
29	11.603591	.3998288
30	11.492032	.4051412
31	11.374319	.4107465
32	11.249900	.4166713
33	11.120596	.4228287
34	10.984885	.4292910
35	10.843476	.4360247
36	10.695363	.4430343
37	10.540582	.4504484
38	10.379465	.4581206
39	10.212134	.4660887

Table XXXV — (*Continued*).

Equal Ages.	Annuity.	Single Premium.
40	10.037954	.4743830
41	9.857134	.4829887
42	9.669437	.4919315
43	9.475902	.5011474
44	9.275192	.5107051
45	9.068253	.5205592
46	8.855569	.5306870
47	8.636624	.5411131
48	8.411806	.5518187
49	8.182252	.5627499
50	7.946790	.5739622
51	7.706621	.5853990
52	7.462326	.5970321
53	7.214218	.6088466
54	6.962550	.6208307
55	6.707869	.6329586
56	6.450691	.6452050
57	6.192407	.6574908
58	5.932573	.6698774
59	5.672242	.6822741
60	5.412529	.6946414
61	5.153319	.7069847
62	4.896293	.7192241
63	4.641225	.7313702
64	4.389243	.7435376
65	4.141008	.7551901
66	3.897278	.7667962
67	3.658496	.7781669
68	3.425202	.7892759
69	3.198224	.8000640
70	2.977888	.8105768
71	2.764952	.8207163
72	2.559694	.8304907
73	2.362012	.8399041
74	2.172645	.8489216
75	1.992038	.8575097

TABLE XXXV — (*Concluded*).

Equal Ages.	Annuity.	Single Premium.
76	1.820066	.8657111
77	1.656758	.8734877
78	1.502574	.8808300
79	1.356897	.8877668
80	1.220349	.8942691
81	1.092474	.9003583
82	.973237	.9060365
83	.862461	.9112728
84	.760211	.9161803
85	.665273	.9206709
86	.578647	.9248263
87	.499470	.9285882
88	.427546	.9320217
89	.362913	.9350994
90	.304638	.9378743
91	.253830	.9402938
92	.208344	.9424595
93	.167693	.9443959
94	.134654	.9459191
95	.102557	.9474968
96	.067393	.9491646
97	.046475	.9501664
98	.014872	.9516745
99	.000000	.9523810

AN ANALYSIS OF THE INHERITANCE TAX LAWS

OF THE

United States and the Various States and Territories, with Particular Reference to the Standards of Mortality and Interest to be Employed in Making Calculations for Inheritance Tax Purposes.

UNITED STATES.

On June 13, 1898, the Federal Collateral Inheritance Tax Law was enacted. Circular No. 527, issued from the office of the Commissioner of Internal Revenue at Washington, shows the rates of legacy taxes imposed on personal property in excess of $10,000. Although the basis for calculating the present value of life estates and remainders is not stated in the circular, the tables prepared by the Actuary of the Treasury Department are based on the Actuaries' or Combined Experience Table of Mortality with interest at the rate of 4 per cent. per annum. This act was repealed April 12, 1902, to take effect July 1, 1902, and at the present time, therefore, there is no Federal Collateral Inheritance Tax.

ALABAMA.

There is no Collateral Inheritance or Transfer Tax Law in this State.

ARIZONA.

There is no Collateral Inheritance or Transfer Tax Law in this Territory.

ARKANSAS.

On page 119 of the Digest of the Revenue Laws of this State, compiled by the Auditor of State in 1903, will be found a reference to the inheritance tax laws of Arkansas, although they are apparently incorporated in the provisions relative to the keeping and maintaining of ferries. Starting with section 352 and ending with section 364 of the act which was approved May 23, 1901, will be found the provisions pertaining to this subject. Section 362 is as follows:

"Sec. 362. The value of such property as may be subject to said tax shall be its actual value as found by the court of probate, but the state treasurer, or any person interested in the succession to said property, may apply to the court of probate having jurisdiction of the estate, or to the circuit court in case there is no administration, and on such application said court shall appoint three (3) disinterested persons who being first sworn, shall view and appraise such property at its actual market value for the purposes of said tax, and shall make return thereof to the court, which return may be accepted by said court and if accepted shall be binding. And the fees of the appraiser shall be such as are customary in the administration of estates. *In the case of an annuity or life estate, the value thereof shall be determined by the tables of mortality employed by insurance actuaries and five (5) per centum compound interest.*"

It is impossible to determine whether the meaning of the italicized portion in the preceding quotation (the italics do not appear in the original) is that the court of probate is authorized to use any of the tables of mortality which are usually employed by insurance actuaries, or whether this is an unskillful reference to the specific table of mortality known as the Actuaries' Table. As the statute runs, however, calculations upon any table of mortality are probably acceptable to the court of probate which has jurisdiction in determining all questions relative to inheritance taxes.

California.

The Collateral Inheritance Tax Law of this State may be found on page 224 of the 1902 compilation of the Revenue Laws of the State of

California. The original act was approved March 23, 1893, took effect two months afterward, was amended on March 9, 1895, March 9, 1897, March 14, 1899, and March 20, 1903. This last amendment will, of course, not be found in the compilation referred to. Section 11 gives the standard of mortality to be used in this State, viz., the Actuaries' Table with 5 per cent. interest. This section reads as follows:

"Sec. 11. When the value of any inheritance, devise, bequest, or other interest subject to the payment of said tax is uncertain, the Superior Court in which the probate proceedings are pending, on the application of any interested party, or upon his own motion, shall appoint some competent person as appraiser, as often as and whenever occasion may require, whose duty it shall be forthwith to give such notice, by mail to all persons known to have or claim an interest in such property, and to such persons as the court may by order direct, of the time and place at which he will appraise such property, and at such time and place to appraise the same and make a report thereof, in writing, to said court, together with such other facts in relation thereto as said court may by order require to be filed with the clerk of said court; and from this report the said court shall, by order, forthwith assess and fix the market value of all inheritances, devises, bequests, or other interests, and the tax to which the same is liable, and shall immediately cause notice thereof to be given, by mail, to all parties known to be interested therein; and the value of every future or contingent or limited estate, income, or interest shall, for the purposes of this Act, be determined by the rule, method, and standards of mortality and of value that are set forth in the actuaries' combined experience tables of mortality for ascertaining the value of policies of life insurance and annuities, and for the determination of the liabilities of life insurance companies, save that the rate of interest to be assessed in computing the present value of all future interests and contingencies shall be five per centum per annum; and the Insurance Commissioner shall, on the application of said court, determine the value of such future or contingent or limited estate, income or interest, upon the facts contained in such report, and certify the same to the court, and his certificate shall be conclusive evidence that the method of computation adopted therein is correct. The said appraiser shall be paid by the County Treasurer out of any funds that he may have in his hands on account of said tax, on the certificate of the court, at the rate of five dollars per day for every day actually and necessarily employed in said appraisement, together with his actual and necessary traveling expenses."

The 1903 amendment, referred to above, does not pertain to the basis of calculation.

Colorado.

Chapter 94 of the laws passed at the thirteenth session of the General Assembly of the State of Colorado, convened in 1901, contains the provisions applicable to Inheritance Tax purposes. The particular section may be found on page 252 of the official publication, and is as follows:

" Sec. 33. In order to fix the value of property of persons whose estate shall be subject to the payment of said tax, the county judge, on the application of any persons interested in the estate, including the state, or upon his own motion, shall appoint some competent person as appraiser as often as, or whenever occasion may require, whose duty it shall be forthwith to give such notice by mail to all persons known to have or claim an interest in such property, and to such persons as the county judge may by order direct, of the time and place at which he will appraise such property, and at such time and place to appraise the same at a fair market value, and for that purpose the appraiser is authorized by leave of the county judge to use subpœnas for and to compel the attendance of witnesses before him, and to take the evidence of such witnesses under oath concerning such property and the value thereof, and he shall make a report thereof and of such value in writing to the county court, with the depositions of the witnesses examined and such other facts in relation thereto, and to said matter as the county court may by order require to be filed in the office of the clerk of said county court, and from this report the said county court shall forthwith make an order and fix the then cash value of all estate, annuities and life estate or terms of years growing out of said estate, and the tax to which the same is liable, and shall immediately give notice by mail to all parties known to be interested therein. Any person or persons dissatisfied with the appraisement or assessment may appeal therefrom to the district court of the proper county within sixty days after the making and filing of such appraisement or assessment, on giving good and sufficient security to the satisfaction of the county judge to pay all costs, together with whatever taxes that shall be fixed by the county court. The said appraiser shall be paid by the county treasurer out of any funds he may have in his hands on account of said tax, on the certificate of the county judge, at the rate of three dollars per day for every day actually and necessarily employed in said appraisement, together with his actual and necessary traveling expenses."

It will be noticed that the county court is the official empowered to fix the present values of the estates and annuities, but no provision is made for any table of mortality or rate of interest to be used in such calculations. An inquiry addressed to the Secretary of State elicited the information that that official was unable to give any information relative to the standards to be employed. The statute being silent on this subject, it is to be assumed that the court will accept calculations made upon any recognized basis. It may be of interest to note that the Insurance Department of this State, which is attached to the Auditor of State's office, uses the Actuaries' Experience Table of Mortality as a basis for calculating the net present value of the outstanding obligations of its insurance companies.

Connecticut.

On June 1, 1897, the Senate and House of Representatives passed "An Act Providing for a Succession Tax." This is known as chapter CCI, and was subsequently amended by an act approved May 6, 1903. Section 8 of the act would seem to place the responsibility for the calculations in the court of probate. This section is as follows:

"Sec. 8. The court of probate, having either principal or ancillary jurisdiction of the settlement of the estate of the decedent, shall have jurisdiction to hear and determine all questions in relation to said tax that may arise affecting any devise, legacy, or inheritance under this act, subject to appeal as in other cases, and the state treasurer shall represent the interests of the state in any such proceeding."

It will be observed that no standard of mortality or rate of interest is specified. The Insurance Commissioner, however, uses both the Actuaries' and American Experience Tables of Mortality as a basis for calculating the present value of the outstanding policy obligations of the life insurance companies of his State.

Delaware.

Chapter 390, volume XIII of the Laws of the State of Delaware, passed April 8, 1869, contains provisions applicable to collateral taxes. The first eleven sections and the last nineteen have been repealed, but this has no practical effect upon the Inheritance Tax Law. The Register of

Wills is the official charged with the calculation of the present value of life estates, annuities, and remainders. The act contains no reference to any table of mortality or rate of interest, and the Attorney-General under date of October, 1904, in an answer to an inquiry on these points, says: "There is no reported case in Delaware where interest rates and mortality tables had to be selected by the Court. The present incumbent of the office of Register of Wills states that he would, if the question arose before him, employ the American Table of Mortality and the legal rate of interest, which in this State is 6 per cent. I think you would probably be safe in stating that to be what would be considered the proper practice in this State."

District of Columbia.

There is no Inheritance or Transfer Tax Law upon the statute books of the District at the present time. A tax was imposed on inheritances by the War Revenue Law of 1898. This was modified, however, by Act of Congress, dated March 2, 1901. (See 31 Stat. at Large, § 29, page 946.)

Florida.

There is no Collateral Inheritance or Transfer Tax Law in this State.

Georgia.

There is no Collateral Inheritance or Transfer Tax Law in this State.

Hawaii.

There is a tax on legacies, bequests and inheritances in Hawaii, and the provisions of the law may be found by consulting sections 910 to 917, inclusive. This is very crude and fixes no standards.

IDAHO.

There is no Collateral Inheritance or Transfer Tax Law in this State.

ILLINOIS.

On page 113 of the Revenue Laws compiled by the Auditor in 1898 will be found the statute relating to inheritance taxes. This may also be found in chapter 120, paragraph 366, of the Revised Statutes of the State. Paragraph 376 has particular reference to our subject. This reads as follows:

"376. *How Value of Property Fixed.*— Sec. 11. In order to fix the value of property of persons whose estate shall be subject to the payment of said tax, the county judge, on the application of any interested party, or upon his own motion, shall appoint some competent person as appraiser as often as or whenever occasion may require, whose duty it shall be forthwith to give such notice by mail to all persons known to have or claim an interest in such property, and to such persons as the county judge may by order direct, of the time and place he will appraise such property, and at such time and place to appraise the same at a fair market value, and for that purpose the appraiser is authorized by leave of the county judge to use subpœnas for and to compel the attendance of witnesses before him, and to take the evidence of such witnesses under oath concerning such property and the value thereof, and he shall make a report thereof and of such value in writing to said county judge, with the depositions of the witnesses examined and such other facts in relation thereto, and to said matter as said county judge may by order require to be filed in the office of the clerk of said county court, and from this report the said county judge shall forthwith use and fix the then cash value of all estates, annuities and life estates or terms of years growing out of said estate, and the tax to which the same is liable, and shall immediately give notice by mail to all parties known to be interested therein. Any person or persons dissatisfied with the appraisement or assessment may appeal therefrom to the county court of the proper county within sixty days after the making and filing of such appraisement or assessment on paying the given security proof to the county judge to pay all costs, together with whatever taxes that shall be fixed by said court. The said appraiser shall be paid by the county treasurer out of any funds he may have in his hands on account of said tax, on the certificate of the county judge at the rate of three dollars per day for every day actually and necessarily employed in said appraisement, together with his actual and necessary traveling expenses."

The county judge is required by this act to make the calculations, but no mortality table or rate of interest is specified. The Superintendent of the Insurance Department, however, states: "Our courts, however, are in the habit of using for determining the value of life estates for taxation purposes Dr. Wigglesworth's table (m) which has been adopted by the Supreme Court of Massachusetts. This is the table when 5 per cent. is the rate of interest. When the income is to be estimated at 6 per cent. the Northampton tables are used for computing the value of life interests. This matter you will find laid down in Puterbaugh's Pleading and Practice, 1896 edition, page 593."

It may be stated, however, that the Wigglesworth table is no longer used even in Massachusetts.

Indiana.

There is no Collateral Inheritance or Transfer Tax Law in this State.

Iowa.

The taxation of collateral inheritance in this State is made in accordance with the provisions of chapter 28 of the Acts of the twenty-sixth General Assembly, in effect July 4, 1896, and re-enacted as chapter 4, title VII, Code of 1897. The following sections have a direct bearing upon the question:

"Sec. 1470. *Remainders.*— When any person whose estate, over and above the amount of his just debts, exceeds the sum of one thousand dollars shall bequeath or devise any real property to or for the use of the father, mother, husband, wife, lineal descendant, adopted child, or lineal descendant of such child, during life or for a term of years, and the remainder to a collateral heir or to a stranger to the blood, the court, upon the determination of such estate for life or years, shall upon its own motion or upon the application of the treasurer of state, cause such estate to be appraised at its then actual market value, from which shall be deducted the value of any improvements thereon, or betterments thereto, if any, made by the remainderman during the time of the prior estate, to be ascertained and determined by the appraisers, and the tax on the remainder shall be paid by such remainderman within sixty days from the approval by the court of the report of the appraisers. If such tax is not paid within said time, the court shall then order said real estate, or so much thereof as shall be necessary to pay such tax, to be sold." (26 G. A., chap. 28, § 4.)

"Sec. 1471. *Life estate.*— Whenever any real estate of a decedent shall be subject to such tax, and there be a life estate or interest for a term of years given to a party other than named in the preceding section, and the remainder to a collateral heir or stranger to the blood, the court shall direct the interest of the life estate or term of years to be appraised at the actual market value thereof, and upon the approval of such appraisement by the court, the party entitled to such life estate, or term of years, shall within sixty days thereafter pay such tax, and in default thereof the court shall order such interest in said estate, or so much thereof as shall be necessary to pay such tax, to be sold. Upon the determination of such life estate or term of years, the same provision shall apply as to the ascertainment of the amount of the tax and the collection of the same on the real estate in remainder as in like cases is provided in the preceding section. Whenever any personal estate of a decedent shall be subject to such tax, and there be a life estate or interest for a term of years given to a party other than named in the preceding section, and remainder to a collateral heir or stranger to the blood, the court shall inquire into and determine the value of the life estate or interest for the term of years, and order and direct the amount of the tax thereon to be paid by the prior estate and that to be paid by the remainderman, each of whom shall pay their proportion of such tax within sixty days from such determination, unless a longer period is fixed by the court, and in default thereof the executor, administrator or trustee shall pay the same out of said property, and hold the same from distribution, and invest it at interest under the order of the court until said tax is paid, or until the interest on the same equals the amount of such tax, which shall thereupon be paid." (Same, § 5.)

"Sec. 1471-a. *Valuation of life, term and deferred estates.*— The value of any estate and property described in sections fourteen hundred and seventy (1470) and fourteen hundred and seventy-one (1471) of the code subject to the collateral inheritance tax shall be determined for the purpose of computing said tax by the rule or standards of mortality and of value commonly used in actuaries' combined experience tables. The treasurer of state is directed to obtain and publish for the use of the courts and appraisers throughout the state tables showing the average expectancy of life, and the value of annuities or life and term estates, and the present worth or value of remainders and reversions. The taxable value of life or term, deferred or future, estates shall be computed at the rate of four per cent interest. Whenever it is desired to remove the lien of the collateral inheritance tax on remainders, reversions, or deferred estates, parties owning the beneficial interest may pay at any time the said tax on the present worth of such interest determined according to the rules herein fixed." (28 G. A., chap. 51, § 7.)

It will be noticed from the above that the courts and appraisers are directed to use "the rule or standards of mortality and of value commonly used in actuaries' combined experience tables." It is assumed that by this is meant the Actuaries' Table of Mortality, which assumption is borne out by the fact that the Treasurer of State has reproduced the tables contained in Circulars 527 and 21,231 issued by the Commissioner of Internal Revenue, which give the figures for an annuity of one dollar and single premiums for insurance of one dollar upon a single life on the basis of the Actuaries' Table with 4 per cent. interest. It is needless to say that these tables are applicable to but few of the problems requiring solution.

Kansas.

There is no Collateral Inheritance or Transfer Tax Law in this State.

Kentucky.

There is no Collateral Inheritance or Transfer Tax Law in this State.

Louisiana.

On June 28, 1904, Act No. 45 was approved by the Governor of the State of Louisiana. This is an exceedingly primitive enactment which would seem to place the determination of the present value of the various estates upon the different judges throughout the State exercising probate jurisdiction. Standards of no kind are provided for.

MAINE.

Chapters 8, 9 and 10 of the Revised Statutes contain the laws relating to taxation. The sections pertaining to collateral inheritance taxes are Nos. 69 to 85, inclusive. Section 82 shows that the Actuaries' Table with 5 per cent. interest is specified as the basis for calculation. This section reads as follows:

"Sec. 82. The value of such property as may be subject to said tax shall be its actual market value as found by the judge of probate, after public notice or personal notice to the board of state assessors and all persons interested in the succession to said property or the board of state assessors or any of said persons interested may apply to the judge of probate having jurisdiction of the estate and on such application the judge shall appoint three disinterested persons, who, being first sworn, shall view and appraise such property at its actual market value for the purposes of said tax, and shall make return thereof to said probate court, which return may be accepted by said court in the same manner as the original inventory of such estate is accepted, and if so accepted it shall be binding upon the person by whom such tax is to be paid, and upon the state. And the fees of the appraisers shall be fixed by the judge of probate and paid by the executor, administrator or trustee. In case of an annuity or life estate the value thereof shall be determined by the so-called actuaries' combined experience tables and five per cent compound interest."

MARYLAND.

The Inheritance or Transfer Tax Laws of Maryland are embodied in article 81 of the Code of Public General Laws. Sections 113 to 116, inclusive, of this article were amended at the last session of the General Assembly. The sections which we seek are as follows:

"Sec. 133. Whenever any estate, real, personal or mixed, of a decedent shall be subject to the tax mentioned in the thirteen preceding sections, and there be a life estate, or interest for a term of years, or a contingent interest given to one party, and the remainder or reversionary interest to another party, the orphans' court of the county or city in which administration is granted, shall determine, in its discretion, and at such time as it shall think proper, what proportion the party entitled to said life estate, or interest for a term of years, or contingent interest, shall pay of said tax; and the judgment of said court shall be final and conclusive; and the party entitled to said life estate, or interest for a term of years, or other contingent interest shall within thirty days after the date of such determination pay to the register of wills his proportion of said tax; and thereafter the said court shall from time to time, after the determination of the preceding estate, and as the remainder of said estate shall vest in the party or parties entitled in remainder or reversion, determine, in its discretion, what proportion of the residue of said tax shall be paid by the party or parties in whom the estate shall so vest; and the judgment of said court shall be final and each of the parties successively entitled in remainder or reversion shall pay his proportion of said tax to the register of wills within thirty days after the date of such determination as to him; and the amount of said tax shall be and remain a lien upon such estate until the same shall be paid.

"Sec. 134. Whenever an interest in any estate, real, personal or mixed, less than an absolute interest, shall be devised or bequeathed to or for the use and benefit of any person or object not exempted from the tax under section 120, then only such interest so devised or bequeathed shall be liable for said tax; and it shall be the duty of the orphans' court of the county or city in which administration is granted, or any other court assuming jurisdiction over such administration, to determine as soon after administration is granted as possible, on application of such person or object, the value of such interest liable for said tax, by deducting from the whole value of the estate so much thereof as shall be the value of the interest therein of any person who, under said section 120, is exempt from said tax, and the residue thereof shall be the value of said interest upon which said tax is payable; and said tax so ascertained shall be paid by such person or object within ninety days from such ascertainment, with interest thereon at six per cent. per annum, after the expiration of twelve (12) months from the date of the death of the decedent, under whose will or by whose intestacy said interest is acquired, if said tax has not sooner been paid, or within ninety days from the time that it shall be ascertained that such person or object shall be entitled to any such interest in any estate; but such tax shall bear interest at the rate of 6 per cent. per annum from the expiration of twelve (12) months from said death; but if such person or object shall fail to pay said tax, as above provided, then such person or object shall at the time when he, she or it comes into possession of such estate, pay a tax as provided for in said section 120, on the whole value thereof."

It will be seen, therefore, that no standard of mortality or rate of interest is provided.

Massachusetts.

On page 7 of the pamphlet entitled "Collateral Legacy and Succession Tax" issued by the Treasurer of the Commonwealth under date of January 1, 1903, will be found section 16, as follows:

"Sec. 16. Said tax shall be assessed upon the actual value of said property as found by the probate court. Upon the application of the treasurer and receiver general or of any party interested in the succession, the probate court shall appoint three disinterested appraisers who, first being sworn, shall appraise such property at its actual market value and shall make return thereof to said court. Such return, when accepted by said court, shall be final. The fees of said appraisers, as determined by the judge of said court, shall be paid by the treasurer and receiver general. The value of an annuity or life estate shall be determined by the 'Actuaries' Combined Experience Tables ' at four per cent compound interest."

It will be noticed that this apparently applies only to annuities or life estates, but it is to be assumed that the same standard will be employed in calculating remainders.

Michigan.

Act No. 195 of the Public Acts of 1903 contains the amendments to the prior act approved in 1899 relative to inheritance taxes. The particular section containing directions for the calculation of future estates is as follows:

" Sec. 11. The judge of probate, upon the application of any interested party, including the Auditor General and county treasurers' or upon his own motion, shall, as often as and whenever occasion may require, appoint a competent person as appraiser to fix the clear market value at the time of the transfer thereof of property which shall be subject to the payment of any tax imposed by this act, a description of which property and the names and residences of the persons to whom it passes shall be given by the judge of probate to such appraiser. If the property, upon the transfer of which a tax is imposed, shall be an estate, income or interest for a term of years or for life, or determinable upon any future or contingent estate, or shall be a remainder or reversion or other expectancy, real or personal, the entire property or fund by which such estate, income or interest is supported, or of which it is a part, shall be appraised immediately after such transfer, or as soon thereafter as may be practicable, at the clear market value thereof as of that date: *Provided, however,* That when such estate, income or interest shall be of such a nature that its clear market value cannot be ascertained at such time, it shall be appraised in like manner at the time when such value first became ascertainable. The value of every future or contingent or limited estate, income, interest or annuity, dependent upon any life or lives in being, shall be determined by the rule, method or standard of mortality and value employed by the Commissioner of Insurance in ascertaining the value of policies of life insurance companies, except that the rate of interest for computing the present value of all future and contingent interests or estates shall be five per centum per annum. The Commissioner of Insurance shall, upon request of the Auditor General, prepare such tables of values, expectancies and other matters as may be necessary for use in computing under the provisions of this act, the value of life estates, annuities, reversions and remainders, which shall be printed and furnished by the Auditor General to the several judges of probate upon request."

As the Commissioner of Insurance employs the American Experience Table of Mortality in ascertaining the present value of life insurance policies, it is evident that the calculations for inheritance tax purposes must be upon that basis with 5 per cent. interest.

MINNESOTA.

Chapter 103 of the General Laws of 1885 levied a tax upon inheritances, but this has been declared unconstitutional by the Supreme Court, and at present there is no similar act upon the statute-books of the State. At the Thirty-fourth Session of the Legislature there was introduced on February 13, 1905, H. F. No. 273. This was an Act providing for the taxation and rate of taxation on inheritances, devises, bequests, legacies and gifts, the value of which exceeds five thousand dollars. The tax is upon the excess only. It provides no standards of mortality or interest rates for the calculation of estates, but makes the judge of probate the officer to determine the value of such inheritances, devises, bequests, etc., etc. When this book went to press final action had not been taken upon the bill.

MISSISSIPPI.

There is no Collateral Inheritance or Transfer Tax Law in this State.

MISSOURI.

Chapter 1, article XVI, Revised Statutes of Missouri, volume I, pages 185 to 193, contains the Collateral Inheritance Tax Law of this State. It may be interesting also to note that this was sustained by the Supreme Court of Missouri on February 19, 1901. Section 313 reads as follows:

"Sec. 313. *Report of appraiser to be filed in probate court, assessment of cash value, amount of tax, etc.*— The report of the appraiser shall be filed in the office of the probate judge, and from such report and other proof relating to any such estate before the probate judge, the probate judge shall forthwith assess and fix the cash value of all estates and the amount of tax to which the same are liable; or the probate judge may so determine the cash value of all such estates and the amount of the tax to which the same are liable without appointing an appraiser. The value of every limited estate, income, interest or annuity dependent upon any life or lives in being shall be determined by the rule, method and standards of mortality and value, which are employed by the superintendent of the insurance department in ascertaining the value of policies of life insurance and annuities, save that the rate of interest for computing the value of such estates or interest shall be five per centum per annum; and the superintendent of the insurance department shall, on the application of any probate judge, determine the value of such limited estates or interests upon the facts contained in such report, and certify the same to the probate judge, and his certificate shall be conclusive evidence that the method of computations adopted therein is correct. Any person dissatisfied with the appraisement or assessment and determination of tax, may appeal therefrom to the probate judge within sixty days from the fixing, assessing and determination of the tax, by the probate judge as herein provided, upon filing in the office of the probate judge a written notice of appeal, which shall state the grounds upon which the appeal is taken and on paying or giving security, approved by the probate judge, to pay all costs of the proceeding. The probate judge shall immediately give notice, upon the determination by him as to the value of any estate which is taxable under this article and of the tax to which it is liable, to all persons known to be interested therein." (New section.)

The Superintendent of Insurance in this State uses the Actuaries' Table of Mortality which, therefore, is the basis for inheritance tax calculations with 5 per cent. interest. It may also be interesting to note the following which appears in the digest of the law:

"EACH SHARE APPRAISED, NOT THE ESTATE IN GENERAL.

"The probate judge or the appraiser does not fix a value upon the *entire* estate, but upon the *share* passing to *each* heir, legatee or devisee, as the case may be. In ascertaining such share, it will be necessary (Sec. 312) to deduct the debts of the deceased (as far as they can be ascertained), and the costs of administration; and determine the CLEAR MARKET VALUE of the share of each person entitled to distribution. The tax is imposed upon such *individual* share."

Montana.

No data can be obtained relative to the standards employed in this State.

Nebraska.

The Inheritance Tax Law in this State is chapter 54 of the Laws of 1901 and was approved April 1st. The county judges are the ones authorized to determine the present value of estates, but there are no standards fixed by law either as to mortality or interest. The Auditor of State, however (who is in charge of the insurance interests), uses the Actuaries' and American Tables of Mortality as a basis for valuing the outstanding insurance contracts in his State.

Nevada.

There is no Collateral Inheritance or Transfer Tax Law in this State.

New Hampshire.

There is no Inheritance or Transfer Tax Law upon the statute-books of New Hampshire at present, inasmuch as the law was declared unconstitutional a few years ago but the Constitution was amended in 1903 to avoid objection. Since that date, however, no legislation has been enacted.

New Jersey.

Chapter 210 of the Laws of 1894 contains the provisions relative to inheritance taxes. Section 13 reads as follows:

"Sec. 13. *And be it enacted,* That in order to fix the value of property of persons whose estates shall be subject to the payment of said tax, the surrogate or register of the prerogative court, on the application of any interested party, or upon his own motion, shall appoint some competent person as appraiser as often as, and whenever occasion may require, whose duty it shall be forthwith to give such notice by mail, and to such persons as the surrogate or register of the prerogative court may by order direct, of the time and place he will appraise such property, and at such time and place to appraise the same at its fair market value, and make a report thereof in writing to said surrogate or register of the prerogative court, together with such other facts in relation thereto as said surrogate or register of the prerogative court may by order require, to be filed in the office of such surrogate or register of the prerogative court, and from this report the said surrogate or register of the prerogative court shall forthwith assess and fix the then cash value of all estates, annuities and life estates, or term of years growing out of said estates, and the tax to which the same is liable, and shall immediately give notice thereof by mail to the state comptroller and to all parties known to be interested therein; any person or persons dissatisfied with said appraisement or assessment may appeal therefrom to the ordinary or orphans' court of the proper county, within sixty days after the making and filing of such assessment, on paying or giving security, approved by the ordinary or orphans' court, to pay all costs, together with whatever tax shall be fixed by said court; the said appraiser shall be paid by the state treasurer on the warrant of the comptroller, on the certificate of the ordinary or surrogate, duly filed with the comptroller, at the rate of three dollars per day for every day actually and necessarily employed in said appraisement, together with his actual and necessary traveling expenses."

The Commissioner of Banking and Insurance uses the Actuaries' Table of Mortality and the American Experience in the valuation of policies.

New Mexico.

There is no Collateral Inheritance or Transfer Tax Law in this State.

New York.

Article X of chapter 908, Laws of 1896, known as the Tax Law, and chapter XXIV of the General Laws, as amended, furnish the basis for levying inheritance taxes in New York. The particular section in which we are interested is as follows:

"The value of every future or limited estate, income, interest or annuity dependent upon any life or lives in being shall be determined by the rule, method and standard of mortality and value employed by the superintendent of insurance in ascertaining the value of policies of life insurance and annuities for the determination of liabilities of life insurance companies, except that the rate of interest for making such computation shall be five per centum per annum. In estimating the value of any estate or interest in property, to the beneficial enjoyment or possession whereof there are persons or corporations presently entitled thereto, no allowance shall be made in respect of any contingent incumbrance thereon, nor in respect of any contingency upon the happening of which the estate or property or some part thereof or interest therein might be abridged, defeated or diminished."

The laws pertaining to the mortality standards which the Superintendent of Insurance may use in that State are very vague, and as an actual fact the Superintendent employs a number of standards in his various valuations. An examination of the certificates which he has issued, shows conclusively that he employs the American Experience Table of Mortality with 5 per cent. interest.

North Carolina.

The Inheritance Tax Law in this State is part of the Revenue and Machinery Acts. Schedule AA pertains particularly to inheritance tax matters and may be found on page 4 of the 1903 compilation of these Acts. Section 15 is as follows:

"Sec. 15. *Appraiser to be appointed by the Clerk, etc.*—It shall be the duty of the Clerk of the Court of the county in which letters testamentary or of administration are granted to appoint an appraiser, as often as, and whenever occasion may require, to fix the valuation of estates which are or shall be subject to inheritance tax, and it shall be the duty of said appraiser to make a fair and conscionable appraisement of such estates; and it shall further be the duty of such appraiser to assess and fix the cash value of all annuities and life estates growing out of said estates, upon which annuities and life estate the inheritance tax shall be immediately payable out of the estate at the rate of such valuation: *Provided,* that any person or persons not satisfied with said appraisement shall have the right to appeal within sixty days to the Court of the proper county on paying or giving security to pay all costs, together with whatever tax shall be fixed by said Court, and upon such appeal said Court shall have jurisdiction to determine all questions of valuation and of the liability of the appraised estate for such tax, subject to the right of appeal to the Supreme Court, as in other cases. The compensation of appraisers appointed under this act shall be at the rate of three dollars per day for each day necessarily employed in making the appraisement, together with such necessary traveling expenses as may be incurred, a statement of which shall be properly itemized and sworn to, subject to the final approval of the Auditor of State before payment is made by the Clerk of the Court."

This paragraph imposes upon appraisers the duty of determining the present values of life estates, but specifies no standards. It is stated, however, that the American Experience Table of Mortality is allowed to be introduced in the courts as evidence and is generally followed, and the legal rate of interest in the State is 6 per cent.

By an Act ratified March 2, 1905, the General

Assembly enacted "An Act to facilitate the calculation of the present worth of annuities." This attempts to give a table which will show the present worth or cash value of a life estate. It merely gives the present value of one dollar per annum for a various number of years from one to fifty. The method adopted in using this table is to ascertain the expectation of life of the life tenant and then to find the present value of one dollar per annum for that number of years. It is needless to say that this is entirely incorrect and leads to serious discrepancies.

North Dakota.

At the Eighth Session of the Legislative Assembly a bill for the assessment and collection of collateral succession or inheritance taxes was passed and approved March 10, 1903. Part of section 10 is of interest to us as referring to our subject:

"Sec. 10. *Life estate.*— Whenever any real estate of a decedent shall be subject to such tax, and there be a life estate or interest for a term of years given to a party other than named in the preceding section, and the remainder to a collateral heir or stranger to the blood, the court shall direct the interest of the life estate or term of years to be appraised at the actual market value thereof, and, upon the approval of such appraisement by the court, the party entitled to such life estate or term of years, shall within sixty days thereafter pay such tax, and in default thereof the court shall order such interest in said estate, or so much thereof as shall be necessary to pay such tax, to be sold. Upon the determination of such life estate or term of years, the same provision shall apply as to the ascertainment of the amount of the tax and the collection of the same on the real estate in remainder as in like cases is provided in the preceding section."

No standards of mortality or interest, however, are specified.

Ohio.

The "Russell Inheritance Tax Law," as it is known, was approved April 25, 1904. Section 9 is as follows:

"Sec. 9. The value of such property as may be subject to such tax shall be its actual market value as found by the court of probate; but the state, through the attorney-general, or the prosecuting attorney of the county when directed by the attorney-general, or any person interested in the succession to said property may apply to the court of probate having jurisdiction of the estate; and on such application the court shall appoint three disinterested persons, who, being first sworn, shall view and appraise such property at its actual market value for the purpose of said tax, and shall make return thereof to said court, which return may be accepted by said court in the same manner as the original inventory of such estate is accepted, and if so accepted it shall be binding upon the person by whom this tax is to be paid, and upon the state. The fees of the appraisers shall be fixed by the judge of probate and paid out of such tax by the auditor of state. In case of an annuity or life estate, the value thereof shall be determined by the so-called actuaries' combined experience tables and five per centum compound interest."

It will be seen from this that the Actuaries' Table of Mortality with 5 per cent. interest is the standard.

Oklahoma.

There is no Collateral Inheritance or Transfer Tax Law in this Territory.

Oregon.

By an act approved February 16, 1903, taxes were levied upon gifts, legacies, and inheritances. Section 22 is as follows:

"Sec. 22. *Immediate appraisal, when.*— Every inheritance, devise, bequest, legacy, or gift, upon which a tax is imposed under this title, shall be appraised at its full and true value immediately upon the death of the decedent, or as soon thereafter as may be practicable: *Provided, however,* that when such devise, bequest, legacy, or gift shall be of such a nature that its full and true value cannot be ascertained at such time, it shall be appraised in like manner at the time when such value first becomes ascertainable. The value of every future or contingent or limited estate, income, interest, or annuity dependent upon any life or lives in being shall be determined by the rules or standard of mortality, and of value commonly used by actuaries' combined experience tables, except that the rates of interest on computing the present value of all future and contingent interests or estates shall be four per centum per annum interest."

It will be seen from this that the Combined Experience Table of Mortality with 4 per cent. interest is the standard.

PENNSYLVANIA.

By an act approved May 6, 1887, the Senate and House of Representatives enacted the inheritance tax laws of the State of Pennsylvania. The following sections are to be noted:

"Sec. 3. In all cases where there has been or shall be a devise, descent or bequest to collateral relatives or strangers, liable to the collateral inheritance tax, to take effect in possession, or come into actual enjoyment after the expiration of one or more life estates, or a period of years, the tax on such estate shall not be payable, nor interest begin to run thereon, until the person or persons liable for the same shall come into actual possession of such estate, by the termination of the estates for life or years, and the tax shall be assessed upon the value of the estate at the time the right of possession accrues to the owner as aforesaid: *Provided*, That the owner shall have the right to pay the tax at any time prior to his coming into possession, and in such cases, the tax shall be assessed on the value of the estate at the time of the payment of the tax, after deducting the value of the life estate or estates for years: *And provided further,* That the tax on real estate shall remain a lien on the real estate on which the same is chargeable until paid. And the owner of any personal estate shall make a full return of the same to the register of wills of the proper county within one year from the death of the decedent, and within that time enter into security for the payment of the tax to the satisfaction of such register; and in case of failure so to do, the tax shall be immediately payable and collectible."

"Sec. 12. It shall be the duty of the register of wills of the county in which letters testamentary, or of administration, are granted, to appoint an appraiser as often as, and whenever occasion may require, to fix the valuation of estates which are, or shall be, subject to collateral inheritance tax, and it shall be the duty of such appraiser to make a fair and conscionable appraisement of such estates, and it shall further be the duty of such appraiser to assess and fix the cash value of all annuities and life estates growing out of said estates, upon which annuities and life estates the collateral inheritance tax shall be immediately payable out of the estate at the rate of such valuation: *Provided,* That any person or persons not satisfied with said appraisement shall have the right to appeal, within thirty days, to the orphans' court of the proper county or city, on paying, or giving security to pay, all costs, together with whatever tax shall be fixed by said court, and upon such appeal said court shall have jurisdiction to determine all questions of valuation, and of the liability of the appraised estate for such tax, subject to the right of appeal to the supreme court as in other cases."

No provision exists here for the table of mortality or rate of interest which is to be used. A communication from the Auditor-General of the

Commonwealth, however, states that the Register of Wills is the authorized agent of the Commonwealth for the collection of collateral inheritance taxes, and while the laws do not designate any particular table of mortality, the Carlisle has been generally accepted as the basis for determining the value of life estates, annuities, etc. The legal rate in the Commonwealth is 6 per cent., although, because it has been more convenient, owing to the existence of some previously prepared table, the 5 per cent, basis has been used in some counties.

Rhode Island.

There is no Collateral Inheritance or Transfer Tax Law in this State.

South Carolina.

There is no Collateral Inheritance or Transfer Tax Law in this State.

South Dakota.

There is no Collateral Inheritance or Transfer Tax Law in this State.

Tennessee.

The provisions relative to inheritance taxes in this State may be found on page 150 of the 1903 Digest of the Tennessee Tax Laws, being chapter 174 of the Acts of 1893. Section 12 is as follows:

" Sec. 12. *Be it further enacted,* That it shall be the duty of the Clerk of the County Court in which letters testamentary or of administration are granted to appoint an appraiser, as often as and whenever occasion may require, to fix the valuation of estates which are or shall be subject to collateral inheritance tax; and it shall be the duty of such appraiser to make a fair conscionable appraisement of such estates, and it shall further be the duty of such appraiser to assess and fix the cash value of all annuities and life estates growing out of said estates, upon which annuities and life estates the collateral inheritance tax shall be immediately payable, out of the estate, at the rate of such valuation, but shall bear no interest till the lapse of twelve months from the death of the decedent; and in fixing the value of such annuities and life estate the computation shall be made by the Carlisle Life Table, whenever the use of life tables is necessary or applicable."

This is peculiar, inasmuch as it specifies the table of mortality, but provides no rate of interest. The Comptroller of the State, however, advises that the legal rate of interest and the one used in all calculations in the State of Tennessee, is 6 per cent.

TEXAS.

There is no Collateral Inheritance or Transfer Tax Law in this State.

UTAH.

The Inheritance Tax Law of this State will be found on page 61 of the Session Laws of 1901, and sections 1 and 11 are amended on page 77 of the Laws of Utah of 1903. No provision is made for either a table of mortality or rate of interest, and the Secretary of State advises that these questions have not yet been determined by the courts of the State.

VERMONT.

By an act approved November 24, 1896 (No. 46), taxes were imposed upon collateral inheritances. Section 8 reads as follows:

"Sec. 8. The value of such property as may be subject to said tax shall be its actual market value as found by the judge of probate; but the commissioner of state taxes, in person may, or the state's attorney of the county where the estate is being settled when by the commissioner directed shall, or any person interested in the succession to said property, may apply to the judge of probate having jurisdiction of the estate, and on such application the judge shall appoint three disinterested persons, who, being first sworn, shall view and appraise such property at its actual market value for the purposes of said tax, and shall make return thereof to said Probate Court, which return may be accepted by said court in the same manner as the original inventory of such estate is accepted, and if so accepted it shall be binding upon the person by whom this tax is to be paid, and upon the State. And the fees of the appraisers shall be fixed by the judge of probate and paid by the executor, administrator or trustee. In case of an annuity or life estate the value thereof shall be determined by the so called actuaries' combined experience tables and five per cent. compound interest."

The Combined Experience Table of Mortality with 5 per cent. interest is, therefore, the standard in this State.

VIRGINIA.

The Collateral Inheritance Tax Law in Virginia was approved April 16, 1903. It is exceedingly primitive and contains no specification as to the table of mortality or rate of interest which is to be used. In response to an inquiry, however, the Secretary of the Commonwealth advises that the Carlisle Table with interest at 6 per cent. is recognized as the legal basis in Virginia.

WASHINGTON.

Chapter IV, approved March 6, 1901, contains the provisions relative to the taxation of inheritances. A portion of section 8 is applicable to our purposes:

"Sec. 8. Whenever any real estate of a decedent shall be subject to such tax, and there be a life estate or interest for a term of years given to a party other than the father, mother, husband, wife, lineal descendant, adopted child, or lineal descendant of such child, and the remainder to a collateral heir or stranger to the blood, the court shall direct the interest of the life estate or term of years to be appraised at the actual value thereof according to the rules or standards of mortality and of value commonly used in actuaries' combined experience tables. The State Treasurer is directed to obtain and publish for the use of the courts and appraisers throughout the state, tables showing the average expectancy of life, and the value of annuities or life and term estates, and the present worth or value of remainders and reversions. The taxable value of life or term, deferred or future estates, shall be computed at the rate of four per cent. per annum interest."

The Combined Experience Table of Mortality, therefore, with 4 per cent. interest, is the standard in this State.

West Virginia.

Chapter 6, enacted by the Legislature of this State at its Extraordinary Session commencing July 26, 1904, provides for the levying and collection of collateral inheritance taxes. This act went into effect at the expiration of ninety days from its passage, August 8, 1904. Section 5 is as follows:

"Sec. 5. Whenever the transfer of any property shall be subject to tax hereunder and only a life estate, or an interest for a term of years, or a contingent interest to be transferred to one person and the remainder or reversionary interest to another, the state tax commissioner on the application of any person in interest, or upon his own motion, may, after due notice to the persons interested, apportion such taxes among such persons and assess to each of them his proper share of such taxes, and shall make his certificates accordingly, which shall be forwarded and disposed of in the same manner as other certificates by him herein provided for. The portion of any such taxes apportioned to any person entitled in remainder or reversion shall be payable at once, and such person shall be required to pay them in the same manner, and within the same time, as if his interest had vested in possession."

This, it will be seen, specifies no table of mortality or rate of interest, and the Auditor of State advises that the courts have never passed upon the question, and no basis has, therefore, legally been established.

WISCONSIN.

The provisions relating to inheritance taxes in this State may be found in chapter 44 of the Laws of 1903. The Commissioner of Insurance is charged with the calculation of future estates, as follows:

"**Transfer where tax imposed.** (2) Whenever a transfer of property is made upon which there is, or in any contingency there may be, a tax imposed, such property shall be appraised at its clear market value immediately upon the transfer or as soon thereafter as practicable. The value of every future or limited estate, income, interest or annuity dependent upon any life or lives in being, shall be determined by the rule, method and standard of mortality and value employed by the commissioner of insurance in ascertaining the value of policies of life insurance and annuities for the determination of liabilities of life insurance companies except that the rate of interest for making such computation shall be five per centum per annum."

The standard of mortality in this State being the American Experience, it follows that that is the one used by the Commissioner of Insurance in inheritance tax calculations, with interest at the rate of 5 per cent. per annum.

WYOMING.

A bill for taxing gifts, legacies, and inheritances in this State was introduced January 30, 1903, passed and approved February 21, 1903. Section 11 is as follows:

"Sec. 11. In order to fix the value of property of persons whose estate shall be subject to the payment of said tax, the district judge, on the application of any persons interested in the estate, including the state, or upon his own motion, shall appoint some competent person as appraiser as often as, or whenever occasion may require, whose duty it shall be forthwith to give notice by mail to all persons known to have or claim an interest in such property, and to such persons as the district judge may by order direct, of the time and place at which he will appraise such property, and at such time and place to appraise the same at a fair market value, and for that purpose the appraiser is authorized by leave of the district judge to use subpœnas for and to compel the attendance of witnesses before him, and to take evidence of such witnesses under oath concerning such property and the value thereof, and he shall make a report thereof and of such value in writing to the district court with the depositions of the witnesses examined and such other facts in relation thereto as the district court may by order require to be filed in the office of the clerk of said district court, and from this report the said district court shall forthwith make an order and fix the then cash value of all estate, annuities and life estates or terms of years growing out of said estate, and the tax to which the same is liable, and shall immediately give notice by mail to all parties known to be interested therein. Any person or persons dissatisfied with the appraisement or assessment may appeal therefrom to the district court of the proper county within sixty days after the making and filing of such appraisement or assessment, on giving good and sufficient security to the satisfaction of the district judge to pay all costs together with whatever taxes that shall be fixed by the district court. The said appraiser shall be paid by the county treasurer out of any funds he may have in his hands on account of said tax, on the certificate of the district judge at the rate of three dollars per day for every day actually and necessarily employed in said appraisement together with his actual and necessary traveling expenses, and the witnesses subpœnaed by said appraiser shall be paid such fees as now provided by law."

The act specifies no table of mortality or rate of interest.

KEY TO NOTATION.

a_x = the present value of an annuity, payable during the life of a person now aged x, the first payment to be made one year from date. This symbol is also used to indicate the present value of the interest of a life tenant now aged x in an estate.

a_{xy} = the present value of an annuity, payable during the joint existence of two individuals now aged x and y respectively, the first payment to be made one year from date. This symbol is also used to indicate the present value of the interest which two beneficiaries have in an estate, the income of which is payable to them during their joint existence.

a_{xyz} = the present value of an annuity, payable during the joint existence of three individuals now aged x, y and z respectively, the first payment to be made one year from date. This symbol is also used to indicate the present value of the interest of three individuals in an estate, the income of which is payable during their joint existence.

$\overset{\circ}{a}$ = the present value of a complete annuity, i. e., one payable but once each year, but in the event of the death of the annuitant a proportionate payment is made to his estate for the period elapsing between the last periodic payment and the date of death.

$a_x^{(2)}$ = the present value of a_x when the payments are made in semi-annual installments instead of annually.

l_x = number living at any age x.

d_x = number dying at any age x.

i = the effective rate of interest, i. e., the interest on a unit of money actually realized in a year.

$1+i$ = the amount of one unit of money at i rate of interest at the end of one year.

$v=\frac{1}{1+i}$ = the present value of one unit of money discounted for one year at i rate of interest.

$\left.\begin{matrix}\mathbf{D}\\ \mathbf{N}\end{matrix}\right\}$ For the explanation of these two symbols see Chapter IV.

$\left.\begin{matrix}\mathbf{C}\\ \mathbf{M}\end{matrix}\right\}$ For the explanation of these two symbols see Chapter VII.

$\mathbf{A}_x$ = the present value of an insurance, payable at the end of the year in which the death of an individual now aged x occurs. This symbol is also used to represent the present value of the remainder which will vest upon the death of a life tenant now aged x.

$\mathbf{A}_{xy}$ = the present value of an insurance, payable at the end of the year in which the first death occurs among two designated individuals now aged x and y respectively. This symbol is also used to designate the present value of the remainder which vests at the first death among two designated individuals now aged x and y.

μ_x = the force of mortality = "the proportion of persons at age x who would die in a year if the intensity of mortality remained constant for a year and if the number of persons under observation also remained constant, the places of those who die being constantly occupied by fresh lives."

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