LIFE TABLES, &c.

BY

T. R. EDMONDS.

LIFE TABLES,

FOUNDED UPON

THE DISCOVERY

OF

A NUMERICAL LAW

REGULATING THE

EXISTENCE OF EVERY HUMAN BEING:

ILLUSTRATED BY

A NEW THEORY

OF THE

CAUSES PRODUCING HEALTH AND LONGEVITY.

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GENERAL OBSERVATIONS.

CHAPTER I.

The foundation of the science of Life Measurement rests upon the observed relation of Dying to Living, in given intervals of age. In constructing a Table of Mortality, the ordinary problem for solution is,—given, this relation for large intervals of age; required, to deduce and interpolate the relation of Dying to Living, corresponding to small intervals of age. In all Tables which have hitherto been published, this relation for annual intervals is continually varying. Now it is manifest, that the same principles which have led to the conclusion, that the variation is continued and *annual*, must lead to the conclusion, that the variation is monthly, and also to the conclusion, that the variation is diurnal, and even *momental*. It may be assumed, therefore, that all Tables of Mortality represent the relation of Dying to Living as changing continuously,—that this relation is never the same for any two successive instants of age. I have used the term "*force of mortality*," to denote this relation at any definite moment of age. It would evidently be improper to use this term to express the relation of Dying to Living in yearly intervals of age; for the force of mortality at the beginning, at the middle, and at the end of any year of age, are all different.

During the succession of years and moments, measured from the birth of any individual, the continuous change in the force of mortality is subject to a very simple law, being that of geometric proportion. But the same geometric progression is not observed from birth to the end of life. Instead of one, there are *three* distinct orders of progression, corresponding to three remarkable periods of animal life. The force of mortality at all ages is expressible,—by the terms of three consecutive geometric series, so connected, that the last term of one series is the first of the succeeding series;—or by the ordinates of three contiguous segments of three logarithmic curves. The common ratios of the three geometric series (or the constants of the curves) appear to be

fixed and immutable, for all human life in all ages of the world. These three constants, now first discovered, correspond to the three grand divisions of life,—Infancy, Manhood (or Florescence), and Old Age. For regulating the continuous change in the force of mortality, Nature uses one constant for *Infancy*, another for *Manhood*, and a third for *Old Age*. The constant of Infancy confirms life, or indicates a continued diminution of the force of mortality; the constants of Manhood and Old Age indicate decay of life, or a continued increase in the force of mortality; but the decay of life is much more rapid in the period of Old Age than in the period of Manhood. Calling the three constants p_1, p_2, p_3, the following are their numerical values, which indicate the rate of increase or decrease of the force of mortality, in a given time, assumed to be one year.

	In Numbers.	In Logarithms.	Period over which Constant presides.
p_1	·6760830	— ·1700	Infancy (from birth to 8 years of age).
p_2	1·0299117	+ ·0128	Manhood (from 12 to 55 years of age).
p_3	1·0796923	+ ·0333	Old Age (from 55 to end of life).

The above constants of Manhood and Old Age are to be regarded as much nearer approximations to the truth than the constant of Infancy, by reason of the comparative shortness of the period of Infancy, in conjunction with the imperfections of all records of mortality. The existence of the above three remarkable periods of human mortality was long ago pointed out by Dr. Price; but he does not appear to have imagined that the marked distinction was expressible in numbers. There may exist a very small fourth period, between Infancy and Manhood, where the force of mortality is stationary and at its minimum. My assumption of the existence of this period, whether true or false, can be of little or no practical consequence.

If Nature had immovably fixed the limits of the three periods of Infancy, Manhood, and Old Age, the theory would be complete and simple. Such, however, is not the case, either in different populations, or in the same population at different times. An attentive examination has impressed on my mind the belief, that the durations of the Infancy and Manhood periods simultaneously increase or decrease. The defective existing materials may serve to establish this fact, although they do not lead to the knowledge of the precise change in Manhood due to

a given change in Infancy. I am inclined to the opinion, that an increase of one year in the duration of Infancy demands, under ordinary circumstances, an increase of *seven* years in the duration of Manhood; under extraordinary circumstances, I believe that the diminution of either stage may be accompanied by the prolongation of the other. In all the best Tables, the limit of the Infancy period appears to be at the age of *nine* years, within half a year more or less; and the limit of the period of Manhood at the age of *fifty-five*, within seven years, more or less.

The knowledge of the cause producing this change in the position of the limits is manifestly of very great importance, in the prediction of future mortality from the past. This cause is identical with that which hastens or retards the maturity of any animal: the simultaneous diminution of the stages of Infancy and Manhood is nothing more than the shortening of the circuit from birth to death. The cause, or the antecedents to change in the limits, will be found, most probably, to consist of variations in food, in labour, or in lodging (temperature). An abundant and nutritious diet, with continued repose in a pleasing temperature, contracts the stages of Infancy and Manhood; whilst scanty and coarse food, or hard labour, or great exposure to cold or heat, increase the length of the two stages, by increasing the difficulties of travelling. The proposition may be better expressed thus;—*Saturation* accelerates, and *Privation* retards, Maturescence.

This opinion is supported by the observations on Human Mortality, hitherto recorded, or appears to be so. But this support is, for the most part, indirect; for the larger portion of these observations have been made on general populations, or the representatives of various degrees of *Privation*. These shew the limits of the stages of Infancy and Manhood to recede as privation diminishes. The only valuable and satisfactory observations on the representatives of *Saturation* are those of Deparcieux, on a great extent of French monks and nuns; and they all confirm the theory, by the exhibition of the earliest known advent of the period of Old Age (at forty-eight years). If the period of Infancy had been observed, the corresponding limit would probably have been found very near seven and a half or eight years of age. The unsatisfactory observations made on English and on French Government Annuitants lend their support (whatever it may be worth) to the theory.

In the Table of Mean Mortality for England, I have assumed the termination of the Infancy stage to be at the age of *eight* years, and the termination of the period of Manhood to be at the age of *fifty-five*.

In the selection of these limits, I have been influenced more by authorities established in popular estimation than by my individual opinion. The termination of the Infancy stage being a matter of little practical importance, I have trusted to the guidance of my theory alone in the fixing upon the age of *eight* years. I have an additional support for selecting so early an age, in the commonly entertained opinion, that the mortality of English infants has been diminished more than that of the rest of the population. Such diminution can be accounted for only by the retrocession of the limit of Infancy. The mortality of infants is a matter of very little moment to any European population, with respect either to money or to population. The number of infants is not more than half so great as it might be; and the existing supply is not regulated in the slightest degree by any imagined future relation of food to surviving adults.

The termination of the Manhood period is a point of considerable practical importance; and I could not select an earlier age than *fifty-five*, without abandoning the support of all Tables of value in the public estimation. In the Northampton Table, this period terminates at sixty-two; in the Carlisle Observations, at fifty-seven years of age. My disinclination to adopt the age of fifty-five has been diminished by the expectation, that, in an improved state of society, this limit will be again attained, and even exceeded. Hitherto, the stages of Infancy and Manhood have never been increased, except in connexion with an increase of mortality. Presently, I intend to shew how these stages may be increased, and the mortality at the same time be diminished. The hopes of indefinite prolongation of the term of human life have now ceased to be visionary. The limiting age of Manhood is variable for different classes of the population. In England, I would place it, for a city population, at fifty-five; for the general population, at fifty-two; and for the monied population, at forty-nine years of age. Those who have belonged to the monied class for some generations, and those who have recently entered it from the labouring class, will probably have different limits of the Life stages.

The following are the limits of the three periods in the five accompanying Tables of Mortality. In the two Tables of Mean and City Mortality, the Infancy period terminates at eight years of age; and the Manhood period commences at twelve and terminates at fifty-five, where the Old Age period commences. In the Carlisle, or Village Table, these limits are nine, ten, and fifty-five. In the corrected Northampton and Stockholm Tables, they are nine, twelve, and sixty-two. In all

these Tables the force of mortality is made stationary for the short period between Infancy and Manhood: but, in the Village Table, the force immediately after ten differs slightly from the stationary force immediately before. The difference is accidental, the two portions of the Table, before and after the age of ten, having been constructed independently of each other.

In forming a Table of Mortality, the essential point to be sought for and ascertained is, the minimum rate of mortality, and the portion of age to which it is applied. When this is known, the force at every other age may be found by the help of the three constants: and knowing the force of mortality, the numbers remaining alive at yearly intervals may be deduced, which is the Table of Mortality required. A slight degree of uncertainty would remain as to the exact time at which the Old Age period commences; because the increase in the duration of Manhood, due to a given increase in the duration of Infancy, is not yet precisely ascertained. As the basis of my chief Table, I have selected a minimum rate of one death in a year out of *one hundred and sixty* living. This number coincides very nearly with the minimum rate of the Swedish population for fifty years, with the minimum rate of the Glasgow population, and with the minimum rate of French monks and nuns, for a very long space of time. Moreover, this base gives a gross mortality between the ages of twenty and fifty, little differing from that reported to have existed upon a great extent of English and French Government Annuitants. The following are the minimum rates in the five Tables:—Village, ·005; Mean, ·00636431; City, ·00795539; Northampton, ·009; Stockholm, ·0127286. (These numbers representing the quantity of death in one year from a unit of life.) The annual rates at birth in the same five Tables are, ·1612228, ·1457979, ·1822474, ·3049598, ·4313017.

I have assumed the Carlisle Table to represent Village Mortality, because it is a truth universally admitted, that the mortality in villages is (in general) less than in towns, or in the country at large; and because the Carlisle Observations express the lowest mortality ever recorded and detailed with accuracy. The Carlisle Observations of Dr. Heysham are not to be regarded as offering any novelty, for they express no general fact which was not expressed long before their existence. Every modern writer on the subject has admitted the existence of a *partial* rate of mortality even lower than that stated to have once existed in the town of Carlisle; but Mr. Milne is the first and

only well-qualified person who has ventured to recommend such a low rate as a national standard.

That the Carlisle Table was ever a good measure of the mortality of the English population in general, no sufficient proof has been, or can be, adduced. And the establishment of such a fact would be of no value, until a chain of connexion has been drawn between the past and future, which has not been hitherto attempted. If the Carlisle rate has been the general rate, the suddenness of change is inconsistent with permanency. Under the ordinary fluctuations of given circumstances, any temporary *decrease* in the rate of mortality is invariably followed by a temporary *increase*. If the circumstances of the English population have been permanently changed for the better, the average rate of mortality may not experience any considerable change. In a population not subject to any high degree of privation, ordinary improvements in food and labour may have no other effect than to diminish the fluctuations from the average rate of mortality, which remains constant, and approaches very near to that prevailing among those who have belonged to the monied or saturated class for two or three generations. It is by no means improbable, that a high degree of saturation, and a high degree of privation, should be attended with the same minimum rate of mortality. The most favourable state of life is that exposed to alternations (within certain limits) of privation and saturation. A high degree of privation, acting for some generations, purifies a population of its weaker and less valuable members, and leaves only those who possess the seeds of the best and strongest constitutions of body and mind. When this pressure of privation is diminished, the health and strength of succeeding generations will be proportional to the privations previously undergone. After the pressure has diminished to a certain point, and become stationary, the average soundness of the population will be continually diminishing (by the accession of lives which could not have existed under the previous higher pressure) until the attainment of that lower degree of health, which balances the lower degree of privation. The average rate of mortality under the high and under the lower pressure may be the same. But a very low degree of mortality will certainly prevail over a population in its passage from the former to the latter state. It may be useful, as well as interesting, here to remark, that the chronological scale adopted by Herodotus is perfectly applicable to Europeans of modern times. In every hundred years three generations pass away. The space of time intervening

between the birth of any existing individual and the birth of his great-grandfather rarely differs in any significant degree from one hundred years.

The Table of City Mortality expresses what I have been induced to believe is the measure of the mortality existing in the largest English towns or cities. The worst kind of life, or the severest mortality, is to be looked for in the poorest class of a city population, and in the highest class of the monied, or non-labouring portion of the community; the former representing the extreme of privation, and the latter the extreme of saturation. It is not improbable that one Table may represent, with correctness sufficient for any practical purpose, the mortality of each of two classes, so widely differing in their circumstances. The chief objection to the making of one Table serve two such different purposes, arises from the error made in assuming that the periods of Infancy and Manhood are not shorter in the well-fed than in the ill-fed portion of a community. The City Table represents the greatest rate of mortality ever shewn to exist in any class of monied life. Since the above remarks were committed to the press, I have arrived at the knowledge of the important confirmatory fact, that this Table is a correct representation of the law of mortality to which the English Peerage are subject.

It may be alleged, in objection to the use of the new Table of Mean Mortality, that it neither is, nor professes to be, the representation of any fact ever having had a specific existence in time, place, and population; but this would be no ground for esteeming it of inferior value, compared with either the Northampton or the Carlisle Table. Admitting the Carlisle and Northampton Observations to be perfect, they cannot be of any considerable value, except in combination with other observations, differing in time, place, and people. In all classes of a population, the mortality is continually varying. Observations of the past lead to no useful result, until a chain of connexion is established between the present, past, and future. To generalise from a single fact is absurd; and it is an absurdity of this kind into which those people fall, who would apply observations made on one kind of life to all kinds of life. It is perfectly irrational to apply the Northampton or Carlisle Mortality to the present monied class of England, without any regard to the utter dissimilarity of the circumstances. One combination of circumstances may yield the same result as a different combination, but it ought never to be assumed that it would do so.

The two Tables of Northampton and Carlisle have been presented to

the British Public by their respective authors as measures of *monied* as well as of *general* life. But neither Dr. Price, the promulgator of the former Table, nor Mr. Milne, appear to have bestowed much of their attention on the justness of the assumption, that a Table good for labourers must also be good for people who do not labour. They might easily have observed this remarkable distinction,—that the mortality of the labouring class was subject to very great fluctuations, whilst the mortality of the monied class was almost invariable. They would have found it easy to cite numerous instances of *general* mortality as high as one (annual) death in twenty, and as low as one death in sixty; but they would have found it extremely difficult to cite an instance of *monied* mortality differing, in any sensible degree, from one in forty. The monied class are continually receiving recruits from the labouring class. Fluctuations in the mortality of the monied class are probably chiefly dependent on variations from the average recruited.

In the monied class, between the ages of twenty and fifty, there is little ground for believing that the mortality was ever so high as that exhibited in the Northampton Table, or so low as that exhibited in the Carlisle Table. But there is some ground for believing that both the Northampton and Carlisle are true expressions of rates of general mortality existing in England at different times. In this respect, the evidence in favour of the Northampton Table is quite as strong as any which has yet been adduced for the Carlisle Table. The partisans of the latter Table appear to have attached undue weight to the superior accuracy of the narrow extent of observations on which it is founded. For any useful practical purpose, there is no reason for believing the Northampton Table to be a less valuable record than the Carlisle Table; the slight inaccuracy of adjustment of mortality to each age, in the former Table, would be of no sensible value in practice. It is extremely doubtful whether the principle of construction of the Carlisle Table is at all preferable in practice to that on which the Northampton Table is founded, when it is desired to obtain the rate of mortality prevailing over an extensive district. If the errors in the returns are suspected to be of considerable magnitude, the latter principle is most to be recommended. The former principle is decidedly the best for indicating the *relative* mortality at different ages. The *truth* of the Northampton Table is not lightly to be called in question, when it is supported by the name of Dr. Price, although its *applicability* to the British population of the present day may fairly be questioned. In confirmation of its truth, I have to remark, that it nearly accords with the newly-discovered

law of human mortality. In favour of its applicability, I would observe, that the rate of mortality among English soldiers at home agrees exactly with the Northampton rate for a population between the ages of twenty and fifty. This fact rests upon materials of the most perfect character, whilst the materials used by Mr. Milne, to prove the applicability of the Carlisle Table, are of the most doubtful character. The acknowledged inaccuracy of the national returns of Living and Dying is so great, that no safe conclusion can be drawn from them. To those who attach weight to such returns, I would observe, that the same reported facts, which establish the applicability of the Carlisle rate to the English population, also prove, that my new Table of Mean Mortality is a measure of the mortality of the English population in general. The proportion of deaths in infancy is considerably greater, according to the Carlisle Table, than according to my Table of Mean Mortality.

It is not improbable that the partial adoption of the Carlisle Table, as a measure of *monied* life, rests entirely upon the assumption, that the class of Life Insurers is a fair sample of the monied class in general. The correctness of this assumption may well be doubted. In every Life Society the rate of mortality greatly depends upon the management. The consequence of ignorance or carelessness in the management is a mortality greater than the average, whilst a combination of illiberality and intelligence will be attended with a mortality less than the average of the class from which the insured are taken. Moreover, there are reasons for believing, that the class of people who are inclined to insure their lives are the best portion of the monied class. The great body of insurers consist of money-making men, of men who are improving, or have improved, their fortunes: and I believe it generally holds true, that the most industrious, money-getting men are of "lower" birth, and, consequently, of better constitutions than the average of the monied class.

The new Table of Mean Mortality is the result of an extensive comparison of the best observations, in combination with the newly discovered Theory of mortality. Without the aid of this Theory, which shews the connexion existing between the mortality at one age with that at every other age, the comparison would have been of low value. So much depending on the soundness of the Theory, I shall proceed to make some remarks, by which the public may determine the degree of confidence it may be entitled to. In the first place, I would state, generally, that the Theory is best supported by the Tables which have been always acknowledged as founded on the most complete materials;

viz. the observations made on the populations at Carlisle, in Sweden at different times, in French convents at different times, and in Glasgow (by Dr. Cleland). The Tables, founded on insufficient materials, or of questionable authority, most frequently support, and very seldom oppose, the Theory. I know but one Table (which is of this latter kind) which really and manifestly opposes the new Theory; but this only at a particular portion of age, about twenty-five years in duration. It is that lately published of the mortality of English Government Annuitants. The value of this Table depends, in a great measure, on the truth of the assumption, that "*selection*" produces no sensible effect; in other words, that there exist no means of distinguishing a good life from a bad one. My opinion is entirely opposed to such a position; at the same time, I think that the Theory would be found applicable to any class of select life, provided that the selection were made for all, at one and the same age. But when the admissions take place at all ages, and at various times, as is the case with Government Annuitants, no useful result is to be expected from a comparison in the gross of the number living and dying in any interval of age, without any regard to the time each individual has belonged to the society. The point on which the Government Table opposes my theory, as well as that of every other person, consists in declaring that, from the age of twenty to forty-five, the force of mortality does not increase with the age; it even goes so far as to shew, that a man's chance of living one year increases in that period. A Table of mortality of French Annuitants presents an appearance of the same anomaly, though less in degree; but contemporaneous observations on French monks and nuns were in perfect accordance with the Theory. Possibly, the cause of this anomaly may be found in the falsification of ages, the above period being that in which people are most tempted to represent themselves as younger than they really are.

The reported mortality of French and of English Annuitants is not entitled to much confidence; for the former is founded on materials avowedly defective, and the latter rests upon the authority of a person whose qualifications for the task undertaken are unknown to the public. In opposition to these questionable statements, it happens very fortunately that I am able to adduce very strong additional evidence in favour of the applicability of the new Theory. In the East Indies, below the age of forty-five, among the civil and military European servants of the government, the mortality increases with the age, according to the same law as in European populations resident at home. I state this fact as the result of very extensive and accurate observa-

tions, derived, in a great measure, from official sources. A most extraordinary coincidence with the Theory is to be found in the mortality of the English officers employed in the Peninsular war. Fatigue and battle, strange as it may appear, did not disturb the operation of the law. The campaign increased seven-fold the previous mortality, but left the new pressure (apparently so anomalous) adjusted to the age, in the same manner as the natural pressure had been. The public is left to decide, whether these facts are not sufficient to neutralise, at least, the effect of Government returns and calculations, so far as they lead to the belief that the mortality between the ages of twenty and forty-five years, among the English middling class, does not increase as the age increases.

Even if the mortality of Government Annuitants should prove to be correctly reported, and be independent of the effect of selection, I do not apprehend that the stability of the new Theory of mortality will be at all endangered thereby. The Theory is applicable only, when the individuals compared differ in age, but resemble each other in all other circumstances. In the labouring class, and in the middling class, there is no remarkable change of circumstances depending on age, and, consequently, to these two classes the Theory is always applicable. But in the wealthiest class there is a most sudden and violent change made about the age of twenty; and it is this class which supplies, in all probability, the young life annuitants. Under the present system, the wealthiest class are subjected to very great restraint for the five or six years immediately succeeding the age of puberty. About the age of twenty they are emancipated, when they indulge themselves with an intemperance proportional to the previous abstinence. The youth of both sexes, between the ages of twenty and thirty, are acting under the influence of false notions of pleasure, acquired in a state of compulsory abstinence. Possibly, the continuance of habits of intemperance in the youthful rich is mainly to be attributed to the passion for distinction. The appendages of wealth are of no intrinsic value, and rich people prize them only as the means of dazzling the herd of mankind. About the age of forty, the rich appear to discover that they have been playing a very foolish game; and after that age, they do not (as slaves to fashion) sacrifice their health, in order to exhibit the length of their purse to their wondering poorer brethren.

There is a second point on which the universality of the new Theory is subject to dispute, though of little practical consequence. In very early infancy, or below the age of one year, the Theory in general

appears to fail; in some cases the error is great, in others insignificant. But the error is always on the same side; the Theory always gives a smaller proportion of deaths below one year of age than the observations. In most cases the difference is unimportant; in the Swedish observations alone is the difference very great. The extraordinary appearance presented by the Swedish Tables may be attributable to inaccuracies in the returns of ages, or to some peculiarity in the treatment of infants. If intervals of five years of age be taken, the Swedish agree with other observations in infancy, made under various circumstances on different populations. A given degree of inaccuracy in the return of ages, which produces no sensible disturbing effect above the age of ten years, may lead to very serious errors below that age, the error increasing as the age diminishes. At present, I think that there are no observations strong enough in accuracy to contend againt the apparent universality of the Theory. Future and improved accuracy of observation may demonstrate the inapplicability of the Theory below the age of *seven or eight weeks.*

CHAPTER II.

THE force of mortality at any age is measured by the number of deaths in a given time, out of a given number constantly living. The given time has been here assumed to be one year, and the given number living to be one person; consequently, the algebraic sign for the force of mortality represents—the quantity of death in one year for a unit of life at the assumed age; or rather (since the force is changing continually) represents—the quantity of death on a unit of life which would occur by the action of this force continued uniform for the space of one year.

The force of mortality is a simple function of the age, or time from birth, and is always of the form (αp^x) during each of the three periods of Infancy, Manhood, and Old Age; where (p) is the characteristic of the period, and represents the ratio of increase or decrease of force of mortality in one year; where (α) represents the force at some given age; and where (x) represents the time (in years and parts) between

that age and any other in the same period;—for the sake of simplicity, the given age may be assumed to coincide with that at which the period commences.

Let, now, (y) represent the number Living or Surviving at any time (x). The force of mortality at that time $= \alpha p^x =$ decrement in unit of time on unit of life; the finite decrement of (y) at that time $= y \times \alpha p^x$; and the true decrement, or the decrement in an infinitely small given time, $= y \alpha p^x dx$; that is, $-dy = y \alpha p^x dx$.

Using (l) to signify hyperbolic logarithm, and (e) to denote the base of that system, we obtain by integration $l\frac{g}{y} = \frac{\alpha}{lp} p^x$ and $\frac{g}{y} = e^{\frac{\alpha}{lp} p^x}$.

If it be assumed that $y = 1$ when $x = o$, then $g = e^{\frac{\alpha}{lp}}$ and the equation becomes $y = e^{\frac{\alpha}{lp}} \times e^{-\frac{\alpha}{lp} p^x}$ or $y = e^{\frac{\alpha}{lp}(1 - p^x)}$.

And calling the modulus of the common system (k), and using (λ) to signify common logarithm, the equation will finally become,—

$$y = 10^{\frac{k^2 \alpha}{\lambda p}(1 - p^x)}.$$

The above is the equation to the curve of Vitality, or rather is the form of the equation to each of the three segments of that curve. In each segment, the quantity (p) has its appropriate value. The first segment terminates near the age of nine years; the second near the age of fifty-five. There may exist a very small fourth segment near the age of ten, in which $p = 1$. The above formula will not serve to discover directly the number of survivors from *birth* at any age above nine years. Before it can be so applied, two constants must previously be deduced from it: first, the value of (y) at the end of the first segment, and then the value of (y) at the end of the second segment. These constants, being used as multipliers, will give the values of (y) at any age, corresponding to a given number born. These values of (y) at annual intervals constitute a Table of Mortality. From the general formula may easily be deduced an expression for the probability of living one year, at any age; by means of which, Tables of Mortality may be constructed with great rapidity and security from error.

The honour of first discovering that some connexion existed between Tables of Mortality and the algebraic expression (a^{b^x}) belongs to Mr. Gompertz: but, to arrive at this single common point, his course of investigation differs so widely from mine, that appearances will be found

corresponding to the reality,—that my discovery is independent of the imperfect one of Mr. Gompertz.

The new Theory is *universally* true. All valuable observations made in Europe concur in proving its truth; and recent extensive and accurate observations made on the Jamaica slave population, of African parentage, are in conformity with it. Whence the conclusion is warrantable,—that the new Theory is equally applicable to the lowest as well as to the highest grade of humanity, and to the inhabitants of tropical as well as of polar regions.

The *proof* of the new Theory is of the strongest possible nature, being *arithmetical.* By the help of the simplest rules of arithmetic, any person may satisfy himself of the truth of the new discovery: he has only to compare the numbers in the Tables which I have constructed on one common principle, with the numbers in the Tables of highest repute, formed on no principle whatever. He will find the numbers correspond so nearly, as to give results identical for long periods, and almost identical for short periods of time. In very few cases will he ever find the differences to be greater than such as would have occurred in Tables formed by different persons from the same materials.

The reader is requested to compare the Village Table with Mr. Milne's Table for Carlisle, at all ages above two months. The Table of Mean Mortality will be found to approach very near to the Swedish Table of Dr. Price. But the coincidence here is accidental, as this Cardinal Table was not intended to coincide with any existing one. The Tables for Northampton and Stockholm will be found agreeing nearly with those of Dr. Price: but with respect to these two Tables, the support derived from the agreement is reciprocated. In order to facilitate examination, I have collected and condensed the information contained in the chief Tables in repute. I have given the annual deaths in intervals of ten years of age for every hundred living. By a very simple inspection, it may be perceived whether the observations accord with the Theory. When the decennial rate between the ages of ten and fifty increases one-third every ten years, and when this rate, after the age of sixty, doubles every ten years, then are the observations in near conformity with the Theory. For the period of Infancy, a good indication of conformity with the Theory is, the proportion of three to two between the deaths of two successive years.

Positive arithmetical coincidence is not to be looked for; and if any such were adduced, it would tend rather to confute, than to confirm the Theory. The Theory informs us what are the *chances* of living or

of dying in a given time; but it does not tell us how many *must* die. According to the doctrine of chances, there exists a high degree of improbability that, in sixty throws with a six-sided die, an ace will be thrown *ten* times *exactly;* although this number expresses the true probability, and is more likely to happen than any other which can be mentioned. In six hundred throws, the times of throwing an ace will approach nearer the proportion of one-sixth than it would in sixty throws. Similarly, with regard to the new Theory of Mortality, as the number and extent of the observations increase, the nearer is the approach to the true measure of the probability of Dying or Living. But perfect coincidence is never to be expected even in nature, much less in erroneous records; and still less in Tables deduced, by the erring judgments of individuals, from such erroneous records.

In a work of the present nature, arithmetical accuracy is a quality of essential importance. In this respect, the accompanying Tables will bear comparison with any hitherto published: at the same time, they aim at a degree of precision never before attempted. These Tables prove by internal evidence their own accuracy. A very simple inspection will serve to detect the existence of an error, however insignificant. All preceding Tables are so anomalous, that irregularity is consistent with correctness; but in these Tables, a breach of uniformity is an indication of error. As a security against errors of the press, and as a check on errors in calculations founded on these Tables, this quality of uniformity is of no inconsiderable importance.

The original calculations have all been performed in duplicate; and two or three days have generally intervened between the similar steps in the parallel operations. The errors of all magnitudes detected in the process, amounted to one in every four thousand written figures. One half of these errors were so inconsiderable, that, if allowed to remain unrectified, they would not have affected the printed part of the results. They were either faults in arithmetic, in the taking out of logarithms, or in copying. The two former sources were the most prolific of error.

CHAPTER III.

The increase of a population has a great dependence upon the number of women at the child-bearing age, which may be assumed to extend from the age of twenty to the age of thirty-six years. In most countries, the proportion of such women is one-eighth of the total population. No sensible effect, I conceive, is produced by a woman's selecting a different period for the developement of her extreme prolific power. The best child-bearing period is that in which woman enjoys her maximum of strength and fertility. There is reason for believing that a woman does not yield more children because she may begin to bear before the age of twenty. That the strength of the children, as well as of the mother, will be deteriorated by early bearing, is almost certain. The fertility, or the chance of conception, probably decreases continually from the age of eighteen to forty-five. In different populations, the average extent of the child-bearing age may be expected to vary with the vitality. In a strong, healthy, and long-lived people, this period will certainly be longer than in a weak people. The period of sixteen years I have considered to be the average due to ordinary European circumstances. There is a deduction to be made on account of total or partial barrenness. The proportion of women totally barren has been estimated at one in forty: to this is to be added a similar and equal barrenness of the men; so that one-twentieth of the women are wholly unprolific. In the next place, an allowance more considerable is to be made for partial barrenness, or for the loss of fertility before the expiration of sixteen years. It would be difficult to make a good estimate of this quantity; probably a deduction of one-seventh on this account will be found not far from the truth. After making these two deductions, we arrive at this result;—that the proportion of the effective child-bearing women is *one-tenth* of the total population.

From extensive observations made by Dr. Granville on women of Lying-in Institutions, the proportion of births to prolific years appears subject to very little variation in all women. This proportion is *one birth every two years*, until a woman ceases to bear; the truth of which statement the experience of most people will confirm. If, then, the prolific power of any European population were fully exerted, every child-bearing woman would yield one birth every two years, and the

total child-bearing women would add annually one-half their own number to the population; that is, the extreme prolificness of any European population is represented by a number of annual births, equal to *one-twentieth* part of the total population.

Their extreme unchecked prolific power was probably never exerted by any population for any considerable period of time. A very insignificant portion of the earth's surface is so insalubrious, that the population may not be increased faster than their food was ever increased. It is even doubtful whether *absolute* insalubrity has any existence in any part of the world; for all observations hitherto made prove *relative* insalubrity only. In the island of Jamaica, for example, the mortality of Europeans is five times as great as that of Africans, which, again, is a little greater than that of Europeans at home. This does not prove the climate of Jamaica to be more unhealthy than that of Britain. We are only justified in concluding, that it is a very unhealthy climate for Europeans, and a probably unhealthy climate for Africans; but, without at all straining the bounds of probability, we may imagine the existence of an indigenous population, more healthy than the African immigrants, and as healthy as Europeans residing in their native climate.

The check on the exertion of the prolific power is scarcity of food. The more the prolific power is exerted, the greater is the difficulty of obtaining food. When the extreme power is put forth, famine and pestilence are seldom far absent. The severe moral and physical penalties attached (by the customs of all nations) to child-bearing, without the consent of the supporting relatives, would never have existed, if the supply of food had been unlimited. By restraining fecundity, there is no class of men, however poor, who may not become rich, and command all the real enjoyments of life. As a society improves in knowledge, the prospect of poverty, or semi-starvation, operates with increasing force. The degree of poverty of the bulk of a nation is one of the best tests of its intelligence,—taking scantiness and coarseness of food as the proper measure of poverty. Brutes, and the lowest order of men, sacrifice their future happiness (in which that of their offspring is involved) for the sake of a present selfish gratification: a wise man is influenced by the remote probable consequences of his actions, and he will refrain from doing any thing which will add to his *present* enjoyment, by diminishing disproportionately his *future* enjoyment.

The observations of Dr. Granville were made on the worst class of London Life; for it is reasonable to expect that the applicants for charitable aid belong to the most suffering class of the community.

The great mortality of the children, of the women observed, supports this opinion. This mortality is not less than it was a century ago for the total London population, which then could barely maintain its numbers by the extreme of propagation. Either these people observed were (contrary to Dr. Granville's opinion) representatives of the worst class of London Life, or the increased duration of life in London is a fable. If they are supposed to belong to the class of severest mortality, it might be doubted whether the interval between two successive births would be the same in the general population as in this class. It might be expected that the births would be quicker in the general population, because subject to a lower degree of privation and mortality. In answer to an objection of this nature, I would urge, that the degree of privation is not so great as to affect considerably the chance of conception; and that any effect thus produced would be balanced by the mortality of the suckling infants, which is greatest when the chance of conception is least. The minimum interval between two successive births is probably *one year and eight months;* which minimum is applicable to the two extremes of the English population,—to the portion enjoying the strongest frames and the most robust health, and to the portion whose health and strength have been undermined and enfeebled by luxurious living; the latter portion (consisting of the wealthiest part of the community) not being accustomed to complete the function of child-bearing, by suckling their infants.

The ordinary average annual mortality of a European population may properly be estimated at *one death to every forty living*. This proportion is subject to little variation on account of any common increase or decrease of population. The possible annual births having been shewn to amount to one-twentieth part of the population, we shall have, on deducting the deaths from the births, the annual possible increase of a European population equal to *one-fortieth* part, or to *two and a half* per cent. This gives twenty-eight years as the period in which a population may double its numbers. This rate of increase apparently agrees with that which has prevailed for a long space of time over the British American population. In most parts of Europe, population increases at the rate of one per cent per annum. The possible prolificness of the British American population is undoubtedly much greater than that of the kindred British population at home. In all probability no people were ever so favourably circumstanced as the inhabitants of the United States for the development of health, strength, and prolificness. They obtain an abundance of plain and nutritious

food by means of a moderate portion of labour, in a pure atmosphere. In England, the bulk of the population acquire a scanty supply of coarse food by incessant labour, in a confined and consequently impure atmosphere. In America, a large quantity of food is given in exchange for a small quantity of useful healthy labour: in England, unceasing toil frequently fails to purchase a sufficiency of the coarsest food. This superiority is, however, of a temporary nature. Every increase of density of the American population is another step towards the state of misery and privation at present existing in Europe.

Whether it is desirable that any European population should increase, is an important question for philanthropists, the proportion of food to population being supposed to remain unchanged. The question resolves itself into this,—Does an increase of human beings add any thing to the national stock of happiness? For any European population, I would, without hesitation, answer in the negative, and say, that an addition to the numbers was an addition to the general mass of misery. In the best state of society, pain and pleasure will balance each other; in the existing state of society in Europe, ten times as much pain as pleasure is spread over a man's life. There is but one advantage attending an increase of population worthy of consideration; it is this, —that knowledge increases with the density of a population. This will be manifest to any one who considers that additions to the common stock of knowledge are made by individuals; as the number of individuals increases, the additions increase, or knowledge more rapidly advances. In the moral, as in the physical world, *the effect of each man's labour increases, as the number of individuals with whom he acts in concert increases.*

There is another important question,—Is it desirable that a nation should exert its utmost powers of increase, when the supply of food is unlimited? As happiness does not depend on abundance of good food alone, I would again answer in the negative. The average soundness and robustness of health in a nation is one of the most important constituents of its happiness. Now, it is perfectly certain that the health of children closely resembles that of their parents. A person's stock of health and strength may be increased or diminished by education, but it will be mainly dependent on the source whence it is derived. It is, therefore, manifestly desirable that no weak or diseased person should transmit his defects to posterity. Even if his life were a blessing to an unhealthy person, it can never be so to the society in which he lives: he will defile every thing he touches—all his objects of attachment will

be injured by his love. When food is secured, procreation ought to be so directed as to yield the highest amount of health, strength, velocity, and intelligence, which are the elements of every thing good and beautiful.

It is a fact, capable of demonstration, that the population of Britain may be increased *five-fold*,—that the soil and agricultural knowledge possessed by Britain are capable of yielding an abundant supply of good food for five times the existing number of inhabitants, without increasing the proportion of agricultural labour due to each individual. The knowledge of this fact has induced many well-meaning people to exert themselves strenuously in support of the doctrine,—that all actions tending to increase the population are deserving of national encouragement. The benevolence of such men gives additional force to their erroneous and mischievous opinions. Every man, who is intelligent as well as benevolent, will regard the increase or decrease of a population as an object of secondary importance; such a man will direct his chief exertions towards the increase of the *proportion of food to population*. He will endeavour to accelerate the increase of food, and to retard the increase of the population. If the population of Britain were to exert their extreme prolific power, and at the same time were to receive an abundance of food, they would quickly degenerate from their high rank among European nations. All the existing bodily and mental defects and diseases would then be transmitted to the next generation; whilst, under the existing pressure of privation, not more probably than one-half are transmitted (although new ones are created). In the struggle for existence in which all European populations are engaged internally, the weak in body and mind are commonly last in the race; they become impoverished, are shunned by others, and leave behind them no progeny or heirs to their defects. In all classes of all countries there are restrictions on the exertion of the extreme prolific power, and all these restrictions are more or less beneficial. Strength, beauty, and intelligence, will retain their hold upon the affections of man as long as he endures; and the force of these virtues will greatly neutralise the effect of money, in the struggle for giving life to the future generation. In a perfect state of society, the good qualities of mind and body will alone form the grounds of attachment or preference between individuals. At present, the possession of money, by inheritance or descending consanguinity, exerts a great disturbing and deteriorating influence on European populations. The greatest defects of body or mind, conjoined with money, are secure of transmission to posterity.

A good system of hereditary distinctions is much to be desired. Talent is hereditary; and it is desirable that the possessors should bear distinguishing marks, which may operate as premiums on the propagation from a good stock. The chances are much in favour of the existence of talent in the children of people of great natural endowments, and as much against the existence of talent in the children of parents who have never possessed any corporeal or mental virtues. Taking the untried progeny of 100 horses, of various ascertained degrees of swiftness, and supposing them to run a race;—the chances of reaching the goal first would be more in favour of the foal of the swiftest horse than in favour of any other foal; but some one of the 99 opponents is likely to outstrip this foal of the swiftest horse. If the same equality prevailed among men as among horses, it would not be very difficult to assign to each man his order of merit. But under the existing unequal distribution of the advantages of education, it is not easy to distinguish the endowments of nature from the adventitious accomplishments of art. The pre-eminence of any individual (under the existing system) is generally the result of natural talent of no high order, combined with extrinsic, fortuitous, and extraordinary advantages of cultivation. In all probability there lived contemporary with Newton hundreds of Englishmen his superiors in mathematical discernment, or in the power of drawing just conclusions from a given quantity of facts, relating to space, time, weight, or number.

Assuming that a child inherits one-half of the aggregate qualities of his father and mother, or (less correctly) that he inherits one-half of the qualities of each parent; the grandchild will inherit 1-4th, the great-grandchild 1-8th, of the qualities of either first parent. The child from the fifth generation will possess no more than 1-32d part of the blood of the original parent. If a distinction were conferred on the first parent, and transmitted to his descendants in such a manner that the honours diminished as the original blood diminished, no evil would ensue, if the honours were reckoned on the side of one parent only. But if the honours are reckoned on both sides, and if the father and mother bear equal distinguishing honours, the children would be entitled to the same honour as their parents. To obviate this absurdity, of accounting a man of presumed excellence equal to a man of tried excellence, a decree of this kind should be made;—that *two-thirds*, instead of one-half, of any hereditary honour shall be extinguished at each generation. In this case, the child from the fifth generation would possess only 1-243d part of the honour of either first parent.

If males and females of similar honours are always paired, then 1-3d of an honour is extinguished at each generation, and the child from the fifth generation would possess about 1-8th part of the original honour.

CHAPTER IV.

In all countries, and in all classes, there is a manifest difference in the mortality of the two sexes; and the difference is always in favour of female life at all ages. Taking a gross average, it may be said, that female life is better than male life, in the proportion of eleven to ten. This superiority is not occasioned by any difference in the occupation of the two sexes; for, in Infancy, it is as conspicuous as at any other period of life. With improved accuracy of observation, a comparison of male with female mortality may lead to some very useful results; principally, perhaps, in shewing the dependence of the first and second periods of mortality on the age of puberty. So far as the existing imperfect observations can be trusted to, there is a strong appearance of the periods of "Infancy" and "Manhood" terminating at an earlier age among females than among males. No existing Table affords any foundation for the belief, that child-bearing produces any disturbing effect on the female rate of mortality. The sensible mark, indicating that a woman has arrived at the termination of her child-bearing age, is probably closely dependent on the year of life at which the period of "Old Age" commences in her class.

The remote cause of the difference in the mortality of the two sexes is yet hidden among other secrets of nature. There is known, however, a proximate cause to which it is probably referable. Throughout the animal kingdom, this general law appears to prevail,—that males are more *excited* by given circumstances than females are. Now, all sickness is occasioned by excessive excitement (positive or negative) of some particular organ; and sickness will be most severe in the sex subject to the higher degree of moral and physical excitement. Let any one institute a comparison between his male and female acquaintance; he can hardly fail to come to the conclusion, that activity is as much the characteristic of the male, as passiveness is of the female sex. In

the outward signs of feeling, women outdo men, and children outdo women; but neither women nor children are, on that account, to be esteemed as capable of more intense pleasurable or painful excitement. The most violent internal commotion is generally accompanied by a forced calmness of exterior. Those who are most ready to give vent to their feelings in words, rarely exhibit much feeling or resolution in their actions. The passions of women more quickly rise, and also more quickly subside, than those of men; but the intensity and duration of excitement is much inferior. The nervous energy of the female is much less than that of the male; and her superior quickness of excitement may be accounted for on the principle, that a small mass is more easily set in motion than a large mass. There is one passion about which some doubt might be entertained, on account of the peculiar organisation of the female,—I mean the sexual. Is this passion stronger in the female than in the male? The reverse is manifestly the case among the inferior animals; and appearances do not oppose the expectation, that the human race, in this respect, obey the law to which other animals are subject. In the shape of proof, may be adduced the records of suicide in Paris, which shew that love kills much more males than females. It is now time that the decision of the ancient Greeks in this matter should be reversed. I allude to the fabled sportful dispute between Jupiter and Juno, wherein the judge is made to award the palm to Jupiter's opinion, that woman had the larger half of the pleasure shared between the two sexes.

CHAPTER V.

The rate of mortality in large towns is greater than in small towns, and greater in the small towns than in the villages of any nation. This truth has been long known; but no satisfactory reason has yet been advanced, why a country population should live longer than a town population. The excessive mortality of large towns has most commonly been attributed to intemperance and debauchery; that is to say, a population known to be suffering a high degree of privation, are supposed to kill themselves by excessive indulgence. In gratifications of inferior moment, it frequently happens, that a man inconsiderately

purchases one pleasure by the sacrifice of one more valuable. But it may safely be denied, that any considerable body of men are content to exchange their necessary food for any other gratification. No enjoyment can co-exist with the pain of hunger. The proportion of people having the power and the disposition to kill themselves by excessive indulgence is so inconsiderable, compared with the total population of any city, that where there is one death from having too much, there are one hundred deaths from having too little. The popular notion, that intemperance causes death, is true, indirectly; but the evil arises from the institutions of society, which sanction the slavish subjection of children to the male parent. There are few fathers of families who do not endeavour to increase their own enjoyments, by diminishing the just gratifications of their wives and children. If the man is poor, this tyrannical disposition is displayed by spending on gin for himself, what ought to be expended in allaying the hunger of his family. Proportioned to the strength of this disposition, is the degree of hunger, and the degree of mortality.

There are two principal causes to which I would ascribe the excessive mortality of large towns, viz. to excessive poverty, and to excessive impurity of air inspired. In other words, these causes are two kinds of privation,—first of *food*, and then of *space*. At first sight, it appears improbable that there should be more poverty in cities than in villages; because it is a well-known fact, that money wages are considerably higher, and real wages a little higher, in cities than in villages. If all labourers obtained constant employment, there would be less poverty in cities than in villages; but this is not the case. Some labourers receive no wages, and very little victuals, for one month every year, some for two months, some for three, and so on. But there is a certain average of unemployed time, in every class of labourers in every place, which might be ascertained without much difficulty. This average waste starving time I imagine to be much greater in cities than in villages; and the reader will agree with me, if he admits that labourers and capitalists have similar principles of action. It is a well-known fact, that the expectation of a high prize, either in a mine or in a lottery, will exchange for much more than the true value of that expectation. In the hopes of getting a high prize in the lottery, many sensible men have paid £16 for a chance, which, on sure mathematical grounds, they knew not to be worth £8. On the same principle operatives proceed: they are all ready to sacrifice twenty shillings a week (nearly) constant employment, for twenty-five shillings a week uncer-

tain employment. Now, if the lottery principle be correctly applied, the receivers of twenty-five shillings will acquire less money in a given long time than the receivers of twenty shillings. Operatives will endure more to obtain a sum of money distributed in twenty-five shilling prizes, than they would endure for the same sum distributed in twenty shilling prizes. Hence high wages, unconnected with high talent, is an indication of great poverty; of course, the places selected for comparison must have free communication with each other. In a city, a man obtains more food for a day's labour than he does in a village; but, in the course of the year, he will have obtained less food in the city than in the village, by reason of the excess of unemployed time in the city. Inequality of employment is also a cause of death, at least it is so when combined with that improvidence or ignorance, which is the necessary attendant upon a system which degrades and confines the labourer to the lowest animal gratifications. There is another reason why the want of food should be felt more severely in cities than in villages. It is this;—that in cities, the sufferers are generally among strangers, whilst in villages they are at home among relatives. It is not so easy to undergo a process of starvation among relatives as among strangers.

The second cause of excess of mortality in cities, is impurity of the air respired. This impurity arises chiefly from privation of space. The purity of confined air increases as the space allotted to each individual increases. About one thousand cubic feet is the proper lodging space for each individual. Perfectly pure air is that which is inhaled in fields; the air in broad streets, or between two parallel walls, is of nearly equal purity. The first stage of sensible impurity may be represented by a cubical vessel having its sixth side removed. In such a vessel, all direct motion is prevented, and the included air will be stagnant, unless acted upon by the motion of the external air, in contact with the open side. If the sixth side of the cube be added, we shall arrive at the second stage of impurity, in which all human habitations are to be classed. If the joinings of the cubic apartments in which men live were air-tight, we should obtain perfectly impure, or irrespirable air. In connexion with this subject, the close alliance existing between "civilisation" and pulmonary consumption is well worthy the most serious attention.

The function of the lungs is of equal importance with the function of the stomach. Good air is as necessary for health as good food. The inhabitants of villages enjoy better health than those of cities, because

they inhale purer air. The circumstances of the villager impel him to pass the chief portion of his time in free, unconfined air; whilst the circumstances of the citizen cause him to spend all his time in a confined space of impure air: the employment of the former is *out of doors*, of the latter *in-doors*. This is applicable to only one-half of a man's life,—to twelve hours out of the twenty-four; there remains for consideration, the manner in which the two kinds of labourers are lodged at night. In this respect, also, it will be found that the villager is greatly superior to the citizen. The average cubical space allotted to the lodging of each individual is much greater in villages than in cities. The crowded state of the poorest class of city labourers is a well-known fact. That the general bulk of city labourers are more crowded than the general bulk of village labourers, results from the undeniable fact, that space is much more valuable in cities than in villages. The rent of a given sized room is much higher in cities than in villages; and a city labourer's inducement to live in impure air is proportionally increased.

CHAPTER VI.

The circumstances most favourable to vitality, consist in alternations of privation and saturation,—in changes between tension and relaxation. The best bodily education is that which elicits the endurance of the greatest oscillation between privation and saturation. There is a certain degree of elasticity in the organs on which life depends, which is capable of unlimited increase or diminution. The elasticity of any organ may be destroyed by either of two opposite causes,—long-continued excitement, or long-continued repose. These two causes of destruction are in constant operation in all "civilised" countries. Most Europeans belong to one of two classes,—either to that of continued privation, or to that of continued saturation. The labouring class suffer continually a high degree of excitement, and enjoy very little relaxation from hunger or labour; the monied, or non-labouring class, are surfeited with repose which they cannot enjoy, because they have not been previously excited. But experience proves that saturation impairs health and strength much more than privation does.

Those men who possess what are esteemed the advantages of wealth and birth combined, are almost invariably distinguished by feebleness of body.

The labourer is continually subject to the evils of exhaustion; the monied class are continually subject to the evils of repletion. Food and repose ought always to be preceded by hunger and labour; this law of Nature is not to be infringed with impunity. All labour consists in the exertion of the contractile force of a certain muscle for a certain time. A weak force of contraction may be continued for a long time, a strong force can be maintained only for a short time; the former constitutes gentle labour, the latter hard labour. The compressing effect of hard labour is much greater than that of gentle labour; and the elasticity or health of any organ appears to be proportional to compression, accompanied by adequate repose. The health and strength of a man who labours *eight* hours a-day may be greatly increased by making him do in a day of *six* hours what he was previously accustomed to do in *seven* hours. By combining privation and saturation in the same individual, and increasing both to their extreme limits by insensible degrees, I believe that the health and force of man may be rendered superior to that of any existing animal. I shall borrow an illustration of this opinion from the phenomena occurring among brutes.

It holds true generally, that the wildest animals are also the strongest. Ferocity and strength, docility and weakness, are most commonly combined. The *lion* may be considered as the representative of ferocity and intractability; the *horse*, of timidity and docility. Consequently, in comparison with the lion, the horse's strength is weakness; that is, a given mass of muscle of a horse will produce an effect much inferior to that of a lion. That a lion is stronger than a horse, in sudden momentary muscular exertions, will hardly be disputed; but it might be denied that a lion would effect more in a day than a horse, although it might be admitted that he would effect much more in a minute. But I believe that there exist no grounds for supposing that one animal, whose *extreme* muscular tension is greater than that of another, should not maintain a given moderate degree of tension longer than the weaker animal. It is, however, extremely probable that, by increasing the time of action, the relative superiority of one animal over another may be diminished indefinitely. The total muscular action of any animal is closely dependent on the quantity of food consumed; and as the stronger animals do not consume much more food than the

weaker, it is not to be expected that the muscles of motion should produce a much greater continued effect in the former than in the latter. Animal strength may be nothing more than the faculty of compressing a given quantity of muscular action into a small space of time. If the experiment could be tried, I imagine that the strength of the lion and of the horse would be found related in this way;—that, for impulse or instantaneous effect, a lion is three times as strong as a horse; but that, in a day, the total extreme development of strength in a lion would only be twice as great as that of a horse; and that, in two days, the superiority would be less than in one day. The best indication of strength consists, I believe, in the density and compactness of the structure of bones and muscles.

The cause of this superiority remains to be considered. I believe the lion to be stronger than the horse, because the former is exposed to greater alternations of privation and saturation. The food of the horse is distributed in small parcels, which may be collected by very easy exertion, continued for a short time in a rich pasture, and for a long time in a scanty pasture. The food of the lion is distributed in large masses, not to be obtained except at the expense of the most violent effort. Before the lion enters into action, the pain arising from the privation of food must preponderate over the pain of extreme muscular exertion: before a horse acts, it is only necessary that the privation of food should be great enough to balance the pain of a very low degree of muscular action. Nature requires of the lion great muscular tension, continued for a short time; and she requires of the horse weak muscular tension, continued for a long space of time. The difference in strength between a horse and a lion rests, I imagine, entirely on this remarkable distinction. This opinion (of incalculable importance, if practically adopted), when expressed in general terms amounts to this,—that muscular strength increases as the average muscular tension is increased. The power of any muscle may be increased, *by diminishing the time, and increasing the force of tension.*

The above remarks relate particularly to the muscles by which animals operate upon external objects, or to the muscles of motion; but they are indirectly applicable to the minute muscles presiding over the complex internal atomic movement existing in every animate body. The organs of digestion, like the muscles of motion, are the strongest when they are accustomed to the greatest tension for a short time, followed by a long interval of repose. No tame animal could survive the gorging of a ravenous beast of prey, any more than it could endure

the long previous fasting. In a long given time, as one year, a horse will probably move over the same space of ground, and consume the same quantity of food, as a lion: but in eating and in moving, the lion will probably effect in four hours what a horse requires twelve hours to effect. The extreme shortness of the alimentary canal in beasts of prey is probably consequent upon the extreme strength of the digestive organs.

Like the muscles of motion and digestion, are the organs or muscles by means of which animals resist or adapt themselves to changes of external temperature: those which are habituated to encounter the greatest changes are invariably the best and strongest. In support of this opinion may be adduced the well-known fact, that the English people are better able to endure sudden changes between cold and heat than any other civilised nation. The variable climate of England demands of the muscles of temperature the most energetic action, continued for a short space of time; whilst other climates are so equable in their variations, that a languid action of long continuance is required of these muscles. For the muscles of motion and digestion, the point of saturation is ascertainable, and subject to little variation; but for the muscles of temperature, this point varies greatly. It is easy to determine, by experiment, the quantity of labour and the quantity of food which will produce the greatest health and strength; but the most advantageous temperature is not so easily to be determined. I believe the natural and the best point of saturation to be,—the mean temperature of the climate. The human body ought to be so disciplined, as to feel most comfortable without clothing in motionless air of the mean temperature of the climate.

The phenomena occurring among the human race are in perfect accordance with the phenomena observed to exist among the inferior animals. The *wild* men (called savages) are greatly superior to the *tame* ones (calling themselves civilised), in every physical advantage. There is hardly a European in existence who could compete (with any chance of success) with an ordinary North American Indian hunter, in either of the three grand tests of animal power,—marching or running the greatest distance in a given time; enduring the greatest hunger or thirst; and bearing the greatest extremes of heat and cold. The astonishing indolence of savages is a mark of affinity to the character of the lion, which knows no medium between perfect repose and most violent action.

It is a fact, too well known to be disputed, that the hardiest

constitutions are to be found among the people who have to endure the severest privations. The tenacity of life is greater among the survivors of great privation than among the survivors of lesser privation. But muscular strength is proportional to the degree of privation and saturation combined, and not to the degree of privation alone. The majority of European labourers suffer moderate privation continually, with little or no admixture of saturation. The effect of incessant privation is, to prune a population of its weaker branches, and to leave only the very best lives. These lives, however, have not been improved by passing through this ordeal; but, on the contrary, have suffered injury proportioned to the privation. Excessive labour, with insufficient food and repose, exhausts and debilitates the strongest frame. If the process of exhaustion has been of long continuance, the suffering individual will never be able to recover the health and strength which he has lost; but his offspring may, by judicious treatment, improve their health, so as to attain the rank from which their parent fell. The men of the strongest and most robust frames are not found among those who labour hardest, but they are generally found among those who labour moderately, and are well fed. The best elements of life and strength are to be sought for among the hardest-faring men; and in performing experiments to elicit the greatest human muscular action, the individuals ought to be selected from this class. The children of the selected individuals may be rendered greatly superior to their parents, and, in a few generations, a greater degree of muscular strength may be elicited than was ever known among men. There is no apparent limit to the increase of the muscular force of man; he may render himself stronger than a lion. The causes of strength and weakness are placed out of the reach of the lion, but within the reach of the intelligence and regulations of man. Strength depends on the length of the oscillations between privation and saturation. Strength is impaired by too great, as well as by too small, oscillations. Man possesses the exclusive privilege of commanding the length or extent of oscillation; which privilege, hitherto, has been worse than useless to him. Instead of using it to increase his strength, which he might do, by insensible additions to the length of the average oscillations, he impairs his strength by extreme and unnatural diminutions in the extent of oscillation.

In the making of war, the strength, velocity, and hardiness of the soldier are of the utmost importance. The effect of courage and discipline may be more than doubled by the careful cultivation of qualities

which have been hitherto totally neglected. An English soldier undergoes no preparation for improving his capacity of enduring long marches, extreme hunger, or extreme cold. On the contrary, there is the strongest ground for believing, that the treatment he experiences is positively injurious, and tends daily to diminish his power of withstanding the effects of fatigue, cold, and hunger. It is a remarkable fact, that the mortality and the sickness of English soldiers at home are very much greater than among the English labouring population of the same age. The proportion of three to two will nearly express the relative mortality and sickness for a soldier and for a labourer. When it is considered that all soldiers are picked men, the difference is still more surprising; and it is very probable that soldiers suffer *twice* as much death and sickness as labourers of equally good constitutions. As soldiers are under the absolute control of government regulations of health, which have never been excepted against, this fact indicates the value of the knowledge in England respecting the laws of health.

The error in the treatment of soldiers consists, I imagine, in the suddenness of passage from a state of continued privation to a state of continued saturation. An English recruit suddenly exchanges coarse and scanty fare, hard labour, and cold lodging,—for good food, warm lodging, and the exercise of drilling. The previous hard labour is but slightly compensated by the fatigue of drilling. In the former, the great muscles are exerted; in the latter, the exertion is chiefly confined to the smaller muscles of motion. It is not improbable that the ordinary muscular action of a day labourer is ten times as great as that of a soldier, although the fatigue on both sides may be equal. It is never expected that a man who has lived in luxury can suddenly descend to privation, without serious injury: it ought no more to be expected, that a body formed under privations can with safety be suddenly transferred to a state of satiety. The excessive mortality of soldiers cannot reasonably be ascribed to their superior freedom from moral restraint; for it is difficult to conceive that any considerable quantity of intemperance and debauchery can be purchased for half-a-crown a-week, which is the limit of the English soldier's spending money.

As a remedy for the existing evil, I would suggest,—the exercising of the soldier in walking, running, and leaping,—the diminution of harassing and unprofitable drillings,—and the reduction of the average temperature of the soldier's skin, by changes in clothing and lodging. From every soldier, let ten miles of running be exacted every day, or

rather one hundred miles every ten days. The kind and quantity of food might remain unchanged, but the frequency of meals should be diminished. The adoption of a plan of this nature would, I conceive, quickly restore the health of soldiers to the level of that of labourers; and in a few years soldiers would become what they ought to be,—the healthiest and strongest part of the community. The experiment proposed may very easily be tried, and the correctness of the principle be proved or disproved, by its application to two or three regiments. If the average rate of sickness be not considerably reduced in a few months, then is the principle to be abandoned, and some new cause of the pernicious consequences of the existing mode of treatment is to be sought for. There is nothing, probably, more deserving the deepest attention of the army government than plans for the diminution of sickness. At home, or in a short campaign, the injurious effects of sickness are not very important; but in a long campaign, and in all great efforts, at least one-half of the army expenditure is to be placed to the account of sickness. It is an important fact, that an English army cannot long continue active operations before *one-third* of its power becomes paralysed by sickness (exclusive of inefficiency from wounds in battle). The enormous proportion of *sick* is attended with a corresponding mortality, which occasions a vast expenditure in the recruiting and transport departments. Simply by reducing the rate of sickness one-half, it is not improbable that the expense may be reduced one-half, of maintaining an active army of a given efficiency in a foreign country.

The *monied* class of England are greatly inferior to the *labouring* class in corporeal advantages. Those who live in a state of continued saturation, cannot compete in bodily exercises with the sufferers of continued privation. But the monied class have it in their power to reverse this relation; they have only to adopt a system of voluntary privation, alternating with their ordinary state of saturation. The readiest means of attaining the desired object, would be to subject themselves to a system of military regulations. They would be no losers in present happiness by so doing: the pain from fasting, from hard labour, or from exposure to cold, is very inconsiderable, when we have in close and certain prospect the unbounded gratification of the desire excited. The pleasure of gratifying a new want is an indisputable gain, to which is to be added the distant pleasures inevitably attendant upon improvements in health and strength. Privation is an ingredient of pleasure more indispensable than saturation; for the

place of the latter is often supplied by the imagination. Pleasure may be defined to be, the meeting together of privation and saturation; in the same manner as the electric shock is the rushing together, commingling, and neutralisation of two antagonist fluids; the shock, in either case, being proportional to the previous degree of tension.

CHAPTER VII.

THERE exists a popular notion, that the mortality of the English population has been diminishing for the last century. This notion is founded upon National Returns of Living and Dying, acknowledged on all sides to be very imperfect. Any approach to correctness in these returns, rests entirely on the principle which impels a man—to tell the truth (if known), when nothing is to be gained by the trouble of falsification. But there exists no principle impelling a man to incur the irksome labour of closely investigating and accurately reporting a truth or fact in which his own immediate interests are not concerned. Any considerable body of men, having a certain duty to perform, never do it carefully when they receive the same amount of praise or money for doing it negligently. These Returns cannot lead to any safe conclusion as to the *absolute* rate of mortality at any time; although they may indicate the *relative* rate of mortality at different times; and they are to be considered as strong evidence of a temporary diminution of English mortality. The force of this evidence would be very great, if any satisfactory reason had been alleged to account for this diminution; but so far is this from being the case, that the strongest arguments can be adduced to shew that English mortality ought to have been increasing during the last century. Mortality varies inversely as food, and food varies as wages. Now, it is an undeniable fact, that wages have been continually decreasing during the last century: the day-labour of a man now will exchange for *one-third* less corn than it used to do; consequently there is strong ground for believing the mortality to have been increasing. This seeming paradox, of a population improving its health by diminishing its food, may be accounted for by change of circumstances so great, that wages do not afford any good measure of the food

consumed in times so distant. The English labourers of former times were small farmers or cottagers, like those of Ireland now; they depended more upon the produce of their plot of ground than upon the produce of their labour in the service of others. Even if the same *kind* of food were consumed, we could not safely institute any comparison as to the *amount* consumed, founded upon the wages of such labourers and the wages of labourers of the present day, who depend entirely on their labour-earnings and on the poor's rate. But what I apprehend to be the true solution of the difficulty is, the substitution, to a very great extent, of potatoes for corn. It is very probable that more nutriment is obtained by English labourers of the present day, by the expenditure of two shillings on a mixture of corn and potatoes, than could be obtained from three shillings expended on corn alone.

In order to ascertain the rate of mortality to which a nation is subject, there is no method to be placed in competition with that of *decennial enumerations of the living, classed in decennial intervals of age.* This method is greatly superior to any other, because the result sought will be affected in the lowest possible degree by errors in the enumeration of the total population. The absolute mortality will be made to depend almost entirely on correctness of proportion in the distribution of the population in classes of decennial age. This is a kind of correctness on which the greatest reliance can be placed, in operations of magnitude, as there exists the highest mathematical probability that any errors of distribution in one return will be neutralised by opposing errors in some other return.

The English Population Returns for 1831 have been published whilst the present work is passing through the press. Their form is very unsatisfactory, and is an indication that the science of life measurement has made a retrograde movement. The best, and perhaps the only, opportunity which ever existed of determining with accuracy the *absolute* mortality of an extensive and varied population has just been thrown away. If the *ages* of the living population had been returned in the present, as they were in the Report of 1821, we should now be informed of the rate of mortality prevailing in every district of England. From the English Population Returns no valuable information is to be derived, respecting either the relative or the absolute mortality at different ages.

From a statement made in the Returns of 1831 of the ages of the

dying population of the county of Essex, I entertain a strong suspicion that the apparent diminution of the gross English mortality arises entirely from the retrogression of the limit of infancy from the age of nine to the age of seven years.

CHAPTER VIII.

THERE subsists the most intimate connexion between *Sickness* and Death; and, in the order of nature, the latter is preceded by the former as its cause. That death and sickness simultaneously increase and decrease, is a proposition which few people will be inclined to dispute. From a great extent of observations, I have collected the important fact, that death is proportional to *duration* of sickness alone, and is independent of intensity. These observations have been made on military masses of the greatest magnitude, under the widest variety of circumstances. They serve to establish the fact, that in any considerable quantity of men, placed for a given time under peculiar circumstances, there exists a fixed proportion between the number of deaths and the aggregate duration of sickness; and, what may appear extraordinary, the definite proportion which is applicable to one set of circumstances, agrees nearly with the definite proportion which is applicable to any other combination of circumstances. *Two years of sickness to each death* appears to be the law of nature, from which little deviation is allowed, except in very unhealthy climates. This proportion has been observed to rule over the English army employed in the Peninsular war, the European troops in the East Indies, and the native troops in the East Indies. In the English army, at home and inactive, there are $2\frac{1}{2}$ years of alleged sickness to each death. In the English West India army, there is $1\frac{1}{3}$ year of sickness to each death. In the East Indies, the proportion, more correctly stated is, $2\frac{1}{3}$ years for the native troops, and $1\frac{2}{3}$ years for the European troops. The experience of Benefit Societies shews that this proportion for the English working population approaches very near to two years. In any population between the ages of 20 and 55, if the numbers constantly sick amount to *four* per cent on the living, then it may be safely inferred that the annual deaths amount to *two* per cent on the living.

At different ages, the rate of sickness increases as the rate of mortality increases. The expectation that it ought, is so reasonable, that Dr. Price long ago acted upon it in the construction of his Tables of Sickness, which are in universal use. The opinion is confirmed by the report of sickness in Scotland, made by the Highland Society, at least with the exception of old age. But the opposition here is a very questionable fact, and of no practical importance.

In constructing the Tables for provision in sickness and in old age, I have been influenced by the general principle,—that all savings from the earnings of labour ought to be made before the age of *fifty-five* years; that between the ages of 55 and 65 a man should expend the labour barely sufficient for his maintenance; and that for the portion of life which may be enjoyed after the age of 65, he should subsist entirely on previous savings. According to these Tables, the allowance during old age commences at 65, but the weekly payments given in exchange for it cease at the age of 55. The Health Assurance Table is confined to periods terminating at the age of 55; at least it is so when the price paid is an even weekly payment, continued from the age of admission to the end of the term of insurance. But I have given a second Table, wherein the contributions are variable and increasing, which shews the value of health insurance for the term of one year, at all ages below 70. By the help of this second Table, the even weekly payment for health insurance, commencing at 55 and terminating at 65 years of age, may be obtained sufficiently near for practical purposes.

The basis assumed of my Tables of Sickness, is intermediate between that reported by the Highland Society, and that *said* to be assumed by Dr. Price. But the basis *really* assumed by Dr. Price in his Tables differs from mine in a very insignificant degree. Dr. Price appears to have fallen into the error of confounding an assurance for a long term with an assurance for a short term. He seems to have assumed, that the weekly payment for health insurance for thirty years does not differ from the weekly payment for a term of ten years. It is, however, not improbable that the error was known at the time,—that Dr. Price preferred making an incorrect statement, to the exposing of difficulties of calculation, which neither he nor any other person has succeeded in surmounting. By the help of the new discovery, I have been able to overcome the difficulty in one case only; and, most fortunately, this case is the only one of great practical importance.

I would here observe, that a Life and Health Association may act in

such a manner as to exhibit results differing widely from my Tables of Mean Mortality and Sickness; and yet there may be no reason for calling in question the correctness of the assumed averages. For I present these Tables as the best standard of truth for a long space of time, on the supposition that the *management* of the Society is liberal and intelligent in an average degree. By liberality, I would be understood to mean, the disposition to admit rather *exceptionable* lives, provided that the inducement to seek admission has not been founded on the knowledge of this exception. The profitable effect of a Life and Health Association greatly depends on the Tables selected; but it is still more dependent on the general management.

ILLUSTRATIONS OF THE TABLES.

TAB. A. 1. Out of 146,472 born alive, 100,000 attain the age of 12 years, 50,224 attain the age of 60, and 1702 die in their 61st year of age.

TAB. A. 3. The value of annuity of £1 on a single life, aged 60 years, when the rate of interest is 4 per cent, is 9·0179; the payments being made at the end of annual intervals, and no allowance being due for the fractional time lived in the year of death.

TAB. A. 6. The present value of annuity of £1 on the joint continuance of two lives, aged 20 and 30 years, is 15·6890; the annual payments cease on the failure of either of the two lives.

TAB. A. 21. The average duration of life from and after any age, is termed the *expectation*. A person aged 35 years has an expectation of living 28·1617 complete years. To obtain the total expectation, about half a-year is to be added to the numbers in this Table for fractional years of existence.

TAB. A. 22. Of two lives, aged 30 and 40 respectively,—the probability that the *younger* will die first, is represented by ·37259; that of the *elder* by ·62741;—the sum of these probabilities, or certainty, being represented by unity.

TAB. A. 30. In a stationary population, wherein 100,000 attain the age of 12 every year, there are 903,374 constantly living between the ages of 20 and 30, and 8445 annually dying in the same interval of age. For 100,000 living at all ages, 42,073 are between the ages of 20 and 50.

TAB. A. 31. In a population increasing ten per cent every ten years (but stationary during each decennial interval), wherein the living, between the ages of 20 and 30, belong to the stationary population of the adjoining Table;—out of a total population of 6,055,290, there are 1,480,766 living below the age of 10, which is equivalent to 244,541 out of one million.

TAB. A. 32. Health insurance for the term of one year. For 100*d.* a week during sickness, a person who has just completed his 30th year will be required to pay 2*d.* (2·0137) per week. The benefit and the weekly payments terminate at the age of 31, when another annual engagement may be made.

TAB. A. 33. Health Insurance during the effective stage of Human Life. A person who has lived exactly 25 years will be required to pay 2½*d.* (2·4927)

per week for 30 years, in order that he may receive 100*d.* per week during the portion of that time in which he may happen to be sick. For ten years' insurance, from 55 to 65, the even weekly payment is about $6\frac{3}{4}d.$

TAB. A. 34. A person aged (precisely) 25 years will be required to pay a weekly premium of 7*d.* (6·9257) for 30 years, as an equivalent for 100*d.* per week, after 40 years, or for the time he may live beyond the age of 65 years.

TAB. A. 35. A person aged 25 will be required to pay 6*d.* (5·9530) every quarter of a year, in order that his representative may receive £5 on the day of his death.

TAB. A. 36. The present value of a deferred annuity of £10, payable to B, now aged 30 years, in case of surviving another person, A, now aged 40, is £52·001 in a single payment, and £3·6002 in yearly payments, during the joint lives, the first payment being made now. If the deferred annuity is to commence growing from the death of A, and not from the date of the last annual payment, the numbers in this Table will then be a trifle too high.

TAB. A. 37. At the age of 40 years precisely, the force of mortality is such, that 1·4526 would die in one year out of 100 constantly living.

TAB. B. 23. Village Mortality. For £100 payable on the death of A, aged 40, provided that another person, B, aged 50, be then alive;—the single payment is £19·954, and the annual payment during the joint lives is £1·689.

TAB. B. 24. For £100 payable at the end of the year, in which a person, now aged 35, may happen to die. If the assurance extends over the whole of life, the equivalent annual payment for life is £2·0300; if the assurance is only for the term of one year, the payment is £1·0140.

TAB. C. 6. Comparative view of three Tables of Mortality, assuming as a common base, that 100,000 annually attain the age of 12 years. According to the Table of Mean Mortality, between the ages of 20 and 30, the sum of the living at the beginning of each of the ten annual intervals is 907,597; the annual deaths amount to 8445; and the proportion of annual deaths to 100 annual survivors is ·9305. The number of annual survivors exceeds the number constantly living by half the annual deaths nearly, which excess is generally very small.

TAB. C. 7. Between the ages of 20 and 50, with the Mean rate of Mortality;—for 100,000 annually attaining the age of 12, there are *living* (annually surviving) 2,429,331, and *dying* annually 30,393, being at the rate of 1·2511 per cent. In a stationary population of one million at all ages, there are living 417,892 between the ages of 20 and 50, and 5228 dying between those ages; and out of 100,000 deaths at all ages, 20,751 happen between 20 and 50 years of age.

*** The accompanying Tables, since being in type, have been read over by the Author *four* times; once before, and three times after going to press; two readings with the manuscript, and two readings with the original calculations. In the first reading, one error of the press was found in every five pages, or one error in ten thousand figures; an extremely small amount, and an index of printing talent of a high order. The first alone of the two under-mentioned errors was not marked for correction before going to press.

ERRATA.

TAB. A. 5. Column 7, line 24, should be 3·1447.
TAB. C. 6. — 10 — 10, — 38·2118.

TABLES.

TAB. A. 1.

Shewing, at the end of any number of years from birth,—the *Living* out of a given number born,—also the *Dying* in the year succeeding.

Age.	Living.	Dying.	Age.	Living.	Dying.
0	146472·1	16647·2	50	64027·2	1255·0
1	129824·9	10169·2	51	62772·2	1266·8
2	119655·7	6420·0	52	61505·4	1278·0
3	113235·7	4144·1	53	60227·4	1288·5
4	109091·6	2715·5	54	58939·0	1298·2
5	106376·1	1797·5	55	57640·8	1338·3
6	104578·6	1198·0	56	56302·5	1410·1
7	103380·6	802·2	57	54892·4	1482·8
8	102578·4	650·8	58	53409·6	1556·0
9	101927·6	646·6	59	51853·6	1629·2
10	101281·0	642·5	60	50224·4	1701·6
11	100638·5	638·5	61	48522·8	1772·6
12	100000·0	643·8	62	46750·2	1841·2
13	99356·2	658·8	63	44909·0	1906·6
14	98697·4	673·8	64	43002·4	1967·7
15	98023·6	689·3	65	41034·7	2023·6
16	97334·3	704·8	66	39011·1	2073·0
17	96629·5	720·5	67	36938·1	2114·7
18	95909·0	736·5	68	34823·5	2147·5
19	95172·6	752·6	69	32676·0	2170·2
20	94420·0	768·9	70	30505·8	2181·6
21	93651·1	785·3	71	28324·2	2180·6
22	92865·8	801·9	72	26143·5	2166·3
23	92063·8	818·7	73	23977·2	2137·9
24	91245·1	835·6	74	21839·3	2094·8
25	90409·6	852·5	75	19744·6	2036·7
26	89557·0	869·7	76	17707·8	1963·8
27	88687·4	886·8	77	15744·0	1876·5
28	87800·5	904·1	78	13867·5	1775·8
29	86896·4	921·4	79	12091·7	1662·9
30	85975·0	938·8	80	10428·8	1539·6
31	85036·2	956·1	81	8889·2	1408·2
32	84080·1	973·5	82	7481·0	1271·0
33	83106·6	990·8	83	6210·0	1131·0
34	82115·8	1008·1	84	5079·0	991·1
35	81107·6	1025·3	85	4087·9	854·1
36	80082·3	1042·5	86	3233·8	723·0
37	79039·8	1059·5	87	2510·8	600·3
38	77980·4	1076·3	88	1910·5	488·1
39	76904·1	1093·0	89	1422·5	388·0
40	75811·1	1109·4	90	1034·5	301·0
41	74701·6	1125·6	91	733·5	227·5
42	73576·0	1141·6	92	506·0	167·1
43	72434·4	1157·2	93	338·9	119·1
44	71277·2	1172·5	94	219·8	82·1
45	70104·7	1187·4	95	137·8	54·6
46	68917·2	1201·9	96	83·2	34·9
47	67715·3	1216·0	97	48·2	21·4
48	66499·3	1229·5	98	26·8	12·6
49	65269·8	1242·5	99	14·2	7·0

TAB. A. 2.

Shewing, at every age of life, in logarithms,—the probability of living one year, ($\lambda_1 a$),—and the *Living* out of a given number born ($\lambda\ a$).

Age.	$\lambda_1 a$	$\lambda\ a$	Age.	$\lambda_1 a$	$\lambda\ a$
0	1·9476032	·1657549	50	1·9914029	1·8063648
1	·9645754	·1133581	51	·9911458	·7977677
2	·9760500	·0779335	52	·9908809	·7889135
3	·9838078	·0539835	53	·9906082	·7797944
4	·9890528	·0377913	54	·9903272	·7704026
5	·9925988	·0268441	55	·9897978	·7607298
6	·9949961	·0194429	56	·9889848	·7505276
7	·9966170	·0144390	57	·9881070	·7395124
8	·9972360	·0110560	58	·9871592	·7276194
9	·9972360	·0082920	59	·9861359	·7147786
10	·9972360	·0055280	60	·9850310	·7009145
11	·9972360	·0027640	61	·9838381	·6859455
12	·9971949	·0000000	62	·9825501	·6697836
13	·9971110	1·9971949	63	·9811595	·6523337
14	·9970246	·9943059	64	·9796581	·6334932
15	·9969356	·9913305	65	·9780370	·6131513
16	·9968439	·9882661	66	·9762867	·5911883
17	·9967495	·9851100	67	·9743969	·5674750
18	·9966523	·9818595	68	·9723566	·5418719
19	·9965521	·9785118	69	·9701536	·5142285
20	·9964490	·9750639	70	·9677751	·4843821
21	·9963428	·9715129	71	·9652070	·4521572
22	·9962334	·9678557	72	·9624343	·4173642
23	·9961207	·9640891	73	·9594406	·3797985
24	·9960047	·9602098	74	·9562083	·3392391
25	·9958852	·9562145	75	·9527184	·2954474
26	·9957621	·9520997	76	·9489504	·2481658
27	·9956353	·9478618	77	·9448822	·1971162
28	·9955048	·9434971	78	·9404897	·1419984
29	·9953703	·9390019	79	·9357472	·0824881
30	·9952318	·9343722	80	·9306268	·0182353
31	·9950892	·9296040	81	·9250983	2·9488621
32	·9949423	·9246932	82	·9191292	·8739604
33	·9947910	·9196355	83	·9126844	·7930896
34	·9946352	·9144265	84	·9057260	·7057740
35	·9944748	·9090617	85	·8982131	·6115000
36	·9943095	·9035365	86	·8901015	·5097131
37	·9941393	·8978460	87	·8813434	·3998146
38	·9939640	·8919853	88	·8718874	·2811580
39	·9937834	·8859493	89	·8616778	·1530454
40	·9935975	·8797327	90	·8506546	·0147232
41	·9934060	·8733302	91	·8387529	3·8653778
42	·9932087	·8667362	92	·8259028	·7041307
43	·9930056	·8599449	93	·8120285	·5300335
44	·9927964	·8529505	94	·7970487	·3420620
45	·9925809	·8457469	95	·7808750	·1391107
46	·9923590	·8383278	96	·7634125	4·9199857
47	·9921304	·8306868	97	·7445582	·6833982
48	·9918950	·8228172	98	·7242015	·4279564
49	·9916526	·8147122	99	·7022225	·1521579

TAB. A. 3.

Shewing the present value of an Annuity of £1 depending on a single life at any age.

Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0	18·0508	14·9621	12·7061	11·0074	50	13·2921	12·0276	10·9518	10·0295
1	19·9764	16·5558	14·0522	12·1640	51	12·9646	11·7588	10·7293	9·8438
2	21·3244	17·6814	15·0088	12·9896	52	12·6285	11·4811	10·4978	9·6494
3	22·2094	18·4312	15·6527	13·5497	53	12·2834	11·1937	10·2566	9·4454
4	22·7447	18·8966	16·0597	13·9083	54	11·9285	10·8959	10·0049	9·2310
5	23·0250	19·1541	16·2931	14·1191	55	11·5631	10·5870	9·7417	9·0052
6	23·1234	19·2627	16·4018	14·2235	56	11·1931	10·2722	9·4720	8·7725
7	23·0931	19·2654	16·4215	14·2516	57	10·8250	9·9575	9·2010	8·5377
8	22·9719	19·1927	16·3774	14·2248	58	10·4593	9·6433	8·9293	8·3012
9	22·8122	19·0878	16·3060	14·1746	59	10·0964	9·3300	8·6571	8·0633
10	22·6465	18·9781	16·2307	14·1210	60	9·7366	9·0179	8·3848	7·8244
11	22·4749	18·8632	16·1510	14·0638	61	9·3804	8·7075	8·1128	7·5847
12	22·2969	18·7430	16·0668	14·0028	62	9·0281	8·3992	7·8414	7·3446
13	22·1146	18·6190	15·9795	13·9392	63	8·6802	8·0933	7·5711	7·1044
14	21·9301	18·4930	15·8904	13·8742	64	8·3370	7·7902	7·3021	6·8646
15	21·7433	18·3650	15·7997	13·8077	65	7·9989	7·4903	7·0348	6·6254
16	21·5541	18·2348	15·7071	13·7398	66	7·6662	7·1940	6·7697	6·3872
17	21·3627	18·1025	15·6128	13·6704	67	7·3393	6·9016	6·5071	6·1504
18	21·1689	17·9680	15·5166	13·5995	68	7·0186	6·6135	6·2474	5·9153
19	20·9727	17·8314	15·4185	13·5271	69	6·7042	6·3301	5·9909	5·6823
20	20·7740	17·6924	15·3184	13·4530	70	6·3966	6·0517	5·7379	5·4517
21	20·5729	17·5512	15·2164	13·3772	71	6·0960	5·7785	5·4889	5·2239
22	20·3693	17·4076	15·1124	13·2998	72	5·8026	5·5109	5·2441	4·9993
23	20·1631	17·2616	15·0062	13·2206	73	5·5166	5·2492	5·0038	4·7780
24	19·9544	17·1131	14·8979	13·1396	74	5·2383	4·9935	4·7683	4·5605
25	19·7429	16·9622	14·7873	13·0567	75	4·9679	4·7442	4·5378	4·3470
26	19·5288	16·8086	14·6745	12·9718	76	4·7055	4·5015	4·3128	4·1378
27	19·3119	16·6523	14·5593	12·8850	77	4·4512	4·2655	4·0932	3·9331
28	19·0922	16·4933	14·4417	12·7960	78	4·2051	4·0364	3·8795	3·7333
29	18·8695	16·3315	14·3216	12·7049	79	3·9674	3·8144	3·6717	3·5384
30	18·6439	16·1668	14·1988	12·6115	80	3·7380	3·5995	3·4700	3·3488
31	18·4152	15·9991	14·0733	12·5158	81	3·5170	3·3918	3·2746	3·1645
32	18·1834	15·8283	13·9450	12·4176	82	3·3044	3·1915	3·0855	2·9858
33	17·9483	15·6542	13·8138	12·3168	83	3·1001	2·9985	2·9029	2·8127
34	17·7098	15·4768	13·6795	12·2134	84	2·9042	2·8129	2·7268	2·6454
35	17·4678	15·2960	13·5420	12·1071	85	2·7165	2·6347	2·5573	2·4840
36	17·2222	15·1115	13·4012	11·9979	86	2·5370	2·4638	2·3943	2·3285
37	16·9728	14·9232	13·2568	11·8855	87	2·3656	2·3001	2·2380	2·1789
38	16·7195	14·7310	13·1088	11·7698	88	2·2021	2·1437	2·0882	2·0353
39	16·4621	14·5346	12·9569	11·6506	89	2·0464	1·9944	1·9449	1·8976
40	16·2004	14·3340	12·8009	11·5276	90	1·8983	1·8521	1·8080	1·7659
41	15·9343	14·1287	12·6405	11·4008	91	1·7577	1·7167	1·6776	1·6401
42	15·6634	13·9187	12·4756	11·2697	92	1·6244	1·5881	1·5534	1·5201
43	15·3875	13·7036	12·3058	11·1342	93	1·4982	1·4661	1·4354	1·4059
44	15·1065	13·4831	12·1309	10·9938	94	1·3788	1·3506	1·3235	1·2974
45	14·8199	13·2569	11·9505	10·8484	95	1·2662	1·2414	1·2174	1·1944
46	14·5275	13·0248	11·7642	10·6974	96	1·1601	1·1383	1·1172	1·0969
47	14·2289	12·7862	11·5717	10·5405	97	1·0602	1·0411	1·0226	1·0048
48	13·9238	12·5408	11·3724	10·3773	98	·9664	·9497	·9335	·9178
49	13·6117	12·2881	11·1660	10·2071	99	·8785	·8639	·8497	·8360

TAB. A. 4.

Shewing the values of Annuity of £1 depending on the co-existence or joint continuance of two lives of *equal* ages.

Ages.	3 ℘ cent	4 ℘ cent	5 ℘ cent	6 ℘ cent	Ages.	3 ℘ cent	4 ℘ cent	5 ℘ cent	6 ℘ cent
0–0	11·5474	9·8585	8·5738	7·5726	50–50	9·8837	9·1358	8·4790	7·8993
1–1	14·1396	12·0509	10·4593	9·2175	51–51	9·5913	8·8849	8·2625	7·7114
2–2	16·1444	13·7537	11·9283	10·5019	52–52	9·2902	8·6249	8·0367	7·5143
3–3	17·5678	14·9718	12·9851	11·4301	53–53	8·9793	8·3546	7·8005	7·3068
4–4	18·4957	15·7761	13·6899	12·0539	54–54	8·6575	8·0728	7·5525	7·0875
5–5	19·0356	16·2555	14·1177	12·4378	55–55	8·3234	7·7781	7·2914	6·8550
6–6	19·2864	16·4918	14·3375	12·6412	56–56	7·9855	7·4784	7·0242	6·6158
7–7	19·3281	16·5513	14·4053	12·7120	57–57	7·6530	7·1822	6·7592	6·3777
8–8	19·2205	16·4836	14·3631	12·6863	58–58	7·3264	6·8900	6·4967	6·1410
9–9	19·0507	16·3626	14·2744	12·6198	59–59	7·0059	6·6021	6·2371	5·9060
10–10	18·8736	16·2351	14·1802	12·5483	60–60	6·6918	6·3189	5·9807	5·6730
11–11	18·6888	16·1008	14·0799	12·4716	61–61	6·3844	6·0407	5·7279	5·4426
12–12	18·4961	15·9593	13·9733	12·3892	62–62	6·0841	5·7677	5·4790	5·2149
13–13	18·2987	15·8135	13·8627	12·3033	63–63	5·7910	5·5003	5·2344	4 9904
14–14	18·1001	15·6663	13·7508	12·2162	64–64	5·5054	5·2388	4·9942	4·7692
15–15	17·9003	15·5178	13·6375	12·1278	65–65	5·2274	4·9834	4·7590	4·5519
16–16	17·6993	15·3678	13·5229	12·0382	66–66	4·9573	4·7344	4·5288	4·3385
17–17	17·4972	15·2165	13·4070	11·9473	67–67	4·6952	4·4919	4·3039	4·1295
18–18	17·2939	15·0639	13·2896	11·8552	68–68	4·4412	4·2562	4·0846	3·9250
19–19	17·0895	14·9098	13·1709	11·7617	69–69	4·1955	4·0274	3·8711	3·7254
20–20	16·8839	14·7544	13·0508	11·6670	70–70	3·9581	3·8057	3·6635	3·5307
21–21	16·6771	14·5976	12·9292	11·5709	71–71	3·7290	3·5911	3·4621	3·3413
22–22	16·4692	14·4393	12·8063	11·4734	72–72	3·5083	3·3837	3·2669	3·1573
23–23	16·2601	14·2796	12·6819	11·3746	73–73	3·2961	3·1837	3·0781	2·9788
24–24	16·0497	14·1185	12·5560	11·2745	74–74	3·0921	2·9910	2·8957	2·8059
25–25	15·8382	13·9559	12·4286	11·1729	75–75	2·8965	2·8057	2·7199	2·6389
26–26	15·6254	13·7918	12·2997	11·0698	76–76	2·7092	2·6277	2·5506	2·4777
27–27	15·4114	13·6262	12·1692	10·9652	77–77	2·5300	2·4571	2·3880	2·3224
28–28	15·1960	13·4589	12·0371	10·8591	78–78	2·3589	2·2937	2·2319	2·1730
29–29	14·9793	13·2901	11·9033	10·7514	79–79	2·1957	2·1376	2·0823	2·0297
30–30	14·7611	13·1195	11·7678	10·6421	80–80	2·0403	1·9886	1·9393	1·8922
31–31	14·5415	12·9472	11·6305	10·5311	81–81	1·8925	1·8466	1·8027	1·7608
32–32	14·3203	12·7731	11·4914	10·4183	82–82	1·7522	1·7115	1·6725	1·6352
33–33	14·0975	12·5970	11·3503	10·3036	83–83	1·6192	1·5831	1·5486	1·5154
34–34	13·8730	12·4190	11·2071	10·1870	84–84	1·4933	1·4614	1·4308	1·4014
35–35	13·6466	12·2388	11·0618	10·0683	85–85	1·3742	1·3461	1·3191	1·2931
36–36	13·4182	12·0564	10·9143	9·9475	86–86	1·2619	1·2371	1·2133	1·1904
37–37	13·1877	11·8716	10·7643	9·8243	87–87	1·1560	1·1343	1·1133	1·0931
38–38	12·9550	11·6842	10·6117	9·6986	88–88	1·0564	1·0373	1·0190	1·0012
39–39	12·7197	11·4941	10·4563	9·5703	89–89	·9628	·9462	·9301	·9145
40–40	12·4818	11·3010	10·2980	9·4392	90–90	·8751	·8605	·8465	·8328
41–41	12·2410	11·1048	10·1364	9·3049	91–91	·7930	·7803	·7680	·7561
42–42	11·9970	10·9050	9·9714	9·1673	92–92	·7163	·7053	·6946	·6842
43–43	11·7494	10·7015	9·8026	9·0261	93–93	·6448	·6352	·6260	·6169
44–44	11·4980	10·4939	9·6297	8·8808	94–94	·5782	·5700	·5620	·5542
45–45	11·2424	10·2818	9·4522	8·7312	95–95	·5165	·5094	·5025	·4958
46–46	10·9822	10·0647	9·2698	8·5768	96–96	·4594	·4533	·4473	·4415
47–47	10·7168	9·8422	9·0819	8·4170	97–97	·4066	·4014	·3963	·3913
48–48	10·4456	9·6136	8·8879	8·2513	98–98	·3581	·3537	·3493	·3450
49–49	10·1682	9·3784	8·6872	8·0790	99–99	·3136	·3098	·3061	·3025

TAB. A. 5.

Shewing the values of Annuity on the joint continuance of two lives.

Difference of age *Five* years.

Ages.	3 ℘ cent	4 ℘ cent	5 ℘ cent	6 ℘ cent	Ages.	3 ℘ cent	4 ℘ cent	5 ℘ cent	6 ℘ cent
0–5	14·8036	12·6406	10·9855	9·6899	48–53	9·6331	8·9195	8·2913	7·7355
1–6	16·4985	14·0868	12·2375	10·7875	49–54	9·3299	8·6576	8·0638	7·5367
2–7	17·6514	15·0796	13·1030	11·5504	50–55	9·0170	8·3854	7·8257	7·3274
3–8	18·3619	15·7015	13·6518	12·0387	51–56	8·6983	8·1066	7·5805	7·1106
4–9	18·7566	16·0581	13·9740	12·3304	52–57	8·3787	7·8255	7·3321	6·8901
5–10	18·9389	16·2361	14·1433	12·4894	53–58	8·0579	7·5420	7·0803	6·6656
6–11	18·9691	16·2854	14·2021	12·5523	54–59	7·7356	7·2557	6·8249	6·4366
7–12	18·8907	16·2425	14·1814	12·5456	55–60	7·4113	6·9661	6·5652	6·2028
8–13	18·7367	16·1346	14·1041	12·4891	56–61	7·0892	6·6771	6·3048	5·9673
9–14	18·5516	15·9998	14·0034	12·4119	57–62	6·7734	6·3926	6·0475	5·7338
10–15	18·3624	15·8612	13·8991	12·3317	58–63	6·4643	6·1130	5·7938	5·5027
11–16	18·1688	15·7185	13·7913	12·2482	59–64	6·1621	5·8386	5·5438	5·2742
12–17	17·9707	15·5716	13·6796	12·1613	60–65	5·8670	5·5698	5·2980	5·0488
13–18	17·7697	15·4218	13·5652	12·0720	61–66	5·5794	5·3067	5·0567	4·8268
14–19	17·5675	15·2707	13·4495	11·9814	62–67	5·2994	5·0497	4·8201	4·6084
15–20	17·3642	15·1182	13·3324	11·8895	63–68	5·0272	4·7990	4·5885	4·3940
16–21	17·1596	14·9642	13·2139	11·7963	64–69	4·7630	4·5548	4·3622	4·1838
17–22	16·9539	14·8089	13·0940	11·7018	65–70	4·5069	4·3173	4·1415	3·9781
18–23	16·7469	14·6521	12·9726	11·6060	66–71	4·2590	4·0867	3·9264	3·7772
19–24	16·5388	14·4939	12·8498	11·5088	67–72	4·0194	3·8630	3·7173	3·5812
20–25	16·3294	14·3342	12·7256	11·4102	68–73	3·7882	3·6465	3·5142	3·3904
21–26	16·1188	14·1730	12·5998	11·3102	69–74	3·5653	3·4373	3·3174	3·2049
22–27	15·9069	14·0104	12·4725	11·2087	60–75	3·3508	3·2353	3·1269	3·0250
23–28	15·6938	13·8462	12·3436	11·1058	71–76	2·1447	3·0407	2·9429	2·8506
24–29	15·4793	13·6804	12·2131	11·0014	72–77	2·9470	2·8535	2·7653	2·6821
25–30	15·2635	13·5130	12·0810	10·8954	73–78	2·7575	2·6736	2·5943	2·5193
26–31	15·0463	13·3439	11·9472	10·7877	74–79	2·5762	2·5011	2·4299	2·3625
27–32	14·8276	13·1731	11·8116	10·6784	75–80	2·4029	2·3358	2·2721	2·2116
28–33	14·6074	13·0005	11·6742	10·5674	76–81	2·2377	2·1778	2·1208	2·0666
29–34	14·3856	12·8260	11·5349	10·4546	77–82	2·0802	2·0269	1·9761	1·9276
30–35	14·1621	12·6496	11·3936	10·3398	78–83	1·9305	1·8831	1·8378	1·7946
31–36	13·9368	12·4711	11·2502	10·2231	79–84	1·7882	1·7462	1·7060	1·6675
32–37	13·7097	12·2904	11·1046	10·1043	80–85	1·6533	1·6161	1·5804	1·5462
33–38	13·4805	12·1075	10·9567	9·9832	81–86	1·5256	1·4926	1·4611	1·4307
34–39	13·2491	11·9221	10·8063	9·8598	82–87	1·4047	1·3757	1·3478	1·3210
35–40	13·0154	11·7341	10·6533	9·7338	83–88	1·2906	1·2651	1·2405	1·2168
36–41	12·7791	11·5432	10·4974	9·6052	84–89	1·1831	1·1606	1·1390	1·1181
37–42	12·5401	11·3494	10·3386	9·4736	85–90	1·0819	1·0622	1·0431	1·0248
38–43	12·2981	11·1523	10·1764	9·3388	86–91	·9867	·9695	·9528	·9367
39–44	12·0529	10·9516	10·0106	9·2007	87–92	·8975	·8824	·8678	·8537
40–45	11·8041	10·7471	9·8411	9·0588	88–93	·8139	·8008	·7881	·7757
41–46	11·5514	10·5384	9·6673	8·9129	89–94	·7358	·7244	·7133	·7026
42–47	11·2944	10·3252	9·4888	8·7624	90–95	·6630	·6531	·6435	·6341
43–48	11·0326	10·1069	9·3054	8·6071	91–96	·5952	·5866	·5783	·5702
44–49	10·7656	9·8830	9·1163	8·4463	92–97	·5322	·5248	·5176	·5106
45–50	10·4929	9·6531	8·9211	8·2795	93–98	·4739	·4675	·4614	·4553
46–51	10·2137	9·4163	8·7190	8·1059	94–99	·4200	·4146	·4093	·4041
47–51	9·9273	9·1721	8·5094	7·9249	95–100	·3704	·3658	·3612	·3568

TAB. A. 6.

Shewing the values of Annuity on the joint continuance of two lives.

Difference of age *Ten* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–10	14·7132	12·6177	11·0016	9·7284	45–55	9·4780	8·7825	8·1697	7·6270
1–11	16·2070	13·8995	12·1161	10·7086	46–56	9·1666	8·5120	7·9334	7·4194
2–12	17·2276	14·7842	12·8912	11·3945	47–57	8·8560	8·2410	7·6957	7·2098
3–13	17·8720	15·3526	13·3959	11·8457	48–58	8·5464	7·9697	7·4566	6·9981
4–14	18·2349	15·6838	13·6974	12·1204	49–59	8·2377	7·6980	7·2163	6·7846
5–15	18·3938	15·8426	13·8508	12·2662	50–60	7·9301	7·4261	6·9748	6·5690
6–16	18·4078	15·8781	13·8981	12·3193	51–61	7·6234	7·1538	6·7319	6·3514
7–17	18·3196	15·8265	13·8698	12·3061	52–62	7·3177	6·8811	6·4876	6·1317
8–18	18·1596	15·7129	13·7874	12·2452	53–63	7·0128	6·6078	6·2417	5·9097
9–19	17·9695	15·5730	13·6820	12·1639	54–64	6·7083	6·3337	5·9940	5·6850
10–20	17·7752	15·4292	13·5730	12·0795	55–65	6·4040	6·0583	5·7440	5·4573
11–21	17·5766	15·2814	13·4604	11·9918	56–66	6·1031	5·7850	5·4949	5·2294
12–22	17·3736	15·1294	13·3440	11·9006	57–67	5·8096	5·5173	5·2499	5·0047
13–23	17·1676	14·9745	13·2248	11·8070	58–68	5·5234	5·2554	5·0095	4·7833
14–24	16·9604	14·8180	13·1041	11·7120	59–69	5·2450	4·9996	4·7739	4·5657
15–25	16·7519	14·6601	12·9820	11·6156	60–70	4·9744	4·7502	4·5434	4·3521
16–26	16·5420	14·5007	12·8583	11·5178	61–71	4·7118	4·5073	4·3181	4·1428
17–27	16·3308	14·3396	12·7330	11·4185	62–72	4·4573	4·2711	4·0985	3·9380
18–28	16·1183	14·1770	12·6062	11·3177	63–73	4·2110	4·0419	3·8846	3·7380
19–29	15·9044	14·0128	12·4777	11·2154	64–74	3·9730	3·8197	3·6767	3·5431
20–30	15·6890	13·8469	12·3475	11·1115	65–75	3·7434	3·6046	3·4748	3·3533
21–31	15·4723	13·6793	12·2156	11·0060	66–76	3·5222	3·3968	3·2792	3·1689
22–32	15·2540	13·5099	12·0820	10·8988	67–77	3·3094	3·1963	3·0900	2·9901
23–33	15·0341	13·3387	11·9465	10·7898	68–78	3·1050	3·0031	2·9072	2·8169
24–34	14·8126	13·1656	11·8091	10·6791	69–79	2·9088	2·8173	2·7310	2·6494
25–35	14·5893	12·9905	11·6697	10·5664	70–80	2·7210	2·6389	2·5613	2·4878
26–36	14·3643	12·8134	11·5282	10·4518	71–81	2·5413	2·4678	2·3982	2·3322
27–37	14·1374	12·6341	11·3845	10·3351	72–82	2·3696	2·3040	2·2417	2·1824
28–38	13·9084	12·4525	11·2385	10·2162	73–83	2·2059	2·1474	2·0917	2·0387
29–39	13·6773	12·2684	11·0901	10·0950	74–84	2·0500	1·9979	1·9483	1·9009
30–40	13·4439	12·0819	10·9391	9·9714	75–85	1·9018	1·8555	1·8113	1·7690
31–41	13·2080	11·8925	10·7853	9·8450	76–86	1·7610	1·7199	1·6807	1·6431
32–42	12·9694	11·7002	10·6286	9·7159	77–87	1·6275	1·5912	1·5563	1·5229
33–43	12·7280	11·5048	10·4687	9·5837	78–88	1·5011	1·4690	1·4382	1·4086
34–44	12·4834	11·3060	10·3053	9·4482	79–89	1·3816	1·3533	1·3261	1·2999
35–45	12·2355	11·1035	10·1383	9·3092	80–90	1·2689	1·2439	1·2199	1·1968
36–46	11·9838	10·8970	9·9673	9·1663	81–91	1·1626	1·1407	1·1196	1·0992
37–47	11·7281	10·6861	9·7919	9·0191	82–92	1·0626	1·0434	1·0248	1·0069
38–48	11·4679	10·4705	9·6118	8·8673	83–93	·9686	·9518	·9356	·9199
39–49	11·2029	10·2498	9·4264	8·7105	84–94	·8805	·8659	·8517	·8379
40–50	10·9325	10·0233	9·2352	8·5480	85–95	·7981	·7853	·7729	·7609
41–51	10·6562	9·7905	9·0378	8·3793	86–96	·7210	·7099	·6991	·6887
42–52	10·3734	9·5509	8·8333	8·2037	87–97	·6492	·6396	·6302	·6211
43–53	10·0832	9·3035	8·6210	8·0204	88–98	·5824	·5740	·5659	·5581
44–54	9·7851	9·0477	8·4002	7·8285	89–99	·5203	·5132	·5062	·4994

TAB. A. 7.

Shewing the values of Annuity on the joint continuance of two lives.

Difference of age *Fifteen* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–15	14·2776	12·3063	10·7721	9·5544	43–58	8·8670	8·2479	7·6993	7·2110
1–16	15·7092	13·5420	11·8514	10·5072	44–59	8·5598	7·9787	7·4621	7·0009
2–17	16·6836	14·3920	12·6000	11·1723	45–60	8·2548	7·7103	7·2247	6·7898
3–18	17·2948	14·9351	13·0851	11·6081	46–61	7·9523	7·4429	6·9872	6·5779
4–19	17·6334	15·2473	13·3717	11·8709	47–62	7·6523	7·1767	6·7499	6·3654
5–20	17·7745	15·3916	13·5134	12·0072	48–63	7·3550	6·9118	6·5129	6·1524
6–21	17·7753	15·4161	13·5515	12·0527	49–64	7·0606	6·6484	6·2762	5·9390
7–22	17·6774	15·3557	13·5157	12·0332	50–65	6·7690	6·3865	6·0401	5·7253
8–23	17·5099	15·2350	13·4270	11·9669	51–66	6·4804	6·1262	5·8044	5·5112
9–24	17·3132	15·0886	13·3157	11·8804	52–67	6·1946	5·8674	5·5693	5·2968
10–25	17·1123	14·9383	13·2008	11·7908	53–68	5·9115	5·6100	5·3344	5·0820
11–26	16·9071	14·7839	13·0821	11·6978	54–69	5·6309	5·3537	5·0998	4·8664
12–27	16·6974	14·6251	12·9595	11·6012	55–70	5·3523	5·0983	4·8649	4·6498
13–28	16·4846	14·4633	12·8340	11·5020	56–71	5·0786	4·8464	4·6323	4·4346
14–29	16·2703	14·2998	12·7068	11·4012	57–72	4·8129	4·6009	4·4050	4·2236
15–30	16·0544	14·1345	12·5778	11·2987	58–73	4·5552	4·3621	4·1832	4·0170
16–31	15·8370	13·9674	12·4470	11·1946	59–74	4·3057	4·1302	3·9670	3·8152
17–32	15·6179	13·7984	12·3144	11·0888	60–75	4·0645	3·9052	3·7568	3·6182
18–33	15·3972	13·6276	12·1799	10·9811	61–76	3·8317	3·6873	3·5525	3·4264
19–34	15·1746	13·4547	12·0433	10·8716	62–77	3·6072	3·4767	3·3545	3·2399
20–35	14·9503	13·2797	11·9047	10·7601	63–78	3·3911	3·2733	3·1628	3·0589
21–36	14·7240	13·1025	11·7639	10·6466	64–79	3·1834	3·0773	2·9775	2·8835
22–37	14·4957	12·9231	11·6209	10·5310	65–80	2·9841	2·8887	2·7987	2·7138
23–38	14·2652	12·7413	11·4754	10·4130	66–81	2·7930	2·7074	2·6265	2·5499
24–39	14·0325	12·5570	11·3274	10·2927	67–82	2·6102	2·5334	2·4608	2·3920
25–40	13·7973	12·3700	11·1768	10·1698	68–83	2·4354	2·3668	2·3017	2·2399
26–41	13·5596	12·1801	11·0233	10·0443	69–84	2·2686	2·2074	2·1492	2·0938
27–42	13·3191	11·9872	10·8668	9·9158	70–85	2·1097	2·0552	2·0033	1·9537
28–43	13·0757	11·7911	10·7070	9·7843	71–86	1·9585	1·9100	1·8638	1·8196
29–44	12·8290	11·5915	10·5438	9·6494	72–87	1·8148	1·7718	1·7307	1·6913
30–45	12·5788	11·3881	10·3768	9·5109	73–88	1·6785	1·6404	1·6039	1·5689
31–46	12·3250	11·1807	10·2057	9·3684	74–89	1·5494	1·5157	1·4834	1·4523
32–47	12·0670	10·9689	10·0302	9·2218	75–90	1·4273	1·3975	1·3690	1·3415
33–48	11·8045	10·7523	9·8499	9·0704	76–91	1·3119	1·2857	1·2605	1·2362
34–49	11·5371	10·5306	9·6644	8·9139	77–92	1·2031	1·1801	1·1579	1·1365
35–50	11·2644	10·3031	9·4731	8·7519	78–93	1·1007	1·0805	1·0610	1·0422
36–51	10·9858	10·0694	9·2755	8·5836	79–94	1·0044	·9867	·9696	·9531
37–52	10·7008	9·8288	9·0710	8·4085	80–95	·9141	·8986	·8837	·8692
38–53	10·4086	9·5807	8·8588	8·2258	81–96	·8295	·8160	·8029	·7903
39–54	10·1086	9·3242	8·6381	8·0347	82–97	·7503	·7386	·7272	·7162
40–55	9·7998	9·0585	8·4080	7·8341	83–98	·6765	·6663	·6564	·6468
41–56	9·4872	8·7880	8·1725	7·6278	84–99	·6078	·5989	·5904	·5821
42–57	9·1762	8·5178	7·9362	7·4201	85–100	·5439	·5363	·5289	·5217

TAB. A. 8.

Shewing the values of Annuity on the joint continuance of two lives.

Difference of age *Twenty* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–20	13·7874	11·9520	10·5086	9·3533	40–60	8·4763	7·9040	7·3951	6·9406
1–21	15·1535	13·1390	11·5511	10·2776	41–61	8·1709	7·6348	7·1565	6·7281
2–22	16·0778	13·9513	12·2708	10·9201	42–62	7·8688	7·3673	6·9186	6·5155
3–23	16·6515	14·4655	12·7334	11·3381	43–63	7·5701	7·1018	6·6815	6·3029
4–24	16·9623	14·7558	13·0025	11·5869	44–64	7·2751	6·8386	6·4456	6·0905
5–25	17·0827	14·8832	13·1305	11·7120	45–65	6·9840	6·5779	6·2111	5·8787
6–26	17·0680	14·8944	13·1575	11·7483	46–66	6·6971	6·3198	5·9781	5·6676
7–27	16·9582	14·8234	13·1125	11·7211	47–67	6·4144	6·0647	5·7470	5·4574
8–28	16·7813	14·6938	13·0160	11·6480	48–68	6·1362	5·8126	5·5178	5·2484
9–29	16·5761	14·5391	12·8971	11·5550	49–69	5·8625	5·5638	5·2907	5·0406
10–30	16·3665	14·3803	12·7745	11·4586	50–70	5·5935	5·3182	5·0660	4·8342
11–31	16·1525	14·2172	12·6479	11·3586	51–71	5·3291	5·0761	4·8435	4·6293
12–32	15·9336	14·0495	12·5170	11·2548	52–72	5·0693	4·8372	4·6234	4·4258
13–33	15·7115	13·8784	12·3830	11·1480	53–73	4·8139	4·6016	4·4055	4·2238
14–34	15·4874	13·7052	12·2469	11·0393	54–74	4·5627	4·3690	4·1896	4·0229
15–35	15·2614	13·5297	12·1086	10·9286	55–75	4·3153	4·1391	3·9754	3·8230
16–36	15·0332	13·3520	11·9680	10·8157	56–76	4·0738	3·9138	3·7648	3·6258
17–37	14·8028	13·1718	11·8250	10·7005	57–77	3·8406	3·6957	3·5604	3·4338
18–38	14·5702	12·9891	11·6794	10·5830	58–78	3·6158	3·4848	3·3621	3·2471
19–39	14·3351	12·8038	11·5313	10·4630	59–79	3·3994	3·2811	3·1702	3·0659
20–40	14·0974	12·6155	11·3803	10·3404	60–80	3·1914	3·0848	2·9846	2·8902
21–41	13·8569	12·4243	11·2263	10·2149	61–81	2·9917	2·8959	2·8056	2·7203
22–42	13·6135	12·2299	11·0692	10·0865	62–82	2·8003	2·7143	2·6331	2·5562
23–43	13·3670	12·0321	10·9087	9·9548	63–83	2·6171	2·5401	2·4672	2·3980
24–44	13·1171	11·8307	10·7445	9·8196	64–84	2·4420	2·3732	2·3078	2·2457
25–45	12·8635	11·6253	10·5764	9·6806	65–85	2·2750	2·2135	2·1550	2·0994
26–46	12·6060	11·4157	10·4042	9·5377	66–86	2·1158	2·0610	2·0088	1·9591
27–47	12·3442	11·2015	10·2273	9·3903	67–87	1·9643	1·9156	1·8691	1·8247
28–48	12·0778	10·9824	10·0455	9·2381	68–88	1·8203	1·7771	1·7357	1·6962
29–49	11·8064	10·7580	9·8583	9·0806	69–89	1·6837	1·6454	1·6087	1·5736
30–50	11·5294	10·5276	9·6651	8·9174	70–90	1·5543	1·5205	1·4880	1·4568
31–51	11·2464	10·2909	9·4656	8·7479	71–91	1·4319	1·4020	1·3733	1·3457
32–52	10·9568	10·0472	9·2589	8·5714	72–92	1·3163	1·2900	1·2646	1·2402
33–53	10·6600	9·7958	9·0444	8·3871	73–93	1·2073	1·1841	1·1618	1·1403
34–54	10·3552	9·5360	8·8214	8·1943	74–94	1·1046	1·0843	1·0647	1·0457
35–55	10·0417	9·2669	8·5888	7·9920	75–95	1·0081	·9903	·9731	·9565
36–56	9·7243	8·9929	8·3508	7·7839	76–96	·9175	·9020	·8869	·8724
37–57	9·4089	8·7194	8·1122	7·5745	77–97	·8327	·8191	·8060	·7932
38–58	9·0955	8·4466	7·8732	7·3640	78–98	·7533	·7415	·7301	·7190
39–59	8·7845	8·1747	7·6341	7·1526	79–99	·6793	·6690	·6591	·6495

TAB. A. 9.

Shewing the values of Annuity on the joint continuance of two lives.

Difference of age *Twenty-five* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–25	13·2444	11·5549	10·2110	9·1247	38–63	7·7239	7·2384	6·8035	6·4122
1–26	14·5374	12·6871	11·2114	10·0163	39–64	7·4246	6·9718	6·5648	6·1977
2–27	15·4054	13·4563	11·8977	10·6326	40–65	7·1296	6·7079	6·3277	5·9838
3–28	15·9366	13·9374	12·3342	11·0298	41–66	6·8392	6·4471	6·0926	5·7709
4–29	16·2155	14·2020	12·5828	11·2620	42–67	6·5535	6·1896	5·8596	5·5593
5–30	16·3119	14·3095	12·6944	11·3736	43–68	6·2729	5·9357	5·6290	5·3493
6–31	16·2787	14·3048	12·7079	11·3987	44–69	5·9975	5·6856	5·4012	5·1410
7–32	16·1543	14·2205	12·6514	11·3616	45–70	5·7275	5·4396	5·1763	4·9348
8–33	15·9654	14·0796	12·5447	11·2797	46–71	5·4632	5·1979	4·9546	4·7308
9–34	15·7491	13·9141	12·4160	11·1780	47–72	5·2047	4·9607	4·7363	4·5294
10–35	15·5280	13·7440	12·2831	11·0725	48–73	4·9520	4·7281	4·5215	4·3306
11–36	15·3021	13·5692	12·1458	10·9630	49–74	4·7054	4·5003	4·3106	4·1348
12–37	15·0710	13·3894	12·0038	10·8493	50–75	4·4648	4·2773	4·1034	3·9419
13–38	14·8359	13·2056	11·8580	10·7320	51–76	4·2302	4·0592	3·9002	3·7522
14–39	14·5983	13·0190	11·7094	10·6121	52–77	4·0015	3·8459	3·7009	3·5655
15–40	14·3579	12·8294	11·5579	10·4895	53–78	3·7785	3·6373	3·5054	3·3819
16–41	14·1146	12·6366	11·4032	10·3639	54–79	3·5610	3·4332	3·3135	3·2012
17–42	13·8681	12·4404	11·2452	10·2351	55–80	3·3485	3·2331	3·1248	3·0230
18–43	13·6182	12·2407	11·0837	10·1030	56–81	3·1424	3·0386	2·9408	2·8487
19–44	13·3648	12·0371	10·9183	9·9673	57–82	2·9448	2·8514	2·7634	2·6802
20–45	13·1076	11·8294	10·7489	9·8276	58–83	2·7554	2·6716	2·5924	2·5175
21–46	12·8462	11·6173	10·5750	9·6838	59–84	2·5742	2·4992	2·4281	2·3607
22–47	12·5803	11·4004	10·3965	9·5354	60–85	2·4010	2·3340	2·2704	2·2099
23–48	12·3096	11·1784	10·2127	9·3820	61–86	2·2359	2·1761	2·1192	2·0650
24–49	12·0336	10·9508	10·0234	9·2231	62–87	2·0785	2·0253	1·9745	1·9261
25–50	11·7519	10·7172	9·8280	9·0584	63–88	1·9288	1·8815	1·8363	1·7931
26–51	11·4640	10·4769	9·6259	8·8871	64–89	1·7867	1·7447	1·7045	1·6661
27–52	11·1693	10·2295	9·4165	8·7086	65–90	1 6518	1·6147	1·5790	1·5449
28–53	10·8672	9·9742	9·1991	8·5222	66–91	1·5242	1·4913	1·4598	1·4295
29–54	10·5569	9·7102	8·9729	8·3271	67–92	1·4034	1·3744	1·3465	1·3197
30–55	10·2376	9·4367	8·7370	8·1222	68–93	1·2894	1·2639	1·2393	1·2156
31–56	9·9146	9·1583	8·4956	7·9115	69–94	1·1819	1·1595	1·1379	1·1170
32–57	9·5934	8·8804	8·2535	7·6994	70–95	1·0807	1·0611	1·0421	1·0237
33–58	9·2745	8·6033	8·0111	7·4862	71–96	·9857	·9685	·9518	·9357
34–59	8·9582	8·3271	7·7687	7·2722	72–97	·8965	·8815	·8669	·8528
35–60	8·6446	8·0522	7·5264	7·0575	73–98	·8130	·7999	·7872	·7749
36–61	8·3342	7·7790	7·2846	6·8424	74–99	·7350	·7236	·7125	·7018
37–62	8·0272	7·5076	7·0435	6·6272	75–100	·6622	·6523	·6427	·6334

TAB. A. 10. Annuity on two joint lives. Difference of age *Thirty* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–30	12·6436	11·1094	9·8733	8·8635	35–65	7·2435	6·8102	6·4201	6·0676
1–31	13·8550	12·1792	10·8255	9·7170	36–66	6·9483	6·5454	6·1816	5·8519
2–32	14·6595	12·8991	11·4730	10·3025	37–67	6·6580	6·2841	5·9453	5·6375
3–33	15·1423	13·3417	11·8788	10·6750	38–68	6·3731	6·0265	5·7116	5·4247
4–34	15·3844	13·5762	12·1027	10·8871	39–69	6·0936	5·7729	5·4808	5·2139
5–35	15·4524	13·6597	12·1943	10·9820	40–70	5·8198	5·5237	5·2531	5·0052
6–36	15·3968	13·6352	12·1908	10·9926	41–71	5·5520	5·2790	5·0288	4·7991
7–37	15·2541	13·5342	12·1195	10·9427	42–72	5·2903	5·0391	4·8082	4·5956
8–38	15·0497	13·3783	11·9992	10·8488	43–73	5·0350	4·8042	4·5915	4·3952
9–39	14·8185	13·1982	11·8570	10·7351	44–74	4·7861	4·5745	4·3790	4·1980
10–40	14·5820	13·0130	11·7100	10·6169	45–75	4·5439	4·3502	4·1708	4·0043
11–41	14·3398	12·8222	11·5578	10·4940	46–76	4·3084	4·1315	3·9672	3·8144
12–42	14·0917	12·6255	11·4000	10·3659	47–77	4·0798	3·9185	3·7683	3·6283
13–43	13·8388	12·4239	11·2375	10·2334	48–78	3·8581	3·7113	3·5743	3·4462
14–44	13·5820	12·2183	11·0709	10·0971	49–79	3·6433	3·5100	3·3853	3·2684
15–45	13·3212	12·0084	10·9002	9·9567	50–80	3·4354	3·3146	3·2013	3·0949
16–46	13·0561	11·7938	10·7248	9·8120	51–81	3·2343	3·1251	3·0224	2·9257
17–47	12·7863	11·5743	10·5445	9·6625	52–82	3·0399	2·9414	2·8485	2·7610
18–48	12·5115	11·3495	10·3589	9·5079	53–83	2·8520	2·7633	2·6796	2·6004
19–49	12·2312	11·1189	10·1675	9·3477	54–84	2·6703	2·5907	2·5153	2·4440
20–50	11·9450	10·8820	9·9698	9·1813	55–85	2·4941	2·4229	2·3553	2·2912
21–51	11·6523	10·6383	9·7652	9·0084	56–86	2·3247	2·2610	2·2005	2·1430
22–52	11·3527	10·3872	9·5532	8·8279	57–87	2·1631	2·1063	2·0523	2·0009
23–53	11·0454	10·1280	9·3329	8·6394	58–88	2·0093	1·9588	1·9106	1·8647
24–54	10·7298	9·8600	9·1036	8·4419	59–89	1·8630	1·8182	1·7754	1·7344
25–55	10·4050	9·5823	8·8644	8·2345	60–90	1·7243	1·6845	1·6465	1·6100
26–56	10·0763	9·2996	8·6196	8·0211	61–91	1·5927	1·5575	1·5238	1·4915
27–57	9·7496	9·0172	8·3741	7·8063	62–92	1·4682	1·4372	1·4073	1·3787
28–58	9·4251	8·7357	8·1282	7·5903	63–93	1·3505	1·3232	1·2969	1·2715
29–59	9·1033	8·4551	7·8822	7·3734	64–94	1·2395	1·2155	1·1923	1·1699
30–60	8·7843	8·1758	7·6363	7·1558	65–95	1·1350	1·1138	1·0934	1·0738
31–61	8·4685	7·8982	7·3910	6·9378	66–96	1·0366	1·0181	1·0002	·9829
32–62	8·1562	7·6225	7·1463	6·7197	67–97	·9443	·9281	·9124	·8973
33–63	7·8477	7·3491	6·9028	6·5018	68–98	·8577	·8436	·8299	·8167
34–64	7·5434	7·0782	6·6606	6·2843	69–99	·7767	·7644	·7525	·7409

TAB. A. 11. Annuity on two joint lives. Difference of age *Thirty-five* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–35	11·9776	10·6070	9·4876	8·5619	14–49	12·4052	11·2669	10·2944	9·4573
1–36	13·0971	11·6052	10·3832	9·3705	15–50	12·1149	11·0271	10·0946	9·2895
2–37	13·8296	12·2679	10·9850	9·9190	16–51	11·8179	10·7803	9·8878	9·1149
3–38	14·2566	12·6651	11·3538	10·2612	17–52	11·5138	10·5259	9·6733	8·9327
4–39	14·4554	12·8634	11·5475	10·4481	18–53	11·2018	10·2632	9·4504	8·7422
5–40	14·4893	12·9173	11·6137	10·5215	19–54	10·8813	9·9914	9·2184	8·5426
6–41	14·4059	12·8678	11·5882	10·5129	20–55	10·5515	9·7098	8·9762	8·3329
7–42	14·2397	12·7447	11·4969	10·4453	21–56	10·2178	9·4231	8·7282	8·1171
8–43	14·0145	12·5687	11·3579	10·3345	22–57	9·8859	9·1368	8·4795	7·8998
9–44	13·7630	12·3685	11·1968	10·2035	23–58	9·5564	8·8511	8·2304	7·6812
10–45	13·5050	12·1618	11·0296	10·0668	24–59	9·2294	8·5665	7·9811	7·4617
11–46	13·2401	11·9484	10·8558	9·9240	25–60	8·9054	8·2832	7·7320	7·2414
12–47	12·9680	11·7276	10·6750	9·7745	26–61	8·5846	8·0015	7·4833	7·0207
13–48	12·6894	11·5003	10·4877	9·6188	27–62	8·2673	7·7217	7·2353	6·7999

TAB. A. 11.—(*Continued.*)

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
28–63	7·9540	7·4443	6·9884	6·5792	47–82	3·0829	2·9818	2·8866	2·7969
29–64	7·6449	7·1694	6·7429	6·3589	48–83	2·8953	2·8041	2·7181	2·6368
30–65	7·3403	6·8975	6·4991	6·1394	49–84	2·7149	2·6328	2·5553	2·4818
31–66	7·0404	6·6288	6·2573	5·9209	50–55	2·5417	2·4680	2·3982	2·3320
32–67	6·7457	6·3636	6·0178	5·7037	51–86	2·3756	2·3095	2·2468	2·1872
33–68	6·4563	6·1023	5·7809	5·4882	52–87	2·2163	2·1572	2·1010	2·0475
34–69	6·1726	5·8451	5·5469	5·2746	53–88	2·0637	2·0110	1·9607	1·9128
35–70	5·8947	5·5923	5·3161	5·0633	54–89	1·9173	1·8704	1·8256	1·7828
36–71	5·6229	5·3441	5·0888	4·8545	55–90	1·7767	1·7351	1·6952	1·6571
37–72	5·3574	5·1009	4·8653	4·6485	56–91	1·6424	1·6055	1·5702	1·5363
38–73	5·0985	4·8628	4·6458	4·4456	57–92	1·5152	1·4826	1·4514	1·4213
39–74	4·8462	4·6301	4·4306	4·2460	58–93	1·3949	1·3662	1·3386	1·3120
40–75	4·6007	4·4029	4·2198	4·0500	59–94	1·2814	1·2561	1·2318	1·2083
41–76	4·3622	4·1815	4·0138	3·8579	60–95	1·1744	1·1522	1·1307	1·1101
42–77	4·1309	3·9661	3·8127	3·6698	61–96	1·0737	1·0542	1·0354	1·0172
43–78	3·9067	3·7567	3·6167	3·4860	62–97	·9790	·9620	·9455	·9295
44–79	3·6898	3·5534	3·4260	3·3067	63–98	·8903	·8754	·8610	·8470
45–80	3·4801	3·3565	3·2407	3·1319	64–99	·8072	·7942	·7816	·7694
46–81	3·2779	3·1659	3·0608	2·9620	65–100	·7295	·7182	·7073	·6967

TAB. A. 12. Annuity on two joint lives. Difference of age *Forty* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–40	11·2352	10·0357	9·0414	8·2085	30–70	5·9595	5·6517	5·3708	5·1137
1–41	12·2501	10·9504	9·8699	8·9625	31–71	5·6841	5·4004	5·1407	4·9025
2–42	12·8994	11·5453	10·4161	9·4653	32–72	5·4151	5·1540	4·9145	4·6941
3–43	13·2609	11·8878	10·7392	9·7692	33–73	5·1527	4·9129	4·6923	4·4888
4–44	13·4078	12·0414	10·8945	9·9232	34–74	4·8971	4·6773	4·4745	4·2870
5–45	13·3994	12·0575	10·9274	9·9676	35–75	4·6485	4·4474	4·2613	4·0888
6–46	13·2805	11·9751	10·8721	9·9324	36–76	4·4070	4·2233	4·0529	3·8945
7–47	13·0830	11·8220	10·7530	9·8394	37–77	4·1728	4·0052	3·8495	3·7043
8–48	12·8292	11·6176	10·5870	9·7035	38–78	3·9458	3·7934	3·6512	3·5185
9–49	12·5490	11·3885	10·3981	9·5464	39–79	3·7263	3·5878	3·4583	3·3372
10–50	12·2604	11·1510	10·2009	9·3814	40–80	3·5142	3·3886	3·2710	3·1606
11–51	11·9629	10·9044	9·9949	9·2079	41–81	3·3097	3·1960	3·0892	2·9889
12–52	11·6559	10·6481	9·7791	9·0250	42–82	3·1126	3·0099	2·9132	2·8222
13–53	11·3398	10·3822	9·5539	8·8328	43–83	2·9230	2·8304	2·7431	2·6606
14–54	11 0150	10·1072	9·3194	8·6313	44–84	2·7409	2·6576	2·5788	2·5042
15–55	10·6807	9·8222	9·0745	8·4195	45–85	2·5663	2·4914	2·4204	2·3532
16–56	10·3424	9·5319	8·8238	8·2016	46–86	2·3990	2·3318	2·2681	2·2075
17–57	10·0060	9·2420	8·5723	7·9820	47–87	2·2389	2·1788	2·1216	2·0672
18–58	9·6718	8·9527	8·3203	7·7612	48–88	2·0860	2·0323	1·9812	1·9324
19–59	9·3403	8·6644	8·0681	7·5393	49–89	1·9402	1·8923	1·8466	1·8030
20–60	9·0118	8·3775	7·8160	7·3166	50–90	1·8013	1·7587	1·7179	1·6789
21–61	8·6865	8·0922	7·5643	7·0935	51–91	1·6691	1·6312	1·5950	1·5602
22–62	8·3649	7·8088	7·3134	6·8702	52–92	1·5434	1·5099	1·4777	1 4468
23–63	8·0472	7·5277	7·0635	6·6470	53–93	1·4240	1·3943	1·3658	1·3384
24–64	7·7338	7·2493	6·8150	6·4242	54–94	1·3105	1·2844	1·2592	1·2349
25–65	7·4249	6·9738	6·5682	6·2022	55–95	1·2025	1·1794	1·1573	1·1359
26–66	7·1209	6·7016	6·3235	5·9812	56–96	1·1001	1·0799	1·0604	1·0416
27–67	6·8221	6·4330	6·0810	5·7615	57–97	1·0038	·9862	·9691	·9526
28–68	6·5288	6·1683	5·8412	5·5435	58–98	·9135	·8981	·8831	·8687
29–69	6·2412	5·9078	5·6044	5·3275	59–99	·8289	·8155	·8024	·7898

TAB. A. 14.— *Continued.*

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
20–70	6·0661	5·7494	5·4606	5·1965	35–85	2·6034	2·5268	2·4543	2·3855
21–71	5·7846	5·4928	5·2259	4·9812	36–86	2·4331	2·3645	2·2993	2·2375
22–72	5·5097	5·2413	4·9952	4·7689	37–87	2·2703	2·2089	2·1505	2·0949
23–73	5·2416	4·9952	4·7686	4·5598	38–88	2·1149	2·0600	2·0078	1·9580
24–74	4·9806	4·7548	4·5465	4·3541	39–89	1·9667	1·9178	1·8711	1·8266
25–75	4·7267	4·5201	4·3291	4·1522	40–90	1·8256	1·7821	1·7405	1·7007
26–76	4·4801	4·2915	4·1167	3·9543	41–91	1·6915	1·6529	1·6159	1·5804
27–77	4·2410	4·0691	3·9093	3·7606	42–92	1·5642	1·5300	1·4971	1·4656
28–78	4·0094	3 8530	3·7073	3·5713	43–93	1·4436	1·4133	1·3842	1·3562
29–79	3·7855	3·6435	3·5108	3·3867	44–94	1·3294	1·3026	1·2769	1·2521
30–80	3·5692	3·4405	3·3200	3·2069	45–95	1·2215	1·1979	1·1752	1·1533
31–81	3·3607	3·2442	3·1349	3·0322	46–96	1·1197	1·0990	1·0790	1·0597
32–82	3·1598	3·0546	2·9557	2·8625	47–97	1·0239	1·0057	·9881	·9711
33–83	2·9667	2·8719	2·7825	2·6981	48–98	·9337	·9178	·9024	·8874
34–84	2·7812	2·6959	2·6153	2·5391	49–99	·8491	·8352	·8217	·8086

TAB. A. 15.

Shewing the values of Annuity on the joint continuance of two lives.
Difference of age *Fifty-five* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–55	8·3250	7·6647	7·0902	6·5873	23–78	4·0354	3·8773	3·7302	3·5928
1–56	8·9042	8·2072	7·5990	7·0652	24–79	3·8096	3·6661	3·5322	3·4068
2–57	9·2064	8·4988	7·8794	7·3343	25–80	3·5916	3·4616	3·3399	3·2258
3–58	9·2984	8·5992	7·9852	7·4432	26–81	3·3814	3·2638	3·1534	3·0498
4–59	9·2395	8·5614	7·9641	7·4353	27–82	3·1790	3·0728	2·9730	2·8789
5–60	9·0762	8·4274	7·8540	7·3448	28–83	2·9844	2·8887	2·7985	2·7134
6–61	8·8427	8·2278	7·6826	7·1970	29–84	2·7976	2·7115	2·6302	2·5533
7–62	8·5628	7·9842	7·4696	7·0099	30–85	2·6184	2·5412	2·4680	2·3987
8–63	8·2531	7·7116	7·2285	6·7956	31–86	2·4470	2·3777	2·3120	2·2496
9–64	7·9342	7·4291	6·9770	6·5707	32–87	2·2830	2·2211	2·1622	2·1061
10–65	7·6188	7·1485	6·7262	6·3455	33–88	2·1265	2·0712	2·0185	1·9683
11–66	7·3072	6·8700	6·4763	6·1204	34–89	1·9773	1·9280	1·8810	1·8361
12–67	6·9995	6·5939	6·2275	5·8954	35–90	1·8353	1·7915	1·7495	1·7094
13–68	6·6969	6·3213	5·9810	5·6716	36–91	1·7004	1·6614	1·6241	1·5884
14–69	6·4002	6·0529	5·7374	5·4497	37–92	1·5723	1·5378	1·5047	1·4729
15–70	6·1097	5·7893	5·4972	5·2302	38–93	1·4509	1·4204	1·3910	1·3628
16–71	5·8257	5·5305	5·2607	5·0133	39–94	1·3360	1·3091	1·2831	1·2582
17–72	5·5483	5·2769	5·0281	4·7994	40–95	1·2275	1·2038	1·1809	1·1588
18–73	5·2779	5·0288	4·7997	4·5886	41–96	1·1252	1·1043	1·0841	1·0647
19–74	5·0146	4·7863	4·5759	4·3814	42–97	1·0288	1·0104	·9927	·9756
20–75	4·7586	4·5498	4·3568	4·1780	43–98	·9381	·9221	·9065	·8915
21–76	4·5099	4·3193	4·1426	3·9786	44–99	·8531	·8391	·8255	·8123
22–77	4·2688	4·0951	3·9337	3·7834	45–100	·7734	·7612	·7493	·7378

TAB. A. 16.

Shewing the values of Annuity on the joint continuance of two lives: Difference of age *Sixty* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–60	7·1091	6·6150	6·1782	5·7899	20–80	3·6111	3·4800	3·3572	3·2422
1–61	7·5510	7·0340	6·5756	6·1671	21–81	3·3995	3·2809	3·1696	3·0651
2–62	7·7584	7·2380	6·7751	6·3616	22–82	3·1957	3·0887	2·9880	2·8932
3–63	7·7905	7·2804	6·8254	6·4178	23–83	2·9998	2·9034	2·8125	2·7267
4–64	7·6983	7·2077	6·7687	6·3744	24–84	2·8118	2·7250	2·6431	2·5656
5–65	7·5216	7·0560	6·6381	6·2616	25–85	2·6315	2·5537	2·4799	2·4101
6–66	7·2891	6·8516	6·4576	6·1016	26–86	2·4590	2·3892	2·3230	2·2601
7–67	7·0210	6·6127	6·2440	5·9098	27–87	2·2941	2·2316	2·1723	2·1159
8–68	6·7308	6·3519	6·0087	5·6968	28–88	2·1366	2·0809	2·0278	1·9773
9–69	6·4355	6·0851	5·7667	5·4765	29–89	1·9866	1·9369	1·8895	1·8443
10–70	6·1455	5·8220	5·5272	5·2578	30–90	1·8438	1·7996	1·7574	1·7170
11–71	5·8609	5·5629	5·2905	5·0408	31–91	1·7080	1·6688	1·6313	1·5953
12–72	5·5820	5·3080	5·0568	4·8259	32–92	1·5793	1·5445	1·5112	1·4792
13–73	5·3096	5·0580	4·8268	4·6138	33–93	1·4572	1·4265	1·3970	1·3686
14–74	5·0443	4·8138	4·6014	4·4052	34–94	1·3418	1·3146	1·2886	1·2634
15–75	4·7864	4·5756	4·3808	4·2005	35–95	1·2327	1·2088	1·1858	1·1636
16–76	4·5359	4·3435	4·1653	3·9998	36–96	1·1298	1·1088	1·0886	1·0690
17–77	4·2931	4·1178	3·9549	3·8034	37–97	1·0330	1·0146	·9967	·9795
18–78	4·0579	3·8985	3·7500	3·6115	38–98	·9419	·9258	·9102	·8951
19–79	3·8306	3·6859	3·5508	3·4244	39–99	·8565	·8424	·8287	·8155

TAB. A. 17.

Shewing the values of Annuity on the joint continuance of two lives. Difference of Age *Sixty-five* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–65	5·9277	5·5724	5·2533	4·9655	18–83	3·0133	2·9161	2·8246	2·7382
1–66	6·2457	5·8776	5·5461	5·2463	19–84	2·8242	2·7368	2·6543	2·5763
2–67	6·3715	6·0044	5·6729	5·3723	20–85	2·6429	2·5645	2·4903	2·4200
3–68	6·3558	5·9993	5·6764	5·3830	21–86	2·4695	2·3992	2·3326	2·2693
4–69	6·2418	5·9020	5·5933	5·3120	22–87	2·3036	2·2408	2·1811	2·1243
5–70	6·0622	5·7425	5·4513	5·1852	23–88	2·1454	2·0893	2·0359	1·9851
6–71	5·8406	5·5428	5·2707	5·0214	24–89	1·9946	1·9446	1·8970	1·8515
7–72	5·5931	5·3177	5·0653	4·8335	25–90	1·8511	1·8067	1·7642	1·7236
8–73	5·3305	5·0772	4·8445	4·6301	26–91	1·7147	1·6753	1·6375	1·6014
9–74	5·0664	4·8342	4·6203	4·4227	27–92	1·5853	1·5504	1·5169	1·4847
10–75	4·8089	4·5965	4·4003	4·2186	28–93	1·4627	1·4318	1·4022	1·3736
11–76	4·5581	4·3642	4·1846	4·0178	29–94	1·3468	1·3195	1·2933	1·2680
12–77	4·3142	4·1375	3·9734	3·8207	30–95	1·2372	1·2132	1·1901	1·1677
13–78	4·0776	3·9169	3·7674	3·6278	31–96	1·1339	1·1128	1·0924	1·0728
14–79	3·8489	3·7030	3·5669	3·4396	32–97	1·0367	1·0181	1·0002	·9829
15–80	3·6281	3·4959	3·3723	3·2565	33–98	·9452	·9290	·9133	·8981
16–81	3·4152	3·2957	3·1837	3·0784	34–99	·8595	·8453	·8315	·8182
17–82	3·2103	3·1024	3·0010	2·9056	35–100	·7791	·7668	·7548	·7432

TAB. A. 18. Annuity on two joint lives. Difference of age *Seventy* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–70	4·8166	4·5717	4·3483	4·1440	15–85	2·6528	2·5740	2·4993	2·4286
1–71	5·0284	4·7774	4·5480	4·3376	16–86	2·4785	2·4079	2·3409	2·2773
2–72	5·0881	4·8404	4·6134	4·4048	17–87	2·3120	2·2488	2·1888	2·1317
3–73	5·0382	4·8000	4·5812	4·3795	18–88	2·1530	2·0966	2·0430	1·9918
4–74	4·9138	4·6889	4·4817	4·2904	19–89	2·0016	1·9513	1·9034	1·8577
5–75	4·7411	4·5315	4·3379	4·1587	20–90	1·8574	1·8128	1·7701	1·7293
6–76	4·5386	4·3452	4·1660	3·9997	21–91	1·7205	1·6809	1·6429	1·6066
7–77	4·3188	4·1415	3·9769	3·8238	22–92	1·5906	1·5555	1·5218	1·4895
8–78	4·0898	3·9283	3·7779	3·6377	23–93	1·4675	1·4365	1·4066	1·3780
9–79	3·8620	3·7153	3·5784	3·4504	24–94	1·3511	1·3237	1·2973	1·2720
10–80	3·6415	3·5086	3·3843	3·2677	25–95	1·2411	1·2170	1·1938	1·1713
11–81	3·4285	3·3083	3·1956	3·0897	26–96	1·1375	1·1162	1·0958	1·0760
12–82	3·2229	3·1144	3·0124	2·9164	27–97	1·0398	1·0212	1·0033	·9859
13–83	3·0249	2·9272	2·8351	2·7482	28–98	·9481	·9318	·9160	·9008
14–84	2·8349	2·7470	2·6641	2·5856	29–99	·8620	·8478	·8340	·8207

TAB. A. 19. Annuity on two joint lives. Difference of age *Seventy-five* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–75	3·8065	3·6448	3·4953	3·3567	13–88	2·1597	2·1030	2·0491	1·9977
1–76	3·9322	3·7686	3·6169	3·4761	14–89	2·0076	1·9572	1·9090	1·8631
2–77	3·9425	3·7828	3·6345	3·4965	15–90	1·8630	1·8181	1·7752	1·7342
3–78	3·8716	3·7197	3·5783	3·4463	16–91	1·7255	1·6857	1·6476	1·6111
4–79	3·7471	3·6052	3·4726	3·3488	17–92	1·5952	1·5599	1·5261	1·4936
5–80	3·5892	3·4582	3·3356	3·2207	18–93	1·4717	1·4405	1·4105	1·3818
6–81	3·4117	3·2920	3·1796	3·0741	19–94	1·3548	1·3273	1·3009	1·2754
7–82	3·2239	3·1152	3·0130	2·9168	20–95	1·2445	1·2203	1·1970	1·1745
8–83	3·0316	2·9335	2·8410	2·7538	21–96	1·1405	1·1192	1·0987	1·0788
9–84	2·8423	2·7540	2·6707	2·5919	22–97	1·0426	1·0239	1·0059	·9884
10–85	2·6605	2·5813	2·5063	2·4352	23–98	·9506	·9342	·9184	·9031
11–86	2·4862	2·4152	2·3479	2·2840	24–99	·8643	·8500	·8361	·8227
12–87	2·3192	2·2557	2·1954	2·1381	25–100	·7834	·7709	·7589	·7472

TAB. A. 20. Annuity on two joint lives. Difference of age *Eighty* years.

Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent	Ages.	3 ℔ cent	4 ℔ cent	5 ℔ cent	6 ℔ cent
0–80	2·9189	2·8168	2·7212	2·6315	10–90	1·8671	1·8221	1·7791	1·7379
1–81	2·9795	2·8776	2·7820	2·6921	11–91	1·7297	1·6898	1·6515	1·6149
2–82	2·9565	2·8582	2·7659	2·6789	12–92	1·5991	1·5637	1·5298	1·4972
3–83	2·8764	2·7840	2·6970	2·6148	13–93	1·4752	1·4440	1·4139	1·3850
4–84	2·7601	2·6746	2·5940	2·5177	14–94	1·3581	1·3305	1·3039	1·2784
5–85	2·6223	2·5442	2·4703	2·4004	15–95	1·2475	1·2232	1·1997	1·1772
6–86	2·4730	2·4023	2·3353	2·2717	16–96	1·1432	1·1218	1·1012	1·0813
7–87	2·3186	2·2551	2·1947	2·1373	17–97	1·0450	1·0262	1·0081	·9907
8–88	2·1631	2·1063	2·0522	2·0007	18–98	·9527	·9363	·9205	·9051
9–89	2·0115	1·9609	1·9126	1·8665	19–99	·8662	·8518	·8380	·8245

TAB. A. 21.

The *Expectation* of complete years, at all ages; or the value of Annuity of £1, when there is no interest of money.

Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.
0	38·6889	17	40·1971	34	28·8037	51	18·1134	68	8·5296	85	2·9926
1	42·6499	18	39·4991	35	28·1617	52	17·4864	69	8·0902	86	2·7830
2	45·2746	19	38·8048	36	27·5223	53	16·8575	70	7·6657	87	2·5844
3	46·8415	20	38·1141	37	26·8853	54	16·2260	71	7·2562	88	2·3964
4	47·6209	21	37·4270	38	26·2505	55	15·5915	72	6·8614	89	2·2186
5	47·8365	22	36·7435	39	25·6179	56	14·9621	73	6·4813	90	2·0507
6	47·6587	23	36·0635	40	24·9873	57	14·3464	74	6·1158	91	1·8923
7	47·2110	24	35·3871	41	24·3584	58	13·7447	75	5·7646	92	1·7431
8	46·5802	25	34·7141	42	23·7310	59	13·1572	76	5·4277	93	1·6027
9	45·8776	26	34·0446	43	23·1050	60	12·5840	77	5·1047	94	1·4707
10	45·1705	27	33·3785	44	22·4802	61	12·0253	78	4·7955	95	1·3468
11	44·4589	28	32·7156	45	21·8561	62	11·4812	79	4·4997	96	1·2307
12	43·7427	29	32·0560	46	21·2327	63	10·9519	80	4·2172	97	1·1219
13	43·0262	30	31·3996	47	20·6096	64	10·4375	81	3·9476	98	1·0203
14	42·3133	31	30·7462	48	19·9865	65	9·9380	82	3·6907	99	·9253
15	41·6042	32	30·0958	49	19·3630	66	9·4535	83	3·4461		
16	40·8988	33	29·4484	50	18·7387	67	8·9841	84	3·2135		

Part the Second of TAB. A. 3.

Shewing the values of Annuity on a single life at any age.

Age.	7 ℔ cent	8 ℔ cent	Age.	7 ℔ cent	8 ℔ cent	Age.	7 ℔ cent	8 ℔ cent	Age.	7 ℔ cent	8 ℔ cent
0	9·6931	8·6518	25	11·6571	10·5084	50	9·2331	8·5408	75	4·1700	4·0057
1	10·7016	9·5421	26	11·5918	10·4571	51	9·0770	8·4085	76	3·9752	3·8238
2	11·4238	10·1813	27	11·5249	10·4044	52	8·9124	8·2682	77	3·7840	3·6448
3	11·9165	10·6192	28	11·4562	10·3503	53	8·7386	8·1191	78	3·5967	3·4690
4	12·2351	10·9044	29	11·3856	10·2946	54	8·5547	7·9604	79	3·4137	3·2968
5	12·4257	11·0774	30	11·3132	10·2373	55	8·3597	7·7908	80	3·2351	3·1282
6	12·5240	11·1692	31	11·2388	10·1784	56	8·1575	7·6141	81	3·0610	2·9636
7	12·5560	11·2025	32	11·1622	10·1177	57	7·9528	7·4345	82	2·8918	2·8032
8	12·5400	11·1933	33	11·0835	10·0551	58	7·7457	7·2521	83	2·7276	2·6471
9	12·5034	11·1660	34	11·0024	9·9905	59	7·5366	7·0674	84	2·5685	2·4955
10	12·4641	11·1362	35	10·9189	9·9239	60	7·3258	6·8803	85	2·4145	2·3486
11	12·4217	11·1039	36	10·8328	9·8550	61	7·1135	6·6913	86	2·2659	2·2064
12	12·3761	11·0688	37	10·7440	9·7838	62	6·9000	6·5007	87	2·1227	2·0691
13	12·3283	11·0318	38	10·6523	9·7100	63	6·6857	6·3085	88	1·9848	1·9367
14	12·2793	10·9938	39	10·5575	9·6336	64	6·4709	6·1153	89	1·8525	1·8093
15	12·2292	10·9550	40	10·4594	9·5543	65	6·2559	5·9212	90	1·7256	1·6870
16	12·1779	10·9151	41	10·3577	9·4719	66	6·0410	5·7267	91	1·6041	1·5697
17	12·1254	10·8743	42	10·2523	9·3862	67	5·8266	5·5319	92	1·4881	1·4574
18	12·0716	10·8325	43	10·1429	9·2968	68	5·6131	5·3372	93	1·3775	1·3502
19	12·0166	10·7896	44	10·0291	9·2036	69	5·4007	5·1430	94	1·2722	1·2480
20	11·9602	10·7457	45	9·9106	9·1061	70	5·1899	4·9496	95	1·1722	1·1507
21	11·9025	10·7006	46	9·7870	9·0040	71	4·9809	4·7573	96	1·0773	1·0584
22	11·8434	10·6544	47	9·6580	8·8970	72	4·7741	4·5665	97	·9875	·9708
23	11·7828	10·6070	48	9·5230	8·7844	73	4·5698	4·3774	98	·9027	·8880
24	11·7207	10·5583	49	9·3816	8·6659	74	4·3684	4·1904	99	·8227	·8099

TABS. A. 22—29. Shewing the probability of the Younger or the Elder of two lives being *first* in the order of Decease.

A. 22.

Difference of age *Ten* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–10	·55552	·44448	45–55	·33932	·66068
1–11	·50211	·49789	46–56	·33594	·66406
2–12	·46300	·53700	47–57	·33271	·66729
3–13	·43555	·56445	48–58	·32966	·67034
4–14	·41699	·58301	49–59	·32683	·67317
5–15	·40496	·59504	50–60	·32425	·67575
6–16	·39759	·60241	51–61	·32199	·67801
7–17	·39350	·60650	52–62	·32010	·67990
8–18	·39171	·60829	53–63	·31864	·68136
9–19	·39085	·60915	54–64	·31769	·68231
10–20	·39007	·60993	55–65	·31736	·68264
11–21	·38938	·61062	56–66	·31738	·68262
12–22	·38876	·61124	57–67	·31739	·68261
13–23	·38818	·61182	58–68	·31740	·68260
14–24	·38758	·61242	59–69	·31742	·68258
15–25	·38694	·61306	60–70	·31744	·68256
16–26	·38627	·61373	61–71	·31746	·68254
17–27	·38558	·61442	62–72	·31748	·68252
18–28	·38485	·61515	63–73	·31750	·68250
19–29	·38408	·61592	64–74	·31753	·68247
20–30	·38328	·61672	65–75	·31757	·68243
21–31	·38244	·61756	66–76	·31761	·68239
22–32	·38155	·61845	67–77	·31765	·68235
23–33	·38062	·61938	68–78	·31770	·68230
24–34	·37964	·62036	69–79	·31776	·68224
25–35	·37862	·62138	70–80	·31782	·68218
26–36	·37753	·62247	71–81	·31789	·68211
27–37	·37639	·62361	72–82	·31798	·68202
28–38	·37519	·62481	73–83	·31807	·68193
29–39	·37392	·62608	74–84	·31818	·68182
30–40	·37259	·62741	75–85	·31831	·68169
31–41	·37117	·62883	76–86	·31846	·68154
32–42	·36968	·63032	77–87	·31862	·68138
33–43	·36810	·63190	78–88	·31881	·68119
34–44	·36642	·63358	79–89	·31903	·68097
35–45	·36465	·63535	80–90	·31929	·68071
36–46	·36276	·63724	81–91	·31958	·68042
37–47	·36077	·63923	82–92	·31991	·68009
38–48	·35864	·64136	83–93	·32029	·67971
39–49	·35639	·64361	84–94	·32072	·67928
40–50	·35398	·64602	85–95	·32120	·67880
41–51	·35142	·64858	86–96	·32173	·67827
42–52	·34869	·65131	87–97	·32231	·67769
43–53	·34578	·65422	88–98	·32294	·67706
44–54	·34266	·65734	89–99	·32362	·67638

A. 23.

Difference of age *Twenty* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–20	·48833	·51167	40–60	·22081	·77919
1–21	·42672	·57328	41–61	·21684	·78316
2–22	·38155	·61845	42–62	·21292	·78708
3–23	·34975	·65025	43–63	·20905	·79095
4–24	·32814	·67186	44–64	·20527	·79473
5–25	·31398	·68602	45–65	·20159	·79841
6–26	·30515	·69485	46–66	·19802	·80198
7–27	·30006	·69994	47–67	·19460	·80540
8–28	·29760	·70240	48–68	·19135	·80865
9–29	·29620	·70380	49–69	·18831	·81169
10–30	·29487	·70513	50–70	·18552	·81448
11–31	·29361	·70639	51–71	·18304	·81696
12–32	·29242	·70758	52–72	·18094	·81906
13–33	·29125	·70875	53–73	·17930	·82070
14–34	·29001	·70999	54–74	·17822	·82178
15–35	·28872	·71128	55–75	·17785	·82215
16–36	·28736	·71264	56–76	·17788	·82212
17–37	·28593	·71407	57–77	·17792	·82208
18–38	·28443	·71557	58–78	·17797	·82203
19–39	·28285	·71715	59–79	·17801	·82199
20–40	·28119	·71881	60–80	·17807	·82193
21–41	·27944	·72056	61–81	·17813	·82187
22–42	·27759	·72241	62–82	·17820	·82180
23–43	·27564	·72436	63–83	·17829	·82171
24–44	·27358	·72642	64–84	·17838	·82162
25–45	·27141	·72859	65–85	·17849	·82151
26–46	·26911	·73089	66–86	·17861	·82139
27–47	·26668	·73332	67–87	·17876	·82124
28–48	·26411	·73589	68–88	·17892	·82108
29–49	·26138	·73862	69–89	·17911	·82089
30–50	·25849	·74151	70–90	·17932	·82068
31–51	·25542	·74458	71–91	·17957	·82043
32–52	·25216	·74784	72–92	·17985	·82015
33–53	·24869	·75131	73–93	·18018	·81982
34–54	·24499	·75501	74–94	·18055	·81945
35–55	·24105	·75895	75–95	·18098	·81902
36–56	·23698	·76302	76–96	·18147	·81853
37–57	·23292	·76708	77–97	·18202	·81798
38–58	·22886	·77114	78–98	·18263	·81737
39–59	·22482	·77518	79–99	·18329	·81671

TABS. A. 22—29. Shewing the probability of the Younger or the Elder of two lives being *first* in the order of Decease.

A. 24.

Difference of age *Thirty* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–30	·43362	·56638	35–65	·14682	·85318
1–31	·36569	·63431	36–66	·14328	·85672
2–32	·31581	·68419	37–67	·13976	·86024
3–33	·28060	·71940	38–68	·13626	·86374
4–34	·25656	·74344	39–69	·13279	·86721
5–35	·24069	·75931	40–70	·12936	·87064
6–36	·23066	·76934	41–71	·12596	·87404
7–37	·22475	·77525	42–72	·12262	·87738
8–38	·22171	·77829	43–73	·11934	·88066
9–39	·21982	·78018	44–74	·11611	·88389
10–40	·21798	·78202	45–75	·11297	·88703
11–41	·21620	·78380	46–76	·10991	·89009
12–42	·21448	·78552	47–77	·10696	·89304
13–43	·21274	·78726	48–78	·10413	·89587
14–44	·21091	·78909	49–79	·10145	·89855
15–45	·20898	·79102	50–80	·09896	·90104
16–46	·20694	·79306	51–81	·09669	·90331
17–47	·20479	·79521	52–82	·09473	·90527
18–48	·20252	·79748	53–83	·09314	·90686
19–49	·20012	·79988	54–84	·09208	·90792
20–50	·19758	·80242	55–85	·09173	·90827
21–51	·19490	·80510	56–86	·09181	·90819
22–52	·19205	·80795	57–87	·09189	·90811
23–53	·18903	·81097	58–88	·09199	·90801
24–54	·18582	·81418	59–89	·09210	·90790
25–55	·18242	·81758	60–90	·09224	·90776
26–56	·17890	·82110	61–91	·09239	·90761
27–57	·17536	·82464	62–92	·09257	·90743
28–58	·17181	·82819	63–93	·09278	·90722
29–59	·16825	·83175	64–94	·09302	·90698
30–60	·16468	·83532	65–95	·09329	·90671
31–61	·16110	·83890	66–96	·09359	·90641
32–62	·15752	·84248	67–97	·09392	·90608
33–63	·15395	·84605	68–98	·09428	·90572
34–64	·15038	·84962	69–99	·09467	·90533

A. 25.

Difference of age *Forty* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–40	·38746	·61254	30–70	·09815	90185
1–41	·31446	·68554	31–71	·09541	·90459
2–42	·26077	·73923	32–72	·09270	·90730
3–43	·22275	·77725	33–73	·09001	·90999
4–44	·19667	·80333	34–74	·08736	·91264
5–45	·17932	·82068	35–75	·08474	·91526
6–46	·16821	·83179	36–76	·08215	·91785
7–47	·16149	·83851	37–77	·07961	·92039
8–48	·15784	·84216	38–78	·07710	·92290
9–49	·15539	·84461	39–79	·07464	·92536
10–50	·15297	·84703	40–80	·07223	·92777
11–51	·15058	·84942	41–81	·06986	·93014
12–52	·14821	·85179	42–82	·06754	·93246
13–53	·14579	·85421	43–83	·06527	·93473
14–54	·14322	·85678	44–84	·06305	·93695
15–55	·14050	·85950	45–85	·06090	·93910
16–56	·13770	·86230	46–86	·05880	·94120
17–57	·13488	·86512	47–87	·05678	·94322
18–58	·13204	·86796	48–88	·05482	·94518
19–59	·12920	·87080	49–89	·05295	·94705
20–60	·12636	·87364	50–90	·05117	·94883
21–61	·12351	·87649	51–91	·04952	·95048
22–62	·12066	·87934	52–92	·04804	·95196
23–63	·11781	·88219	53–93	·04680	·95320
24–64	·11497	·88503	54–94	·04594	·95406
25–65	·11213	·88787	55–95	·04573	·95427
26–66	·10930	·89070	56–96	·04598	·95402
27–67	·10649	·89351	57–97	·04633	·95367
28–68	·10369	·89631	58–98	·04678	·95322
29–69	·10091	·89909	59–99	·04738	·95262

TABS. A. 22—29. Shewing the probability of the Younger or the Elder of two lives being *first* in the order of Decease.

A. 26.

Difference of age *Fifty* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–50	·34716	·65284	25–75	·06428	·93572
1–51	·27000	·73000	26–76	·06229	·93771
2–52	·21311	·78689	27–77	·06033	·93967
3–53	·17268	·82732	28–78	·05840	·94160
4–54	·14475	·85525	29–79	·05651	·94349
5–55	·12598	·87402	30–80	·05465	·94535
6–56	·11379	·88621	31–81	·05282	·94718
7–57	·10633	·89367	32–82	·05104	·94896
8–58	·10221	·89779	33–83	·04929	·95071
9–59	·09947	·90053	34–84	·04759	·95241
10–60	·09686	·90314	35–85	·04592	·95408
11–61	·09440	·90560	36–86	·04430	·95570
12–62	·09210	·90790	37–87	·04272	·95728
13–63	·08989	·91011	38–88	·04119	·95881
14–64	·08768	·91232	39–89	·03970	·96030
15–65	·08547	·91453	40–90	·03826	·96174
16–66	·08328	·91672	41–91	·03686	·96314
17–67	·08110	·91890	42–92	·03551	·96449
18–68	·07893	·92107	43–93	·03421	·96579
19–69	·07677	·92323	44–94	·03296	·96704
20–70	·07464	·92536	45–95	·03177	·96823
21–71	·07252	·92748	46–96	·03064	·96936
22–72	·07042	·92958	47–97	·02957	·97043
23–73	·06835	·93165	48–98	·02856	·97144
24–74	·06630	·93370	49–99	·02762	·97238

A. 27.

Difference of age *Sixty* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–60	·30734	·69266	20–80	·04120	·95880
1–61	·22843	·77157	21–81	·03981	·96019
2–62	·17065	·82935	22–82	·03845	·96155
3–63	·12986	·87014	23–83	·03713	·96287
4–64	·10194	·89806	24–84	·03583	·96417
5–65	·08341	·91659	25–85	·03457	·96543
6–66	·07161	·92839	26–86	·03334	·96666
7–67	·06459	·93541	27–87	·03214	·96786
8–68	·06099	·93901	28–88	·03097	·96903
9–69	·05882	·94118	29–89	·02984	·97016
10–70	·05680	·94320	30–90	·02875	·97125
11–71	·05493	·94507	31–91	·02769	·97231
12–72	·05325	·94675	32–92	·02667	·97333
13–73	·05166	·94834	33–93	·02569	·97431
14–74	·05009	·94991	34–94	·02474	·97526
15–75	·04855	·95145	35–95	·02384	·97616
16–76	·04703	·95297	36–96	·02299	·97701
17–77	·04553	·95447	37–97	·02220	·97780
18–78	·04406	·95594	38–98	·02146	·97854
19–79	·04262	·95738	39–99	·02076	·97924

A. 28.

Difference of age *Seventy* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–70	·26705	·73295	15–85	·02595	·97405
1–71	·19134	·80866	16–86	·02502	·97498
2–72	·13638	·86362	17–87	·02411	·97589
3–73	·09788	·90212	18–88	·02323	·97677
4–74	·07169	·92831	19–89	·02238	·97762
5–75	·05444	·94556	20–90	·02156	·97844
6–76	·04357	·95643	21–91	·02076	·97924
7–77	·03726	·96274	22–92	·01999	·98001
8–78	·03429	·96571	23–93	·01925	·98075
9–79	·03272	·96728	24–94	·01854	·98146
10–80	·03128	·96872	25–95	·01786	·98214
11–81	·03000	·97000	26–96	·01721	·98279
12–82	·02889	·97111	27–97	·01662	·98338
13–83	·02788	·97212	28–98	·01608	·98392
14–84	·02690	·97310	29–99	·01558	·98442

A. 29.

Difference of age *Eighty* years.

Ages.	Younger	Elder.	Ages.	Younger	Elder.
0–80	·22206	·77794	10–90	·01642	·98358
1–81	·15460	·84540	11–91	·01561	·98439
2–82	·10633	·89367	12–92	·01496	·98504
3–83	·07286	·92714	13–93	·01440	·98560
4–84	·05025	·94975	14–94	·01387	·98613
5–85	·03540	·96460	15–95	·01336	·98664
6–86	·02606	·97394	16–96	·01287	·98713
7–87	·02070	·97930	17–97	·01242	·98758
8–88	·01837	·98163	18–98	·01201	·98799
9–89	·01735	·98265	19–99	·01164	·98836

TABS. A. 30 and 31.

Shewing the relations of constantly *Living*, and annually *Dying*, to large intervals of age, in a Stationary Population, and in a Population increasing (suddenly) ten per cent in the successive decennial intervals of age.

A. 30. Stationary Population.

Ages.	Living.	Dying.	Rate ℘ cent.	Living.
0—5	596227	40096	6·7250	10391
5–10	516294	5095	·9869	8998
10–20	979612	6861	·7004	17072
20–30	903374	8445	·9348	15744
30–40	810346	10164	1·2543	14122
40–50	700415	11784	1·6824	12207
50–60	574669	13803	2·4019	10015
60–70	408033	19719	4·8326	7111
70–80	199907	20077	10·0432	3484
80–90	46556	9394	20·1783	811
90–100	2578	1027	39·8503	45
0–100	5738010	146465	2·5525	100000
0–20	2092133	52052	2·4880	36461
20–50	2414135	30393	1·2590	42073
50–100	1231743	64020	5·1975	21466

A. 31. Increasing Population.

Ages.	Living.	Dying.	Living.	Dying.
0–10	1480766	60150	244541	9933
10–20	1185330	8302	195751	1371
20–30	993712	9290	164106	1534
30–40	810346	10164	133824	1679
40–50	636741	10713	105154	1769
50–60	474933	11407	78433	1884
60–70	306561	14815	50627	2447
70–80	136539	13713	22549	2265
80–90	28908	5833	4774	963
90–100	1455	580	240	96
0–100	6055290	144966	1000000	23940
0–20	2666096	68452	440292	11304
20–50	2440798	30166	403085	4982
50–100	948396	46348	156623	7654

TABS. A. 32 and 33.

Health Insurance. Weekly payments equivalent to a benefit during Sickness of 100 pence per week, when the Insurance is for the term of one year, and when it is for the term comprehended between the age of admission and the age of *Fifty-five* years. Rate of interest 3 per cent.

A. 32. Insurance for one year.

Between ages.	Weekly payment in pence.	Between ages.	Weekly payment in pence.	Between ages.	Weekly payment in pence.
20–21	1·4997	38–39	2·5492	55–56	4·4106
21–22	1·5445	39–40	2·6254	56–57	4·7621
22–23	1·5907	40–41	2·7040	57–58	5·1416
23–24	1·6383	41–42	2·7848	58–59	5·5514
24–25	1·6873	42–43	2·8681	59–60	5·9938
25–26	1·7378	43–44	2·9539	60–61	6·4714
26–27	1·7898	44–45	3·0423	61–62	6·9871
27–28	1·8433	45–46	3·1333	62–63	7·5440
28–29	1·8985	46–47	3·2270	63–64	8·1452
29–30	1·9552	47–48	3·3235	64–65	8·7943
30–31	2·0137	48–49	3·4229	65–66	9·4951
31–32	2·0740	49–50	3·5253	66–67	10·2518
32–33	2·1360	50–51	3·6308	67–68	11·0688
33–34	2·1999	51–52	3·7394	68–69	11·9509
34–35	2 2657	52–53	3·8512	69–70	12·9033
35–36	2·3335	53–54	3·9664	70–71	13·9316
36–37	2·4033	54–55	4·0851		
37–38	2·4751				

A. 33. Insurance until aged 55.

Age.	Weekly payment in pence.	Age.	Weekly payment in pence.
20	2·2702	38	3·1481
21	2·3134	39	3·2029
22	2·3572	40	3·2583
23	2·4017	41	3·3143
24	2·4469	42	3·3708
25	2·4927	43	3·4279
26	2·5392	44	3·4854
27	2·5864	45	3·5435
28	2·6342	46	3·6021
29	2·6827	47	3·6611
30	2·7318	48	3·7205
31	2·7816	49	3·7803
32	2·8321	50	3·8405
33	2·8832	51	3·9010
34	2·9349	52	3·9619
35	2·9873	53	4·0229
36	3·0403	54	4·0842
37	3·0939		

TAB. A. 34. Maintenance in old age. Benefit 100 pence per week, after the age of *Sixty-five*. Weekly payments to cease at the age of *Fifty-five*.

Age.	Weekly payment in pence.	Single payment in pounds.	Age.	Weekly payment in pence.	Single payment in pounds.
20	5·2352	21·2206	28	8·3021	28·9082
21	5·5259	22·0366	29	8·8431	30·0853
22	5·8380	22·8897	30	9·4336	31·3200
23	6·1737	23·7817	35	13·3987	38·4873
24	6·5354	24·7150	40	20·3183	47·7346
25	6·9257	25·6917	45	34·6910	59·8418
26	7·3478	26·7144	50	79·0212	75·9579
27	7·8052	27·7856	55	—	97·8125

TAB. A. 35. Benefit 100 shillings on the day of death. Equivalents in quarterly and in single present payments.

Age.	Quarterly payment in pence.	Single payment in shillings.
20	5·2347	37·1211
25	5·9530	40·1687
30	6·8038	43·4170
35	7·8295	46·8932
40	9·0966	50·6391
45	10·7154	54·7195
50	12·8846	59·2352
55	16·0023	64·3456
60	20·4397	69·7441

TAB. A. 36. Shewing the values in single and in annual payments of a deferred Annuity of £10, payable on the death of A, during the future portion of life which may be enjoyed by another person, B. Interest 3 per cent.

B.	A.	Single payment.	Annual payment.	B.	A.	Single payment.	Annual payment.	B.	A.	Single payment.	Annual payment.
20	20	38·901	2·1752	40	20	21·031	1·3930	60	20	7·248	·7239
	30	50·850	3·0469		30	27·566	1·9085		30	9·523	·9733
	40	66·766	4·4224		40	37·188	2·7583		40	12·603	1·3300
	50	88·291	6·8205		50	52·679	4·4147		50	18·065	2·0230
	60	117·622	11·7484		60	77·242	8·1511		60	30·448	3·9585
	70	147·079	20·8146		70	103·806	15·2213		70	47·622	7·9711
	80	171·629	37·2210		80	126·862	28·1027		80	65·452	15·6159
30	20	29·549	1·7705	50	20	13·471	1·0407	70	20	3·305	·4677
	30	38·828	2·4635		30	17·627	1·4068		30	4·371	·6280
	40	52·001	3·6002		40	23·596	1·9774		40	5·768	8458
	50	71·145	5·6783		50	34·084	3·1317		50	8·031	1·2180
	60	98·597	10·0771		60	53·620	6·0045		60	14·222	2·3805
	70	126·844	18·2260		70	76·986	11·6760		70	24·385	4·9183
	80	150·747	32·9918		80	98·567	22·2230		80	36·756	9·8781

TAB. A. 37. Shewing, at quinquennial intervals of age, the force of mortality, or the number of Deaths which would occur in one year, upon 100 constantly living.

Age.	Rate ℘ cent.	Age.	Rate ℘ cent.	Age.	Rate ℘ cent.	Age.	Rate ℘ cent.	Age.	Rate ℘ cent.	Age.	Rate ℘ cent.
0	14·5798	20	·8057	40	1·4526	60	3·3163	80	15·3692	100	71·2281
5	2·0595	25	·9336	45	1·6833	65	4·8658	85	22·5502	105	104·5084
10	·6364	30	1·0818	50	1·9505	70	7·1392	90	33·0865	110	153·3386
15	·6953	35	1·2536	55	2·2602	75	10·4749	95	48·5458	115	224·9838

TAB. B. 1.

Shewing, at the end of any number of years from birth,—the *Living* out of a given number born,—also the *Dying* in the year succeeding.

Age.	Living.	Dying.	Age.	Living.	Dying.
0	151403·0	18909·6	50	68966·3	1128·4
1	132493·4	11427·5	51	67838·0	1142·8
2	121065·9	7162·1	52	66695·2	1156·9
3	113903·8	4600·6	53	65538·3	1170·5
4	109303·2	3004·6	54	64367·8	1183·7
5	106298·6	1984·4	55	63184·1	1224·9
6	104314·1	1320·6	56	61959·2	1295·8
7	102993·5	883·3	57	60663·4	1368·7
8	102110·2	592·9	58	59294·7	1443·1
9	101517·3	481·9	59	57851·6	1518·7
10	101035·4	511·4	60	56332·8	1595·0
11	100524·0	524·0	61	54737·8	1671·5
12	100000·0	536·8	62	53066·4	1747·4
13	99463·2	549·8	63	51319·0	1822·1
14	98913·3	563·1	64	49496·8	1894·8
15	98350·2	576·6	65	47602·1	1964·4
16	97773·6	590·4	66	45637·7	2030·0
17	97183·3	604·2	67	43607·6	2090·6
18	96579·0	618·4	68	41517·0	2144·8
19	95960·6	632·8	69	39372·2	2191·5
20	95327·9	647·3	70	37180·7	2229·4
21	94680·5	662·1	71	34951·4	2257·2
22	94018·4	677·1	72	32694·1	2273·7
23	93341·4	692·2	73	30420·4	2277·7
24	92649·2	707·5	74	28142·7	2268·2
25	91941·6	723·1	75	25874·5	2244·1
26	91218·5	738·8	76	23630·4	2205·0
27	90479·8	754·6	77	21425·4	2150·3
28	89725·2	770·6	78	19275·2	2080·0
29	88954·6	786·7	79	17195·2	1994·5
30	88167·8	803·0	80	15200·7	1894·5
31	87364·8	819·4	81	13306·1	1781·3
32	86545·5	835·8	82	11524·8	1656·5
33	85709·6	852·4	83	9868·3	1522·3
34	84857·2	869·0	84	8346·0	1381·1
35	83988·2	885·8	85	6964·9	1235·7
36	83102·4	902·5	86	5729·2	1089·3
37	82200·0	919·2	87	4639·9	944·8
38	81280·8	936·0	88	3695·1	805·3
39	80344·8	952·7	89	2889·8	673·7
40	79392·1	969·4	90	2216·2	552·2
41	78422·7	986·0	91	1664·0	442·8
42	77436·7	1002·6	92	1221·2	346·8
43	76434·1	1019·0	93	874·4	264·8
44	75415·2	1035·2	94	609·6	196·6
45	74379·9	1051·4	95	413·0	141·8
46	73328·5	1067·3	96	271·2	99·0
47	72261·2	1083·0	97	172·2	66·7
48	71178·3	1098·4	98	105·5	43·3
49	70079·9	1113·5	99	62·2	27·1

TAB. B. 2.

Shewing, at every age of life, in logarithms,—the probability of living one year (λ,a),—and the *Living* out of a given number born ($\lambda\ a$).

Age.	λ,a	$\lambda\ a$	Age.	λ,a	$\lambda\ a$
0	$\bar{1}$·9420598	·1801345	50	$\bar{1}$·9928358	$\bar{1}$·8386371
1	·9608276	·1221943	51	·9926215	·8314729
2	·9735162	·0830219	52	·9924007	·8240944
3	·9820948	·0565381	53	·9921735	·8164951
4	·9878946	·0386329	54	·9919392	·8086686
5	·9918157	·0265275	55	·9914982	·8006078
6	·9944668	·0183432	56	·9908207	·7921060
7	·9962591	·0128100	57	·9900891	·7829267
8	·9974708	·0090691	58	·9892993	·7730158
9	·9979336	·0065399	59	·9884466	·7623151
10	·9977962	·0044735	60	·9875259	·7507617
11	·9977303	·0022697	61	·9865318	·7382876
12	·9976624	·0000000	62	·9854585	·7248194
13	·9975925	$\bar{1}$·9976624	63	·9842996	·7102779
14	·9975205	·9952549	64	·9830484	·6945775
15	·9974463	·9927754	65	·9816975	·6776259
16	·9973699	·9902217	66	·9802389	·6593234
17	·9972913	·9875916	67	·9786641	·6395623
18	·9972102	·9848829	68	·9769638	·6182264
19	·9971268	·9820931	69	·9751280	·5951902
20	·9970408	·9792199	70	·9731459	·5703182
21	·9969523	·9762607	71	·9710058	·5434641
22	·9968612	·9732130	72	·9686952	·5144699
23	·9967673	·9700742	73	·9662005	·4831651
24	·9966706	·9668415	74	·9635069	·4493656
25	·9965710	·9635121	75	·9605987	·4128725
26	·9964684	·9600831	76	·9574587	·3734712
27	·9963628	·9565515	77	·9540685	·3309299
28	·9962540	·9529143	78	·9504081	·2849984
29	·9961419	·9491683	79	·9464560	·2354065
30	·9960265	·9453102	80	·9421890	·1818625
31	·9959077	·9413367	81	·9375819	·1240515
32	·9957853	·9372444	82	·9326076	·0616334
33	·9956592	·9330297	83	·9272370	$\bar{2}$·9942410
34	·9955293	·9286889	84	·9214383	·9214780
35	·9953956	·9242182	85	·9151775	·8429163
36	·9952579	·9196138	86	·9084178	·7580938
37	·9951160	·9148717	87	·9011194	·6665116
38	·9949700	·9099877	88	·8932395	·5676310
39	·9948195	·9049577	89	·8847314	·4608705
40	·9946645	·8997772	90	·8755455	·3456019
41	·9945050	·8944417	91	·8656274	·2211474
42	·9943406	·8889467	92	·8549189	·0867748
43	·9941713	·8832873	93	·8433570	$\bar{3}$·9416937
44	·9939970	·8774586	94	·8308738	·7850507
45	·9938174	·8714556	95	·8173958	·6159245
46	·9936325	·8652730	96	·8028436	·4333203
47	·9934420	·8589055	97	·7871318	·2361639
48	·9932458	·8523475	98	·7701679	·0232957
49	·9930438	·8455933	99	·7518520	$\bar{4}$·7934636

TAB. B. 3. The *Expectation* of complete years, at all ages; or the value of Annuity of £1, when there is no interest of money.

Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.
0	39·4556	15	44·5490	30	33·8378	45	23·7501	60	13·9704	75	6·6232	90	2·4662
1	44·0867	16	43·8117	31	33·1488	46	23·0906	61	13·3775	76	6·2522	91	2·2846
2	47·2481	17	43·0779	32	32·4627	47	22·4317	62	12·7989	77	5·8956	92	2·1130
3	49·2190	18	42·3474	33	31·7792	48	21·7730	63	12·2347	78	5·5533	93	1·9511
4	50·2906	19	41·6203	34	31·0984	49	21·1142	64	11·6850	79	5·2251	94	1·7984
5	50·7121	20	40·8966	35	30·4202	50	20·4552	65	11·1502	80	4·9107	95	1·6547
6	50·6769	21	40·1762	36	29·7445	51	19·7954	66	10·6301	81	4·6099	96	1·5196
7	50·3267	22	39·4591	37	29·0710	52	19·1346	67	10·1250	82	4·3224	97	1·3927
8	49·7620	23	38·7454	38	28·3998	53	18·4724	68	9·6348	83	4·0480	98	1·2737
9	49·0527	24	38·0348	39	27·7306	54	17·8083	69	9·1597	84	3·7863	99	1·1622
10	48·2866	25	37·3275	40	27·0634	55	17·1419	70	8·6996	85	3·5371		
11	47·5323	26	36·6234	41	26·3979	56	16·4808	71	8·2545	86	3·3000		
12	46·7813	27	35·9224	42	25·7341	57	15·8328	72	7·8243	87	3·0747		
13	46·0338	28	35·2246	43	25·0716	58	15·1983	73	7·4092	88	2·8609		
14	45·2897	29	34·5297	44	24·4104	59	14·5774	74	7·0088	89	2·6582		

TAB. B. 4. Shewing the present value of Annuity of £1, depending on a single life.

Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent	Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent	Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent
0	17·8833	14·7461	12·4756	34	18·6442	16·1957	14·2424	68	7·7912	7·3055	6·8696
1	20·0487	16·5247	13·9690	35	18·4022	16·0179	14·1093	69	7·4621	7·0116	6·6060
2	21·5993	17·8079	15·0519	36	18·1563	15·8361	13·9726	70	7·1390	6·7218	6·3452
3	22·6462	18·6847	15·7983	37	17·9063	15·6504	13·8323	71	6·8222	6·4366	6·0874
4	23·3073	19·2500	16·2864	38	17·6521	15·4605	13·6882	72	6·5120	6·1563	5·8331
5	23·6851	19·5859	16·5841	39	17·3934	15·2662	13·5401	73	6·2087	5·8811	5·5825
6	23·8598	19·7569	16·7445	40	17·1302	15·0674	13·3877	74	5·9125	5·6113	5·3360
7	23·8907	19·8106	16·8072	41	16·8622	14·8638	13·2308	75	5·6238	5·3473	5·0940
8	23·8202	19·7812	16·8002	42	16·5893	14·6551	13·0693	76	5·3426	5·0894	4·8566
9	23·6781	19·6926	16·7433	43	16·3110	14·4413	12·9027	77	5·0692	4·8377	4·6243
10	23·5048	19·5780	16·6643	44	16·0274	14·2218	12·7309	78	4·8037	4·5924	4·3972
11	23·3331	19·4648	16·5865	45	15·7380	13·9966	12·5535	79	4·5463	4·3539	4·1755
12	23·1590	19·3494	16·5071	46	15·4425	13·7651	12·3702	80	4·2971	4·1222	3·9596
13	22·9825	19·2320	16·4260	47	15·1407	13·5272	12·1805	81	4·0562	3·8974	3·7495
14	22·8036	19·1124	16·3432	48	14·8322	13·2823	11·9841	82	3·8237	3·6798	3·5455
15	22·6222	18·9907	16·2586	49	14·5166	13·0301	11·7806	83	3·5995	3·4694	3·3477
16	22·4383	18·8668	16·1722	50	14·1936	12·7701	11·5693	84	3·3837	3·2663	3·1562
17	22·2518	18·7407	16·0839	51	13·8625	12·5018	11·3498	85	3·1763	3·0706	2·9711
18	22·0627	18·6123	15·9938	52	13·5230	12·2247	11·1215	86	2·9772	2·8822	2·7926
19	21·8711	18·4815	15·9017	53	13·1746	11·9381	10·8837	87	2·7865	2·7012	2·6206
20	21·6767	18·3483	15·8076	54	12·8166	11·6414	10·6357	88	2·6039	2·5275	2·4551
21	21·4797	18·2127	15·7115	55	12·4484	11·3339	10·3767	89	2·4294	2·3611	2·2963
22	21·2799	18·0746	15·6132	56	12·0754	11·0202	10·1110	90	2·2629	2·2020	2·1440
23	21·0772	17·9340	15·5128	57	11·7033	10·7059	9·8433	91	2·1043	2·0500	1·9982
24	20·8718	17·7907	15·4101	58	11·3326	10·3911	9·5740	92	1·9533	1·9051	1·8590
25	20·6634	17·6447	15·3052	59	10·9638	10·0763	9·3035	93	1·8099	1·7671	1·7261
26	20·4520	17·4959	15·1978	60	10·5972	9·7619	9·0320	94	1·6739	1·6359	1·5996
27	20·2375	17·3443	15·0880	61	10·2331	9·4482	8·7600	95	1·5450	1·5115	1·4793
28	20·0200	17·1898	14·9756	62	9·8721	9·1356	8·4877	96	1·4231	1·3935	1·3651
29	19·7992	17·0322	14·8606	63	9·5145	8·8246	8·2155	97	1·3080	1·2819	1·2568
30	19·5752	16·8716	14·7429	64	9·1607	8·5154	7·9439	98	1·1995	1·1765	1·1544
31	19·3477	16·7077	14·6223	65	8·8111	8·2085	7·6731	99	1·0973	1·0771	1·0577
32	19·1168	16·5406	14·4988	66	8·4661	7·9043	7·4035				
33	18·8823	16·3699	14·3722	67	8·1260	7·6032	7·1356				

TABS. B. 5, 6, and 7. Shewing the values of Annuity depending on the co-existence or joint continuance of two lives, whose common difference of age is 0, 5, or 10 years.

B. 5.

Equal ages.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0—0	9·4836	50–50	9·8984
1—1	11·8791	51–51	9·6397
2—2	13·7966	52–52	9·3718
3—3	15·2097	53–53	9·0938
4—4	16·1777	54–54	8·8046
5—5	16·7893	55–55	8·5031
6—6	17·1316	56–56	8·1963
7—7	17·2767	57–57	7·8922
8—8	17·2799	58–58	7·5912
9—9	17·1817	59–59	7·2937
10–10	17·0398	60–60	6·9999
11–11	16·9022	61–61	6·7104
12–12	16·7629	62–62	6·4253
13–13	16·6221	63–63	6·1452
14–14	16·4798	64–64	5·8702
15–15	16·3358	65–65	5·6007
16–16	16·1902	66–66	5·3369
17–17	16·0430	67–67	5·0792
18–18	15·8941	68–68	4·8277
19–19	15·7436	69–69	4·5828
20–20	15·5914	70–70	4·3445
21–21	15·4376	71–71	4·1130
22–22	15·2820	72–72	3·8886
23–23	15·1247	73–73	3·6713
24–24	14·9656	74–74	3·4612
25–25	14·8047	75–75	3·2584
26–26	14·6419	76–76	3·0629
27–27	14·4773	77–77	2·8748
28–28	14·3107	78–78	2·6941
29–29	14·1421	79–79	2·5207
30–30	13·9714	80–80	2·3546
31–31	13·7986	81–81	2·1958
32–32	13·6236	82–82	2·0441
33–33	13·4462	83–83	1·8994
34–34	13·2664	84–84	1·7617
35–35	13·0841	85–85	1·6308
36–36	12·8991	86–86	1·5066
37–37	12·7112	87–87	1·3889
38–38	12·5204	88–88	1·2776
39–39	12·3263	89–89	1·1724
40–40	12·1289	90–90	1·0733
41–41	11·9278	91–91	·9799
42–42	11·7228	92–92	·8922
43–43	11·5137	93–93	·8100
44–44	11·3000	94–94	·7330
45–45	11·0814	95–95	·6611
46–46	10·8575	96–96	·5941
47–47	10·6278	97–97	·5318
48–48	10·3918	98–98	·4740
49–49	10·1489	99–99	·4205

B. 6.

Difference of age *Five* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0—5	12·5945	48–53	9·6783
1—6	14·2525	49–54	9·4091
2—7	15·4297	50–55	9·1297
3—8	16·2034	51–56	8·8437
4—9	16·6634	52–57	8·5549
5–10	16·9048	53–58	8·2631
6–11	17·0066	54–59	7·9682
7–12	17·0075	55–60	7·6697
8–13	16·9371	56–61	7·3712
9–14	16·8159	57–62	7·0765
10–15	16·6726	58–63	6·7858
11–16	16·5305	59–64	6·4995
12–17	16·3868	60–65	6·2180
13–18	16·2414	61–66	5·9417
14–19	16·0944	62–67	5·6707
15–20	15·9457	63–68	5·4054
16–21	15·7954	64–69	5·1461
17–22	15·6434	65–70	4·8930
18–23	15·4897	66–71	4·6463
19–24	15·3342	67–72	4·4062
20–25	15·1770	68–73	4·1730
21–26	15·0180	69–74	3·9467
22–27	14·8571	70–75	3·7275
23–28	14·6944	71–76	3·5155
24–29	14·5297	72–77	3·3108
25–30	14·3630	73–78	3·1134
26–31	14·1944	74–79	2·9234
27–32	14·0236	75–80	2·7407
28–33	13·8506	76–81	2·5654
29–34	13·6753	77–82	2·3974
30–35	13·4977	78–83	2·2366
31–36	13·3176	79–84	2·0831
32–37	13·1350	80–85	1·9366
33–38	12·9496	81–86	1·7971
34–39	12·7613	82–87	1·6645
35–40	12·5700	83–88	1·5385
36–41	12·3755	84–89	1·4191
37–42	12·1775	85–90	1·3061
38–43	11·9758	86–91	1·1994
39–44	11·7701	87–92	1·0987
40–45	11·5603	88–93	1·0038
41–46	11·3458	89–94	·9147
42–47	11·1264	90–95	·8310
43–48	10·9016	91–96	·7527
44–49	10·6709	92–97	·6794
45–50	10·4339	93–98	·6112
46–51	10·1899	94–99	·5476
47–52	9·9383	95–100	·4887

B. 7.

Difference of age *Ten* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–10	12·6734	45–55	9·5447
1–11	14·1381	46–56	9·2679
2–12	15·1758	47–57	8·9899
3–13	15·8658	48–58	8·7109
4–14	16·2905	49–59	8·4308
5–15	16·5207	50–60	8·1498
6–16	16·6117	51–61	7·8679
7–17	16·6040	52–62	7·5849
8–18	16·5265	53–63	7·3009
9–19	16·3993	54–64	7·0156
10–20	16·2504	55–65	6·7288
11–21	16·1025	56–66	6·4435
12–22	15·9529	57–67	6·1630
13–23	15·8016	58–68	5·8877
14–24	15·6485	59–69	5·6178
15–25	15·4935	60–70	5·3537
16–26	15·3368	61–71	5·0956
17–27	15·1782	62–72	4·8437
18–28	15·0176	63–73	4·5983
19–29	14·8552	64–74	4·3596
20–30	14·6907	65–75	4·1277
21–31	14·5242	66–76	3·9028
22–32	14·3555	67–77	3·6850
23–33	14·1847	68–78	3·4744
24–34	14·0116	69–79	3·2712
25–35	13·8361	70–80	3·0752
26–36	13·6582	71–81	2·8867
27–37	13·4778	72–82	2·7055
28–38	13·2946	73–83	2·5316
29–39	13·1086	74–84	2·3650
30–40	12·9197	75–85	2·2057
31–41	12·7276	76–86	2·0536
32–42	12·5321	77–87	1·9085
33–43	12·3331	78–88	1·7704
34–44	12·1303	79–89	1·6390
35–45	11·9235	80–90	1·5144
36–46	11·7123	81–91	1·3963
37–47	11·4964	82–92	1·2845
38–48	11·2754	83–93	1·1790
39–49	11·0490	84–94	1·0794
40–50	10·8166	85–95	·9857
41–51	10·5777	86–96	·8977
42–52	10·3318	87–97	·8151
43–53	10·0782	88–98	·7378
44–54	9·8161	89–99	·6655

TABS. B. 8, 9, 10. Shewing the value of Annuity depending on the co-existence or joint continuance of two lives, whose common difference of age is 15, 20, or 25 years.

B. 8.

Difference of age *Fifteen* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–15	12·3809	43–58	9·0039
1–16	13·8006	44–59	8·7274
2–17	14·8028	45–60	8·4509
3–18	15·4653	46–61	8·1747
4–19	15·8689	47–62	7·8990
5–20	16·0828	48–63	7·6239
6–21	16·1608	49–64	7·3496
7–22	16·1426	50–65	7·0762
8–23	16·0564	51–66	6·8037
9–24	15·9217	52–67	6·5321
10–25	15·7655	53–68	6·2614
11–26	15·6102	54–69	5·9915
12–27	15·4529	55–70	5·7220
13–28	15·2936	56–71	5·4556
14–29	15·1324	57–72	5·1951
15–30	14·9690	58–73	4·9408
16–31	14·8035	59–74	4·6929
17–32	14·6358	60–75	4·4515
18–33	14·4658	61–76	4·2170
19–34	14·2935	62–77	3·9894
20–35	14·1188	63–78	3·7688
21–36	13·9415	64–79	3·5554
22–37	13·7615	65–80	3·3493
23–38	13·5788	66–81	3·1505
24–39	13·3932	67–82	2·9591
25–40	13·2046	68–83	2·7750
26–41	13·0127	69–84	2·5983
27–42	12·8175	70–85	2·4289
28–43	12·6186	71–86	2·2668
29–44	12·4159	72–87	2·1119
30–45	12·2091	73–88	1·9641
31–46	11·9979	74–89	1·8232
32–47	11·7819	75–90	1·6893
33–48	11·5610	76–91	1·5621
34–49	11·3345	77–92	1·4414
35–50	11·1022	78–93	1·3272
36–51	10·8634	79–94	1·2193
37–52	10·6177	80–95	1·1174
38–53	10·3644	81–96	1·0215
39–54	10·1029	82–97	·9313
40–55	9·8322	83–98	·8466
41–56	9·5566	84–99	·7672
42–57	9·2804	85–100	·6930

B. 9.

Difference of age *Twenty* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–20	12·0498	40–60	8·6546
1–21	13·4182	41–61	8·3776
2–22	14·3797	42–62	8·1015
3–23	15·0105	43–63	7·8267
4–24	15·3895	44–64	7·5535
5–25	15·5842	45–65	7·2820
6–26	15·6468	46–66	7·0125
7–27	15·6159	47–67	6·7453
8–28	15·5188	48–68	6·4804
9–29	15·3744	49–69	6·2182
10–30	15·2090	50–70	5·9586
11–31	15·0439	51–71	5·7019
12–32	14·8766	52–72	5·4480
13–33	14·7068	53–73	5·1969
14–34	14·5346	54–74	4·9485
15–35	14·3599	55–75	4·7024
16–36	14·1825	56–76	4·4608
17–37	14·0023	57–77	4·2260
18–38	13·8192	58–78	3·9981
19–39	13·6331	59–79	3·7773
20–40	13·4438	60–80	3·5636
21–41	13·2511	61–81	3·3572
22–42	13·0549	62–82	3·1581
23–43	12·8550	63–83	2·9664
24–44	12·6511	64–84	2·7821
25–45	12·4429	65–85	2·6051
26–46	12·2302	66–86	2·4354
27–47	12·0126	67–87	2·2730
28–48	11·7899	68–88	2·1178
29–49	11·5615	69–89	1·9697
30–50	11·3272	70–90	1·8286
31–51	11·0863	71–91	1·6944
32–52	10·8383	72–92	1·5669
33–53	10·5827	73–93	1·4460
34–54	10·3187	74–94	1·3316
35–55	10·0456	75–95	1·2234
36–56	9·7675	76–96	1·1213
37–57	9·4891	77–97	1·0251
38–58	9·2106	78–98	·9347
39–59	8·9324	79–99	·8497

B. 10.

Difference of age *Twenty-five* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–25	11·6757	38–63	7·9698
1–26	12·9857	39–64	7·6938
2–27	13·9006	40–65	7·4199
3–28	14·4949	41–66	7·1483
4–29	14·8453	42–67	6·8794
5–30	15·0171	43–68	6·6134
6–31	15·0612	44–69	6·3506
7–32	15·0147	45–70	6·0913
8–33	14·9033	46–71	5·8356
9–34	14·7466	47–72	5·5839
10–35	14·5690	48–73	5·3363
11–36	14·3912	49–74	5·0929
12–37	14·2104	50–75	4·8539
13–38	14·0267	51–76	4·6194
14–39	13·8397	52–77	4·3894
15–40	13·6494	53–78	4·1638
16–41	13·4556	54–79	3·9425
17–42	13·2581	55–80	3·7251
18–43	13·0567	56–81	3·5131
19–44	12·8511	57–82	3·3085
20–45	12·6411	58–83	3·1112
21–46	12·4264	59–84	2·9213
22–47	12·2067	60–85	2·7387
23–48	11·9816	61–86	2·5634
24–49	11·7508	62–87	2·3955
25–50	11·5137	63–88	2·2349
26–51	11·2699	64–89	2·0814
27–52	11·0188	65–90	1·9350
28–53	10·7600	66–91	1·7956
29–54	10·4926	67–92	1·6630
30–55	10·2159	68–93	1·5371
31–56	9·9341	69–94	1·4178
32–57	9·6521	70–95	1·3049
33–58	9·3700	71–96	1·1982
34–59	9·0883	72–97	1·0976
35–60	8·8071	73–98	1·0028
36–61	8·5267	74–99	·9137
37–62	8·2475	75–100	·8301

TABS. B. 11, 12, 13, and 14. Shewing the values of Annuity depending on the co-existence or joint continuance of two lives, whose common difference of age is 30, 35, 40, or 45 years.

B. 11.

Difference of age *Thirty* years.

Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–30	11·2519	24–54	10·6400	48–78	4·2470
1–31	12·4950	25–55	10·3596	49–79	4·0288
2–32	13·3561	26–56	10·0741	50–80	3·8162
3–33	13·9077	27–57	9·7882	51–81	3·6094
4–34	14·2242	28–58	9·5023	52–82	3·4082
5–35	14·3687	29–59	9·2167	53–83	3·2126
6–36	14·3900	30–60	8·9316	54–84	3·0223
7–37	14·3239	31–61	8·6474	55–85	2·8370
8–38	14·1957	32–62	8·3643	56–86	2·6578
9–39	14·0227	33–63	8·0828	57–87	2·4859
10–40	13·8290	34–64	7·8032	58–88	2·3213
11–41	13·6340	35–65	7·5256	59–89	2·1640
12–42	13·4352	36–66	7·2505	60–90	2·0137
13–43	13·2323	37–67	6·9782	61–91	1·8705
14–44	13·0250	38–68	6·7090	62–92	1·7342
15–45	12·8132	39–69	6·4432	63–93	1·6047
16–46	12·5965	40–70	6·1810	64–94	1·4819
17–47	12·3746	41–71	5·9228	65–95	1·3655
18–48	12·1471	42–72	5·6688	66–96	1·2554
19–49	11·9137	43–73	5·4193	67–97	1·1515
20–50	11·6739	44–74	5·1746	68–98	1·0536
21–51	11·4272	45–75	4·9348	69–99	·9614
22–52	11·1730	46–76	4·7001	70–100	·8748
23–53	10·9109	47–77	4·4708		

B. 12.

Difference of age *Thirty-five* years.

Ages.	4 ℔ cent	Ages,	4 ℔ cent	Ages.	4 ℔ cent
0–35	10·7709	22–57	9·9060	44–79	4·0770
1–36	11·9369	23–58	9·6165	45–80	3·8632
2–37	12·7354	24–59	9·3272	46–81	3·6556
3–38	13·2368	25–60	9·0385	47–82	3·4542
4–39	13·5128	26–61	8·7506	48–83	3·2593
5–40	13·6240	27–62	8·4639	49–84	3·0707
6–41	13·6169	28–63	8·1787	50–85	2·8886
7–42	13·5258	29–64	7·8954	51–86	2·7128
8–43	13·3747	30–65	7·6142	52–87	2·5434
9–44	13·1799	31–66	7·3356	53–88	2·3800
10–45	12·9642	32–67	7·0598	54–89	2·2226
11–46	12·7457	33–68	6·7871	55–90	2·0706
12–47	12·5217	34–69	6·5178	56–91	1·9247
13–48	12·2921	35–70	6·2523	57–92	1·7858
14–49	12·0563	36–71	5·9909	58–93	1·6537
15–50	11·8140	37–72	5·7338	59–94	1·5283
16–51	11·5646	38–73	5·4814	60–95	1·4094
17–52	11·3076	39–74	5·2338	61–96	1·2970
18–53	11·0423	40–75	4·9913	62–97	1·1907
19–54	10·7682	41–76	4·7542	63–98	1·0905
20–55	10·4844	42–77	4·5227	64–99	·9961
21–56	10·1954	43–78	4·2969	65–100	·9074

B. 13.

Difference of age *Forty* years.

Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–40	10·2205	20–60	9·1319	40–80	3·8979
1–41	11·2965	21–61	8·8408	41–81	3·6882
2–42	12·0210	22–62	8·5508	42–82	3·4850
3–43	12·4623	23–63	8·2623	43–83	3·2884
4–44	12·6887	24–64	7·9757	44–84	3·0983
5–45	12·7582	25–65	7·6913	45–85	2·9149
6–46	12·7148	26–66	7·4093	46–86	2·7382
7–47	12·5907	27–67	7·1303	47–87	2·5682
8–48	12·4086	28–68	6·8544	48–88	2·4049
9–49	12·1837	29–69	6·5820	49–89	2·2482
10–50	11·9371	30–70	6·3135	50–90	2·0981
11–51	11·6853	31–71	6·0490	51–91	1·9544
12–52	11·4257	32–72	5·7890	52–92	1·8171
13–53	11·1577	33–73	5·5336	53–93	1·6859
14–54	10·8807	34–74	5·2833	54–94	1·5606
15–55	10·5939	35–75	5·0381	55–95	1·4407
16–56	10·3018	36–76	4·7983	56–96	1·3265
17–57	10·0092	37–77	4·5643	57–97	1·2186
18–58	9·7164	38–78	4·3361	58–98	1·1168
19–59	9·4239	39–79	4·1139	59–99	1·0209

B. 14.

Difference of age *Forty-five* years.

Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–45	9·5833	19–64	8·0460	38–83	3·3123
1–46	10·5523	20–65	7·7587	39–84	3·1206
2–47	11·1877	21–66	7·4739	40–85	2·9356
3–48	11·5550	22–67	7·1920	41–86	2·7574
4–49	11·7192	23–68	6·9133	42–87	2·5861
5–50	11·7349	24–69	6·6382	43–88	2·4215
6–51	11·6433	25–70	6·3669	44–89	2·2636
7–52	11·4744	26–71	6·0997	45–90	2·1125
8–53	11·2491	27–72	5·8371	46–91	1·9680
9–54	10·9814	28–73	5·5792	47–92	1·8301
10–55	10·6901	29–74	5·3263	48–93	1·6986
11–56	10·3952	30–75	5·0787	49–94	1·5735
12–57	10·0997	31–76	4·8366	50–95	1·4546
13–58	9·8042	32–77	4·6002	51–96	1·3418
14–59	9·5088	33–78	4·3698	52–97	1·2349
15–60	9·2139	34–79	4·1455	53–98	1·1337
16–61	8·9198	35–80	3·9275	54–99	1·0379
17–62	8·6269	36–81	3·7158	55–100	·9471
18–63	8·3356	37–82	3·5108		

TABS. B. 15, 16, 17, 18, and 19. Shewing the values of Annuity depending on the co-existence or joint continuance of two lives, whose common difference of age is 50, 55, 60, 65, or 70 years.

B. 15.

Difference of age *Fifty* yesrs.					
Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–50	8·8332	17–67	7·2460	34–84	3·1399
1–51	9·6723	18–68	6·9649	35–85	2·9535
2–52	10·1973	19–69	6·6873	36–86	2·7740
3–53	10·4710	20–70	6·4136	37–87	2·6014
4–54	10·5545	21–71	6·1441	38–88	2·4356
5–55	10·4984	22–72	5·8791	39–89	2·2766
6–56	10·3460	23–73	5·6189	40–90	2·1244
7–57	10·1306	24–74	5·3639	41–91	1·9789
8–58	9·8723	25–75	5·1141	42–92	1·8401
9–59	9·5848	26–76	4·8699	43–93	1·7078
10–60	9·2857	27–77	4·6316	44–94	1·5819
11–61	8·9891	28–78	4·3992	45–95	1·4623
12–62	8·6936	29–79	4·1730	46–96	1·3489
13–63	8·3997	30–80	3·9532	47–97	1·2415
14–64	8·1076	31–81	3·7399	48–98	1·1399
15–65	7·8178	32–82	3·5332	49–99	1·0441
16–66	7·5305	33–83	3·3332	50–100	·9538

B. 16.

Difference of age *Fifty-five* years.					
Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–55	7·9297	16–71	6·1828	32–87	2·6147
1–56	8·6102	17–72	5·9158	33–88	2·4478
2–57	9·0092	18–73	5·6537	34–89	2·2879
3–58	9·1886	19–74	5·3966	35–90	2·1348
4–59	9·2068	20–75	5·1450	36–91	1·9885
5–60	9·1111	21–76	4·8990	37–92	1·8488
6–61	8·9372	22–77	4·6589	38–93	1·7157
7–62	8·7103	23–78	4·4249	39–94	1·5891
8–63	8·4482	24–79	4·1971	40–95	1·4689
9–64	8·1628	25–80	3·9757	41–96	1·3549
10–65	7·8694	26–81	3·7608	42–97	1·2469
11–66	7·5798	27–82	3·5527	43–98	1·1449
12–67	7·2932	28–83	3·3513	44–99	1·0485
13–68	7·0099	29–84	3·1568	45–100	·9578
14–69	6·7302	30–85	2·9691		
15–70	6·4544	31–86	2·7884		

B. 17.

Difference of age *Sixty* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–60	6·9156	20–80	3·9952
1–61	7·4582	21–81	3·7791
2–62	7·7560	22–82	3·5697
3–63	7·8654	23–83	3·3671
4–64	7·8381	24–84	3·1714
5–65	7·7156	25–85	2·9827
6–66	7·5289	26–86	2·8010
7–67	7·2996	27–87	2·6263
8–68	7·0429	28–88	2·4585
9–69	6·7687	29–89	2·2977
10–70	6·4899	30–90	2·1438
11–71	6·2166	31–91	1·9967
12–72	5·9478	32–92	1·8564
13–73	5·6839	33–93	1·7226
14–74	5·4252	34–94	1·5954
15–75	5·1720	35–95	1·4746
16–76	4·9244	36–96	1·3601
17–77	4·6827	37–97	1·2516
18–78	4·4472	38–98	1·1491
19–79	4·2180	39–99	1·0524

B. 18.

Difference of age *Sixty-five* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–65	5·8949	18–83	3·3808
1–66	6·3073	19–84	3·1842
2–67	6·5129	20–85	2·9945
3–68	6·5618	21–86	2·8119
4–69	6·4989	22–87	2·6363
5–70	6·3596	23–88	2·4678
6–71	6·1697	24–89	2·3062
7–72	5·9474	25–90	2·1516
8–73	5·7051	26–91	2·0039
9–74	5·4510	27–92	1·8629
10–75	5·1954	28–93	1·7286
11–76	4·9465	29–94	1·6009
12–77	4·7035	30–95	1·4796
13–78	4·4666	31–96	1·3646
14–79	4·2362	32–97	1·2557
15–80	4·0122	23–98	1·1528
16–81	3·7949	34–99	1·0557
17–82	3·5844	35–100	·9643

B. 19.

Difference of age *Seventy* years.			
Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–70	4·9008	16–86	2·8214
1–71	5·1958	17–87	2·6451
2–72	5·3219	18–88	2·4758
3–73	5·3225	19–89	2·3136
4–74	5·2353	20–90	2·1584
5–75	5·0894	21–91	2·0101
6–76	4·9059	22–92	1·8686
7–77	4·6993	23–93	1·7338
8–78	4·4795	24–94	1·6056
9–79	4·2527	25–95	1·4839
10–80	4·0270	26–96	1·3685
11–81	3·8087	27–97	1·2593
12–82	3·5973	28–98	1·1560
13–83	3·3927	29–99	1·0586
14–84	3·1952	30–100	·9669
15–85	3·0047		

TABS. B. 20 and 21. Shewing the values of Annuity depending on the co-existence or joint continuance of two lives, whose common difference of age is 75, or 80 years.

B. 20.

Difference of age *Seventy-five* years.					
Ages.	4 ℔' cent	Ages.	4 ℔' cent	Ages.	4 ℔' cent
0–75	3·9652	9–84	3·2054	18–93	1·7383
1–76	4·1599	10–85	3·0136	19–94	1·6097
2–77	4·2220	11–86	2·8296	20–95	1·4876
3–78	4·1875	12–87	2·6526	21–96	1·3719
4–79	4·0873	13–88	2·4828	22–97	1·2623
5–80	3·9445	14–89	2·3200	23–98	1·1588
6–81	3·7755	15–90	2·1643	24–99	1·0611
7–82	3·5916	16–91	2·0155	25–100	·9691
8–83	3·4000	17–92	1·8735		

B. 21.

Difference of age *Eighty* years.					
Ages.	4 ℔' cent	Ages.	4 ℔' cent	Ages.	4 ℔' cent
0–80	3·1152	7–87	2·6469	14–94	1·6133
1–81	3·2293	8–88	2·4865	15–95	1·4909
2–82	3·2436	9–89	2·3260	16–96	1·3748
3–83	3·1874	10–90	2·1694	17–97	1·2650
4–84	3·0845	11–91	2·0202	18–98	1·1612
5–85	2·9526	12–92	1·8778	19–99	1·0633
6–86	2·8040	13–93	1·7422		

TAB. B. 22. Shewing the values of a Temporary Assurance of £100,—in one single present payment, or in annual payments continued during the term of years insured.

Age.	Annual Premium.				Single Premium.				Age.
	Five years.	Ten years.	Fifteen years.	Twenty years.	Five years.	Ten years.	Fifteen years.	Twenty years.	
20	·6911	·7394	·7877	·8355	3·1572	6·0494	8·6826	11·0628	20
25	·8004	·8560	·9115	·9662	3·6484	6·9701	9·9726	12·6643	25
30	·9268	·9909	1·0546	1·1169	4·2143	8·0237	11·4387	14·4708	30
35	1·0730	1·1468	1·2198	1·2908	4·8653	9·2270	13·0996	16·5001	35
40	1·2421	1·3270	1·4105	1·5278	5·6137	10·5982	14·9749	19·2233	40
45	1·4377	1·5352	1·6879	1·9060	6·4730	12·1567	17·6739	23·4574	45
50	1·6638	1·8767	2·1762	2·5055	7·4579	14·6973	22·2863	29·7409	50
55	2·1616	2·5751	3·0162	3·4479	9·6139	19·6920	29·5916	38·4353	55
60	3·1498	3·7249	4·3016	4·8089	13·7528	27·2621	39·3302	48·7192	60
65	4·5753	5·3544	6·0654	6·5964	19·4506	36·8263	50·3446	58·9504	65

TAB. B. 23. Contingent Assurance. Benefit £100. on the death of (A), provided that this person (A) dies before another person (B). Interest 4 per cent.

A.	B.	Single payment.	Annual payment.	A.	B.	Single payment.	Annual payment.	A.	B.	Single payment.	Annual payment.	A.	B.	Single payment.	Annual payment.
20	20	18·093	1·090	40	20	30·910	2·140	50	20	40·295	3·179	60	20	52·971	5·228
	30	15·936	1·016		30	28·386	2·039		30	38·102	3·091		30	51·198	5·155
	40	13·537	·937		40	24·752	1·885		40	34·597	2·928		40	48·526	5·026
	50	10·958	·865		50	19·954	1·689		50	29·042	2·665		50	43·437	4·747
	60	8·061	·796		60	14·341	1·485		60	21·372	2·336		60	34·616	4·327
	70	5·408	·729		70	9·499	1·323		70	13·855	1·991		70	24·002	3·778
	80	3·313	·663		80	5·845	1·193		80	8·191	1·701		80	14·708	3·223
30	20	23·715	1·511	45	15	36·140	2·616	55	15	47·087	4·061	70	20	66·077	8·913
	30	21·210	1·417		25	34·198	2·544		25	45·394	3·996		30	64·724	8·850
	40	18·077	1·299		35	31·226	2·416		35	42·959	3·889		40	62·882	8·757
	50	14·486	1·175		45	26·766	2·216		45	38·785	3·678		50	59·381	8·534
	60	10·603	1·068		55	20·658	1·959		55	31·725	3·338		60	51·562	8·115
	70	7·147	·977		65	14·040	1·695		65	22·029	2·850		70	39·722	7·432
	80	4·407	·890		75	8·803	1·483		75	13·739	2·409		80	26·785	6·573

TAB. B. 24. Shewing the Annual Payments equivalent to £100. in the year of death,—when the Assurance is for one year, and when it extends over the whole of life. Rate of interest 4 per cent.

Age.	One year.	For life.	Age.	One year.	For life.	Age.	One year.	For life.	Age.	One year.	For life.
0	12·0092	2·5046	25	·7562	1·5173	50	1·5731	3·4159	75	8·3395	11·9085
1	8·2932	1·8601	26	·7787	1·5604	51	1·6198	3·5602	76	8·9721	12·5759
2	5·6884	1·4708	27	·8019	1·6051	52	1·6678	3·7155	77	9·6500	13·2840
3	3·8836	1·2339	28	·8258	1·6514	53	1·7173	3·8830	78	10·3761	14·0352
4	2·6432	1·0921	29	·8504	1·6995	54	1·7682	4·0644	79	11·1531	14·8319
5	1·7950	1·0115	30	·8757	1·7493	55	1·8640	4·2616	80	11·9842	15·6769
6	1·2173	·9715	31	·9018	1·8011	56	2·0110	4·4731	81	12·8723	16·5727
7	·8247	·9591	32	·9286	1·8549	57	2·1694	4·6966	82	13·8208	17·5221
8	·5583	·9659	33	·9563	1·9109	58	2·3402	4·9326	83	14·8327	18·5280
9	·4564	·9865	34	·9847	1·9692	59	2·5242	5·1821	84	15·9112	19·5931
10	·4867	1·0134	35	1·0140	2·0300	60	2·7225	5·4459	85	17·0597	20·7203
11	·5012	1·0403	36	1·0442	2·0934	61	2·9361	5·7249	86	18·2813	21·9125
12	·5161	1·0680	37	1·0753	2·1597	62	3·1662	6·0200	87	19·5790	23·1724
13	·5315	1·0965	38	1·1072	2·2290	63	3·4140	6·3324	88	20·9558	24·5027
14	·5474	1·1259	39	1·1401	2·3016	64	3·6808	6·6631	89	22·4147	25·9060
15	·5637	1·1562	40	1·1741	2·3776	65	3·9680	7·0133	90	23·9580	27·3847
16	·5805	1·1874	41	1·2089	2·4575	66	4·2771	7·3843	91	25·5881	28·9410
17	·5978	1·2195	42	1·2448	2·5415	67	4·6096	7·7774	92	27·3067	30·5765
18	·6157	1·2527	43	1·2818	2·6300	68	4·9674	8·1941	93	29·1154	32·2929
19	·6340	1·2869	44	1·3199	2·7234	69	5·3520	8·6358	94	31·0149	34·0910
20	·6529	1·3222	45	1·3591	2·8220	70	5·7655	9·1041	95	33·0054	35·9713
21	·6724	1·3587	46	1·3995	2·9265	71	6·2098	9·6008	96	35·0863	37·9335
22	·6924	1·3964	47	1·4410	3·0375	72	6·6870	10·1276	97	37·2561	39·9767
23	·7130	1·4354	48	1·4838	3·1555	73	7·1995	10·6865	98	39·5124	42·0990
24	·7343	1·4756	49	1·5278	3·2814	74	7·7495	11·2794	99	41·8515	44·2975

TAB. B. 25. Values of Annuity on the joint continuance of three lives, whose differences of age are 0 and 30 years.

Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent	Ages.	4 ℔ cent
0–30–30	9·5190	18–48–48	9·7004	36–66–66	5·0200	54–84–84	1·6768
1–31–31	10·5216	19–49–49	9·4742	37–67–67	4·7809	55–85–85	1·5509
2–32–32	11·2031	20–50–50	9·2415	38–68–68	4·5476	56–86–86	1·4308
3–33–33	11·6266	21–51–51	9·0015	39–69–69	4·3200	57–87–87	1·3172
4–34–34	11·8550	22–52–52	8·7533	40–70–70	4·0985	58–88–88	1·2098
5–35–35	11·9414	23–53–53	8·4960	41–71–71	3·8832	59–89–89	1·1085
6–36–36	11·9265	24–54–54	8·2286	42–72–72	3·6742	60–90–90	1·0131
7–37–37	11·8400	25–55–55	7·9497	43–73–73	3·4716	61–91–91	·9234
8–38–38	11·7026	26–56–56	7·6660	44–74–74	3·2756	62–92–92	·8392
9–39–39	11·5287	27–57–57	7·3848	45–75–75	3·0861	63–93–93	·7603
10–40–40	11·3379	28–58–58	7·1064	46–76–76	2·9033	64–94–94	·6866
11–41–41	11·1462	29–59–59	6·8313	47–77–77	2·7272	65–95–95	·6178
12–42–42	10·9514	30–60–60	6·5596	48–78–78	2·5577	66–96–96	·5538
13–43–43	10·7533	31–61–61	6·2918	49–79–79	2·3948	67–97–97	·4944
14–44–44	10·5516	32–62–62	6·0280	50–80–80	2·2385	68–98–98	·4394
15–45–45	10·3458	33–63–63	5·7687	51–81–81	2·0887	69–99–99	·3886
16–46–46	10·1357	34–64–64	5·5141	52–82–82	1·9453		
17–47–47	9·9207	35–65–65	5·2644	53–83–83	1·8081		

TAB. C. 1.

Shewing, at the end of any number of years from birth,—the *Living* out of a given number born,—also the *Dying* in the year succeeding.

Age.	Living.	Dying.	Age.	Living.	Dying.
0	161136·4	22557·3	50	57273·8	1399·8
1	138579·0	13433·1	51	55873·9	1405·9
2	125146·0	8336·1	52	54468·0	1411·0
3	116809·8	5319·0	53	53057·0	1415·0
4	111490·9	3458·2	54	51642·0	1417·9
5	108032·7	2277·0	55	50224·1	1453·3
6	105755·6	1512·2	56	48770·7	1522·0
7	104243·5	1010·1	57	47248·7	1590·0
8	103233·3	818·0	58	45658·7	1656·7
9	102415·3	811·5	59	44002·0	1721·3
10	101603·8	805·1	60	42280·7	1783·0
11	100798·7	798·7	61	40497·8	1840·7
12	100000·0	804·1	62	38657·1	1893·6
13	99195·9	821·4	63	36763·5	1940·5
14	98374·4	838·9	64	34823·0	1980·3
15	97535·5	856·5	65	32842·7	2011·9
16	96679·1	874·2	66	30830·8	2034·1
17	95804·8	892·1	67	28796·7	2045·8
18	94912·7	910·1	68	26751·0	2046·0
19	94002·5	928·2	69	24705·0	2033·7
20	93074·3	946·4	70	22671·3	2008·2
21	92127·8	964·7	71	20663·1	1969·0
22	91163·2	983·0	72	18694·1	1915·8
23	90180·2	1001·3	73	16778·3	1848·7
24	89178·9	1019·6	74	14929·6	1768·0
25	88159·2	1037·9	75	13161·6	1674·6
26	87121·3	1056·2	76	11487·0	1569·7
27	86065·1	1074·4	77	9917·3	1454·9
28	84990·7	1092·5	78	8462·5	1332·2
29	83898·1	1110·5	79	7130·3	1203·9
30	82787·6	1128·4	80	5926·4	1072·7
31	81659·2	1146·1	81	4853·7	941·3
32	80513·1	1163·6	82	3912·5	812·5
33	79349·5	1180·8	83	3100·0	688·9
34	78168·7	1197·7	84	2411·1	573·0
35	76971·0	1214·4	85	1838·1	466·8
36	75756·6	1230·7	86	1371·3	371·9
37	74525·9	1246·6	87	999·5	289·2
38	73279·3	1262·1	88	710·3	219·1
39	72017·2	1277·1	89	491·2	161·3
40	70740·1	1291·7	90	329·9	115·3
41	69448·5	1305·6	91	214·6	79·7
42	68142·8	1319·1	92	135·0	53·2
43	66823·8	1331·8	93	81·8	34·2
44	65492·0	1343·9	94	47·6	21·1
45	64148 1	1355·3	95	26·5	12·4
46	62792·8	1365·9	96	14·1	7·0
47	61426·9	1375·7	97	7·1	3·7
48	60051·2	1384·7	98	3·4	1·9
49	58666·5	1392·7	99	1·5	·9

TAB. C. 2.

Shewing, in logarithms, at every age of life,—the probability of living one year (λ,a),—also the *Living* out of a given number born ($\lambda\, a$).

Age.	λ,a	$\lambda\, a$	Age.	λ,a	$\lambda\, a$
0	T·9345040	·2071936	50	T·9892535	T·7579557
1	·9557193	·1416976	51	·9889322	·7472092
2	·9700626	·0974169	52	·9886012	·7361414
3	·9797598	·0674795	53	·9882602	·7247426
4	·9863159	·0472393	54	·9879090	·7130028
5	·9907484	·0335552	55	·9872473	·7009118
6	·9937452	·0243036	56	·9862310	·6881591
7	·9957712	·0180488	57	·9851337	·6743901
8	·9965450	·0138200	58	·9839490	·6595238
9	·9965450	·0103650	59	·9826699	·6434728
10	·9965450	·0069100	60	·9812888	·6261427
11	·9965450	·0034550	61	·9797977	·6074315
12	·9964936	·0000000	62	·9781877	·5872292
13	·9963887	T·9964936	63	·9764494	·5654169
14	·9962807	·9928823	64	·9745726	·5418663
15	·9961694	·9891630	65	·9725462	·5164389
16	·9960549	·9853324	66	·9703584	·4889851
17	·9959369	·9813873	67	·9679962	·4593435
18	·9958153	·9773242	68	·9654457	·4273397
19	·9956902	·9731395	69	·9626920	·3927854
20	·9955612	·9688297	70	·9597188	·3554774
21	·9954285	·9643909	71	·9565088	·3151962
22	·9952917	·9598194	72	·9530428	·2717050
23	·9951509	·9551111	73	·9493007	·2247478
24	·9950059	·9502620	74	·9452604	·1740485
25	·9948565	·9452679	75	·9408980	·1193089
26	·9947026	·9401244	76	·9361881	·0602069
27	·9945442	·9348270	77	·9311027	$\frac{1}{2}$·9963950
28	·9943810	·9293712	78	·9256122	·9274977
29	·9942129	·9237522	79	·9196840	·8531099
30	·9940398	·9179651	80	·9132835	·7727939
31	·9938615	·9120049	81	·9063728	·6860774
32	·9936779	·9058664	82	·8989115	·5924502
33	·9934888	·8995443	83	·8908555	·4913617
34	·9932940	·8930331	84	·8821575	·3822172
35	·9930934	·8863271	85	·8727664	·2643747
36	·9928869	·8794205	86	·8626268	·1371411
37	·9926741	·8723074	87	·8516792	$\frac{3}{4}$·9997679
38	·9924550	·8649815	88	·8398592	·8514471
39	·9922293	·8574365	89	·8270972	·6913063
40	·9919968	·8496658	90	·8133182	·5184035
41	·9917575	·8416626	91	·7984412	·3317217
42	·9915109	·8334201	92	·7823784	·1301629
43	·9912570	·8249310	93	·7650357	$\frac{1}{4}$·9125413
44	·9909955	·8161880	94	·7463108	·6775770
45	·9907261	·8071835	95	·7260937	·4238878
46	·9904487	·7979096	96	·7042656	·1499815
47	·9901630	·7883583	97	·6806978	$\frac{1}{5}$·8542471
48	·9898689	·7785213	98	·6552519	·5349449
49	·9895655	·7683902	99	·6277781	·1901968

TAB. C. 3. The *Expectation* of complete years, at all ages of life; or the value of Annuity of £1, when there is no interest of money.

Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.	Age.	Expectn.
0	33·0085	15	37·9929	30	28·4525	45	19·6183	60	10·9988	75	4·8227	90	1·6150
1	37·3815	16	37·3295	31	27·8457	46	19·0417	61	10·4831	76	4·5257	91	1·4822
2	40·3940	17	36·6701	32	27·2420	47	18·4652	62	9·9823	77	4·2420	92	1·3576
3	42·2767	18	36·0148	33	26·6415	48	17·8882	63	9·4964	78	3·9713	93	1·2408
4	43·2936	19	35·3635	34	26·0440	49	17·3104	64	9·0256	79	3·7133	94	1·1314
5	43·6795	20	34·7162	35	25·4492	50	16·7313	65	8·5698	80	3·4676	95	1·0291
6	43·6200	21	34·0728	36	24·8572	51	16·1505	66	8·1290	81	3·2339	96	·9336
7	43·2527	22	33·4334	37	24·2676	52	15·5674	67	7·7032	82	3·0120	97	·8446
8	42·6759	23	32·7978	38	23·6805	53	14·9814	68	7·2923	83	2·8014	98	·7617
9	42·0168	24	32·1661	39	23·0955	54	14·3919	69	6·8963	84	2·6018	99	·6847
10	41·3524	25	31·5381	40	22·5124	55	13·7982	70	6·5149	85	2·4128		
11	40·6827	26	30·9138	41	21·9311	56	13·2094	71	6·1480	86	2·2341		
12	40·0076	27	30·2932	42	21·3513	57	12·6349	72	5·7956	87	2·0654		
13	39·3320	28	29·6762	43	20·7728	58	12·0749	73	5·4574	88	1·9062		
14	38·6604	29	29·0626	44	20·1952	59	11·5295	74	5·1331	89	1·7561		

TAB. C. 4. Shewing the present value of Annuity of £1, depending on a single life.

Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent	Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent	Age.	3 ℔ cent	4 ℔ cent	5 ℔ cent
0	16·0590	13·4264	11·4802	34	16·5180	14·5447	12·9387	68	6·1227	5·8028	5·5111
1	18·2332	15·2364	13·0163	35	16·2783	14·3619	12·7971	69	5·8286	5·5347	5·2659
2	19·7960	16·5468	14·1341	36	16·0354	14·1758	12·6523	70	5·5420	5·2724	5·0251
3	20·8450	17·4367	14·9000	37	15·7892	13·9863	12·5043	71	5·2630	5·0162	4·7892
4	21·4946	17·9993	15·3913	38	15·5395	13·7932	12·3529	72	4·9919	4·7664	4·5583
5	21·8482	18·3185	15·6782	39	15·2862	13·5963	12·1978	73	4·7287	4·5230	4·3327
6	21·9882	18·4614	15·8166	40	15·0291	13·3954	12·0390	74	4·4737	4·2864	4·1127
7	21·9763	18·4784	15·8484	41	14·7678	13·1903	11·8760	75	4·2269	4·0567	3·8984
8	21·8571	18·4056	15·8036	42	14·5023	12·9808	11·7087	76	3·9884	3·8340	3·6901
9	21·6926	18·2947	15·7263	43	14·2322	12·7665	11·5368	77	3·7582	3·6185	3·4879
10	21·5219	18·1785	15·6445	44	13·9573	12·5471	11·3600	78	3·5365	3·4102	3·2919
11	21·3446	18·0566	15·5579	45	13·6772	12·3224	11·1779	79	3·3231	3·2092	3·1022
12	21·1605	17·9289	15·4663	46	13·3916	12·0919	10·9901	80	3·1181	3·0156	2·9190
13	20·9720	17·7972	15·3713	47	13·1000	11·8552	10·7962	81	2·9214	2·8293	2·7423
14	20·7815	17·6636	15·2746	48	12·8022	11·6119	10·5958	82	2·7330	2·6504	2·5722
15	20·5891	17·5281	15·1763	49	12·4974	11·3614	10·3881	83	2·5528	2·4788	2·4087
16	20·3946	17·3908	15·0763	50	12·1854	11·1032	10·1728	84	2·3806	2·3145	2·2517
17	20·1982	17·2514	14·9745	51	11·8654	10·8366	9·9490	85	2·2164	2·1574	2·1013
18	19·9996	17·1101	14·8710	52	11·5368	10·5609	9·7161	86	2·0600	2·0075	1·9575
19	19·7991	16·9668	14·7658	53	11·1989	10·2755	9·4732	87	1·9113	1·8646	1·8201
20	19·5964	16·8215	14·6587	54	10·8510	9·9793	9·2194	88	1·7700	1·7286	1·6890
21	19·3917	16·6741	14·5497	55	10·4920	9·6715	8·9537	89	1·6360	1·5994	1·5643
22	19·1848	16·5245	14·4389	56	10·1288	9·3581	8·6816	90	1·5092	1·4768	1·4458
23	18·9757	16·3728	14·3261	57	9·7687	9·0459	8·4093	91	1·3893	1·3607	1·3333
24	18·7645	16·2189	14·2113	58	9·4122	8·7353	8·1372	92	1·2761	1·2509	1·2267
25	18·5509	16·0628	14·0944	59	9·0596	8·4268	7·8658	93	1·1694	1·1473	1·1260
26	18·3351	15·9043	13·9755	60	8·7112	8·1206	7·5953	94	1·0689	1·0496	1·0309
27	18·1169	15·7434	13·8543	61	8·3676	7·8173	7·3262	95	·9746	·9577	·9413
28	17·8963	15·5802	13·7309	62	8·0290	7·5171	7·0588	96	·8861	·8713	·8570
29	17·6733	15·4144	13·6052	63	7·6958	7·2204	6·7934	97	·8033	·7904	·7779
30	17·4476	15·2460	13·4771	64	7·3684	6·9277	6·5306	98	·7259	·7147	·7038
31	17·2194	15·0750	13·3465	65	7·0471	6·6392	6·2706	99	·6537	·6440	·6346
32	16·9884	14·9011	13·2133	66	6·7322	6·3554	6·0138				
33	16·7547	14·7244	13·0774	67	6·4239	6·0765	5·7605				

TAB. C. 5. Comparative view of the preceding Tables of Mortality. Quinquennial stages. Common basis, 100000 aged 12 years. Shewing,—the *Survivors* at the beginning, and the *Dying*, during each stage;—also the *Sum of the Survivors* at the beginning of each of the five years of the stage.

Between Ages.	Sum of Annual Survivors.			Dying.			Survivors incepting.			Incepting Age.
	Village.	Mean.	City.	Village.	Mean.	City.	Village.	Mean.	City.	
0—5	628169	618280	653162	45104	40096	53103	151403	146472	161136	0
5–10	517234	518841	523680	5264	5095	6429	106299	106376	108033	5
10–15	499936	499973	499973	2685	3257	4069	101035	101281	101604	10
15–20	485847	483069	478935	3022	3604	4461	98350	98024	97535	15
20–25	470017	464246	455724	3386	4010	4915	95328	94420	93074	20
25–30	452320	443351	430234	3774	4435	5371	91942	90410	88159	25
30–35	432645	420314	402478	4180	4867	5817	88168	85975	82788	30
35–40	410916	395114	372550	4596	5297	6231	83988	81108	76971	35
40–45	387101	367800	340647	5012	5706	6592	79392	75811	70740	40
45–50	361228	338506	307085	5414	6078	6874	74380	70105	64148	45
50–55	333406	307471	272315	5782	6386	7050	68966	64027	57274	50
55–60	302953	274099	235904	6851	7417	7943	63184	57641	50224	55
60–65	264953	233409	193022	8731	9189	9438	56333	50224	42281	60
65–70	217737	184483	143926	10421	10529	10172	47602	41035	32843	65
70–75	163389	130790	93736	11306	10761	9509	37181	30506	22671	70
75–80	107401	79156	50159	10674	9316	7236	25875	19745	13162	75
80–85	58246	38088	20204	8236	6341	4088	15201	10429	5926	80
85–90	23919	13165	5410	4749	3053	1508	6965	4088	1838	85
90–95	6585	2833	809	1803	897	304	2216	1035	330	90
95–100	1024	310	53	378	131	25	413	138	26	95
							35	7	1	100
0–100	6125026	5813298	5480006	151368	146465	161135				

TAB. C. 6. Comparison continued. Decennial stages. Common basis 100000 annually attaining the age of 12 years. Shewing the relations of Annual Deaths and Annual Survivors.

Between Ages.	Sum of Annual Survivors.			Annual Deaths.			Deaths from 100 years of Life.			Between Ages.
	Village.	Mean.	City.	Village.	Mean.	City.	Village.	Mean.	City.	
0–10	1145403	1137121	1176842	50368	45191	59533	4·3974	3·9742	5·0587	0–10
10–20	985783	983042	978907	5708	6861	8530	·5790	·6979	·8713	10–20
20–30	922337	907597	885959	7160	8445	10287	·7763	·9305	1·1611	20–30
30–40	843561	815428	775028	8776	10164	12048	1·0403	1·2464	1·5545	30–40
40–50	748329	706307	647733	10426	11784	13466	1·3932	1·6684	2·0790	40–50
50–60	636359	581570	508219	12633	13803	14993	1·9853	2·3734	2·9501	50–60
60–70	482689	417892	336948	19152	19719	19609	3·9678	4·7186	5·8197	60–70
70–80	270790	209946	143895	21980	20077	16745	8·1170	9·5629	11·6369	70–80
80–90	82165	51253	25614	12984	9394	5596	15·8030	18·3292	21·8492	80–90
90–100	7610	3143	862	2181	1027	329	28·6628	32·6887	32·8118	90–100
0–100	6125026	5813299	5480007	151368	146465	161136	2·4713	2·5195	2·9404	0–100

TAB. C. 7. Comparison continued. Exhibiting, in three large intervals of age, the relations of Annual Survivors and Annual Deaths. Assuming two additional bases—a total Population of 1,000,000—and 100,000 as the total yearly deaths.

Between Ages.	Living.			Dying.			Rate of Death to Life, and to Age.			Between Ages.
	Village.	Mean.	City.	Village.	Mean.	City.	Village.	Mean.	City.	
0–20	2131186	2120164	2155750	56075	52052	68062	2·6312	2·4551	3·1572	0–20
20–50	2514227	2429331	2308719	26362	30393	35801	1·0485	1·2511	1·5507	20–50
50–100	1479612	1263804	1015538	68931	64020	57273	4·6587	5·0657	5·6397	50–100
0–100	6125025	5813299	5480007	151368	146465	161136	2·4713	2·5195	2·9404	0–100
0–20	347947	364709	393385	9155	8954	12420	37045	35539	42239	0–20
20–50	410485	417892	421298	4304	5228	6533	17416	20751	22218	20–50
50–100	241568	217399	185317	11254	11013	10451	45539	43710	35543	50–100
0–100	1000000	1000000	1000000	24713	25195	29404	100000	100000	100000	0–100

TAB. C. 8. Comparison continued. Shewing, at quinquennial intervals, the *Expectation* of complete years, and the values of Assurance of £100. in Single Payments, and in Annual Payments. Rate of interest 3 per cent.

Age.	Expectation.			For Assurance of £100 in the year of Death.						Age.
				Annual Premium for Life.			Single Premium.			
	Village.	Mean.	City.	Village.	Mean.	City.	Village.	Mean.	City.	
0	39·4556	38·6889	33·0085	2·3831	2·3365	2·9494	45·0001	44·5121	50·3137	0
5	50·7121	47·8365	43·6795	1·1384	1·2497	1·4641	28·1016	30·0241	33·4519	5
10	48·2866	45·1705	41·3524	1·1682	1·3163	1·5275	28·6268	31·1266	34·4024	10
15	44·5490	41·6042	37·9929	1·3207	1·4843	1·7194	31·1975	33·7575	37·1192	15
20	40·8966	38·1141	34·7162	1·4972	1·6800	1·9426	33·9513	36·5806	40·0104	20
25	37·3275	34·7141	31·5381	1·7035	1·9083	2·2022	36·9028	39·5837	43·0555	25
30	33·8378	31·3996	28·4525	1·9476	2·1780	2·5081	40·0724	42·7847	46·2690	30
35	30·4202	28·1617	25·4492	2·2414	2·5022	2·8750	43·4887	46·2103	49·6749	35
40	27·0634	24·9873	22·5124	2·6030	2·9012	3·3260	47·1935	49·9017	53·3134	40
45	23·7501	21·8561	19·6183	3·0618	3·4085	3·9007	51·2487	53·9226	57·2508	45
50	20·4552	18·7387	16·7313	3·6691	4·0843	4·6715	55·7470	58·3726	61·5960	50
55	17·1419	15·5915	13·7982	4·5232	5·0472	5·7891	60·8298	63·4085	66·5281	55
60	13·9704	12·5840	10·9988	5·7102	6·4013	7·3847	66·2219	68·7284	71·7148	60
65	11·1502	9·9380	8·5698	7·2799	8·1999	9·5142	71·4240	73·7897	76·5618	65
70	8·6996	7·6657	6·5149	9·3739	10·6071	12·3733	76·2941	78·4565	80·9457	70
75	6·6232	5·7646	4·8227	12·1845	13·8436	16·2192	80·7075	82·6177	84·7760	75
80	4·9107	4·2172	3·4676	15·9655	18·1934	21·3703	84·5715	86·2000	88·0055	80
85	3·5371	2·9926	2·4128	21·0320	23·9942	28·1777	87·8360	89·1752	90·6318	85
90	2·4662	2·0507	1·6150	27·7348	31·5905	36·9407	90·4963	91·5584	92·6916	90
95	1·6547	1·3468	1·0291	36·3798	41·2137	47·7305	92·5873	93·3994	94·2487	95

TAB. D. 1.

Shewing, at the end of any number of years from birth,—the *Living* out of a given number born,—also the *Dying* in the year succeeding.

Age.	Living.	Dying.	Age.	Living.	Dying.
0	218820·2	48803·7	50	53232·0	1469·5
1	170016·5	26667·4	51	51762·5	1471·1
2	143349·1	15617·1	52	50291·5	1471·4
3	127732·0	9582·7	53	48820·1	1470·4
4	118149·3	6067·9	54	47349·7	1468·1
5	112081·4	3924·9	55	45881·6	1464·4
6	108156·4	2575·4	56	44417·2	1459·4
7	105581·1	1706·3	57	42957·8	1453·0
8	103874·8	1138·0	58	41504·8	1445·1
9	102736·8	920·5	59	40059·8	1435·7
10	101816·3	912·3	60	38624·1	1424·9
11	100904·0	904·0	61	37199·2	1412·6
12	100000·0	909·2	62	35786·6	1431·8
13	99090·8	927·8	63	34354·8	1481·7
14	98163·0	946·5	64	32873·2	1528·1
15	97216·5	965·2	65	31345·1	1570·2
16	96251·3	984·1	66	29774·9	1607·1
17	95267·2	1003·0	67	28167·7	1638·0
18	94264·1	1022·0	68	26529·8	1661·7
19	93242·2	1041·0	69	24868·0	1677·5
20	92201·2	1060·0	70	23190·5	1684·4
21	91141·2	1078·9	71	21506·1	1681·5
22	90062·3	1097·9	72	19824·6	1668·2
23	88964·5	1116·7	73	18156·4	1643·9
24	87847·8	1135·5	74	16512·5	1608·2
25	86712·4	1154·1	75	14904·2	1561·0
26	85558·3	1172·6	76	13343·2	1502·4
27	84385·7	1190·8	77	11840·8	1432·8
28	83194·9	1208·9	78	10408·1	1353·0
29	81986·1	1226·7	79	9055·1	1264·0
30	80759·4	1244·2	80	7791·1	1167·4
31	79515·2	1261·4	81	6623·7	1064·9
32	78253·8	1278·2	82	5558·8	958·4
33	76975·7	1294·6	83	4600·4	850·1
34	75681·0	1310·5	84	3750·3	742·4
35	74370·5	1326·0	85	3007·9	637·5
36	73044·5	1341·0	86	2370·4	537·5
37	71703·5	1355·4	87	1832·9	444·4
38	70348·1	1369·1	88	1388·5	359·7
39	68978·9	1382·2	89	1028·9	284·5
40	67596·7	1394·6	90	744·4	219·5
41	66202·0	1406·3	91	524·8	165·0
42	64795·7	1417·1	92	359·9	120·4
43	63378·6	1427·1	93	239·5	85·2
44	61951·5	1436·2	94	154·2	58·3
45	60515·2	1444·4	95	95·9	38·5
46	59070·8	1451·6	96	57·4	24·4
47	57619·2	1457·7	97	33·0	14·9
48	56161·5	1462·8	98	18·2	8·6
49	54698·8	1466·7	99	9·5	4·8

TAB. D. 2.

Shewing, at every age of life, in logarithms,—the probability of living one year ($\lambda_x a$),—also the *Living* out of a given number born (λa).

Age.	$\lambda_x a$	λa	Age.	$\lambda_x a$	λa
0	$\bar{1}$·8904037	·3400875	50	$\bar{1}$·9878426	$\bar{1}$·7261730
1	·9259038	·2304912	51	·9874789	·7140156
2	·9499048	·1563950	52	·9871044	·7014945
3	·9661315	·1062998	53	·9867186	·6885989
4	·9771021	·0724313	54	·9863214	·6753175
5	·9845191	·0495334	55	·9859122	·6616389
6	·9895336	·0340525	56	·9854908	·6475511
7	·9929239	·0235861	57	·9850568	·6330419
8	·9952159	·0165100	58	·9846099	·6180987
9	·9960914	·0117259	59	·9841495	·6027086
10	·9960913	·0078173	60	·9836754	·5868581
11	·9960914	·0039086	61	·9831871	·5705335
12	·9960332	·0000000	62	·9822670	·5537206
13	·9959145	$\bar{1}$·9960332	63	·9808538	·5359876
14	·9957923	·9919477	64	·9793280	·5168414
15	·9956665	·9877400	65	·9776806	·4961694
16	·9955368	·9834065	66	·9759019	·4738500
17	·9954033	·9789433	67	·9739814	·4497519
18	·9952658	·9743466	68	·9719080	·4237333
19	·9951242	·9696124	69	·9696693	·3956413
20	·9949784	·9647366	70	·9672521	·3653106
21	·9948282	·9597150	71	·9646424	·3325627
22	·9946735	·9545432	72	·9618246	·2972051
23	·9945142	·9492167	73	·9587824	·2590297
24	·9943501	·9437309	74	·9554976	·2178121
25	·9941811	·9380810	75	·9519511	·1733097
26	·9940070	·9322621	76	·9481220	·1252608
27	·9938278	·9262691	77	·9439877	·0733828
28	·9936431	·9200969	78	·9395240	·0173705
29	·9934530	·9137400	79	·9347045	$\bar{2}$·9568945
30	·9932572	·9071930	80	·9295010	·8915990
31	·9930555	·9004502	81	·9238827	·8211000
32	·9928477	·8935057	82	·9178168	·7449827
33	·9926338	·8863534	83	·9112674	·6627995
34	·9924135	·8789872	84	·9041961	·5740669
35	·9921866	·8714007	85	·8965613	·4782630
36	·9919528	·8635873	86	·8883180	·3748243
37	·9917121	·8555401	87	·8794178	·2631423
38	·9914642	·8472522	88	·8698083	·1425601
39	·9912089	·8387164	89	·8594331	·0123684
40	·9909460	·8299253	90	·8482310	$\bar{3}$·8718015
41	·9906751	·8208713	91	·8361362	·7200325
42	·9903962	·8115464	92	·8230775	·5561687
43	·9901089	·8019426	93	·8089781	·3792462
44	·9898131	·7920515	94	·7937552	·1882243
45	·9895084	·7818646	95	·7773190	$\bar{4}$·9819795
46	·9891946	·7713730	96	·7595730	·7592985
47	·9888713	·7605676	97	·7404129	·5188715
48	·9885385	·7494389	98	·7197258	·2592844
49	·9881956	·7379774	99	·6973901	$\bar{5}$·9790102

TAB. D. 3.

Shewing, at the end of any number of years from birth,—the *Living* out of a given number born,—also the *Dying* in the year succeeding.

Age.	Living.	Dying.	Age.	Living.	Dying.
0	302679·3	90852·2	50	40994·9	1591·3
1	211827·1	45413·8	51	39403·6	1574·4
2	166413·3	25049·3	52	37829·2	1555·7
3	141364·0	14762·4	53	36273·4	1535·4
4	126601·6	9097·0	54	34738·0	1513·4
5	117504·6	5777·0	55	33224·6	1489·8
6	111727·6	3744·0	56	31734·8	1464·6
7	107983·6	2459·9	57	30270·2	1437·8
8	105523·7	1631·3	58	28832·4	1409·4
9	103892·4	1314·0	59	27423·0	1379·6
10	102578·4	1297·4	60	26043·4	1348·3
11	101281·0	1281·0	61	24695·1	1315·7
12	100000·0	1283·5	62	23379·3	1311·9
13	98716·5	1304·7	63	22067·4	1333·9
14	97411·8	1325·7	64	20733·6	1349·8
15	96086·1	1346·5	65	19383·7	1358·9
16	94739·7	1367·0	66	18024·8	1360·4
17	93372·6	1387·3	67	16664·4	1353·8
18	91985·4	1407·3	68	15310·6	1338·5
19	90578·1	1426·8	69	13972·1	1314·1
20	89151·3	1446·0	70	12658·0	1280·4
21	87705·2	1464·7	71	11377·6	1237·4
22	86240·5	1483·0	72	10140·1	1185·4
23	84757·5	1500·7	73	8954·7	1124·8
24	83256·7	1517·8	74	7830·0	1056·3
25	81738·9	1534·3	75	6773·6	981·1
26	80204·6	1550·1	76	5792·5	900·4
27	78654·4	1565·2	77	4892·1	815·7
28	77089·3	1579·5	78	4076·4	728·7
29	75509·8	1592·9	79	3347·7	641·3
30	73916·9	1605·4	80	2706·4	555·2
31	72311·5	1617·0	81	2151·3	472·3
32	70694·6	1627·5	82	1679·0	394·2
33	69067·0	1637·1	83	1284·7	322·4
34	67429·9	1645·5	84	962·3	257·9
35	65784·5	1652·8	85	704·4	201·4
36	64131·7	1658·8	86	503·0	153·3
37	62472·9	1663·6	87	349·6	113·5
38	60809·4	1667·0	88	236·1	81·6
39	59142·3	1669·1	89	154·5	56·7
40	57473·2	1669·8	90	97·7	38·1
41	55803·4	1669·1	91	59·6	24·7
42	54134·3	1666·8	92	35·0	15·3
43	52467·4	1663·1	93	19·7	9·1
44	50804·3	1657·7	94	10·6	5·2
45	49146·6	1650·8	95	5·4	2·8
46	47495·8	1642·2	96	2·6	1·4
47	45853·6	1632·0	97	1·2	·7
48	44221·6	1620·1	98	·5	·3
49	42601·4	1606·6	99	·2	·1

TAB. D. 4.

Shewing, in logarithms, at every age of life,—the probability of living one year (λ,a),—also the *Living* out of a given number born ($\lambda\ a$).

Age.	λ,a	$\lambda\ a$	Age.	λ,a	$\lambda\ a$
0	$\bar{1}$·8449989	·4809828	50	$\bar{1}$·9828058	$\bar{1}$·6127296
1	·8952064	·3259817	51	·9822915	·5955354
2	·9291508	·2211881	52	·9817618	·5778269
3	·9521001	·1503389	53	·9812163	·5595887
4	·9676157	·1024390	54	·9806544	·5408050
5	·9781055	·0700547	55	·9800758	·5214594
6	·9851975	·0481602	56	·9794798	·5015352
7	·9899923	·0333577	57	·9788660	·4810150
8	·9932340	·0233500	58	·9782339	·4598810
9	·9944720	·0165840	59	·9775828	·4381149
10	·9944720	·0110560	60	·9769123	·4156977
11	·9944720	·0055280	61	·9762217	·3926100
12	·9943898	·0000000	62	·9749203	·3688317
13	·9942219	$\bar{1}$·9943898	63	·9729217	·3437520
14	·9940491	·9886117	64	·9707637	·3166737
15	·9938711	·9826608	65	·9684338	·2874374
16	·9936878	·9765319	66	·9659182	·2558712
17	·9934990	·9702197	67	·9632022	·2217894
18	·9933045	·9637187	68	·9602697	·1849916
19	·9931043	·9570232	69	·9571035	·1452613
20	·9928980	·9501275	70	·9536850	·1023648
21	·9926856	·9430255	71	·9499940	·0560498
22	·9924668	·9357111	72	·9460089	·0060438
23	·9922414	·9281779	73	·9417063	$\bar{2}$·9520527
24	·9920094	·9204193	74	·9370607	·8937590
25	·9917703	·9124287	75	·9320449	·8308197
26	·9915242	·9041990	76	·9266294	·7628646
27	·9912707	·8957232	77	·9207823	·6894940
28	·9910095	·8869939	78	·9144693	·6102763
29	·9907406	·8780034	79	·9076532	·5247456
30	·9904637	·8687440	80	·9002939	·4323988
31	·9901784	·8592077	81	·8923480	·3326927
32	·9898846	·8493861	82	·8837690	·2250407
33	·9895821	·8392707	83	·8745064	·1088097
34	·9892705	·8288528	84	·8645054	$\bar{3}$·9833161
35	·9889495	·8181233	85	·8537075	·8478215
36	·9886190	·8070728	86	·8420492	·7015290
37	·9882786	·7956918	87	·8294617	·5435782
38	·9879280	·7839704	88	·8158711	·3730399
39	·9875669	·7718984	89	·8011975	·1889110
40	·9871950	·7594653	90	·7853545	$\bar{4}$·9901085
41	·9868119	·7466603	91	·7682489	·7754630
42	·9864175	·7334722	92	·7497800	·5437119
43	·9860112	·7198897	93	·7298394	·2934919
44	·9855928	·7059009	94	·7083097	·0233313
45	·9851618	·6914937	95	·6850643	$\bar{5}$·7316410
46	·9847180	·6766555	96	·6599663	·4167053
47	·9842609	·6613735	97	·6328683	·0766716
48	·9837900	·6456344	98	·6036107	$\bar{6}$·7095399
49	·9833052	·6294244	99	·5720216	·3131506

TAB. D. 5. Comparison of the preceding Northampton and Stockholm Tables (which are those of Dr. Price, adapted to the New Theory) under the heads,—Expectation of complete years,—Survivors at successive ages—Annual Deaths, and Constantly Living in a Stationary Population, resulting from 100,000 annually attaining the age of 12 years.

Age.	Expectation.		Survivors.	
	Northampton	Stockholm.	Northampton	Stockholm.
0	24·1582	15·7839	218820	302679
5	41·1753	34·1583	112081	117505
10	40·1980	33·9452	101816	102578
15	37·0044	31·1028	97216	96086
20	33·9064	28·3644	92201	89151
25	30·9239	25·7530	86712	81739
30	28·0538	23·2646	80759	73917
35	25·2897	20·8919	74371	65784
40	22·6214	18·6232	67597	57473
45	20·0328	16·4401	60515	49147
50	17·4990	14·3142	53232	40995
55	14·9821	12·2000	45882	33225
60	12·4233	10·0232	38624	26043
65	9·8351	7·7786	31345	19384
70	7·5785	5·8578	23190	12658
75	5·6928	4·2920	14904	6774
80	4·1596	3·0510	7791	2706
85	2·9478	2·0948	3008	704
90	2·0172	1·3783	744	98
95	1·3255	·8387	96	5

Between Ages.	Living.	Dying.	Rate ℘ cent.	
0—5	724698	106739	14·7287	Northampton.
5–10	527298	10265	1·9467	
10–20	971408	9615	·9898	
20–30	866334	11442	1·3207	
30–40	743049	13163	1·7715	
40–50	604808	14365	2·3751	
50–60	458973	14608	3·1827	
60–70	311806	15434	4·9497	
70–80	151042	15399	10·1954	
80–90	34430	7047	20·4669	
90–100	1867	740	39·6197	
0–100	5395713	218816	4·0554	
20–50	2214191	38969	1·7600	
0—5	856298	185175	21·6250	Stockholm.
5–10	539169	14926	2·7684	
10–20	960036	13427	1·3986	
20–30	816691	15234	1·8654	
30–40	657539	16444	2·5008	
40–50	491762	16478	3·3508	
50–60	333248	14951	4·4866	
60–70	193582	13385	6·9146	
70–80	70867	9952	14·0425	
80–90	9427	2609	27·6726	
90–100	184	98	53·2193	
0–100	4928803	302679	6·1410	
20–50	1965992	48156	2·4495	

TAB. D. 6. Exhibiting the coincidence, for long portions of time, of the Table of Village Mortality with the Carlisle Table of Mr. Milne; the former being under the regulation of the New Theory, and the latter expressing an *imagined* decrement for short periods of the greatest irregularity. Rate of interest 4 per cent.

Age.	Survivors.		Expectation.		Life Annual Premium for Assurance of £100.		Premium for one year's Assurance of £100.		Life Annuity of £1.		Age.
	Milne.	Theory.	Milne.	Theory.	Milne.	Theory.	Milne.	Theory.	Milne.	Theory.	
5	10522	10521	51·25	51·21	1·0096	1·0115	1·7117	1·7950	19·594	19·586	5
10	10000	10000	48·82	48·79	1·0117	1·0134	·4316	·4867	19·585	19·578	10
15	9752	9734	45·00	45·05	1·1648	1·1562	·5952	·5637	18·956	18·991	15
20	9427	9435	41·46	41·40	1·3183	1·3222	·6789	·6529	18·363	18·348	20
25	9101	9100	37·86	37·83	1·5172	1·5173	·7032	·7562	17·645	17·645	25
30	8734	8726	34·34	34·34	1·7554	1·7493	·9714	·8757	16·852	16·872	30
35	8300	8313	31·00	30·92	2·0220	2·0300	·9863	1·0140	16·041	16·018	35
40	7856	7858	27·61	27·56	2·3750	2·3776	1·2504	1·1740	15·074	15·067	40
45	7317	7362	24·46	24·25	2·7746	2·8220	1·4239	1·3591	14·104	13·997	45
50	6807	6826	21·11	20·96	3·3641	3·4159	1·2902	1·5731	12·869	12·770	50
55	6305	6254	17·58	17·64	4·2839	4·2616	1·7233	1·8640	11·300	11·334	55
60	5639	5576	14·34	14·47	5·5320	5·4459	3·2201	2·7225	9·663	9·762	60
65	4672	4711	11·79	11·65	6·8984	7·0133	3·9506	3·9680	8·307	8·208	65
70	3717	3680	9·18	9·20	9·1257	9·1041	4·9658	5·7654	6·709	6·722	70
75	2593	2561	7·01	7·12	12·1820	11·9085	9·1848	8·3395	5·239	5·347	75
80	1475	1504	5·51	5·41	15·4476	15·6769	11·7039	11·9842	4·183	4·122	80
85	689	689	4·12	4·04	20·4551	20·7203	16·8539	17·0597	3·115	3·071	85
90	220	219	3·28	2·97	25·4278	27·3847	25·0541	23·9580	2·416	2·202	90
95	46	41	3·53	2·15	23·3721	35·9713	22·4359	33·0054	2·674	1·511	95

TAB. D. 7. The Observations made on the Populations of Sweden, Glasgow, Carlisle, and Stockholm, compared with the New Table of Mean Mortality. Expressing the annual *Death* from 100 constantly *Living*.

Between Ages.	Glasgow.	Carlisle.	The New Table.	Sweden.			Stockholm. 9 Years. 1755—63.		Between Ages.
	6 Years. 1821—26.	9 Years. 1779—87.		21 Years. 1755—75.	20 Years. 1776—95.	5 Years. 1801—5.	Males.	Females.	
0—5	7·7300	8·2282	6·7250	9·0089	8·5027	7·3889	26·9579	22·8428	0—5
5—10	1·2937	1·0226	·9869	1·4165	1·3648	1·0701	2·8926	2·5641	5—10
10—20	·7147	·5854	·7004	·7086	·6530	·5370	1·3041	·9353	10—20
20—30	1·0500	·7541	·9348	·9181	·8910	·7415	2·6260	1·5035	20—30
30—40	1·3101	1·0588	1·2543	1·2200	1·1560	·9712	3·5419	2·4115	30—40
40—50	1·7057	1·4345	1·6824	1·7409	1·6063	1·4602	4·6711	3·3909	40—50
50—60	2·8802	1·8267	2·4019	2·6412	2·3868	2·5115	6·4587	4·0532	50—60
60—70	5·1932	4·1249	4·8326	4·8095	4·9340	4·8940	10·0992	6·6732	60—70
70—80	11·4978	8·2992	10·0432	10·2320	10·4115	11·1768	15·8654	14·6809	70—80
80—90	19·2833	17·5627	20·1783	20·7769	19·7391	23·2119	31·9444	34·1708	80—90
Above 90	37·1515	28·4444	39·8503	39·4096	35·1325	41·9837	37·5000	44·4444	90—100
All Ages.	2·5557	2·5000	2·5525	2·8898	2·6786	2·4449	5·9312	4·7772	0—100

TAB. D. 8. Deparcieux's French Monks, Nuns, and Tontine. Expressing the relation of annual Deaths to 100 annual Survivors.

Between Ages.	Tontine.	Benedict. Monks of St. Maur.	Other Benedictine Monks.	Monks of St. Geneviève	Many other Monks.	Many Nuns in Paris.
20—30	1·03	·74	·83	·87	·78	·80
30—40	1·10	1·12	·95	1·36	·94	1·04
40—50	1·22	1·58	1·53	2·03	1·51	1·40
50—60	2·22	2·98	2·91	3·11	2·72	2·34
60—70	3·83	5·48	5·67	5·89	5·20	4·59
70—80	8·65	12·30	12·88	11·20	10·93	9·10
80—90	18·23	23·77	24·14	24·54	24·03	18·84
90—100	44·00	33·33	33·33	33·33	42·86	26·67
20—100	2·46	2·57	2·56	2·70	2·51	2·46

TAB. D. 9. Shewing the relation of *Sickness* to Life, at different ages, according to the Report made by the Highland Society.

Between Ages.	Years of Life.	Weeks of Sickness.	Sick Weeks in a Year.	Rate of Sick time to 100 of Life time.
17—20	1056	401	·3797	·7278
20—30	23509	13907	·5916	1·1337
30—40	36261	24894	·6865	1·3157
40—50	25119	25806	1·0273	1·9689
50—60	12598	23691	1·8805	3·6041
60—70	4548	25622	5·6337	10·7970
Above 70	1127	18642	16·5413	31·7016
20—50	84889	64607	·7611	1·4586

TAB. D. 10. Shewing the Annual Rate of Mortality per cent, on Six Classes of Government Annuitants, for periods terminating in the year 1826, so far as can be collected from the published "Statement."

Between Ages.	Nos. 1.		2.		3.		4.		5.		6.		2, 3, 4, and 5.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
0—11	·95	1·44	·54	·68	·70	·59	·79	·65	·84	·78			·77	·67
11—21	1·21	·78	·50	·52	·85	·67	·96	·78	·87	·89			·85	·75
21—31	2·61	1·57	1·16	1·12	1·36	·97	1·31	·76	1·30	·81			1·30	·89
31—41	2·21	1·88	1·17	1·28	1·25	1·15	1·30	1·00	1·12	·93			1·20	1·07
41—51	2·57	2·02	1·29	1·63	1·35	1·24	1·17	1·30	1·46	·97	1·65	·76	1·34	1·31
51—61	3·33	3·42	2·91	2·49	2·40	1·52	2·18	1·71	3·05	1·63	2·20	1·44	2·69	1·94
61—71	6·29	4·49	6·64	5·03	4·27	3·53	4·07	2·73	5·34	4·35	4·27	2·80	5·30	4·20
71—81	11·91	9·95	11·72	9·14	8·59	8·78	8·08	7·50	9·35	—	8·37	6·85	9·73	8·78
81—91	21·05	25·22	20·66	14·76	20·12	14·93	11·59	19·19	21·97	—	15·17	13·98	18·95	15·30
Total Deaths.	594	408	892	1504	911	1082	637	678	1243	580	593	955	3683	3844
Number living originally.	594	408	928	1624	1486	2071	1498	2020	2764	2067	2077	4815	6676	7782
Time of observation in years.	90 years.		80		51		37		37		9		46	

TAB. D. 11. Shewing the present value of £100 *certain*, to be received at the end of any number of years, from one to fifty.

Years.	3 ℔ cent.	4 ℔ cent.	5 ℔ cent.	6 ℔ cent.
1	97·0874	96·1538	95·2381	94·3396
2	94·2596	92·4556	90·7029	88·9996
3	91·5142	88·8996	86·3838	83·9619
4	88·8487	85·4804	82·2702	79·2094
5	86·2609	82·1927	78·3526	74·7258
6	83·7484	79·0315	74·6215	70·4961
7	81·3092	75·9918	71·0681	66·5057
8	78·9409	73·0690	67·6839	62·7412
9	76·6417	70·2587	64·4609	59·1898
10	74·4094	67·5564	61·3913	55·8395
11	72·2421	64·9581	58·4679	52·6788
12	70·1380	62·4597	55·6837	49·6969
13	68·0951	60·0574	53·0321	46·8839
14	66·1118	57·7475	50·5068	44·2301
15	64·1862	55·5265	48·1017	41·7265
16	62·3167	53·3908	45·8112	39·3646
17	60·5016	51·3373	43·6297	37·1364
18	58·7395	49·3628	41·5521	35·0344
19	57·0286	47·4642	39·5734	33·0513
20	55·3676	45·6387	37·6889	31·1805
21	53·7549	43·8834	35·8942	29·4155
22	52·1893	42·1955	34·1850	27·7505
23	50·6692	40·5726	32·5571	26·1797
24	49·1934	39·0121	31·0068	24·6979
25	47·7606	37·5117	29·5303	23·2999
26	46·3695	36·0689	28·1241	21·9810
27	45·0189	34·6817	26·7848	20·7368
28	43·7077	33·3477	25·5094	19·5630
29	42·4346	32·0651	24·2946	18·4557
30	41·1987	30·8319	23·1377	17·4110
31	39·9987	29·6460	22·0359	16·4255
32	38·8337	28·5058	20·9866	15·4957
33	37·7026	27·4094	19·9873	14·6186
34	36·6045	26·3552	19·0355	13·7912
35	35·5383	25·3415	18·1290	13·0105
36	34·5032	24·3669	17·2657	12·2741
37	33·4983	23·4297	16·4436	11·5793
38	32·5226	22·5285	15·6605	10·9239
39	31·5754	21·6621	14·9148	10·3056
40	30·6557	20·8289	14·2046	9·7222
41	29·7628	20·0278	13·5282	9·1719
42	28·8959	19·2575	12·8840	8·6527
43	28·0543	18·5168	12·2704	8·1630
44	27·2372	17·8046	11·6861	7·7009
45	26·4439	17·1198	11·1297	7·2650
46	25·6737	16·4614	10·5997	6·8538
47	24·9259	15·8283	10·0949	6·4658
48	24·1999	15·2195	9·6142	6·0998
49	23·4950	14·6341	9·1564	5·7546
50	22·8107	14·0713	8·7204	5·4288
60	16·9733	9·5060	5·3536	3·0314
70	12·6297	6·4219	3·2866	1·6927
80	9·3977	4·3384	2·0177	·9452
90	6·9928	2·9309	1·2387	·5278

TAB. D. 12. Shewing the present value of *Annuity* of £1, for a fixed term of years, payments being made at the end of each year.

Years.	3 ℔ cent.	4 ℔ cent.	5 ℔ cent.	6 ℔ cent.
1	·9709	·9615	·9524	·9434
2	1·9134	1·8861	1·8594	1·8334
3	2·8286	2·7751	2·7232	2·6730
4	3·7171	3·6299	3·5460	3·4651
5	4·5797	4·4518	4·3295	4·2124
6	5·4172	5·2421	5·0757	4·9173
7	6·2303	6·0021	5·7864	5·5824
8	7·0197	6·7327	6·4632	6·2098
9	7·7861	7·4353	7·1078	6·8017
10	8·5302	8·1109	7·7217	7·3601
11	9·2526	8·7605	8·3064	7·8869
12	9·9540	9·3851	8·8633	8·3838
13	10·6350	9·9856	9·3936	8·8527
14	11·2961	10·5631	9·8986	9·2950
15	11·9379	11·1184	10·3797	9·7122
16	12·5611	11·6523	10·8378	10·1059
17	13·1661	12·1657	11·2741	10·4773
18	13·7535	12·6593	11·6896	10·8276
19	14·3238	13·1339	12·0853	11·1581
20	14·8775	13·5903	12·4622	11·4699
21	15·4150	14·0292	12·8212	11·7641
22	15·9369	14·4511	13·1630	12·0416
23	16·4436	14·8568	13·4886	12·3034
24	16·9355	15·2470	13·7986	12·5504
25	17·4131	15·6221	14·0939	12·7834
26	17·8768	15·9828	14·3752	13·0032
27	18·3270	16·3296	14·6430	13·2105
28	18·7641	16·6631	14·8981	13·4062
29	19·1885	16·9837	15·1411	13·5907
30	19·6004	17·2920	15·3725	13·7648
31	20·0004	17·5885	15·5928	13·9291
32	20·3888	17·8736	15·8027	14·0840
33	20·7658	18·1476	16·0025	14·2302
34	21·1318	18·4112	16·1929	14·3681
35	21·4872	18·6646	16·3742	14·4982
36	21·8323	18·9083	16·5469	14·6210
37	22·1672	19·1426	16·7113	14·7368
38	22·4925	19·3679	16·8679	14·8460
39	22·8082	19·5845	17·0170	14·9491
40	23·1148	19·7928	17·1591	15·0463
41	23·4124	19·9931	17·2944	15·1380
42	23·7014	20·1856	17·4232	15·2245
43	23·9819	20·3708	17·5459	15·3062
44	24·2543	20·5488	17·6628	15·3832
45	24·5187	20·7200	17·7741	15·4558
46	24·7754	20·8847	17·8801	15·5244
47	25·0247	21·0429	17·9810	15·5890
48	25·2667	21·1951	18·0772	15·6500
49	25·5017	21·3415	18·1687	15·7076
50	25·7298	21·4822	18·2559	15·7619
60	27·6756	22·6235	18·9293	16·1614
70	29·1234	23·3945	19·3427	16·3845
80	30·2008	23·9154	19·5965	16·5091
Perpetual.	33·3333	25·0000	20·0000	16·6667

The few following Formulæ will be found to embrace all cases of common occurrence in the Practice of Life Assurance. I have adopted the Notation used by Mr. Milne, in his "Treatise on Life Annuities."

The different letters of the alphabet denote distinct lives of specified ages. The manner of writing each letter denotes the kind of contingency. For a specified life or age, the Saxon large character denotes an Assurance of £1, or the value of £1, payable at the expiration of the year of death; the common Roman capitals denote the value of £1, payable annually during life; the small *Italic* characters denote the tabular Survivors at the given age out of a given number born. The last characters, with small figures added to the left and lower corner, express the probability of surviving one, two, or more years. The expression for any specific contingency on a given life is made to serve for a life older or younger by a known *number* of years: if *older*, this number is placed at the higher and left corner; if *younger*, at the lower and right corner.

The present value of £1, payable *certain*, at the end of one year $= v$.

$A = {}_1a\, v\,(1 + {}^1A)$: *i. e.* value of Annuity of £1 on given life $= \left(\frac{{}^1a}{a}\right)$ probability of living one year $\times\ v\ \times$ (1 + Annuity on life one year older).

$\overline{AB} = A + B - AB$: *i. e.* Annuity on longest of two lives = Annuity on A + Annuity on B — Annuity on the joint lives.

${}_{\overline{t}|}A = A - {}_ta\, v^t {}^tA$: *i. e.* life Annuity for (t) years = Annuity for whole of life — probability of living (t) years $\times\ v^t\ \times$ Annuity on life (t) years older.

Annual payment for Assurance of £1 for (t) years $= \dfrac{1 - {}_ta\, v^t}{1 + A - {}_ta\, v^t (1 + {}^tA)} + v - 1$

Single payment for same = Annual payment $\times \{1 + A - {}_ta\, v^t (1 + {}^tA)\} = {}_{\overline{t}|}\mathfrak{A}$

Single payment for £1, payable on the death of (A), provided (B) then alive $\Big\} = \frac{1}{2}\left\{\mathfrak{A}\mathfrak{B} + \frac{B\,A_1}{{}_1a_1} - \frac{A\,B_1}{{}_1b_1}\right\}$ = Annual payment $\times$ (1 + AB).

Value of Annuity on longest of three lives, or $\overline{ABC} = (A + B + C) - (AB + AC + BC) + ABC$.

Value of £1, payable if A, B, and C are all alive at the end of (t) years . . . . . $\Big\} = \dfrac{{}^ta\,{}^tb\,{}^tc}{abc} v^t = {}_t(abc) v^t$

Value of absolute reversion of Life Annuity $= \dfrac{v}{1 - v} - A$.

Value of Life Reversion to B after A = B — AB.

Value of Life Annuity of £1, payable weekly = A + ·5.

CONSTANTS.

Interest.	v.	$\lambda\, v$.	$\lambda\ 1 - v)$.
3 per cent.	·97087379	$\bar{1}$·98716277	$\bar{2}$·4642840
4 per cent.	·96153846	·98296666	·5850267
5 per cent.	·95238095	·97881070	·6777807
6 per cent.	·94339623	·97469413	·7528454

$y = 10^{\frac{k^2\alpha}{\lambda p}(1 - p^r)}$. The three values of $\lambda p = \begin{cases} -·1700. \\ +·0128. \\ +·0333. \end{cases}$

k, or modulus of common logarithms = ·434294482. And $\lambda\, k = \bar{1}$·6377843.

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