

# Table of Contents

<b>The Life Table . . . . .</b>	<b>1</b>
1. Tables of Annuity Values Which Were Sanctioned by the Roman Law for the Purposes of the Lex Falcidia.	
C. F. Trenerry (1926) . . . . .	7
2. Natural and Political Observations Mentioned in a Following Index, and Made Upon the Bills of Mortality.	
John Graunt (1664 (1662)) . . . . .	11
3. An Estimate of the Degrees of the Mortality of Mankind.	
Edmund Halley (1693) . . . . .	21
4. A Treatise on the Valuation of Annuities and Assurances on Lives and Survivors.	
Joshua Milne (1815) . . . . .	27
5. Statistical Applications of the Mortality Table.	
George King (1902) . . . . .	35
6. Formal Treatment of Aggregate Mortality Data.	
Wilhelm Lexis (1875) . . . . .	39
7. A Short Method for Constructing an Abridged Life Table.	
Lowell J. Reed and Margaret Merrell (1939) . . . . .	43
— Editors' Note: Approximations to $\pi_x$ . . . . .	50
8. Short Methods of Constructing Abridged Life Tables.	
T. N. E. Greville (1943) . . . . .	53
9. Life Tables for Natural Populations of Animals.	
Edward S. Deevey, Jr. (1947) . . . . .	61
 <b>Stable Population Theory . . . . .</b>	<b>75</b>
10. An Illustration of Population Growth.	
Johann Peter Süssmilch (1761) . . . . .	79
11. A General Investigation into the Mortality and Multiplication of the Human Species.	
Leonard Euler (1760) . . . . .	83
12. Relation Between Birth Rates and Death Rates.	
Alfred J. Lotka (1907) . . . . .	93
13. A Problem in Age-Distribution.	
F. R. Sharpe and Alfred J. Lotka (1911) . . . . .	97
14. The Stability of the Normal Age Distribution.	
Alfred J. Lotka (1922) . . . . .	101
15. Resolving a Historical Confusion in Population Analysis.	
Paul A. Samuelson (1976) . . . . .	109
16. On the Integral Equation of Renewal Theory.	
William Feller (1941) . . . . .	131
17. A New Method for Calculating Lotka's $r$ —The Intrinsic Rate of Growth in a Stable Population.	
Ansley J. Coale (1957) . . . . .	157

18. The Fundamental Theorem of Natural Selection. R. A. Fisher (1958 (1930)) . . . . .	161
19. How the Age Distribution of a Human Population is Determined. Ansley J. Coale (1957) . . . . .	167
20. On the Reproduction of Organisms with Overlapping Generations. W. R. Thompson (1931) . . . . .	173
21. The Population Consequences of Life History Phenomena. Lamont C. Cole (1954). . . . .	183
Attempts at Prediction and the Theory they Stimulated . . . . .	193
22. The Probability of a Cessation of the Growth of Population in England and Wales during the Next Century. Edwin Cannan (1895) . . . . .	195
23. An Empirical Method for Calculating Future Population. P. K. Whelpton (1936) . . . . .	205
24. Population Waves. Harro Bernardelli (1941) . . . . .	215
25. On the Generation and Growth of a Population. E. G. Lewis (1942) . . . . .	221
26. On the Use of Matrices in Certain Population Mathematics. P. H. Leslie (1945). . . . .	227
27. Matrix Representation of Changes in the Active Population. Léon Tabah (1968) . . . . .	239
28. Weak Ergodicity. Alvaro Lopez (1961). . . . .	255
29. Ergodic Properties of Populations I: The One Sex Model. Beresford Parlett (1970) . . . . .	259
Parameterization and Curve Fitting . . . . .	273
30. On the Nature of the Function Expressive of the Law of Human Mortality. Benjamin Gompertz (1825) . . . . .	279
31. On the Law of Mortality. William M. Makeham (1867) . . . . .	283
32. Calculation of Model Tables. Ansley J. Coale and Paul Demeny (1966). . . . .	289
33. Estimates of Fertility and Mortality Based on Reported Age Distributions and Reported Child Survival. United Nations (1967) . . . . .	301
34. Methods of Analysis and Estimation. William Brass and Ansley J. Coale (1968) . . . . .	307
35. Nuptiality, Fertility, and Reproductivity. S. D. Wicksell (1931) . . . . .	315
36. Model Fertility Tables: Variations in the Age Structure of Childbearing in Human Popu- lations. Ansley J. Coale und T. James Trussell (1974) . . . . .	323
37. A Note on the Law of Population Growth. Pierre-François Verhulst (1838) . . . . .	333
-- Editors' Note: Fitting the Logistic. . . . .	338
38. On the Rate of Growth of the Population of the United States since 1790 and its Mathe- matical Representation. Raymond Pearl and Lowell J. Reed (1920) . . . . .	341
39. The Measurement of Population Distribution. Otis Dudley Duncan (1957). . . . .	349

Probability Models of Conception and Birth . . . . .	365
40. First Investigations on the Fecundability of a Woman. Corrado Gini (1924) . . . . .	367
41. Theoretical Basis of Measures of Natural Fertility. Louis Henry (1972 (1953)) . . . . .	373
42. A Note on the Structure of a Stochastic Model Considered by V. M. Dandekar. D. Basu (1955) . . . . .	383
43. On the Time Required for Conception. Mindel C. Sheps (1964) . . . . .	387
 Branching Theory and Other Stochastic Processes . . . . .	397
44. On the Probability of the Extinction of Families. Francis Galton and H. W. Watson (1974) . . . . .	399
45. Extinction Probabilities in Branching Processes. William Feller (1968 (1950)) . . . . .	407
46. Stochastic Processes and Population Growth. David G. Kendall (1949) . . . . .	411
47. An Age-Dependent Birth and Death Process. W. A. O'N. Waugh (1955) . . . . .	417
48. On the Use of the Direct Matrix Product in Analyzing Certain Stochastic Population Models. J. H. Pollard (1966) . . . . .	423
 Cohort and Period, Problem of the Sexes, Sampling . . . . .	429
49. Aspects of Recent Trends in Marriage in England and Wales. John Hajnal (1947) . . . . .	433
50. The Relations between Male and Female Reproduction Rates. P. H. Karmel (1947) . . . . .	441
51. The Measurement of Reproductivity. A. H. Pollard (1948) . . . . .	453
52. Stochastic Processes and Population Growth. David G. Kendall (1949) . . . . .	465
53. Population Growth of the Sexes. Leo A. Goodman (1953) . . . . .	469
54. On Future Population. Nathan Keyfitz (1972) . . . . .	481
55. The Standard Deviation of Sampling for Life Expectancy. E. B. Wilson (1938) . . . . .	485
56. Probability Distributions of Life Table Functions. C. L. Chiang (1968) . . . . .	491
 References . . . . .	501
Author Index . . . . .	507
Subject Index . . . . .	510