

# TRANSACTIONS OF SOCIETY OF ACTUARIES 1969 REPORTS

## II. MORTALITY UNDER INDIVIDUAL IMMEDIATE ANNUITIES

### ABSTRACT

1. This report presents the 1963-67 mortality experience under individual immediate annuities of twenty-two large insurance companies in the United States and Canada. There were three new contributors, but inclusion of their experience did not appear to affect the over-all results appreciably.

2. There has been a substantial increase during recent years in the average amount of annual income provided under immediate annuities. Based on the experience of seven large companies, the average amount of annual income provided under 1966 issues was about 25 per cent higher than that under 1961 issues and about 70 per cent higher than that under 1956 issues. However, the average amount of annual income provided remains very small—less than \$1,100 in 1966.

3. As was true in earlier studies, the ratios of actual to expected mortality were generally lower on nonrefund than on refund annuities and generally lower by amounts of annual income than by number of contracts. These findings are attributable to self-selection—healthier annuitants consciously or otherwise seeking larger lifetime payments in preference to refund guarantees. Self-selection is especially strong on nonrefund annuities in the first five contract durations, which characteristically show lower mortality than durations 6 and over, and the financial effect of self-selection increases with age above age 70.

4. There were no significant changes in the mortality under immediate annuities during the fifteen-year period between 1948 and 1963 anniversaries. The 1963-67 experience, however, shows a distinct decline in the mortality ratios for durations 6 and over on nonrefund annuities issued to both males and females and a somewhat lesser reduction in the mortality ratios on female refund annuities. Only on male refund annuities at durations 6 and over does the current study indicate little change in mortality levels.

5. In a new analysis by amount of annual income, surprisingly low mortality ratios were found on annuities for larger amounts of annual income. At durations 6 and over, annuities providing annual incomes of \$2,500 or more showed 10-20 per cent lower mortality than annuities for all amounts of income combined. The low ratios were found among refund as well as among nonrefund annuities for the large amounts in both sexes.

6. It is surmised that annuitant mortality has shown the declines reported for the larger amounts of annual income because a better-to-do class of buyer entered the market in the mid-1950's. A similar shift in class of buyer has been reported for British annuitant mortality experience following a change in the tax laws in 1956. This surmise suggests that if more of the well-to-do should turn to immediate annuities in the future, the level of annuitant mortality

could decline further, even in the absence of any underlying downtrend in general population death rates.

#### INTRODUCTION

**T**HIS report, the latest in a series of intercompany studies of mortality under individual immediate annuities, covers the experience between 1963 and 1967 anniversaries. The previous report (*TSA, 1964 Reports*, pp. 80 ff.) covered the experience from 1958 to 1963 anniversaries. The present study includes the experience on individual immediate nonrefund and refund annuity issues of 1931-66. Contracts providing for either cash or installment refund payments and annuities with a period certain were classified as refund annuities. The types of annuities excluded were the same as those in earlier studies (*TSA, 1964 Reports*, p. 80).

The age at issue was taken as the age nearest birthday on the issue date of the contract, or some reasonable approximation thereto.

Expected deaths were calculated on the Annuity Table for 1949 Ultimate without projection and also with Projection B. allowing for mortality improvement from the end of 1950 through the period from 1963 to 1967 anniversaries.

The names of the twenty-two contributing companies and their proportionate contributions to the experience on nonrefund and refund annuities by sex are given in Table A of the Appendix, both by number of contracts and by amounts of annual income. The inclusion of the experience of three companies which contributed their data for the first time did not appreciably affect the results for all the companies combined.

The present study extended over a period of four years is comprised of exposures of 551,286 contract years and \$290,567,215 income years; 35,756 contracts involving \$15,344,411 of annual income were terminated by death. Compared with the previous study, which extended over a period of five years, the current study shows a decrease of 27 per cent in the exposures by contract years but an increase of 13 per cent in the exposures by amounts of annual income.

Table B of the Appendix presents an analysis of the exposures and deaths in the current study by sex, type of annuity, and duration. This analysis shows that refund annuities accounted for 64 per cent of the total exposures by amounts of annual income in the current study, or about the same proportion as in the previous study. Females accounted for 63 per cent of the refund annuity exposures and for about the same proportion of the nonrefund annuity exposures by amounts of annual income; the proportion of males in the current study increased to about 37 per

cent, as compared with 33 per cent in the previous study. The proportion of the exposures in the first five contract years increased from about 21 per cent by amounts of annual income in the previous study to about 46 per cent in the current study; by number of contracts the proportion of the exposures in the first five contract years increased from 11 to 24 per cent. These last few figures demonstrate the substantial rise in the volume of immediate annuities issued during recent years.

Since the 1948-53 study there has been a steady increase in the average amount of annual income provided under immediate annuities. This is indicated in the accompanying tabulation, which presents figures derived from the first contract year exposures entering into the four most recent intercompany studies.

AVERAGE AMOUNT OF ANNUAL INCOME UNDER  
INDIVIDUAL IMMEDIATE ANNUITIES  
DERIVED FROM FIRST CONTRACT YEAR EXPOSURES  
IN LAST FOUR INTERCOMPANY STUDIES

| EXPERIENCE    | NONREFUND |        | REFUND |        |
|---------------|-----------|--------|--------|--------|
|               | Male      | Female | Male   | Female |
| 1948-53 ..... | \$ 540    | \$ 377 | \$ 392 | \$325  |
| 1953-58 ..... | 760       | 507    | 529    | 427    |
| 1958-63 ..... | 903       | 849    | 779    | 659    |
| 1963-67 ..... | 1,403     | 1,150  | 1,126  | 967    |

Details of the current study, relating to exposures, actual deaths, and expected deaths are set forth in Table C of the Appendix.

#### SUMMARY OF FINDINGS

1. Whereas there were no significant changes in the mortality under immediate annuities during the fifteen-year period from 1948 to 1963 anniversaries, the experience from 1963 to 1967 anniversaries shows a distinct decline in the mortality ratios at durations 6 and over on non-refund annuities issued to both males and females and a somewhat lesser reduction in mortality ratios on female refund annuities; only on male refund annuities does the current study indicate little change in mortality levels at durations 6 and over. (See Tables 10 and 11.)

2. The current study is the first to analyze the experience under immediate annuities according to the amount of annual income provided. It indicates that the mortality ratios at durations 6 and over on annuities providing for an annual income of \$2,500 or more have recently been

significantly lower than those on annuities for all amounts combined, with the rather small experience on annuities providing an annual income of \$5,000 or more showing very low mortality ratios on other than female nonrefund annuities. (See Tables 7 and 8.)

3. Judging by the experience of six companies, the decrease in male annuitant mortality noted in the current study seems to have occurred chiefly on annuities issued since the mid-fifties. It may perhaps be associated with the increase in the proportion of annuities providing for larger amounts of income. In the case of female annuitants, the decrease in mortality probably reflects a continuing downtrend in female mortality as well as a change in the class of persons purchasing annuities. (See Tables 10, 11, and 13.)

EXPERIENCE IN RELATION TO THE ANNUITY TABLE FOR 1949 ULTIMATE  
(WITHOUT PROJECTION)

Tables 1 and 2 present the mortality ratios on the Annuity Table for 1949 Ultimate (*a*-1949 Table) for nonrefund and refund annuities, respectively. Mortality ratios on nonrefund annuities are generally lower than those on refund annuities, and the ratios are also generally lower by amounts of annual income than by number of contracts.

The mortality ratios for all durations combined are markedly affected by the higher proportion of the exposures in the early contract durations. A clearer picture of the recent level of mortality under immediate annuities is probably given by the mortality ratios for the sixth and subsequent contract durations, which may be regarded as broadly representative of the ultimate mortality under immediate annuities; select mortality is discussed separately in a later section of this report. The main features of the 1963-67 experience for the sixth and subsequent contract durations are as follows:

1. *On nonrefund annuities at attained ages 60 or older* the mortality ratios are for the most part significantly below 100 per cent and generally increase with duration. The mortality ratios for the eleventh and subsequent contract durations average at least 10 percentage points higher than those for the sixth through tenth contract durations; the latter are about 82 per cent by number of contracts for all ages combined in both sexes, 67 per cent by amounts of income for males (all ages combined), and 82 per cent by amounts of income for females (all ages combined).

2. *On nonrefund annuities at attained ages under 60* the mortality ratios are in excess of 100 per cent by number of contracts and by amounts of annual income for both sexes.

3. *On nonrefund annuities issued to males* the mortality ratios are particularly low at attained ages 60-69 by number of contracts (67 per cent) and at attained ages 70-89 by amounts of annual income (84 per cent).

TABLE 1  
 INDIVIDUAL IMMEDIATE NONREFUND ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| ATTAINED AGES    | BY NUMBER OF CONTRACTS |            |            |             |             |                    | BY AMOUNTS OF ANNUAL INCOME |            |            |             |             |                    |
|------------------|------------------------|------------|------------|-------------|-------------|--------------------|-----------------------------|------------|------------|-------------|-------------|--------------------|
|                  | Contract Years         |            |            |             |             | All Contract Years | Contract Years              |            |            |             |             | All Contract Years |
|                  | 1-2                    | 3-5        | 6-10       | 11 and Over | 6 and Over  |                    | 1-2                         | 3-5        | 6-10       | 11 and Over | 6 and Over  |                    |
| Male             |                        |            |            |             |             |                    |                             |            |            |             |             |                    |
| Under 50.....    | *                      | *          | *          | *           | *           | *                  | *                           | *          | *          | *           | *           | *                  |
| 50-59.....       | <i>158%</i>            | *          | *          | <i>175%</i> | <i>145%</i> | <i>125%</i>        | <i>148%</i>                 | *          | *          | <i>102%</i> | <i>105%</i> | <i>104%</i>        |
| 60-69.....       | 71                     | <i>75%</i> | <i>55%</i> | 72          | 67          | 70                 | 57                          | <i>93%</i> | <i>96%</i> | 88          | 92          | 77                 |
| 70-79.....       | 67                     | 80         | 87         | 94          | 92          | 86                 | 76                          | 74         | 77         | 84          | 81          | 78                 |
| 80-89.....       | 72                     | 80         | 82         | 94          | 92          | 89                 | 66                          | 76         | 60         | 97          | 85          | 80                 |
| 90 and over..... | *                      | <i>113</i> | 78         | 88          | 87          | 87                 | *                           | <i>111</i> | 69         | 99          | 91          | 97                 |
| All ages.....    | <i>71%</i>             | <i>80%</i> | <i>82%</i> | <i>92%</i>  | <i>90%</i>  | <i>87%</i>         | <i>73%</i>                  | <i>78%</i> | <i>67%</i> | <i>95%</i>  | <i>86%</i>  | <i>82%</i>         |
| Female           |                        |            |            |             |             |                    |                             |            |            |             |             |                    |
| Under 50.....    | *                      | *          | *          | *           | *           | *                  | *                           | *          | *          | *           | *           | *                  |
| 50-59.....       | <i>232%</i>            | *          | *          | *           | *           | <i>145%</i>        | <i>468%</i>                 | *          | *          | *           | *           | <i>306%</i>        |
| 60-69.....       | 82                     | <i>87%</i> | <i>68%</i> | 115         | <i>102%</i> | 93                 | 44                          | <i>70%</i> | <i>43%</i> | <i>105%</i> | <i>80%</i>  | 63                 |
| 70-79.....       | 54                     | 81         | 79         | 101         | 97          | 90                 | 48                          | 80         | 80         | 92          | 88          | 77                 |
| 80-89.....       | 46                     | 76         | 85         | 94          | 93          | 91                 | 56                          | 79         | 82         | 99          | 96          | 90                 |
| 90 and over..... | *                      | 55         | 95         | 89          | 89          | 89                 | *                           | 47         | 94         | 89          | 90          | 89                 |
| All ages.....    | <i>58%</i>             | <i>79%</i> | <i>83%</i> | <i>93%</i>  | <i>92%</i>  | <i>90%</i>         | <i>56%</i>                  | <i>78%</i> | <i>82%</i> | <i>95%</i>  | <i>92%</i>  | <i>86%</i>         |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 2  
 INDIVIDUAL IMMEDIATE REFUND ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| ATTAINED AGES    | BY NUMBER OF CONTRACTS |             |             |             |             |                    | BY AMOUNTS OF ANNUAL INCOME |            |             |             |             |                    |
|------------------|------------------------|-------------|-------------|-------------|-------------|--------------------|-----------------------------|------------|-------------|-------------|-------------|--------------------|
|                  | Contract Years         |             |             |             |             | All Contract Years | Contract Years              |            |             |             |             | All Contract Years |
|                  | 1-2                    | 3-5         | 6-10        | 11 and Over | 6 and Over  |                    | 1-2                         | 3-5        | 6-10        | 11 and Over | 6 and Over  |                    |
| Male             |                        |             |             |             |             |                    |                             |            |             |             |             |                    |
| Under 50.....    | *                      | *           | *           | <i>256%</i> | <i>218%</i> | <i>229%</i>        | *                           | *          | *           | <i>621%</i> | <i>440%</i> | <i>308%</i>        |
| 50-59.....       | <i>198%</i>            | <i>121%</i> | <i>137%</i> | <i>98</i>   | <i>106</i>  | <i>129</i>         | <i>133%</i>                 | <i>76%</i> | <i>123%</i> | <i>130</i>  | <i>128</i>  | <i>117</i>         |
| 60-69.....       | 108                    | 97          | 110         | 104         | 105         | 104                | 95                          | 85         | 86          | 148         | 124         | 98                 |
| 70-79.....       | 80                     | 92          | 97          | 106         | 104         | 99                 | 75                          | 97         | 91          | 110         | 102         | 94                 |
| 80-89.....       | 72                     | 76          | 74          | 108         | 104         | 100                | 82                          | 69         | 65          | 119         | 106         | 97                 |
| 90 and over..... | *                      | 73          | 123         | 104         | 105         | 105                | *                           | 70         | 130         | 91          | 95          | 93                 |
| All ages.....    | 92%                    | 89%         | 92%         | 106%        | 104%        | 102%               | 84%                         | 84%        | 83%         | 113%        | 105%        | 96%                |
| Female           |                        |             |             |             |             |                    |                             |            |             |             |             |                    |
| Under 50.....    | *                      | *           | *           | *           | <i>165%</i> | <i>210%</i>        | *                           | *          | *           | *           | <i>132%</i> | <i>98%</i>         |
| 50-59.....       | <i>91%</i>             | <i>123%</i> | <i>154%</i> | <i>130%</i> | <i>136</i>  | <i>122</i>         | <i>70%</i>                  | <i>76%</i> | <i>189%</i> | <i>112%</i> | <i>138</i>  | <i>96</i>          |
| 60-69.....       | 76                     | 83          | 95          | 106         | 103         | 93                 | 99                          | 120        | 97          | 116         | 109         | 108                |
| 70-79.....       | 65                     | 81          | 79          | 98          | 96          | 92                 | 65                          | 82         | 81          | 95          | 91          | 84                 |
| 80-89.....       | 73                     | 80          | 102         | 104         | 103         | 102                | 80                          | 65         | 84          | 103         | 101         | 95                 |
| 90 and over..... | *                      | 70          | 85          | 92          | 92          | 92                 | *                           | 43         | 93          | 92          | 92          | 91                 |
| All ages.....    | 71%                    | 82%         | 92%         | 99%         | 99%         | 97%                | 77%                         | 80%        | 86%         | 99%         | 97%         | 92%                |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

4. *On nonrefund annuities issued to females* the mortality ratios are particularly low at attained ages 60-69 by amounts of annual income (80 per cent), but the corresponding ratio by number of contracts is higher (102 per cent).

5. *On refund annuities issued to males* the mortality ratios are above 100 per cent except at attained ages 90 and over by amounts of annual income. The mortality ratios for the eleventh and subsequent contract years are distinctly higher than those for the sixth through tenth contract years at attained ages 70-89 by number of contracts and at attained ages 60-89 by amounts of annual income.

6. *On refund annuities issued to females* the mortality ratios for all attained ages 60 and over combined are slightly below 100 per cent; at these ages the mortality ratios generally increase with duration. At attained ages under 60, the mortality ratios are in excess of 130 per cent.

Some indication of the extent to which the *aggregate* (all ages and durations combined) mortality ratios by amounts of annual income vary among companies is given by the accompanying tabulation.

DISTRIBUTION OF MORTALITY RATIOS BY AMOUNTS OF ANNUAL INCOME

| MORTALITY RATIOS                 | MALES               |                             | FEMALES             |                             |
|----------------------------------|---------------------|-----------------------------|---------------------|-----------------------------|
|                                  | Number of Companies | Proportion of Actual Deaths | Number of Companies | Proportion of Actual Deaths |
| Nonrefund Annuities              |                     |                             |                     |                             |
| Percentage points below average: |                     |                             |                     |                             |
| >20 .....                        | 2                   | 3.4%                        | 1                   | 1.4%                        |
| 11-20 .....                      | 4                   | 18.6                        | 5                   | 13.1                        |
| 6-10 .....                       | 3                   | 15.3                        | 2                   | 18.1                        |
| 1-5 .....                        | 2                   | 16.5                        | 2                   | 10.5                        |
| Percentage points above average: | (82%)*              |                             | (86%)               |                             |
| 0-5 .....                        | 3                   | 16.2                        | 2                   | 12.2                        |
| 6-10 .....                       | 1                   | 3.1                         | 4                   | 21.3                        |
| 11-20 .....                      | 2                   | 11.6                        | 3                   | 14.0                        |
| >20 .....                        | 4                   | 15.3                        | 2                   | 9.4                         |
| Refund Annuities                 |                     |                             |                     |                             |
| Percentage points below average: |                     |                             |                     |                             |
| >20 .....                        | 4                   | 8.0%                        | 2                   | 2.2%                        |
| 11-20 .....                      | 2                   | 6.5                         | 3                   | 6.7                         |
| 6-10 .....                       | 2                   | 11.3                        | 2                   | 7.3                         |
| 1-5 .....                        | 1                   | 16.3                        | 2                   | 26.9                        |
| Percentage points above average: | (96%)               |                             | (92%)               |                             |
| 0-5 .....                        | 3                   | 8.6                         | 6                   | 30.0                        |
| 6-10 .....                       | 5                   | 30.0                        | 1                   | 5.6                         |
| 11-20 .....                      | 3                   | 11.3                        | 5                   | 19.2                        |
| >20 .....                        | 2                   | 8.0                         | 1                   | 2.1                         |

\* All figures in parentheses indicate average mortality ratios.

Table 3 presents the mortality ratios for the combined experience under nonrefund and refund annuities on the *a*-1949 Table, for the convenience of those who may wish to consider the annuity experience on this basis.

EXPERIENCE IN RELATION TO THE ANNUITY TABLE  
FOR 1949 ULTIMATE WITH PROJECTION B

The mortality experience under individual immediate annuities during the period from 1963 to 1967 anniversaries was also calculated on the basis of the *a*-1949 Table with Projection B, assuming decreases in mortality from the end of 1950 continuing through the period from 1963 to 1967 anniversaries. (The methods used in the computation of expected deaths on this basis are described on p. 40.) Tables 4 and 5 present such mortality ratios for nonrefund and refund annuities, respectively. The main features of the experience *at the sixth and subsequent contract durations* may be summarized as follows:

1. The effect of using Projection B is to raise the mortality ratios by about 4 percentage points on nonrefund annuities and by somewhat more on refund annuities for all ages combined.

The mortality ratios on the *a*-1949 Table with Projection B exhibit some tendency to decrease with advancing age, reflecting the reduction in the projection factors with increase in age.

2. *On nonrefund annuities* the mortality ratios for all ages combined are below 100 per cent, with a low figure of 90 per cent on male nonrefund annuities by amounts of annual income and a high figure of 96 per cent on female nonrefund annuities, both by number and amounts of annual income. The mortality ratios for all ages combined for the eleventh and subsequent durations are close to 100 per cent by amounts of annual income.

3. *On refund annuities* the mortality ratios for all ages combined are distinctly above 100 per cent in the case of males but only slightly above 100 per cent in the case of females. The mortality ratios for the eleventh and subsequent durations for all ages combined are about the same as those for durations 6 and over, except in the case of males by amounts of annual income where the former are appreciably higher.

Table 6 presents the mortality ratios for the combined experience under nonrefund and refund annuities on the *a*-1949 Table with Projection B, for the convenience of those who may wish to consider the annuity experience on this basis.

EXPERIENCE BY SIZE OF ANNUITY

The distribution by amount of annual income of the annuities issued by seven large companies in 1956, 1961, and 1966 (sample years) is shown



TABLE 3  
 INDIVIDUAL IMMEDIATE NONREFUND AND REFUND ANNUITIES COMBINED  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| ATTAINED AGES    | BY NUMBER OF CONTRACTS |             |             |             |             |                    | BY AMOUNTS OF ANNUAL INCOME |            |             |             |             |                    |
|------------------|------------------------|-------------|-------------|-------------|-------------|--------------------|-----------------------------|------------|-------------|-------------|-------------|--------------------|
|                  | Contract Years         |             |             |             |             | All Contract Years | Contract Years              |            |             |             |             | All Contract Years |
|                  | 1-2                    | 3-5         | 6-10        | 11 and Over | 6 and Over  |                    | 1-2                         | 3-5        | 6-10        | 11 and Over | 6 and Over  |                    |
| Male             |                        |             |             |             |             |                    |                             |            |             |             |             |                    |
| Under 50.....    | *                      | *           | *           | <i>234%</i> | <i>198%</i> | <i>205%</i>        | *                           | *          | *           | <i>575%</i> | <i>407%</i> | <i>277%</i>        |
| 50-59.....       | <i>187%</i>            | <i>101%</i> | <i>126%</i> | <i>108%</i> | 112         | 128                | <i>136%</i>                 | <i>67%</i> | <i>120%</i> | <i>127</i>  | <i>124</i>  | <i>114</i>         |
| 60-69.....       | 100                    | 91          | 91          | 96          | 95          | 96                 | 86                          | 87         | 89          | 134         | 115         | 93                 |
| 70-79.....       | 75                     | 87          | 93          | 102         | 100         | 95                 | 75                          | 88         | 85          | 101         | 95          | 88                 |
| 80-89.....       | 72                     | 78          | 78          | 103         | 99          | 96                 | 73                          | 73         | 62          | 109         | 96          | 89                 |
| 90 and over..... | *                      | 95          | 96          | 97          | 97          | 97                 | *                           | 94         | 87          | 95          | 93          | 95                 |
| All ages.....    | <i>85%</i>             | <i>86%</i>  | <i>87%</i>  | <i>101%</i> | <i>99%</i>  | <i>96%</i>         | <i>80%</i>                  | <i>82%</i> | <i>75%</i>  | <i>105%</i> | <i>96%</i>  | <i>90%</i>         |
| Female           |                        |             |             |             |             |                    |                             |            |             |             |             |                    |
| Under 50.....    | *                      | *           | *           | <i>203%</i> | <i>207%</i> | <i>252%</i>        | *                           | *          | *           | <i>168%</i> | <i>131%</i> | <i>113%</i>        |
| 50-59.....       | <i>117%</i>            | <i>123%</i> | <i>137%</i> | <i>128</i>  | <i>130</i>  | <i>125</i>         | <i>154%</i>                 | <i>92%</i> | <i>176%</i> | <i>113</i>  | <i>135</i>  | <i>132</i>         |
| 60-69.....       | 78                     | 84          | 88          | 108         | 103         | 93                 | 82                          | 104        | 84          | 113         | 102         | 95                 |
| 70-79.....       | 61                     | 81          | 79          | 99          | 96          | 91                 | 58                          | 81         | 81          | 94          | 90          | 81                 |
| 80-89.....       | 62                     | 78          | 94          | 100         | 99          | 98                 | 69                          | 72         | 83          | 102         | 99          | 93                 |
| 90 and over..... | <i>100</i>             | <i>61</i>   | 90          | 90          | 90          | 90                 | <i>74</i>                   | <i>45</i>  | 94          | 91          | 91          | 90                 |
| All ages.....    | <i>66%</i>             | <i>81%</i>  | <i>88%</i>  | <i>97%</i>  | <i>96%</i>  | <i>94%</i>         | <i>68%</i>                  | <i>79%</i> | <i>84%</i>  | <i>97%</i>  | <i>95%</i>  | <i>90%</i>         |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 4  
 INDIVIDUAL IMMEDIATE NONREFUND ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE  
 WITH PROJECTION B

| ATTAINED AGES    | BY NUMBER OF CONTRACTS |             |            |             |             |                    | BY AMOUNTS OF ANNUAL INCOME |            |             |             |             |                    |
|------------------|------------------------|-------------|------------|-------------|-------------|--------------------|-----------------------------|------------|-------------|-------------|-------------|--------------------|
|                  | Contract Years         |             |            |             |             | All Contract Years | Contract Years              |            |             |             |             | All Contract Years |
|                  | 1-2                    | 3-5         | 6-10       | 11 and Over | 6 and Over  |                    | 1-2                         | 3-5        | 6-10        | 11 and Over | 6 and Over  |                    |
| Male             |                        |             |            |             |             |                    |                             |            |             |             |             |                    |
| 14 Under 50..... | *                      | *           | *          | *           | *           | *                  | *                           | *          | *           | *           | *           | *                  |
| 50-59.....       | <i>188%</i>            | *           | *          | <i>207%</i> | <i>171%</i> | <i>148%</i>        | <i>178%</i>                 | *          | *           | <i>123%</i> | <i>126%</i> | <i>126%</i>        |
| 60-69.....       | 83                     | 88%         | <i>65%</i> | 85          | 78          | 82                 | 67                          | 109%       | <i>113%</i> | 103         | 108         | 90                 |
| 70-79.....       | 75                     | 90          | 97         | 105         | 103         | 96                 | 84                          | 83         | 86          | 94          | 90          | 87                 |
| 80-89.....       | 75                     | 84          | 85         | 98          | 96          | 93                 | 69                          | 80         | 62          | 101         | 88          | 83                 |
| 90 and over..... | *                      | 113         | 78         | 88          | 87          | 87                 | *                           | 111        | 69          | 99          | 91          | 97                 |
| All ages.....    | <i>78%</i>             | <i>88%</i>  | <i>87%</i> | <i>96%</i>  | <i>94%</i>  | <i>92%</i>         | <i>80%</i>                  | <i>85%</i> | <i>71%</i>  | <i>99%</i>  | <i>90%</i>  | <i>87%</i>         |
| Female           |                        |             |            |             |             |                    |                             |            |             |             |             |                    |
| Under 50.....    | *                      | *           | *          | *           | *           | *                  | *                           | *          | *           | *           | *           | *                  |
| 50-59.....       | <i>276%</i>            | *           | *          | *           | *           | <i>174%</i>        | <i>563%</i>                 | *          | *           | *           | *           | <i>367%</i>        |
| 60-69.....       | 96                     | <i>102%</i> | <i>79%</i> | <i>135%</i> | <i>119%</i> | 109                | 51                          | <i>82%</i> | <i>51%</i>  | <i>123%</i> | <i>94%</i>  | 73                 |
| 70-79.....       | 60                     | 90          | 87         | 112         | 107         | 100                | 54                          | 89         | 89          | 102         | 98          | 85                 |
| 80-89.....       | 48                     | 80          | 89         | 97          | 97          | 94                 | 59                          | 83         | 86          | 103         | 99          | 93                 |
| 90 and over..... | *                      | 55          | 95         | 89          | 89          | 89                 | *                           | 47         | 94          | 89          | 90          | 89                 |
| All ages.....    | <i>64%</i>             | <i>85%</i>  | <i>89%</i> | <i>96%</i>  | <i>96%</i>  | <i>94%</i>         | <i>61%</i>                  | <i>84%</i> | <i>87%</i>  | <i>98%</i>  | <i>96%</i>  | <i>90%</i>         |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 5  
INDIVIDUAL IMMEDIATE REFUND ANNUITIES  
ISSUES OF 1931 TO 1966  
EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE  
WITH PROJECTION B

| ATTAINED AGES    | BY NUMBER OF CONTRACTS |             |             |             |             |                    | BY AMOUNTS OF ANNUAL INCOME |            |             |             |             |                    |
|------------------|------------------------|-------------|-------------|-------------|-------------|--------------------|-----------------------------|------------|-------------|-------------|-------------|--------------------|
|                  | Contract Years         |             |             |             |             | All Contract Years | Contract Years              |            |             |             |             | All Contract Years |
|                  | 1-2                    | 3-5         | 6-10        | 11 and Over | 6 and Over  |                    | 1-2                         | 3-5        | 6-10        | 11 and Over | 6 and Over  |                    |
| Male             |                        |             |             |             |             |                    |                             |            |             |             |             |                    |
| 15 Under 50..... | *                      | *           | *           | <i>310%</i> | <i>268%</i> | <i>287%</i>        | *                           | *          | *           | <i>748%</i> | <i>531%</i> | <i>372%</i>        |
| 50-59.....       | <i>238%</i>            | <i>145%</i> | <i>164%</i> | <i>118</i>  | <i>128</i>  | <i>155</i>         | <i>159%</i>                 | <i>91%</i> | <i>148%</i> | <i>156</i>  | <i>154</i>  | <i>140</i>         |
| 60-69.....       | 127                    | 114         | 129         | 122         | 123         | 122                | 111                         | 99         | 101         | 173         | 145         | 115                |
| 70-79.....       | 89                     | 103         | 108         | 118         | 115         | 110                | 84                          | 109        | 101         | 123         | 114         | 105                |
| 80-89.....       | 76                     | 79          | 77          | 112         | 108         | 105                | 86                          | 72         | 68          | 124         | 111         | 102                |
| 90 and over..... | *                      | 73          | 123         | 104         | 105         | 105                | *                           | 70         | 130         | 91          | 95          | 93                 |
| All ages.....    | <i>104%</i>            | <i>99%</i>  | <i>100%</i> | <i>112%</i> | <i>111%</i> | <i>109%</i>        | <i>94%</i>                  | <i>93%</i> | <i>89%</i>  | <i>119%</i> | <i>111%</i> | <i>104%</i>        |
| Female           |                        |             |             |             |             |                    |                             |            |             |             |             |                    |
| Under 50.....    | *                      | *           | *           | *           | <i>203%</i> | <i>258%</i>        | *                           | *          | *           | *           | <i>159%</i> | <i>118%</i>        |
| 50-59.....       | <i>110%</i>            | <i>148%</i> | <i>185%</i> | <i>157%</i> | <i>163</i>  | <i>146</i>         | <i>84%</i>                  | <i>91%</i> | <i>227%</i> | <i>135%</i> | <i>166</i>  | <i>115</i>         |
| 60-69.....       | 89                     | 98          | 111         | 124         | 121         | 109                | 116                         | 140        | 113         | 136         | 127         | 127                |
| 70-79.....       | 73                     | 90          | 88          | 109         | 107         | 102                | 73                          | 91         | 91          | 105         | 102         | 94                 |
| 80-89.....       | 77                     | 83          | 107         | 108         | 108         | 106                | 84                          | 68         | 88          | 107         | 105         | 99                 |
| 90 and over..... | *                      | 70          | 85          | 92          | 92          | 92                 | *                           | 43         | 93          | 92          | 92          | 91                 |
| All ages.....    | <i>79%</i>             | <i>90%</i>  | <i>99%</i>  | <i>103%</i> | <i>103%</i> | <i>102%</i>        | <i>85%</i>                  | <i>87%</i> | <i>93%</i>  | <i>103%</i> | <i>102%</i> | <i>98%</i>         |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 6  
 INDIVIDUAL IMMEDIATE NONREFUND AND REFUND ANNUITIES COMBINED  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE  
 WITH PROJECTION B

| ATTAINED AGES    | BY NUMBER OF CONTRACTS |             |             |             |             |                    | BY AMOUNTS OF ANNUAL INCOME |             |             |             |             |                    |
|------------------|------------------------|-------------|-------------|-------------|-------------|--------------------|-----------------------------|-------------|-------------|-------------|-------------|--------------------|
|                  | Contract Years         |             |             |             |             | All Contract Years | Contract Years              |             |             |             |             | All Contract Years |
|                  | 1-2                    | 3-5         | 6-10        | 11 and Over | 6 and Over  |                    | 1-2                         | 3-5         | 6-10        | 11 and Over | 6 and Over  |                    |
| Male             |                        |             |             |             |             |                    |                             |             |             |             |             |                    |
| 16 Under 50..... | *                      | *           | *           | <i>283%</i> | <i>245%</i> | <i>260%</i>        | *                           | *           | *           | <i>693%</i> | <i>491%</i> | <i>335%</i>        |
| 50-59.....       | <i>224%</i>            | <i>120%</i> | <i>150%</i> | 130         | 134         | 154                | <i>164%</i>                 | <i>80%</i>  | <i>145%</i> | 152         | 149         | 137                |
| 60-69.....       | 117                    | 107         | 107         | 113         | 111         | 112                | 101                         | 102         | 105         | 158         | 135         | 109                |
| 70-79.....       | 84                     | 98          | 104         | 114         | 111         | 106                | 84                          | 98          | 95          | 113         | 105         | 98                 |
| 80-89.....       | 76                     | 82          | 81          | 107         | 103         | 100                | 77                          | 77          | 65          | 113         | 100         | 92                 |
| 90 and over..... | *                      | 95          | 96          | 97          | 97          | 97                 | *                           | <i>94</i>   | 87          | 95          | 93          | 95                 |
| All ages.....    | <i>95%</i>             | <i>94%</i>  | <i>94%</i>  | <i>106%</i> | <i>104%</i> | <i>102%</i>        | <i>88%</i>                  | <i>89%</i>  | <i>80%</i>  | <i>111%</i> | <i>101%</i> | <i>97%</i>         |
| Female           |                        |             |             |             |             |                    |                             |             |             |             |             |                    |
| Under 50.....    | *                      | *           | *           | <i>246%</i> | <i>256%</i> | <i>315%</i>        | *                           | *           | *           | <i>202%</i> | <i>158%</i> | <i>137%</i>        |
| 50-59.....       | <i>140%</i>            | <i>148%</i> | <i>164%</i> | 155         | 157         | 151                | <i>185%</i>                 | <i>111%</i> | <i>212%</i> | 135         | 163         | 159                |
| 60-69.....       | 91                     | 99          | 103         | 127         | 121         | 109                | 97                          | 122         | 98          | 133         | 120         | 112                |
| 70-79.....       | 68                     | 90          | 88          | 110         | 107         | 101                | 65                          | 90          | 90          | 104         | 100         | 91                 |
| 80-89.....       | 65                     | 82          | 98          | 104         | 103         | 101                | 73                          | 75          | 87          | 105         | 102         | 96                 |
| 90 and over..... | <i>100</i>             | <i>61</i>   | 90          | 90          | 90          | 90                 | <i>74</i>                   | <i>45</i>   | 94          | 91          | 91          | 90                 |
| All ages.....    | <i>74%</i>             | <i>88%</i>  | <i>95%</i>  | <i>101%</i> | <i>100%</i> | <i>99%</i>         | <i>75%</i>                  | <i>85%</i>  | <i>90%</i>  | <i>101%</i> | <i>99%</i>  | <i>95%</i>         |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

in the tabulation below. The proportion of annuity issues providing for annual income of \$2,500 or more increased from 23.4 per cent in 1956 to 30.3 per cent in 1966 (by amounts of annual income).

The current study—which comprises the experience of twenty-two companies—includes an analysis of the mortality experience by size of annuity (amount of annual income) for the issues of 1931–66 combined. This experience is presented in Tables 7, 8, and 9 for nonrefund annuities, refund annuities, and nonrefund and refund annuities combined, respectively.

NONREFUND AND REFUND ANNUITY ISSUES OF 1956, 1961, AND 1966  
MALE AND FEMALE COMBINED

| ANNUAL INCOME PROVIDED                   | YEAR OF ISSUE       |                          |                     |                          |                     |                          |
|--|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|
|  | 1956                |                          | 1961                |                          | 1966                |                          |
|  | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income |
| Under \$1,500 . . . . .                  | 1,495               | \$ 644,196               | 1,812               | \$ 976,422               | 4,674               | \$3,102,718              |
| \$1,500–\$2,499 . . . . .                | 72                  | 139,598                  | 157                 | 302,526                  | 589                 | 1,135,976                |
| \$2,500–\$4,999 . . . . .                | 28                  | 91,365                   | 65                  | 226,455                  | 272                 | 922,802                  |
| \$5,000 and over . . . . .               | 19                  | 147,438                  | 38                  | 303,357                  | 110                 | 923,482                  |
| \$2,500 and over . . . . .               | 47                  | 238,803                  | 103                 | 529,812                  | 382                 | 1,846,284                |
| All amounts . . . . .                    | 1,614               | \$1,022,597              | 2,072               | \$1,808,760              | 5,645               | \$6,084,978              |
| Ratio of \$2,500 and over to all amounts | 2.9%                | 23.4%                    | 5.0%                | 29.3%                    | 6.8%                | 30.3%                    |

The rather small experience on annuities providing for an annual income of \$5,000 or more shows very low mortality ratios, except in the case of female nonrefund annuities. In the case of male nonrefund annuities providing an annual income of \$5,000 or more, the mortality ratios for durations 6 and over are only 56 per cent by number of contracts and 51 per cent by amounts of income (17 contracts terminated by death), or about 35 percentage points below the corresponding mortality ratios for all amounts of income combined; in the case of male refund annuities the corresponding mortality ratios are 70 per cent by number of contracts and 93 per cent by amounts of income (14 contracts terminated by death), which is, respectively, 34 and 12 percentage points below the corresponding mortality ratios for all amounts of annual income combined. In the case of female refund annuities providing an annual income of \$5,000 or

TABLE 7—INDIVIDUAL IMMEDIATE NONREFUND ANNUITIES  
ISSUES OF 1931 TO 1966  
EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| INCOME GROUP          | BY NUMBER OF CONTRACTS |           |             |            |                    | BY AMOUNTS OF ANNUAL INCOME |           |             |            |                    |
|-----------------------|------------------------|-----------|-------------|------------|--------------------|-----------------------------|-----------|-------------|------------|--------------------|
|                       | Contract Years         |           |             |            | All Contract Years | Contract Years              |           |             |            | All Contract Years |
|                       | 1-5                    | 6-10      | 11 and Over | 6 and Over |                    | 1-5                         | 6-10      | 11 and Over | 6 and Over |                    |
| Male                  |                        |           |             |            |                    |                             |           |             |            |                    |
| Under \$1,000.....    | 81%                    | 83%       | 93%         | 92%        | 90%                | 83%                         | 87%       | 98%         | 96%        | 93%                |
| \$1,000-\$1,499.....  | 71                     | 108       | 99          | 102        | 91                 | 71                          | 109       | 100         | 103        | 91                 |
| \$1,500-\$2,499.....  | 81                     | 74        | 94          | 86         | 84                 | 82                          | 75        | 93          | 86         | 84                 |
| \$2,500-\$4,999.....  | <i>81</i>              | <i>69</i> | <i>90</i>   | <i>81</i>  | <i>81</i>          | <i>82</i>                   | <i>68</i> | <i>88</i>   | <i>80</i>  | <i>81</i>          |
| \$5,000 and over..... | <i>63</i>              | *         | <i>84</i>   | <i>56</i>  | <i>60</i>          | <i>75</i>                   | *         | <i>89</i>   | <i>51</i>  | <i>65</i>          |
| Unknown.....          | 63                     | 70        | 77          | 75         | 72                 | 56                          | 53        | 93          | 78         | 70                 |
| \$2,500 and over..... | 74                     | 56        | 88          | 73         | 74                 | 77                          | 43        | 88          | 65         | 72                 |
| All.....              | 76%                    | 82%       | 92%         | 90%        | 87%                | 76%                         | 67%       | 95%         | 86%        | 82%                |
| Female                |                        |           |             |            |                    |                             |           |             |            |                    |
| Under \$1,000.....    | 77%                    | 80%       | 92%         | 91%        | 91%                | 67%                         | 79%       | 94%         | 92%        | 90%                |
| \$1,000-\$1,499.....  | 59                     | 93        | 96          | 96         | 84                 | 59                          | 95        | 94          | 94         | 83                 |
| \$1,500-\$2,499.....  | 73                     | 95        | 92          | 93         | 85                 | 74                          | 97        | 91          | 93         | 85                 |
| \$2,500-\$4,999.....  | 65                     | 75        | 76          | 76         | 71                 | 65                          | 74        | 79          | 77         | 73                 |
| \$5,000 and over..... | <i>115</i>             | *         | <i>126</i>  | <i>94</i>  | <i>104</i>         | <i>92</i>                   | *         | <i>121</i>  | <i>87</i>  | <i>90</i>          |
| Unknown.....          | 43                     | 91        | 108         | 105        | 95                 | 37                          | 99        | 115         | 110        | 84                 |
| \$2,500 and over..... | 77                     | 69        | 83          | 79         | 78                 | 78                          | 61        | 91          | 81         | 80                 |
| All.....              | 69%                    | 83%       | 93%         | 92%        | 90%                | 67%                         | 82%       | 95%         | 92%        | 86%                |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 8—INDIVIDUAL IMMEDIATE REFUND ANNUITIES  
ISSUES OF 1931 TO 1966  
EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| INCOME GROUP          | BY NUMBER OF CONTRACTS |      |             |            |                    | BY AMOUNTS OF ANNUAL INCOME |      |             |            |                    |
|-----------------------|------------------------|------|-------------|------------|--------------------|-----------------------------|------|-------------|------------|--------------------|
|                       | Contract Years         |      |             |            | All Contract Years | Contract Years              |      |             |            | All Contract Years |
|                       | 1-5                    | 6-10 | 11 and Over | 6 and Over |                    | 1-5                         | 6-10 | 11 and Over | 6 and Over |                    |
| Male                  |                        |      |             |            |                    |                             |      |             |            |                    |
| Under \$1,000.....    | 93%                    | 91%  | 107%        | 105%       | 103%               | 93%                         | 90%  | 112%        | 108%       | 104%               |
| \$1,000-\$1,499.....  | 99                     | 115  | 117         | 117        | 109                | 98                          | 115  | 118         | 117        | 109                |
| \$1,500-\$2,499.....  | 89                     | 104  | 88          | 94         | 92                 | 92                          | 104  | 88          | 93         | 93                 |
| \$2,500-\$4,999.....  | 91                     | 59   | 109         | 87         | 89                 | 96                          | 54   | 107         | 83         | 91                 |
| \$5,000 and over..... | 48                     | *    | *           | 70         | 56                 | 53                          | *    | *           | 93         | 72                 |
| Unknown.....          | 88                     | 89   | 106         | 104        | 101                | 82                          | 97   | 111         | 108        | 98                 |
| \$2,500 and over..... | 76                     | 62   | 99          | 82         | 79                 | 72                          | 46   | 131         | 89         | 80                 |
| All.....              | 91%                    | 92%  | 106%        | 104%       | 102%               | 84%                         | 83%  | 113%        | 105%       | 96%                |
| Female                |                        |      |             |            |                    |                             |      |             |            |                    |
| Under \$1,000.....    | 69%                    | 99%  | 102%        | 102%       | 99%                | 71%                         | 93%  | 100%        | 99%        | 95%                |
| \$1,000-\$1,499.....  | 79                     | 91   | 106         | 103        | 96                 | 78                          | 92   | 106         | 103        | 96                 |
| \$1,500-\$2,499.....  | 91                     | 77   | 89          | 86         | 87                 | 94                          | 77   | 90          | 86         | 89                 |
| \$2,500-\$4,999.....  | 88                     | 101  | 86          | 90         | 90                 | 88                          | 109  | 85          | 92         | 90                 |
| \$5,000 and over..... | 77                     | *    | *           | 87         | 82                 | 61                          | *    | *           | 77         | 67                 |
| Unknown.....          | 82                     | 82   | 95          | 95         | 94                 | 80                          | 83   | 99          | 97         | 93                 |
| \$2,500 and over..... | 85                     | 91   | 89          | 90         | 88                 | 74                          | 80   | 91          | 87         | 80                 |
| All.....              | 77%                    | 92%  | 99%         | 99%        | 97%                | 78%                         | 86%  | 99%         | 97%        | 92%                |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 9—INDIVIDUAL IMMEDIATE NONREFUND AND REFUND ANNUITIES  
ISSUES OF 1931 TO 1966  
EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| INCOME GROUP          | BY NUMBER OF CONTRACTS |      |             |            |                    | BY AMOUNTS OF ANNUAL INCOME |      |             |            |                    |
|-----------------------|------------------------|------|-------------|------------|--------------------|-----------------------------|------|-------------|------------|--------------------|
|                       | Contract Years         |      |             |            | All Contract Years | Contract Years              |      |             |            | All Contract Years |
|                       | 1-5                    | 6-10 | 11 and Over | 6 and Over |                    | 1-5                         | 6-10 | 11 and Over | 6 and Over |                    |
| Male                  |                        |      |             |            |                    |                             |      |             |            |                    |
| Under \$1,000.....    | 88%                    | 87%  | 101%        | 99%        | 97%                | 89%                         | 89%  | 105%        | 102%       | 99%                |
| \$1,000-\$1,499.....  | 87                     | 112  | 108         | 109        | 100                | 87                          | 112  | 109         | 110        | 101                |
| \$1,500-\$2,499.....  | 85                     | 86   | 91          | 90         | 88                 | 88                          | 87   | 91          | 89         | 88                 |
| \$2,500-\$4,999.....  | 86                     | 65   | 98          | 84         | 85                 | 89                          | 62   | 95          | 81         | 85                 |
| \$5,000 and over..... | 56                     | 47   | 79          | 62         | 58                 | 65                          | 33   | 121         | 72         | 68                 |
| Unknown.....          | 82                     | 84   | 102         | 100        | 97                 | 76                          | 80   | 107         | 101        | 91                 |
| \$2,500 and over..... | 75                     | 58   | 93          | 77         | 76                 | 75                          | 44   | 109         | 76         | 75                 |
| All.....              | 85%                    | 87%  | 101%        | 99%        | 96%                | 81%                         | 75%  | 105%        | 96%        | 90%                |
| Female                |                        |      |             |            |                    |                             |      |             |            |                    |
| Under \$1,000.....    | 72%                    | 90%  | 97%         | 97%        | 95%                | 70%                         | 86%  | 97%         | 96%        | 93%                |
| \$1,000-\$1,499.....  | 69                     | 92   | 102         | 100        | 90                 | 69                          | 93   | 100         | 99         | 90                 |
| \$1,500-\$2,499.....  | 80                     | 87   | 90          | 89         | 86                 | 83                          | 88   | 90          | 89         | 87                 |
| \$2,500-\$4,999.....  | 76                     | 86   | 80          | 82         | 79                 | 76                          | 89   | 81          | 83         | 80                 |
| \$5,000 and over..... | 96                     | *    | 117         | 91         | 93                 | 76                          | *    | 114         | 83         | 79                 |
| Unknown.....          | 75                     | 84   | 96          | 96         | 94                 | 71                          | 88   | 101         | 99         | 92                 |
| \$2,500 and over..... | 81                     | 78   | 86          | 83         | 82                 | 76                          | 69   | 91          | 83         | 80                 |
| All.....              | 74%                    | 88%  | 97%         | 96%        | 94%                | 73%                         | 84%  | 97%         | 95%        | 90%                |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.



more, the mortality ratios at durations 6 and over are 12 percentage points below the mortality ratios for all amounts of income by number of contracts but 20 percentage points below the corresponding mortality ratios by amounts of income (13 contracts terminated by death).

On female nonrefund annuities, the lowest mortality ratios occur on annuities providing an annual income of \$2,500-\$4,999 (63 contracts terminated by death); these mortality ratios are about 15 percentage points below the corresponding mortality ratios at durations 6 and over on annuities for all amounts of income.

Of greater portent is the larger experience on annuities providing an annual income of \$2,500 or more; such annuities accounted for 2 per cent of the exposures by number of contracts and for 20 per cent of the exposures by amounts of annual income in the current study. The mortality ratios experienced on these annuities at durations 6 and over are significantly lower than those on annuities for all amounts of income combined, as indicated by the following tabulation:

MORTALITY RATIOS FOR SIXTH AND SUBSEQUENT CONTRACT DURATIONS

|   | BY NUMBER OF CONTRACTS |        | BY AMOUNTS OF ANNUAL INCOME |        |
|---|------------------------|--------|-----------------------------|--------|
|   | Male                   | Female | Male                        | Female |
| Nonrefund annuities:                              |                        |        |                             |        |
| Providing annual incomes of \$2,500 and over..... | 73%                    | 79%    | 65%                         | 81%    |
| Of all amounts.....                               | 90                     | 92     | 86                          | 92     |
| Refund annuities:                                 |                        |        |                             |        |
| Providing annual incomes of \$2,500 and over..... | 82                     | 90     | 89                          | 87     |
| Of all amounts.....                               | 104                    | 99     | 105                         | 97     |

Except in the case of male refund annuities, the select mortality on annuities providing an annual income of \$2,500 or more appears to be about the same or higher than that on annuities for all amounts of income combined.

For both sexes and on both nonrefund and refund annuities the highest mortality ratios at durations 6 and over occur uniformly on contracts providing an annual income of \$1,000-\$1,499.

COMPARISONS WITH PREVIOUS STUDIES

A comparison of the experience under individual immediate annuities for successive periods between 1941 and 1967 anniversaries is presented in Tables 10, 11, and 12 for nonrefund annuities, refund annuities, and

TABLE 10  
 COMPARISON OF MORTALITY RATIOS ON INDIVIDUAL IMMEDIATE  
 NONREFUND ANNUITIES—MALE  
 EXPERIENCE BETWEEN 1941 AND 1967 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON ANNUITY TABLE FOR 1949 ULTIMATE  
 BY NUMBER OF CONTRACTS

| ATTAINED<br>AGES          | WITHOUT PROJECTION |            |             |             |             | WITH PROJECTION B |             |             |
|---------------------------|--------------------|------------|-------------|-------------|-------------|-------------------|-------------|-------------|
|                           | 1941-48            | 1948-53    | 1953-58     | 1958-63     | 1963-67     | 1953-58           | 1958-63     | 1963-67     |
| Contract Years 1-5        |                    |            |             |             |             |                   |             |             |
| Under 60                  | 146%               | <i>89%</i> | <i>134%</i> | *           | <i>106%</i> | <i>142%</i>       | *           | <i>128%</i> |
| 60-69                     | 106                | 92         | 113         | 54%         | 73          | 120               | 61%         | 85          |
| 70-79                     | 99                 | 88         | 98          | 72          | 74          | 102               | 78          | 83          |
| 80 and over               | 93                 | 64         | 81          | 53          | 70          | 82                | 54          | 82          |
| All ages                  | 100%               | 80%        | 95%         | 59%         | 76%         | 98%               | 63%         | 84%         |
| All ages adjusted         | 98%                | 78%        | 94%         | 60%         | 76%         | 96%               | 64%         | 84%         |
| Contract Years 6 and Over |                    |            |             |             |             |                   |             |             |
| Under 60                  | 130%               | 103%       | 131%        | <i>231%</i> | <i>134%</i> | 140%              | <i>262%</i> | <i>150%</i> |
| 60-69                     | 127                | 89         | 91          | 97          | 67          | 97                | 109         | 78          |
| 70-79                     | 111                | 113        | 106         | 101         | 92          | 110               | 108         | 103         |
| 80 and over               | 106                | 93         | 98          | 104         | 90          | 100               | 106         | 93          |
| All ages                  | 111%               | 101%       | 100%        | 103%        | 90%         | 103%              | 107%        | 94%         |
| All ages adjusted         | 108%               | 97%        | 100%        | 103%        | 90%         | 102%              | 107%        | 94%         |
| All Contract Years        |                    |            |             |             |             |                   |             |             |
| Under 60                  | 136%               | 99%        | 132%        | <i>169%</i> | <i>119%</i> | 141%              | <i>192%</i> | <i>142%</i> |
| 60-69                     | 120                | 90         | 97          | 83          | 70          | 103               | 93          | 82          |
| 70-79                     | 108                | 109        | 105         | 96          | 86          | 109               | 103         | 96          |
| 80 and over               | 103                | 90         | 97          | 100         | 89          | 99                | 102         | 91          |
| All ages                  | 109%               | 97%        | 100%        | 98%         | 87%         | 102%              | 102%        | 92%         |
| All ages adjusted         | 105%               | 95%        | 99%         | 98%         | 87%         | 102%              | 102%        | 92%         |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 10—Continued—NONREFUND—MALE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED AGES             | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60.....             | 128%               | 127%    | 211%    | *       | 101%    | 225%              | *       | 122%    |
| 60-69.....                | 104                | 123     | 90      | 66%     | 72      | 95                | 73%     | 84      |
| 70-79.....                | 94                 | 83      | 78      | 71      | 75      | 81                | 77      | 84      |
| 80 and over.....          | 82                 | 76      | 96      | 49      | 77      | 98                | 50      | 80      |
| All ages.....             | 93%                | 86%     | 89%     | 58%     | 76%     | 91%               | 61%     | 82%     |
| All ages adjusted.....    | 89%                | 84%     | 90%     | 58%     | 76%     | 93%               | 61%     | 82%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60.....             | 148%               | 95%     | 168%    | 334%    | 98%     | 180%              | 379%    | 118%    |
| 60-69.....                | 133                | 101     | 127     | 116     | 92      | 135               | 129     | 108     |
| 70-79.....                | 106                | 128     | 97      | 101     | 81      | 101               | 109     | 90      |
| 80 and over.....          | 116                | 93      | 107     | 98      | 87      | 108               | 100     | 89      |
| All ages.....             | 114%               | 105%    | 106%    | 100%    | 86%     | 108%              | 103%    | 90%     |
| All ages adjusted.....    | 114%               | 100%    | 106%    | 99%     | 86%     | 107%              | 103%    | 90%     |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60.....             | 141%               | 106%    | 180%    | 189%    | 101%    | 193%              | 214%    | 121%    |
| 60-69.....                | 123                | 108     | 115     | 93      | 77      | 122               | 104     | 90      |
| 70-79.....                | 103                | 118     | 93      | 92      | 78      | 96                | 99      | 87      |
| 80 and over.....          | 110                | 91      | 106     | 90      | 84      | 107               | 92      | 87      |
| All ages.....             | 109%               | 102%    | 103%    | 91%     | 82%     | 105%              | 94%     | 87%     |
| All ages adjusted.....    | 109%               | 99%     | 103%    | 91%     | 82%     | 105%              | 95%     | 87%     |

TABLE 10—*Continued*—NONREFUND—FEMALE  
BY NUMBER OF CONTRACTS

| ATTAINED<br>AGES          | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 118%               | 98%     | 247%    | 214%    | 214%    | 263%              | 238%    | 262%    |
| 60-69                     | 98                 | 83      | 93      | 81      | 84      | 98                | 90      | 99      |
| 70-79                     | 90                 | 75      | 90      | 81      | 68      | 93                | 88      | 76      |
| 80 and over               | 87                 | 61      | 66      | 77      | 64      | 68                | 79      | 67      |
| All ages                  | 93%                | 73%     | 83%     | 80%     | 69%     | 86%               | 85%     | 76%     |
| All ages adjusted         | 90%                | 70%     | 81%     | 80%     | 69%     | 83%               | 85%     | 76%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60                  | 137%               | 121%    | 146%    | 134%    | 142%    | 156%              | 152%    | 172%    |
| 60-69                     | 122                | 109     | 97      | 122     | 102     | 102               | 136     | 119     |
| 70-79                     | 113                | 109     | 101     | 105     | 97      | 105               | 113     | 107     |
| 80 and over               | 110                | 101     | 96      | 102     | 91      | 97                | 104     | 93      |
| All ages                  | 113%               | 104%    | 97%     | 103%    | 92%     | 99%               | 106%    | 96%     |
| All ages adjusted         | 111%               | 102%    | 97%     | 103%    | 92%     | 98%               | 106%    | 96%     |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 128%               | 114%    | 165%    | 154%    | 176%    | 176%              | 174%    | 215%    |
| 60-69                     | 113                | 102     | 96      | 112     | 93      | 102               | 125     | 109     |
| 70-79                     | 108                | 105     | 100     | 103     | 90      | 104               | 111     | 100     |
| 80 and over               | 107                | 99      | 95      | 102     | 90      | 96                | 104     | 92      |
| All ages                  | 109%               | 101%    | 97%     | 102%    | 90%     | 99%               | 105%    | 94%     |
| All ages adjusted         | 107%               | 100%    | 96%     | 102%    | 90%     | 97%               | 106%    | 94%     |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

TABLE 10—Continued—NONREFUND—FEMALE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED<br>AGES          | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60 .....            | 110%               | 94%     | 111%    | 207%    | 382%    | 118%              | 235%    | 460%    |
| 60-69 .....               | 104                | 93      | 85      | 59      | 55      | 90                | 66      | 64      |
| 70-79 .....               | 100                | 75      | 86      | 71      | 63      | 89                | 77      | 71      |
| 80 and over .....         | 79                 | 63      | 65      | 75      | 68      | 66                | 77      | 71      |
| All ages .....            | 95%                | 73%     | 77%     | 73%     | 67%     | 79%               | 77%     | 73%     |
| All ages adjusted .....   | 90%                | 71%     | 76%     | 73%     | 67%     | 78%               | 77%     | 73%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60 .....            | 175%               | 112%    | 101%    | 132%    | 119%    | 108%              | 151%    | 143%    |
| 60-69 .....               | 114                | 109     | 87      | 127     | 80      | 92                | 141     | 94      |
| 70-79 .....               | 124                | 112     | 100     | 111     | 88      | 104               | 119     | 98      |
| 80 and over .....         | 102                | 101     | 97      | 99      | 93      | 98                | 101     | 95      |
| All ages .....            | 113%               | 105%    | 97%     | 102%    | 92%     | 99%               | 105%    | 96%     |
| All ages adjusted .....   | 106%               | 103%    | 97%     | 101%    | 92%     | 99%               | 104%    | 96%     |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60 .....            | 148%               | 106%    | 103%    | 160%    | 301%    | 110%              | 182%    | 362%    |
| 60-69 .....               | 111                | 104     | 87      | 102     | 63      | 92                | 114     | 73      |
| 70-79 .....               | 119                | 106     | 98      | 102     | 77      | 102               | 110     | 85      |
| 80 and over .....         | 99                 | 98      | 95      | 98      | 89      | 96                | 100     | 92      |
| All ages .....            | 109%               | 101%    | 96%     | 99%     | 86%     | 98%               | 102%    | 90%     |
| All ages adjusted .....   | 104%               | 100%    | 95%     | 99%     | 86%     | 97%               | 103%    | 90%     |

**TABLE 11**  
**COMPARISON OF MORTALITY RATIOS ON INDIVIDUAL IMMEDIATE**  
**REFUND ANNUITIES—MALE**  
**EXPERIENCE BETWEEN 1941 AND 1967 ANNIVERSARIES**  
**EXPECTED DEATHS BASED ON ANNUITY TABLE FOR 1949 ULTIMATE**  
**BY NUMBER OF CONTRACTS**

| ATTAINED<br>AGES          | WITHOUT PROJECTION |             |             |             |             | WITH PROJECTION B |             |             |
|---------------------------|--------------------|-------------|-------------|-------------|-------------|-------------------|-------------|-------------|
|                           | 1941-48            | 1948-53     | 1953-58     | 1958-63     | 1963-67     | 1953-58           | 1958-63     | 1963-67     |
| Contract Years 1-5        |                    |             |             |             |             |                   |             |             |
| Under 60                  | <i>135%</i>        | <i>136%</i> | <i>135%</i> | <i>170%</i> | <i>174%</i> | <i>197%</i>       | <i>192%</i> | <i>210%</i> |
| 60-69                     | 126                | 121         | 112         | 102         | 104         | 119               | 114         | 122         |
| 70-79                     | 108                | 110         | 117         | 90          | 86          | 122               | 98          | 96          |
| 80 and over               | 104                | 94          | 75          | 83          | 73          | 76                | 86          | 78          |
| All ages                  | 114%               | 110%        | 105%        | 93%         | 91%         | 109%              | 100%        | 102%        |
| All ages adjusted         | 113%               | 110%        | 106%        | 94%         | 91%         | 110%              | 102%        | 102%        |
| Contract Years 6 and Over |                    |             |             |             |             |                   |             |             |
| Under 60                  | <i>148%</i>        | <i>128%</i> | <i>134%</i> | <i>102%</i> | <i>120%</i> | <i>143%</i>       | <i>116%</i> | <i>145%</i> |
| 60-69                     | 136                | 128         | 140         | 119         | 105         | 149               | 133         | 123         |
| 70-79                     | 121                | 122         | 120         | 110         | 104         | 124               | 118         | 115         |
| 80 and over               | 109                | 97          | 101         | 100         | 104         | 102               | 102         | 107         |
| All ages                  | 120%               | 111%        | 111%        | 104%        | 104%        | 114%              | 109%        | 111%        |
| All ages adjusted         | 114%               | 106%        | 109%        | 104%        | 104%        | 110%              | 108%        | 111%        |
| All Contract Years        |                    |             |             |             |             |                   |             |             |
| Under 60                  | <i>142%</i>        | <i>130%</i> | <i>142%</i> | <i>115%</i> | <i>140%</i> | <i>152%</i>       | <i>131%</i> | <i>169%</i> |
| 60-69                     | 132                | 126         | 134         | 113         | 104         | 142               | 126         | 122         |
| 70-79                     | 118                | 120         | 119         | 108         | 99          | 124               | 117         | 110         |
| 80 and over               | 108                | 97          | 100         | 99          | 102         | 101               | 101         | 105         |
| All ages                  | 118%               | 111%        | 111%        | 103%        | 102%        | 114%              | 108%        | 109%        |
| All ages adjusted         | 114%               | 107%        | 109%        | 103%        | 102%        | 110%              | 108%        | 109%        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

TABLE 11—*Continued*—REFUND—MALE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED<br>AGES            | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|-----------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                             | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5          |                    |         |         |         |         |                   |         |         |
| Under 60 . . . . .          | 166%               | 215%    | 241%    | 127%    | 117%    | 257%              | 144%    | 140%    |
| 60-69 . . . . .             | 124                | 140     | 114     | 102     | 91      | 121               | 114     | 107     |
| 70-79 . . . . .             | 118                | 110     | 110     | 98      | 85      | 114               | 107     | 96      |
| 80 and over . . . . .       | 100                | 109     | 92      | 86      | 75      | 94                | 89      | 78      |
| All ages . . . . .          | 117%               | 122%    | 108%    | 96%     | 84%     | 112%              | 103%    | 94%     |
| All ages adjusted . . . . . | 115%               | 120%    | 109%    | 96%     | 84%     | 112%              | 104%    | 94%     |
| Contract Years 6 and Over   |                    |         |         |         |         |                   |         |         |
| Under 60 . . . . .          | 170%               | 154%    | 178%    | 125%    | 167%    | 190%              | 142%    | 201%    |
| 60-69 . . . . .             | 159                | 138     | 134     | 138     | 124     | 142               | 155     | 145     |
| 70-79 . . . . .             | 139                | 128     | 117     | 115     | 102     | 122               | 124     | 114     |
| 80 and over . . . . .       | 121                | 100     | 107     | 103     | 103     | 108               | 106     | 106     |
| All ages . . . . .          | 136%               | 116%    | 114%    | 109%    | 105%    | 117%              | 114%    | 111%    |
| All ages adjusted . . . . . | 129%               | 111%    | 112%    | 108%    | 105%    | 114%              | 114%    | 111%    |
| All Contract Years          |                    |         |         |         |         |                   |         |         |
| Under 60 . . . . .          | 168%               | 171%    | 189%    | 126%    | 135%    | 201%              | 143%    | 162%    |
| 60-69 . . . . .             | 145                | 139     | 129     | 121     | 98      | 136               | 135     | 115     |
| 70-79 . . . . .             | 133                | 124     | 116     | 111     | 94      | 120               | 120     | 105     |
| 80 and over . . . . .       | 116                | 101     | 105     | 101     | 96      | 107               | 104     | 100     |
| All ages . . . . .          | 130%               | 117%    | 113%    | 107%    | 96%     | 116%              | 112%    | 104%    |
| All ages adjusted . . . . . | 126%               | 115%    | 112%    | 108%    | 96%     | 114%              | 114%    | 104%    |

TABLE 11—*Continued*—REFUND—FEMALE  
BY NUMBER OF CONTRACTS

| ATTAINED AGES             | WITHOUT PROJECTION |         |             |             |             | WITH PROJECTION B |             |             |
|---------------------------|--------------------|---------|-------------|-------------|-------------|-------------------|-------------|-------------|
|                           | 1941-48            | 1948-53 | 1953-58     | 1958-63     | 1963-67     | 1953-58           | 1958-63     | 1963-67     |
| Contract Years 1-5        |                    |         |             |             |             |                   |             |             |
| Under 60                  | 136%               | 93%     | <i>104%</i> | <i>149%</i> | <i>119%</i> | <i>111%</i>       | <i>168%</i> | <i>144%</i> |
| 60-69                     | 114                | 125     | 100         | 82          | 79          | 106               | 91          | 93          |
| 70-79                     | 106                | 95      | 82          | 91          | 73          | 85                | 99          | 81          |
| 80 and over               | 108                | 96      | 72          | 98          | 77          | 73                | 101         | 81          |
| All ages                  | 110%               | 102%    | 82%         | 93%         | 77%         | 85%               | 100%        | 85%         |
| All ages adjusted         | 109%               | 101%    | 83%         | 93%         | 77%         | 85%               | 100%        | 85%         |
| Contract Years 6 and Over |                    |         |             |             |             |                   |             |             |
| Under 60                  | 172%               | 172%    | 160%        | 171%        | 140%        | 171%              | 194%        | 168%        |
| 60-69                     | 127                | 125     | 113         | 120         | 103         | 120               | 134         | 121         |
| 70-79                     | 118                | 114     | 110         | 104         | 96          | 115               | 112         | 107         |
| 80 and over               | 110                | 107     | 101         | 102         | 99          | 102               | 104         | 102         |
| All ages                  | 117%               | 112%    | 105%        | 103%        | 99%         | 107%              | 107%        | 103%        |
| All ages adjusted         | 112%               | 109%    | 103%        | 103%        | 99%         | 105%              | 106%        | 103%        |
| All Contract Years        |                    |         |             |             |             |                   |             |             |
| Under 60                  | 156%               | 152%    | 151%        | 166%        | 131%        | 161%              | 188%        | 158%        |
| 60-69                     | 122                | 125     | 111         | 112         | 93          | 118               | 125         | 109         |
| 70-79                     | 115                | 111     | 108         | 103         | 92          | 113               | 111         | 102         |
| 80 and over               | 110                | 106     | 100         | 102         | 98          | 101               | 104         | 101         |
| All ages                  | 115%               | 111%    | 104%        | 103%        | 97%         | 106%              | 107%        | 102%        |
| All ages adjusted         | 112%               | 108%    | 102%        | 103%        | 97%         | 104%              | 106%        | 102%        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.



TABLE 11—*Continued*—REFUND—FEMALE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED<br>AGES          | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60.....             | 147%               | 92%     | 92%     | 113%    | 72%     | 98%               | 128%    | 87%     |
| 60-69.....                | 119                | 135     | 106     | 83      | 107     | 112               | 93      | 126     |
| 70-79.....                | 107                | 93      | 117     | 103     | 73      | 121               | 112     | 81      |
| 80 and over.....          | 106                | 99      | 82      | 92      | 71      | 83                | 95      | 75      |
| All ages.....             | 111%               | 103%    | 101%    | 96%     | 78%     | 105%              | 102%    | 86%     |
| All ages adjusted.....    | 110%               | 103%    | 101%    | 95%     | 78%     | 103%              | 102%    | 86%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60.....             | 179%               | 186%    | 183%    | 179%    | 138%    | 196%              | 204%    | 165%    |
| 60-69.....                | 122                | 119     | 118     | 118     | 109     | 125               | 132     | 127     |
| 70-79.....                | 122                | 120     | 112     | 107     | 91      | 117               | 115     | 102     |
| 80 and over.....          | 114                | 106     | 104     | 105     | 98      | 105               | 107     | 101     |
| All ages.....             | 120%               | 113%    | 108%    | 106%    | 97%     | 110%              | 110%    | 102%    |
| All ages adjusted.....    | 116%               | 110%    | 107%    | 106%    | 97%     | 109%              | 110%    | 102%    |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60.....             | 167%               | 160%    | 164%    | 157%    | 96%     | 175%              | 179%    | 116%    |
| 60-69.....                | 121                | 122     | 115     | 108     | 108     | 122               | 120     | 127     |
| 70-79.....                | 118                | 116     | 113     | 107     | 84      | 117               | 115     | 94      |
| 80 and over.....          | 113                | 106     | 103     | 104     | 94      | 104               | 106     | 97      |
| All ages.....             | 118%               | 112%    | 107%    | 105%    | 92%     | 110%              | 110%    | 98%     |
| All ages adjusted.....    | 115%               | 110%    | 107%    | 106%    | 92%     | 109%              | 110%    | 98%     |

**TABLE 12**  
**COMPARISON OF MORTALITY RATIOS ON INDIVIDUAL IMMEDIATE**  
**NONREFUND AND REFUND ANNUITIES COMBINED—MALE**  
**EXPERIENCE BETWEEN 1941 AND 1967 ANNIVERSARIES**  
**EXPECTED DEATHS BASED ON ANNUITY TABLE FOR 1949 ULTIMATE**  
**BY NUMBER OF CONTRACTS**

| ATTAINED AGES             | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 137%               | 125%    | 169%    | 128%    | 155%    | 180%              | 142%    | 187%    |
| 60-69                     | 120                | 113     | 113     | 89      | 96      | 119               | 100     | 113     |
| 70-79                     | 105                | 102     | 109     | 83      | 81      | 114               | 91      | 91      |
| 80 and over               | 100                | 81      | 78      | 69      | 76      | 79                | 72      | 80      |
| All ages                  | 109%               | 100%    | 100%    | 80%     | 85%     | 104%              | 86%     | 95%     |
| All ages adjusted         | 108%               | 99%     | 101%    | 81%     | 85%     | 104%              | 88%     | 95%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60                  | 144%               | 123%    | 133%    | 126%    | 122%    | 142%              | 145%    | 147%    |
| 60-69                     | 133                | 117     | 127     | 113     | 95      | 135               | 126     | 111     |
| 70-79                     | 117                | 119     | 115     | 107     | 100     | 119               | 116     | 111     |
| 80 and over               | 108                | 96      | 100     | 101     | 99      | 101               | 104     | 101     |
| All ages                  | 117%               | 107%    | 107%    | 104%    | 99%     | 110%              | 108%    | 104%    |
| All ages adjusted         | 112%               | 103%    | 105%    | 103%    | 99%     | 107%              | 108%    | 104%    |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 141%               | 123%    | 139%    | 127%    | 136%    | 149%              | 144%    | 164%    |
| 60-69                     | 128                | 116     | 123     | 105     | 96      | 131               | 117     | 112     |
| 70-79                     | 114                | 116     | 114     | 104     | 95      | 118               | 112     | 106     |
| 80 and over               | 106                | 94      | 99      | 99      | 96      | 100               | 101     | 99      |
| All ages                  | 115%               | 106%    | 106%    | 101%    | 96%     | 109%              | 106%    | 102%    |
| All ages adjusted         | 111%               | 102%    | 105%    | 101%    | 96%     | 107%              | 106%    | 102%    |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

TABLE 12—Continued—NONREFUND AND REFUND—MALE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED<br>AGES          | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 157%               | 193%    | 231%    | 96%     | 113%    | 246%              | 108%    | 135%    |
| 60-69                     | 117                | 135     | 105     | 93      | 86      | 111               | 103     | 101     |
| 70-79                     | 107                | 97      | 94      | 85      | 81      | 97                | 93      | 91      |
| 80 and over               | 92                 | 91      | 94      | 64      | 76      | 96                | 66      | 79      |
| All ages                  | 107%               | 106%    | 98%     | 77%     | 81%     | 101%              | 83%     | 89%     |
| All ages adjusted         | 104%               | 104%    | 99%     | 79%     | 81%     | 102%              | 84%     | 89%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60                  | 164%               | 142%    | 176%    | 158%    | 157%    | 188%              | 179%    | 189%    |
| 60-69                     | 149                | 127     | 132     | 132     | 115     | 140               | 148     | 135     |
| 70-79                     | 123                | 128     | 109     | 110     | 95      | 113               | 119     | 105     |
| 80 and over               | 119                | 97      | 107     | 101     | 95      | 108               | 103     | 98      |
| All ages                  | 126%               | 112%    | 110%    | 105%    | 96%     | 113%              | 110%    | 101%    |
| All ages adjusted         | 121%               | 106%    | 109%    | 105%    | 96%     | 111%              | 109%    | 101%    |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 161%               | 157%    | 187%    | 138%    | 127%    | 199%              | 156%    | 153%    |
| 60-69                     | 137                | 130     | 124     | 113     | 93      | 131               | 127     | 109     |
| 70-79                     | 119                | 121     | 106     | 104     | 88      | 110               | 112     | 98      |
| 80 and over               | 113                | 96      | 106     | 96      | 90      | 107               | 98      | 93      |
| All ages                  | 121%               | 111%    | 108%    | 100%    | 90%     | 111%              | 104%    | 97%     |
| All ages adjusted         | 118%               | 106%    | 109%    | 101%    | 90%     | 111%              | 105%    | 97%     |

TABLE 12--Continued--NONREFUND AND REFUND--FEMALE  
BY NUMBER OF CONTRACTS

| ATTAINED AGES             | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 132%               | 95%     | 137%    | 161%    | 135%    | 147%              | 179%    | 163%    |
| 60-69                     | 108%               | 111     | 97      | 82      | 81      | 103               | 93      | 95      |
| 70-79                     | 100                | 88      | 85      | 87      | 71      | 88                | 97      | 79      |
| 80 and over               | 102                | 84      | 70      | 89      | 71      | 71                | 92      | 75      |
| All ages                  | 104%               | 92%     | 83%     | 88%     | 74%     | 85%               | 96%     | 81%     |
| All ages adjusted         | 103%               | 91%     | 82%     | 88%     | 74%     | 85%               | 96%     | 81%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60                  | 163%               | 162%    | 157%    | 165%    | 140%    | 168%              | 187%    | 169%    |
| 60-69                     | 125                | 120     | 108     | 120     | 103     | 115               | 134     | 121     |
| 70-79                     | 116                | 112     | 107     | 104     | 96      | 111               | 113     | 107     |
| 80 and over               | 110                | 104     | 99      | 102     | 96      | 100               | 104     | 98      |
| All ages                  | 116%               | 109%    | 102%    | 103%    | 96%     | 104%              | 107%    | 100%    |
| All ages adjusted         | 111%               | 106%    | 101%    | 103%    | 96%     | 102%              | 106%    | 100%    |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60                  | 149%               | 144%    | 154%    | 164%    | 138%    | 164%              | 185%    | 166%    |
| 60-69                     | 119                | 118     | 107     | 112     | 93      | 113               | 126     | 109     |
| 70-79                     | 112                | 109     | 105     | 103     | 91      | 110               | 111     | 101     |
| 80 and over               | 109                | 103     | 98      | 102     | 95      | 99                | 104     | 97      |
| All ages                  | 113%               | 107%    | 101%    | 103%    | 94%     | 103%              | 106%    | 99%     |
| All ages adjusted         | 110%               | 105%    | 100%    | 103%    | 94%     | 102%              | 106%    | 99%     |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

TABLE 12—Continued—NONREFUND AND REFUND—FEMALE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED AGES             | WITHOUT PROJECTION |         |         |         |         | WITH PROJECTION B |         |         |
|---------------------------|--------------------|---------|---------|---------|---------|-------------------|---------|---------|
|                           | 1941-48            | 1948-53 | 1953-58 | 1958-63 | 1963-67 | 1953-58           | 1958-63 | 1963-67 |
| Contract Years 1-5        |                    |         |         |         |         |                   |         |         |
| Under 60 .....            | 138%               | 93%     | 96%     | 129%    | 128%    | 103%              | 146%    | 154%    |
| 60-69 .....               | 113                | 119     | 99      | 75      | 91      | 104               | 85      | 107     |
| 70-79 .....               | 104                | 85      | 103     | 88      | 69      | 107               | 97      | 77      |
| 80 and over .....         | 96                 | 82      | 74      | 83      | 70      | 75                | 86      | 73      |
| All ages .....            | 105%               | 90%     | 90%     | 85%     | 73%     | 93%               | 91%     | 80%     |
| All ages adjusted .....   | 102%               | 89%     | 90%     | 85%     | 73%     | 92%               | 91%     | 80%     |
| Contract Years 6 and Over |                    |         |         |         |         |                   |         |         |
| Under 60 .....            | 178%               | 171%    | 166%    | 172%    | 135%    | 177%              | 195%    | 162%    |
| 60-69 .....               | 119                | 116     | 108     | 120     | 102     | 114               | 134     | 120     |
| 70-79 .....               | 123                | 117     | 107     | 109     | 90      | 112               | 118     | 100     |
| 80 and over .....         | 109                | 104     | 100     | 102     | 96      | 102               | 104     | 98      |
| All ages .....            | 117%               | 109%    | 103%    | 104%    | 95%     | 105%              | 108%    | 99%     |
| All ages adjusted .....   | 112%               | 107%    | 102%    | 104%    | 95%     | 104%              | 108%    | 99%     |
| All Contract Years        |                    |         |         |         |         |                   |         |         |
| Under 60 .....            | 162%               | 148%    | 151%    | 158%    | 131%    | 161%              | 179%    | 157%    |
| 60-69 .....               | 117                | 117     | 106     | 106     | 95      | 112               | 119     | 112     |
| 70-79 .....               | 119                | 112     | 107     | 105     | 81      | 111               | 114     | 91      |
| 80 and over .....         | 107                | 102     | 99      | 101     | 92      | 100               | 103     | 94      |
| All ages .....            | 114%               | 107%    | 102%    | 103%    | 90%     | 104%              | 106%    | 95%     |
| All ages adjusted .....   | 111%               | 106%    | 102%    | 103%    | 90%     | 104%              | 107%    | 95%     |

nonrefund and refund annuities combined, respectively. These tables show the mortality ratios on the *a*-1949 Table without projection and also on the *a*-1949 Table with Projection B. The exposures were not available to calculate the expected deaths for the period between 1941 and 1948 anniversaries exactly, and the expected deaths previously computed on the 1937 Standard Annuity Table were translated into ratios on the *a*-1949 Table by assuming that the ratio of the expected deaths on the two tables in each age-duration group was the same as that available from the study for the period between 1953 and 1958 anniversaries.

Since the distribution of the exposures by attained age and duration had changed markedly from the earlier to the later periods, "adjusted" mortality ratios were computed for all ages combined. Within a particular duration group, the adjusted ratios for all ages combined were taken as the weighted average of the ratios for component age groups, the weights being the corresponding expected deaths in the experience between 1963 and 1967 anniversaries. Thus the adjusted ratios are approximations to the mortality ratios for all ages combined on the assumption that the distribution of the exposures over the four attained age groups shown was the same in the earlier periods as it was during the period from 1963 to 1967 anniversaries.

The mortality ratios on the *a*-1949 Ultimate Table with Projection B shown in Table 12 for nonrefund and refund annuities combined for the period from 1953 to 1958 anniversaries were calculated by weighting the nonrefund and refund mortality ratios by the corresponding expected deaths of the experience without Projection B.

The principal trends indicated by the adjusted mortality ratios on the *a*-1949 Table without projection may be summarized as follows:

*Male nonrefund annuities.*—The mortality ratios for contract durations 6 and over, all ages combined, declined by 13 percentage points from the period 1958–63 to the period 1963–67, after having shown little change between 1948–53 and 1958–63; the recent decreases in mortality ratios were most pronounced at attained ages under 70. The mortality ratios for contract durations 1–5 increased from the period 1958–63 to the period 1963–67 by 16 percentage points on the basis of number of contracts and by 18 percentage points on the basis of amounts of annual income, after having dropped sharply from the period 1953–58 to the period 1958–63; the recent increases in select mortality were relatively large at attained ages 80 and over (both by number of contracts and by amounts of annual income) and at attained ages 60–69 (by number of contracts only).

*Female nonrefund annuities.*—The mortality ratios for durations 6 and over, all ages combined, declined by about 10 percentage points from the period 1958–63 to the period 1963–67, after having shown little change between 1948–

53 and 1958-63; the recent decreases in mortality ratios were most pronounced at attained ages 60-69. The mortality ratios for contract durations 1-5 also decreased from the period 1958-63 to the period 1963-67 by 11 percentage points on the basis of number of contracts and by 6 percentage points on the basis of amounts of annual income, after having shown relatively little change by amounts of annual income and an increase of 7 per cent by number of contracts between 1948-53 and 1958-63; the recent decreases in select mortality were greatest at attained ages 70 and over.

*Male refund annuities.*—The mortality ratios for contract durations 6 and over, all ages combined, remained unchanged at 104 per cent by number of contracts but decreased slightly to 105 per cent by amounts of income from the period 1958-63 to the period 1963-67, after having shown little change between 1948-53 and 1958-63; the mortality ratios decreased significantly at attained ages 60-79. The mortality ratios for contract durations 1-5 decreased slightly by number of contracts but dropped 12 percentage points by amounts of income from the period 1958-63 to the period 1963-67; the recent decreases in select mortality by amounts of income were about the same in each of the four broad attained age groups.

*Female refund annuities.*—The mortality ratios for contract durations 6 and over, all ages combined, decreased by 4 percentage points on the basis of number of contracts and by 9 percentage points on the basis of amounts of income from the period 1958-63 to the period 1963-67, continuing the long-term gradual downtrend in mortality since 1941-48; at attained ages 70-79 the mortality ratios recorded during 1963-67 were for the first time significantly below 100 per cent. The mortality ratios for contract durations 1-5 decreased by about 17 percentage points between 1958-63 and 1963-67, with the sharpest declines at attained ages 70 and over.

The marked drop in mortality ratios for durations 6 and over on non-refund annuities, the lesser decreases in corresponding mortality ratios by amounts of income on refund annuities, and the significant declines in select mortality on refund annuities by amounts of income raise pointed questions on the nature of recent mortality trends under immediate annuity contracts.

There has been little change in recent years in the male mortality rates in the general population, among insured lives and among retired lives covered under group annuity contracts, while the female mortality rates in the general population have registered only small declines. It would appear, therefore, that the recent decreases in the mortality under immediate annuity contracts do not reflect underlying mortality downtrends. The selective declines in annuitant mortality may be related to changes in the marketing of immediate annuity contracts; these are evident in the increased proportion of annuities providing larger amounts of

annual income, under which the mortality has been quite low, and probably also in some changes in the class of persons purchasing immediate annuities, especially refund contracts.

It would have been instructive to examine the changes in mortality from the 1958-63 period to the 1963-67 period for annuities issued during specific years. This can be done only approximately by comparing the experience for contract durations 6-10 during the period 1958-63 (issues

TABLE 13  
GENERATION ANALYSIS OF SIX COMPANIES' EXPERIENCE  
UNDER INDIVIDUAL IMMEDIATE ANNUITIES  
ISSUES OF 1949 TO 1956†  
MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE

| ATTAINED AGES     | 1958-63 EXPERIENCE          |        |        |        | 1963-67 EXPERIENCE   |        |        |        |
|-------------------|-----------------------------|--------|--------|--------|----------------------|--------|--------|--------|
|                   | Contract Years 6-10         |        |        |        | Contract Years 11-15 |        |        |        |
|                   | Nonrefund                   |        | Refund |        | Nonrefund            |        | Refund |        |
|                   | Male                        | Female | Male   | Female | Male                 | Female | Male   | Female |
|                   | By Number of Contracts      |        |        |        |                      |        |        |        |
| Under 50 .....    | *                           | *      | *      | *      | *                    | *      | *      | *      |
| 50-59 .....       | *                           | *      | *      | *      | *                    | *      | *      | *      |
| 60-69 .....       | 63%                         | 96%    | 160%   | 84%    | *                    | *      | 111%   | 96%    |
| 70-79 .....       | 80                          | 97     | 102    | 99     | 86%                  | 72%    | 110    | 93     |
| 80 and over ..... | 59                          | 92     | 115    | 107    | 99                   | 85     | 119    | 86     |
| All ages .....    | 68%                         | 94%    | 113%   | 101%   | 93%                  | 82%    | 116%   | 89%    |
|                   | By Amounts of Annual Income |        |        |        |                      |        |        |        |
| Under 50 .....    | *                           | *      | *      | *      | *                    | *      | *      | *      |
| 50-59 .....       | *                           | *      | *      | *      | *                    | *      | *      | *      |
| 60-69 .....       | 75%                         | 84%    | 169%   | 67%    | *                    | *      | 262%   | 112%   |
| 70-79 .....       | 90                          | 87     | 91     | 97     | 86%                  | 67%    | 115    | 117    |
| 80 and over ..... | 58                          | 93     | 142    | 111    | 93                   | 76     | 100    | 64     |
| All ages .....    | 70%                         | 90%    | 119%   | 101%   | 89%                  | 75%    | 118%   | 87%    |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

† Issues of 1949-57 for 1958-63 experience.

of 1949-1957) with the experience for contract durations 11-15 during the period 1963-67 (issues of 1949-1956). Such a comparison, based on data from six companies, is presented in Table 13. It suggests that the mortality ratios for all ages combined on male annuities issued before the mid-fifties did not decline during the period from 1963 to 1967 anniversaries, whereas the mortality ratios on corresponding female annuities did decrease in comparison with the experience during the earlier period. This finding is consistent with the underlying mortality trends by sex in the general population.



It can further be surmised that, if the six companies' experience shown in Table 13 is reasonably representative of what has happened more broadly—that is, if the mortality on male annuities issued before the mid-fifties did not decline—then such decrease in male annuitant mortality as was observed at durations 6 and over (see Tables 10 and 11) from the 1958–63 period to the 1963–67 period must have occurred chiefly on contracts issued since the mid-fifties. A similar decrease was noted in Britain following a radical change in the tax laws applicable to immediate annuities which became effective in 1956; after this tax change there was a substantial upsurge of new annuity business, with an indication that immediate annuities were being purchased to an increasing degree by well-to-do people rather than by people of very modest means. It was noted that mortality began at first to fall in the early durations, and arrangements were accordingly made by the Mortality Committee of the Institute of Actuaries and the Faculty of Actuaries to study the experience on annuity issues of 1957 and subsequent years separately from that for 1956 and prior years.

A similar phenomenon may be taking place in the United States, even though the increase in the proportion of immediate annuities providing larger amounts of income cannot be associated with specific tax changes (such as the enactment of the 1954 Code in the United States). The mortality experienced under the larger annuities has apparently been low, especially on male annuities providing an income of \$5,000 or more, and constitutes evidence that the class of persons purchasing annuities has been changing. Population studies have demonstrated that superior economic status is a major factor in lower death rates. If more and more of the well-to-do turned to immediate annuities, the level of annuitant mortality might decline further, even if there were no underlying down-trends in the mortality of the general population.

#### SELECT MORTALITY

The details of the changes in select mortality from the period 1958–63 to the period 1963–67 for individual contract durations are given in Tables 14 and 15 for nonrefund and refund annuities, respectively. Since the experience in many of the age-duration classifications for each of these periods is relatively small, it was felt advisable to present also a broader picture of select mortality for individual contract durations based on the combined experience from 1958 to 1967 anniversaries.

It is clear that the effect of self-selection on nonrefund annuities is very pronounced, especially for females in the first contract duration; this self-selection appears to persist in some degree for at least five

TABLE 14  
 INDIVIDUAL IMMEDIATE NONREFUND ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1958 AND 1967 ANNIVERSARIES  
 MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE  
 BY AMOUNTS OF ANNUAL INCOME

| ATTAINED AGES | 1958-63 ANNIVERSARIES |            |            |             |             |            |             | 1963-67 ANNIVERSARIES |            |            |            |            |             |            | 1958-67 ANNIVERSARIES |            |            |             |            |             |             |
|---------------|-----------------------|------------|------------|-------------|-------------|------------|-------------|-----------------------|------------|------------|------------|------------|-------------|------------|-----------------------|------------|------------|-------------|------------|-------------|-------------|
|               | Contract Years        |            |            |             |             |            |             |                       |            |            |            |            |             |            |                       |            |            |             |            |             |             |
|               | 1                     | 2          | 3          | 4           | 5           | 1-5        | 6 and Over  | 1                     | 2          | 3          | 4          | 5          | 1-5         | 6 and Over | 1                     | 2          | 3          | 4           | 5          | 1-5         | 6 and Over  |
|               | Male                  |            |            |             |             |            |             |                       |            |            |            |            |             |            |                       |            |            |             |            |             |             |
| Under 50      | *                     | *          | *          | *           | *           | *          | *           | *                     | *          | *          | *          | *          | *           | *          | *                     | *          | *          | *           | *          | *           | *           |
| 50-59         | <i>37%</i>            | <i>*</i>   | <i>46%</i> | <i>250%</i> | <i>*</i>    | <i>66%</i> | <i>326%</i> | <i>52%</i>            | <i>63%</i> | <i>96%</i> | <i>96%</i> | <i>82%</i> | <i>72</i>   | <i>92</i>  | <i>48%</i>            | <i>50%</i> | <i>82%</i> | <i>147%</i> | <i>61%</i> | <i>81%</i>  | <i>236%</i> |
| 60-69         | <i>106</i>            | <i>42%</i> | <i>70</i>  | <i>50</i>   | <i>78%</i>  | <i>71</i>  | <i>101</i>  | <i>90</i>             | <i>58</i>  | <i>66</i>  | <i>88</i>  | <i>70</i>  | <i>75</i>   | <i>81</i>  | <i>94</i>             | <i>53</i>  | <i>67</i>  | <i>74</i>   | <i>73</i>  | <i>74</i>   | <i>92</i>   |
| 70-79         | <i>41</i>             | <i>47</i>  | <i>43</i>  | <i>46</i>   | <i>66</i>   | <i>49</i>  | <i>98</i>   | <i>46</i>             | <i>102</i> | <i>98</i>  | <i>61</i>  | <i>76</i>  | <i>77</i>   | <i>87</i>  | <i>44</i>             | <i>86</i>  | <i>81</i>  | <i>55</i>   | <i>72</i>  | <i>68</i>   | <i>92</i>   |
| 80 and over   | <i>65%</i>            | <i>41%</i> | <i>53%</i> | <i>62%</i>  | <i>68%</i>  | <i>58%</i> | <i>100%</i> | <i>66%</i>            | <i>82%</i> | <i>86%</i> | <i>73%</i> | <i>74%</i> | <i>76%</i>  | <i>86%</i> | <i>65%</i>            | <i>70%</i> | <i>76%</i> | <i>69%</i>  | <i>71%</i> | <i>70%</i>  | <i>93%</i>  |
| All ages      | <i>65%</i>            | <i>41%</i> | <i>53%</i> | <i>62%</i>  | <i>68%</i>  | <i>58%</i> | <i>100%</i> | <i>66%</i>            | <i>82%</i> | <i>86%</i> | <i>73%</i> | <i>74%</i> | <i>76%</i>  | <i>86%</i> | <i>65%</i>            | <i>70%</i> | <i>76%</i> | <i>69%</i>  | <i>71%</i> | <i>70%</i>  | <i>93%</i>  |
|               | Female                |            |            |             |             |            |             |                       |            |            |            |            |             |            |                       |            |            |             |            |             |             |
| Under 50      | *                     | *          | *          | *           | *           | *          | *           | *                     | *          | *          | *          | *          | *           | *          | *                     | *          | *          | *           | *          | *           | *           |
| 50-59         | <i>*</i>              | <i>59%</i> | <i>46%</i> | <i>113%</i> | <i>116%</i> | <i>59%</i> | <i>144%</i> | <i>53%</i>            | <i>34%</i> | <i>75%</i> | <i>*</i>   | <i>91%</i> | <i>386%</i> | <i>55</i>  | <i>80%</i>            | <i>41%</i> | <i>40%</i> | <i>68%</i>  | <i>70%</i> | <i>101%</i> | <i>305%</i> |
| 60-69         | <i>40%</i>            | <i>78</i>  | <i>87</i>  | <i>71</i>   | <i>97</i>   | <i>71</i>  | <i>111</i>  | <i>36</i>             | <i>62</i>  | <i>92</i>  | <i>58%</i> | <i>87</i>  | <i>63</i>   | <i>88</i>  | <i>37</i>             | <i>67</i>  | <i>91</i>  | <i>62</i>   | <i>90</i>  | <i>66</i>   | <i>101</i>  |
| 70-79         | <i>69</i>             | <i>69</i>  | <i>104</i> | <i>91</i>   | <i>45</i>   | <i>75</i>  | <i>99</i>   | <i>30</i>             | <i>84</i>  | <i>58</i>  | <i>80</i>  | <i>96</i>  | <i>68</i>   | <i>93</i>  | <i>41</i>             | <i>79</i>  | <i>71</i>  | <i>84</i>   | <i>75</i>  | <i>66</i>   | <i>97</i>   |
| 80 and over   | <i>49%</i>            | <i>74%</i> | <i>92%</i> | <i>88%</i>  | <i>67%</i>  | <i>73%</i> | <i>102%</i> | <i>42%</i>            | <i>71%</i> | <i>75%</i> | <i>69%</i> | <i>92%</i> | <i>67%</i>  | <i>92%</i> | <i>44%</i>            | <i>71%</i> | <i>80%</i> | <i>75%</i>  | <i>82%</i> | <i>69%</i>  | <i>98%</i>  |
| All ages      | <i>49%</i>            | <i>74%</i> | <i>92%</i> | <i>88%</i>  | <i>67%</i>  | <i>73%</i> | <i>102%</i> | <i>42%</i>            | <i>71%</i> | <i>75%</i> | <i>69%</i> | <i>92%</i> | <i>67%</i>  | <i>92%</i> | <i>44%</i>            | <i>71%</i> | <i>80%</i> | <i>75%</i>  | <i>82%</i> | <i>69%</i>  | <i>98%</i>  |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE 15

INDIVIDUAL IMMEDIATE REFUND ANNUITIES  
ISSUES OF 1931 TO 1966  
EXPERIENCE BETWEEN 1958 AND 1967 ANNIVERSARIES  
MORTALITY RATIOS ON ANNUITY TABLE FOR 1949 ULTIMATE  
BY AMOUNTS OF ANNUAL INCOME

| ATTAINED<br>AGES | 1958-63 ANNIVERSARIES |      |      |      |      |     | 1963-67 ANNIVERSARIES |     |     |     |     |      | 1958-67 ANNIVERSARIES |               |     |     |     |     |      |      |               |     |    |     |
|------------------|-----------------------|------|------|------|------|-----|-----------------------|-----|-----|-----|-----|------|-----------------------|---------------|-----|-----|-----|-----|------|------|---------------|-----|----|-----|
|                  | Contract Years        |      |      |      |      |     |                       |     |     |     |     |      |                       |               |     |     |     |     |      |      |               |     |    |     |
|                  | 1                     | 2    | 3    | 4    | 5    | 1-5 | 6 and<br>Over         | 1   | 2   | 3   | 4   | 5    | 1-5                   | 6 and<br>Over | 1   | 2   | 3   | 4   | 5    | 1-5  | 6 and<br>Over |     |    |     |
|                  | Male                  |      |      |      |      |     |                       |     |     |     |     |      |                       |               |     |     |     |     |      |      |               |     |    |     |
| Under 50.....    | *                     | *    | *    | *    | *    | *   | 150%                  | *   | *   | *   | *   | *    | *                     | 440%          | *   | *   | *   | *   | *    | 190% | 275%          |     |    |     |
| 50-59.....       | 70%                   | 105% | 122% | 114% | 145% | 102 | 138                   | 92  | 98  | 79% | 83% | 102% | 91                    | 124           | 86  | 100 | 90  | 92% | 116  | 94   | 132           |     |    |     |
| 60-69.....       | 72                    | 114  | 95   | 89   | 128  | 98  | 115                   | 73  | 78  | 76  | 113 | 113  | 85                    | 102           | 73  | 86  | 81  | 106 | 119  | 89   | 109           |     |    |     |
| 70-79.....       | 53                    | 98   | 132  | 93   | 56   | 86  | 103                   | 79  | 83  | 55  | 75  | 83   | 75                    | 103           | 72  | 87  | 78  | 81  | 73   | 78   | 103           |     |    |     |
| 80 and over..... |                       |      |      |      |      |     |                       |     |     |     |     |      |                       |               |     |     |     |     |      |      |               |     |    |     |
| All ages.....    | 66%                   | 107% | 116% | 98%  | 102% | 96% | 109%                  | 82% | 87% | 70% | 91% | 99%  | 84%                   | 105%          | 78% | 92% | 83% | 93% | 100% | 88%  | 107%          |     |    |     |
|                  | Female                |      |      |      |      |     |                       |     |     |     |     |      |                       |               |     |     |     |     |      |      |               |     |    |     |
| Under 50.....    | *                     | *    | *    | *    | *    | *   | 387%                  | *   | *   | *   | *   | *    | *                     | 132%          | *   | *   | *   | *   | *    | 83%  | 289%          |     |    |     |
| 50-59.....       | 100%                  | 235% | 75   | 52%  | 94%  | 86% | 113%                  | 83  | 118 | 105 | 91% | 115% | 150%                  | 85%           | 107 | 109 | 104 | 87  | 99   | 131% | 85%           | 101 | 83 | 143 |
| 60-69.....       | 110                   | 85   | 140  | 94   | 88   | 103 | 107                   | 66  | 65  | 76  | 77  | 98   | 73                    | 91            | 77  | 69  | 93  | 32  | 94   | 81   | 114           |     |    |     |
| 70-79.....       | 69                    | 86   | 85   | 92   | 125  | 92  | 105                   | 69  | 90  | 76  | 49  | 76   | 64                    | 71            | 98  | 89  | 78  | 62  | 87   | 77   | 102           |     |    |     |
| 80 and over..... |                       |      |      |      |      |     |                       |     |     |     |     |      |                       |               |     |     |     |     |      |      |               |     |    |     |
| All ages.....    | 92%                   | 87%  | 103% | 93%  | 106% | 96% | 106%                  | 75% | 78% | 82% | 76% | 80%  | 78%                   | 97%           | 80% | 80% | 88% | 81% | 90%  | 83%  | 102%          |     |    |     |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

contract years at attained ages 60 and over. Self-selection is less marked on refund annuities, but ultimate mortality is nevertheless not reached until at least three years have elapsed at ages 60-79 and over five years at ages 80 and over.

It is difficult to draw a line between the effects of self-selection and the effects of an increasing proportion of annuities for larger amounts of income which apparently carry with them a distinctly lower underlying mortality. If we judge by the limited experience in Tables 7 and 8, the level of select mortality on male nonrefund annuities and on female nonrefund and refund annuities for amounts of annual income of \$2,500 or more is about the same or higher than that on annuities for all amounts of income combined; however, that on male refund annuities providing an annual income of \$5,000 or more appears to be exceptionally low.

IMPROVEMENT RATES AND PROJECTION FACTORS  
ACCORDING TO PROJECTION B

Expected deaths on the *a*-1949 Table with Projection B were calculated from those on the *a*-1949 Table without projection by multiplying the latter by projection factors reflecting the improvement in mortality, according to Projection B, through the period covered by the present study.

In the calculation of the projection factors, the assumptions detailed in the paper "A New Mortality Basis for Annuities" (*TSA*, I, 424) were followed. Briefly, it was assumed that the mortality rates of the *a*-1949 Table continued throughout the calendar year 1950 and that the first decrease in mortality occurred at the beginning of 1951.

As a practical matter, the formula for the reduction in mortality rate turns out to be

$$100\% \left\{ 1 - \frac{1}{2} \left[ \left( 1 - \frac{S_x}{100} \right)^{1963-1950} + \left( 1 - \frac{S_x}{100} \right)^{1967-1950} \right] \right\},$$

where  $S_x$ , defined as the annual rate of decrease in the mortality rate, expressed as a percentage, was used to represent the average improvement factor for the experience from 1963 to 1967 anniversaries. While it would have been desirable to apply projection factors separately to each calendar year's experience, the form of the data precluded such a procedure.

The tabulation at the top of page 41 shows the annual rates of improvement in mortality according to Projection B and the projection factors which were applied to expected deaths for the 1963-67 experience. Factors at ages not shown were calculated by interpolation in column 1 and substitution in the above formula.

PROJECTION B IMPROVEMENT FACTORS

| Attained Age | Rate of Decrease per Year in Mortality Rate $S_x$ | Reductions in Mortality Rate from 1950 through 1963-67 |
|--------------|---|--|
| 10-50.....   | 1.25%   | 17.17%   |
| 60.....      | 1.20  | 16.54  |
| 65.....      | 1.10  | 15.27  |
| 70.....      | 0.95  | 13.32  |
| 75.....      | 0.75  | 10.67  |
| 80.....      | 0.50  | 7.24   |
| 85.....      | 0.25  | 3.68   |
| 90.....      | 0.00  | 0.00   |

APPENDIX

TABLE A

CONTRIBUTING COMPANIES

PROPORTION OF TOTAL EXPOSURES CONTRIBUTED BY EACH

| COMPANY                   | NONREFUND ANNUITIES |                          |                     |                          | REFUND ANNUITIES    |                          |                     |                          |
|---------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|
|                           | Males               |                          | Females             |                          | Males               |                          | Females             |                          |
|                           | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income |
| Equitable, N.Y.....       | 15.2%               | 12.3%                    | 22.9%               | 16.8%                    | 16.1%               | 10.5%                    | 24.6%               | 15.7%                    |
| Manufacturers.....        | 11.9                | 16.0                     | 6.0                 | 11.9                     | 10.4                | 19.2                     | 5.4                 | 11.8                     |
| Prudential.....           | 7.9                 | 7.8                      | 5.2                 | 5.8                      | 4.5                 | 4.4                      | 5.2                 | 5.8                      |
| New York Life.....        | 7.0                 | 6.7                      | 8.7                 | 8.4                      | 6.8                 | 6.5                      | 9.5                 | 8.7                      |
| Metropolitan.....         | 6.8                 | 7.8                      | 4.7                 | 6.6                      | 6.8                 | 8.5                      | 6.4                 | 9.5                      |
| John Hancock.....         | 5.4                 | 3.5                      | 5.5                 | 4.7                      | 5.4                 | 3.9                      | 5.2                 | 4.4                      |
| Mutual Life, N.Y.....     | 5.3                 | 4.9                      | 4.5                 | 4.4                      | 4.4                 | 3.6                      | 4.4                 | 3.6                      |
| Massachusetts Mutual..... | 5.0                 | 4.6                      | 6.0                 | 6.1                      | 4.5                 | 6.2                      | 5.1                 | 6.4                      |
| Connecticut Mutual.....   | 4.1                 | 4.3                      | 4.1                 | 4.1                      | 5.4                 | 4.8                      | 4.6                 | 4.6                      |
| Northwestern Mutual.....  | 3.9                 | 2.5                      | 4.0                 | 2.9                      | 7.4                 | 5.6                      | 4.8                 | 4.1                      |
| Aetna Life.....           | 3.7                 | 4.1                      | 3.3                 | 3.1                      | 3.4                 | 1.9                      | 3.4                 | 2.8                      |
| Connecticut General.....  | 3.6                 | 2.7                      | 4.0                 | 3.7                      | 0.8                 | 1.3                      | 0.8                 | 1.0                      |
| Penn Mutual.....          | 3.2                 | 2.3                      | 5.0                 | 3.3                      | 3.9                 | 2.3                      | 3.9                 | 2.7                      |
| Travelers.....            | 2.8                 | 3.4                      | 3.5                 | 4.5                      | 2.7                 | 3.7                      | 2.7                 | 4.0                      |
| Canada Life.....          | 2.7                 | 4.6                      | 1.3                 | 2.1                      | 3.3                 | 4.6                      | 1.4                 | 2.2                      |
| Sun Life.....             | 2.3                 | 1.9                      | 1.9                 | 1.4                      | 1.9                 | 1.6                      | 1.8                 | 1.4                      |
| Phoenix Mutual.....       | 2.3                 | 2.2                      | 2.5                 | 2.7                      | 1.8                 | 1.2                      | 1.6                 | 1.4                      |
| Crown Life.....           | 2.0                 | 3.4                      | 0.9                 | 2.3                      | 1.5                 | 2.7                      | 0.6                 | 1.4                      |
| New England Mutual.....   | 1.9                 | 0.9                      | 2.9                 | 1.9                      | 1.8                 | 0.9                      | 2.0                 | 1.3                      |
| Provident Mutual.....     | 1.5                 | 1.2                      | 2.3                 | 1.6                      | 1.5                 | 1.4                      | 1.7                 | 1.2                      |
| Southwestern Life.....    | 1.5                 | 2.9                      | 0.8                 | 1.7                      | 2.8                 | 2.9                      | 1.7                 | 2.6                      |
| National Life.....        | .....               | .....                    | .....               | .....                    | 2.9                 | 2.3                      | 3.2                 | 3.4                      |
| Total.....                | 100.0%              | 100.0%                   | 100.0%              | 100.0%                   | 100.0%              | 100.0%                   | 100.0%              | 100.0%                   |

**TABLE B**  
**EXPOSURES AND DEATHS UNDER INDIVIDUAL IMMEDIATE ANNUITIES**  
**ISSUES OF 1931 TO 1966**  
**EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES**

| CONTRACT YEARS           | NONREFUND ANNUITIES |                          | REFUND ANNUITIES    |                          |
|--------------------------|---------------------|--------------------------|---------------------|--------------------------|
|                          | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income |
|                          | Exposures           |                          |                     |                          |
| Males:                   |                     |                          |                     |                          |
| 1-5 .....                | 16,038              | \$19,657,625             | 35,072              | \$ 37,860,242            |
| 6 and over .....         | 33,841              | 18,709,622               | 69,167              | 30,635,187               |
| All contract years ..... | 49,879              | \$38,367,247             | 104,239             | \$ 68,495,429            |
| Females:                 |                     |                          |                     |                          |
| 1-5 .....                | 25,708              | \$27,150,941             | 55,058              | \$ 49,828,130            |
| 6 and over .....         | 105,654             | 37,706,804               | 210,748             | 69,018,664               |
| All contract years ..... | 131,362             | \$64,857,745             | 265,806             | \$118,846,794            |
|                          | Deaths              |                          |                     |                          |
| Males:                   |                     |                          |                     |                          |
| 1-5 .....                | 643                 | \$ 900,898               | 1,226               | \$ 1,327,313             |
| 6 and over .....         | 2,911               | 1,639,561                | 5,552               | 2,458,963                |
| All contract years ..... | 3,554               | \$ 2,540,459             | 6,778               | \$ 3,786,276             |
| Females:                 |                     |                          |                     |                          |
| 1-5 .....                | 638                 | \$ 713,011               | 1,112               | \$ 1,101,518             |
| 6 and over .....         | 8,716               | 2,965,876                | 14,958              | 4,237,271                |
| All contract years ..... | 9,354               | \$ 3,678,887             | 16,070              | \$ 5,338,789             |

TABLE C  
INDIVIDUAL IMMEDIATE ANNUITIES  
ISSUES OF 1931 TO 1966  
EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
NONREFUND—MALE LIVES  
EXPECTED DEATHS ON *a*-1949 ULTIMATE TABLE

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 1:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 37                        | \$ 23,218                         | 0                         | \$ 0                              | 0.11                      | \$ 86                             | *                         | *                                 |
| 50-59.....                              | 294                       | 341,687                           | 3                         | 4,261                             | 3.36                      | 4,032                             | *                         | *                                 |
| 60-69.....                              | 1,622                     | 1,799,850                         | 28                        | 22,547                            | 38.59                     | 43,347                            | <i>73%</i>                | <i>52%</i>                        |
| 70-79.....                              | 1,457                     | 2,318,979                         | 48                        | 112,060                           | 75.80                     | 124,350                           | <i>63</i>                 | <i>90</i>                         |
| 80 and over.....                        | 593                       | 1,133,246                         | 40                        | 61,217                            | 69.39                     | 133,578                           | <i>58</i>                 | <i>46</i>                         |
| All ages.....                           | 4,003                     | \$ 5,616,980                      | 119                       | \$ 200,085                        | 187.25                    | \$ 305,393                        | <i>64%</i>                | <i>66%</i>                        |
| Year 2:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 37                        | \$ 29,971                         | 0                         | \$ 0                              | 0.11                      | \$ 136                            | *                         | *                                 |
| 50-59.....                              | 253                       | 270,376                           | 7                         | 6,587                             | 2.97                      | 3,305                             | *                         | *                                 |
| 60-69.....                              | 1,429                     | 1,469,998                         | 24                        | 22,697                            | 35.12                     | 36,154                            | <i>68%</i>                | <i>63%</i>                        |
| 70-79.....                              | 1,399                     | 1,965,481                         | 52                        | 59,276                            | 72.72                     | 102,379                           | <i>72</i>                 | <i>58</i>                         |
| 80 and over.....                        | 635                       | 1,168,274                         | 64                        | 140,363                           | 75.65                     | 137,758                           | <i>85</i>                 | <i>102</i>                        |
| All ages.....                           | 3,753                     | \$ 4,904,100                      | 147                       | \$ 228,923                        | 186.57                    | \$ 279,732                        | <i>79%</i>                | <i>82%</i>                        |
| Year 3:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 35                        | \$ 27,985                         | 0                         | \$ 0                              | 0.12                      | \$ 134                            | *                         | *                                 |
| 50-59.....                              | 203                       | 200,899                           | 3                         | 2,394                             | 2.39                      | 2,458                             | *                         | *                                 |
| 60-69.....                              | 1,168                     | 1,059,359                         | 20                        | 25,674                            | 29.76                     | 26,804                            | <i>67%</i>                | <i>96%</i>                        |
| 70-79.....                              | 1,263                     | 1,592,512                         | 55                        | 55,194                            | 65.79                     | 84,016                            | <i>84</i>                 | <i>66</i>                         |
| 80 and over.....                        | 612                       | 1,028,199                         | 72                        | 123,973                           | 74.72                     | 126,571                           | <i>96</i>                 | <i>98</i>                         |
| All ages.....                           | 3,281                     | \$ 3,908,954                      | 150                       | \$ 207,235                        | 172.78                    | \$ 239,983                        | <i>87%</i>                | <i>86%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 4:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 24                        | \$ 6,897                          | 0                         | \$ 0                              | 0.07                      | \$ 23                             | *                         | *                                 |
| 50-59.....                              | 157                       | 157,256                           | 0                         | 0                                 | 1.79                      | 1,842                             | *                         | *                                 |
| 60-69.....                              | 834                       | 680,541                           | 17                        | 16,940                            | 21.85                     | 17,722                            | 78%                       | 96%                               |
| 70-79.....                              | 1,139                     | 1,282,406                         | 52                        | 59,327                            | 58.96                     | 67,448                            | 88                        | 88                                |
| 80 and over.....                        | 590                       | 889,275                           | 63                        | 69,016                            | 74.17                     | 113,139                           | 85                        | 61                                |
| All ages.....                           | 2,744                     | \$ 3,016,375                      | 132                       | \$ 145,283                        | 156.84                    | \$ 200,174                        | 84%                       | 73%                               |
| Year 5:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 19                        | \$ 4,946                          | 0                         | \$ 0                              | 0.05                      | \$ 20                             | *                         | *                                 |
| 50-59.....                              | 113                       | 91,266                            | 0                         | 0                                 | 1.30                      | 1,052                             | *                         | *                                 |
| 60-69.....                              | 569                       | 426,024                           | 13                        | 9,075                             | 14.85                     | 11,025                            | 88%                       | 82%                               |
| 70-79.....                              | 1,027                     | 959,793                           | 36                        | 35,839                            | 53.53                     | 51,325                            | 67                        | 70                                |
| 80 and over.....                        | 529                       | 729,187                           | 46                        | 74,458                            | 69.05                     | 98,125                            | 67                        | 76                                |
| All ages.....                           | 2,257                     | \$ 2,211,216                      | 95                        | \$ 119,372                        | 138.78                    | \$ 161,547                        | 68%                       | 74%                               |
| Year 6:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 19                        | \$ 7,087                          | 0                         | \$ 0                              | 0.04                      | \$ 33                             | *                         | *                                 |
| 50-59.....                              | 81                        | 51,406                            | 1                         | 299                               | 0.95                      | 658                               | *                         | *                                 |
| 60-69.....                              | 383                       | 256,206                           | 7                         | 12,363                            | 9.48                      | 6,354                             | *                         | *                                 |
| 70-79.....                              | 963                       | 796,699                           | 42                        | 25,316                            | 49.64                     | 42,126                            | 85%                       | 60%                               |
| 80 and over.....                        | 517                       | 648,873                           | 58                        | 51,220                            | 69.88                     | 92,728                            | 83                        | 55                                |
| All ages.....                           | 1,963                     | \$ 1,760,271                      | 108                       | \$ 89,198                         | 129.99                    | \$ 141,899                        | 83%                       | 63%                               |
| Year 7:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 15                        | \$ 4,304                          | 0                         | \$ 0                              | 0.05                      | \$ 20                             | *                         | *                                 |
| 50-59.....                              | 66                        | 28,424                            | 0                         | 0                                 | 0.79                      | 329                               | *                         | *                                 |
| 60-69.....                              | 293                       | 195,653                           | 6                         | 3,231                             | 7.38                      | 4,868                             | *                         | *                                 |
| 70-79.....                              | 798                       | 652,506                           | 31                        | 23,980                            | 42.32                     | 36,840                            | 73%                       | 65%                               |
| 80 and over.....                        | 486                       | 555,029                           | 57                        | 59,307                            | 65.54                     | 81,079                            | 87                        | 73                                |
| All ages.....                           | 1,658                     | \$ 1,435,916                      | 94                        | \$ 86,518                         | 116.08                    | \$ 123,136                        | 81%                       | 70%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.



TABLE C—Continued—NONREFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 8:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 11                        | \$ 2,567                          | 0                         | \$ 0                              | 0.02                      | \$ 10                             | *                         | *                                 |
| 50-59.....                              | 60                        | 23,299                            | 2                         | 1,382                             | 0.70                      | 249                               | *                         | *                                 |
| 60-69.....                              | 268                       | 159,395                           | 4                         | 2,628                             | 6.80                      | 4,023                             | *                         | *                                 |
| 70-79.....                              | 730                       | 588,184                           | 39                        | 37,431                            | 39.89                     | 34,945                            | <i>98%</i>                | <i>107%</i>                       |
| 80 and over.....                        | 527                       | 555,491                           | 65                        | 71,182                            | 72.57                     | 81,910                            | 90                        | 87                                |
| All ages.....                           | 1,596                     | \$ 1,328,936                      | 110                       | \$ 112,623                        | 119.98                    | \$ 121,137                        | 92%                       | 93%                               |
| Year 9:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 9                         | \$ 2,327                          | 0                         | \$ 0                              | 0.02                      | \$ 8                              | *                         | *                                 |
| 50-59.....                              | 44                        | 19,344                            | 0                         | 0                                 | 0.49                      | 204                               | *                         | *                                 |
| 60-69.....                              | 270                       | 148,033                           | 3                         | 2,855                             | 6.74                      | 3,756                             | *                         | *                                 |
| 70-79.....                              | 719                       | 564,768                           | 33                        | 16,650                            | 38.99                     | 33,519                            | <i>85%</i>                | <i>50%</i>                        |
| 80 and over.....                        | 603                       | 648,606                           | 59                        | 34,014                            | 82.80                     | 93,258                            | 71                        | 36                                |
| All ages.....                           | 1,645                     | \$ 1,383,078                      | 95                        | \$ 53,519                         | 129.04                    | \$ 130,745                        | 74%                       | 41%                               |
| Year 10:                                |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 8                         | \$ 1,873                          | 0                         | \$ 0                              | 0.03                      | \$ 9                              | *                         | *                                 |
| 50-59.....                              | 30                        | 12,252                            | 0                         | 0                                 | 0.32                      | 124                               | *                         | *                                 |
| 60-69.....                              | 229                       | 111,160                           | 0                         | 0                                 | 5.84                      | 2,869                             | *                         | *                                 |
| 70-79.....                              | 731                       | 517,318                           | 39                        | 33,472                            | 40.62                     | 29,972                            | <i>96%</i>                | <i>112%</i>                       |
| 80 and over.....                        | 629                       | 778,706                           | 69                        | 66,308                            | 88.90                     | 105,345                           | 78                        | 63                                |
| All ages.....                           | 1,627                     | \$ 1,421,309                      | 108                       | \$ 99,780                         | 135.71                    | \$ 138,319                        | 80%                       | 72%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 1-5:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 152                       | \$ 93,017                         | 0                         | \$ 0                              | 0.46                      | \$ 399                            | *                         | *                                 |
| 50-59.....                              | 1,020                     | 1,061,484                         | 13                        | 13,242                            | 11.81                     | 12,689                            | <i>110%</i>               | <i>104%</i>                       |
| 60-69.....                              | 5,622                     | 5,435,772                         | 102                       | 96,933                            | 140.17                    | 135,052                           | 73                        | 72                                |
| 70-79.....                              | 6,285                     | 8,119,171                         | 243                       | 321,696                           | 326.80                    | 429,518                           | 74                        | 75                                |
| 80 and over.....                        | 2,959                     | 4,948,181                         | 285                       | 469,027                           | 362.98                    | 609,171                           | 79                        | 77                                |
| All ages.....                           | 16,038                    | \$ 19,657,625                     | 643                       | \$ 900,898                        | 842.22                    | \$ 1,186,829                      | <i>76%</i>                | <i>76%</i>                        |
| Years 6-10:                             |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 62                        | \$ 18,158                         | 0                         | \$ 0                              | 0.16                      | \$ 80                             | *                         | *                                 |
| 50-59.....                              | 281                       | 134,725                           | 3                         | 1,681                             | 3.25                      | 1,564                             | *                         | *                                 |
| 60-69.....                              | 1,443                     | 870,447                           | 20                        | 21,077                            | 36.24                     | 21,870                            | <i>55%</i>                | <i>96%</i>                        |
| 70-79.....                              | 3,941                     | 3,119,475                         | 184                       | 136,849                           | 211.46                    | 177,402                           | 87                        | 77                                |
| 80 and over.....                        | 2,762                     | 3,186,705                         | 308                       | 282,031                           | 379.69                    | 454,320                           | 81                        | 62                                |
| All ages.....                           | 8,489                     | \$ 7,329,510                      | 515                       | \$ 441,638                        | 630.80                    | \$ 655,236                        | <i>82%</i>                | <i>67%</i>                        |
| Years 1-10:                             |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 214                       | \$ 111,175                        | 0                         | \$ 0                              | 0.62                      | \$ 479                            | *                         | *                                 |
| 50-59.....                              | 1,301                     | 1,196,209                         | 16                        | 14,923                            | 15.06                     | 14,253                            | <i>106%</i>               | <i>105%</i>                       |
| 60-69.....                              | 7,065                     | 6,306,219                         | 122                       | 118,010                           | 176.41                    | 156,922                           | 69                        | 75                                |
| 70-79.....                              | 10,226                    | 11,238,646                        | 427                       | 458,545                           | 538.26                    | 606,920                           | 79                        | 76                                |
| 80 and over.....                        | 5,721                     | 8,134,886                         | 593                       | 751,058                           | 742.67                    | 1,063,491                         | 80                        | 71                                |
| All ages.....                           | 24,527                    | \$ 26,987,135                     | 1,158                     | \$ 1,342,536                      | 1,473.02                  | \$ 1,842,065                      | <i>79%</i>                | <i>73%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 11 and over:                      |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 157                       | \$ 33,901                         | 0                         | \$ 0                              | 0.53                      | \$ 146                            | *                         | *                                 |
| 50-59.....                              | 540                       | 169,309                           | 10                        | 1,858                             | 5.73                      | 1,815                             | <i>175%</i>               | <i>102%</i>                       |
| 60-69.....                              | 3,058                     | 833,198                           | 55                        | 18,712                            | 76.06                     | 21,332                            | 72                        | 88                                |
| 70-79.....                              | 8,498                     | 3,644,606                         | 453                       | 179,295                           | 480.09                    | 212,356                           | 94                        | 84                                |
| 80 and over.....                        | 13,099                    | 6,699,098                         | 1,878                     | 998,058                           | 2,043.06                  | 1,021,318                         | 92                        | 98                                |
| All ages.....                           | 25,352                    | \$ 11,380,112                     | 2,396                     | \$1,197,923                       | 2,605.47                  | \$1,256,967                       | <i>92%</i>                | <i>95%</i>                        |
| Years 6 and over:                       |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 219                       | \$ 52,059                         | 0                         | \$ 0                              | 0.69                      | \$ 226                            | *                         | *                                 |
| 50-59.....                              | 821                       | 304,034                           | 13                        | 3,539                             | 8.98                      | 3,379                             | <i>145%</i>               | <i>105%</i>                       |
| 60-69.....                              | 4,501                     | 1,703,645                         | 75                        | 39,789                            | 112.30                    | 43,202                            | 67                        | 92                                |
| 70-79.....                              | 12,439                    | 6,764,081                         | 637                       | 316,144                           | 691.55                    | 389,758                           | 92                        | 81                                |
| 80 and over.....                        | 15,861                    | 9,885,803                         | 2,186                     | 1,280,089                         | 2,422.75                  | 1,475,638                         | 90                        | 87                                |
| All ages.....                           | 33,841                    | \$ 18,709,622                     | 2,911                     | \$1,639,561                       | 3,236.27                  | \$1,912,203                       | <i>90%</i>                | <i>86%</i>                        |
| All years:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 371                       | \$ 145,076                        | 0                         | \$ 0                              | 1.15                      | \$ 625                            | *                         | *                                 |
| 50-59.....                              | 1,841                     | 1,365,518                         | 26                        | 16,781                            | 20.79                     | 16,068                            | <i>125%</i>               | <i>104%</i>                       |
| 60-69.....                              | 10,123                    | 7,139,417                         | 177                       | 136,722                           | 252.47                    | 178,254                           | 70                        | 77                                |
| 70-79.....                              | 18,724                    | 14,883,252                        | 880                       | 637,840                           | 1,018.35                  | 819,276                           | 86                        | 78                                |
| 80 and over.....                        | 18,820                    | 14,833,984                        | 2,471                     | 1,749,116                         | 2,785.73                  | 2,084,809                         | 89                        | 84                                |
| All ages.....                           | 49,879                    | \$ 38,367,247                     | 3,554                     | \$2,540,459                       | 4,078.49                  | \$3,099,032                       | <i>87%</i>                | <i>82%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued  
 INDIVIDUAL IMMEDIATE ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 NONREFUND—FEMALE LIVES  
 EXPECTED DEATHS ON *a*-1949 ULTIMATE TABLE

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 1:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 45                        | \$ 69,777                         | 1                         | \$ 55                             | 0.05                      | \$ 153                            | *                         | *                                 |
| 50-59.....                              | 455                       | 613,176                           | 6                         | 19,987                            | 2.50                      | 3,483                             | *                         | *                                 |
| 60-69.....                              | 2,544                     | 2,403,751                         | 26                        | 16,950                            | 33.28                     | 31,960                            | <i>78%</i>                | <i>53%</i>                        |
| 70-79.....                              | 2,926                     | 3,487,764                         | 39                        | 43,307                            | 99.38                     | 120,408                           | <i>39</i>                 | <i>36</i>                         |
| 80 and over.....                        | 831                       | 1,248,091                         | 19                        | 32,778                            | 72.97                     | 110,091                           | <i>26</i>                 | <i>30</i>                         |
| All ages.....                           | 6,801                     | \$ 7,822,559                      | 91                        | \$ 113,077                        | 208.18                    | \$ 266,095                        | <i>44%</i>                | <i>42%</i>                        |
| Year 2:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 46                        | \$ 56,653                         | 0                         | \$ 0                              | 0.06                      | \$ 130                            | *                         | *                                 |
| 50-59.....                              | 331                       | 346,637                           | 4                         | 5,267                             | 1.81                      | 1,912                             | *                         | *                                 |
| 60-69.....                              | 2,166                     | 2,166,923                         | 25                        | 9,756                             | 28.77                     | 28,972                            | <i>87%</i>                | <i>34%</i>                        |
| 70-79.....                              | 2,723                     | 3,002,951                         | 65                        | 65,676                            | 94.17                     | 105,353                           | <i>69</i>                 | <i>62</i>                         |
| 80 and over.....                        | 898                       | 1,315,581                         | 56                        | 100,716                           | 81.54                     | 120,459                           | <i>69</i>                 | <i>84</i>                         |
| All ages.....                           | 6,164                     | \$ 6,888,745                      | 150                       | \$ 181,415                        | 206.35                    | \$ 256,826                        | <i>73%</i>                | <i>71%</i>                        |
| Year 3:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 39                        | \$ 36,543                         | 1                         | \$ 1,200                          | 0.03                      | \$ 88                             | *                         | *                                 |
| 50-59.....                              | 222                       | 219,270                           | 2                         | 4,021                             | 1.21                      | 1,229                             | *                         | *                                 |
| 60-69.....                              | 1,681                     | 1,665,904                         | 25                        | 17,006                            | 22.74                     | 22,774                            | <i>110%</i>               | <i>75%</i>                        |
| 70-79.....                              | 2,335                     | 2,414,954                         | 64                        | 79,793                            | 82.37                     | 86,479                            | <i>78</i>                 | <i>92</i>                         |
| 80 and over.....                        | 880                       | 1,163,879                         | 46                        | 63,876                            | 81.74                     | 110,621                           | <i>56</i>                 | <i>58</i>                         |
| All ages.....                           | 5,157                     | \$ 5,500,550                      | 138                       | \$ 165,896                        | 188.09                    | \$ 221,191                        | <i>73%</i>                | <i>75%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 4:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 29                        | \$ 12,733                         | 0                         | \$ 0                              | 0.02                      | \$ 24                             | *                         | *                                 |
| 50-59.....                              | 136                       | 108,912                           | 0                         | 0                                 | 0.71                      | 573                               | *                         | *                                 |
| 60-69.....                              | 1,261                     | 944,323                           | 9                         | 6,381                             | 17.56                     | 13,280                            | *                         | *                                 |
| 70-79.....                              | 1,894                     | 1,912,655                         | 51                        | 38,970                            | 67.09                     | 67,339                            | 76%                       | 58%                               |
| 80 and over.....                        | 848                       | 922,316                           | 59                        | 73,690                            | 81.18                     | 91,641                            | 73                        | 80                                |
| All ages.....                           | 4,168                     | \$ 3,900,939                      | 119                       | \$ 119,041                        | 166.56                    | \$ 172,857                        | 71%                       | 69%                               |
| Year 5:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 23                        | \$ 7,621                          | 0                         | \$ 0                              | 0.04                      | \$ 15                             | *                         | *                                 |
| 50-59.....                              | 108                       | 80,373                            | 1                         | 162                               | 0.59                      | 423                               | *                         | *                                 |
| 60-69.....                              | 878                       | 599,790                           | 12                        | 7,931                             | 12.55                     | 8,718                             | 96%                       | 91%                               |
| 70-79.....                              | 1,574                     | 1,517,346                         | 51                        | 47,069                            | 55.50                     | 54,402                            | 92                        | 87                                |
| 80 and over.....                        | 835                       | 833,018                           | 76                        | 78,420                            | 81.44                     | 82,001                            | 93                        | 96                                |
| All ages.....                           | 3,418                     | \$ 3,038,148                      | 140                       | \$ 133,582                        | 150.12                    | \$ 145,559                        | 93%                       | 92%                               |
| Year 6:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 15                        | \$ 6,108                          | 0                         | \$ 0                              | 0.01                      | \$ 12                             | *                         | *                                 |
| 50-59.....                              | 94                        | 80,656                            | 0                         | 0                                 | 0.49                      | 429                               | *                         | *                                 |
| 60-69.....                              | 628                       | 405,474                           | 5                         | 2,620                             | 8.69                      | 5,792                             | *                         | *                                 |
| 70-79.....                              | 1,445                     | 1,200,139                         | 53                        | 39,513                            | 50.40                     | 44,130                            | 105%                      | 90%                               |
| 80 and over.....                        | 789                       | 754,297                           | 69                        | 57,966                            | 78.23                     | 76,554                            | 88                        | 76                                |
| All ages.....                           | 2,971                     | \$ 2,446,674                      | 127                       | \$ 100,099                        | 137.82                    | \$ 126,917                        | 92%                       | 79%                               |
| Year 7:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 14                        | \$ 9,421                          | 0                         | \$ 0                              | 0.02                      | \$ 20                             | *                         | *                                 |
| 50-59.....                              | 84                        | 62,127                            | 0                         | 0                                 | 0.46                      | 340                               | *                         | *                                 |
| 60-69.....                              | 476                       | 267,600                           | 5                         | 1,669                             | 6.73                      | 3,849                             | *                         | *                                 |
| 70-79.....                              | 1,256                     | 951,711                           | 35                        | 26,512                            | 44.55                     | 35,005                            | 79%                       | 76%                               |
| 80 and over.....                        | 803                       | 788,668                           | 74                        | 69,626                            | 83.08                     | 81,187                            | 89                        | 86                                |
| All ages.....                           | 2,633                     | \$ 2,079,527                      | 114                       | \$ 97,807                         | 134.84                    | \$ 120,401                        | 85%                       | 81%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| <b>Year 8:</b>                          |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 11                        | \$ 7,090                          | 0                         | \$ 0                              | 0 01                      | \$ 17                             | *                         | *                                 |
| 50-59.....                              | 66                        | 48,839                            | 0                         | 0                                 | 0 35                      | 259                               | *                         | *                                 |
| 60-69.....                              | 449                       | 249,260                           | 5                         | 700                               | 6 44                      | 3,504                             | *                         | *                                 |
| 70-79.....                              | 1,244                     | 799,242                           | 24                        | 17,135                            | 45 23                     | 29,709                            | <i>53%</i>                | <i>58%</i>                        |
| 80 and over.....                        | 852                       | 796,882                           | 76                        | 73,746                            | 91 44                     | 84,882                            | 83                        | 87                                |
| All ages.....                           | 2,622                     | \$ 1,901,313                      | 105                       | \$ 91,581                         | 143 47                    | \$ 118,371                        | <i>73%</i>                | <i>77%</i>                        |
| <b>Year 9:</b>                          |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 7                         | \$ 4,960                          | 0                         | \$ 0                              | 0 01                      | \$ 12                             | *                         | *                                 |
| 50-59.....                              | 63                        | 41,728                            | 0                         | 0                                 | 0 34                      | 226                               | *                         | *                                 |
| 60-69.....                              | 390                       | 214,098                           | 3                         | 1,014                             | 5 67                      | 3,009                             | *                         | *                                 |
| 70-79.....                              | 1,366                     | 809,162                           | 42                        | 32,071                            | 49 94                     | 29,824                            | <i>84%</i>                | <i>108%</i>                       |
| 80 and over.....                        | 940                       | 800,548                           | 84                        | 55,841                            | 101 33                    | 88,194                            | 83                        | 63                                |
| All ages.....                           | 2,766                     | \$ 1,870,496                      | 129                       | \$ 88,926                         | 157 29                    | \$ 121,265                        | <i>82%</i>                | <i>73%</i>                        |
| <b>Year 10:</b>                         |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 7                         | \$ 4,807                          | 0                         | \$ 0                              | 0 01                      | \$ 13                             | *                         | *                                 |
| 50-59.....                              | 47                        | 28,889                            | 1                         | 1,694                             | 0 24                      | 150                               | *                         | *                                 |
| 60-69.....                              | 330                       | 170,458                           | 4                         | 2,057                             | 4 85                      | 2,426                             | *                         | *                                 |
| 70-79.....                              | 1,376                     | 753,129                           | 36                        | 18,159                            | 51 83                     | 28,444                            | <i>69%</i>                | <i>64%</i>                        |
| 80 and over.....                        | 976                       | 755,466                           | 100                       | 95,595                            | 108 04                    | 85,254                            | 93                        | 112                               |
| All ages.....                           | 2,736                     | \$ 1,712,749                      | 141                       | \$ 117,505                        | 164 97                    | \$ 116,287                        | <i>85%</i>                | <i>101%</i>                       |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 1-5:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 182                       | \$ 183,327                        | 2                         | \$ 1,255                          | 0.20                      | \$ 410                            | *                         | *                                 |
| 50-59.....                              | 1,252                     | 1,368,368                         | 13                        | 29,437                            | 6.82                      | 7,620                             | <i>191%</i>               | <i>386%</i>                       |
| 60-69.....                              | 8,530                     | 7,780,691                         | 97                        | 58,024                            | 114.90                    | 105,704                           | 84                        | 55                                |
| 70-79.....                              | 11,452                    | 12,335,670                        | 270                       | 274,815                           | 398.51                    | 433,981                           | 68                        | 63                                |
| 80 and over.....                        | 4,292                     | 5,482,885                         | 256                       | 349,480                           | 398.87                    | 514,813                           | 64                        | 68                                |
| All ages.....                           | 25,708                    | \$ 27,150,941                     | 638                       | \$ 713,011                        | 919.30                    | \$1,062,528                       | <i>69%</i>                | <i>67%</i>                        |
| Years 6-10:                             |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 54                        | \$ 32,386                         | 0                         | \$ 0                              | 0.06                      | \$ 74                             | *                         | *                                 |
| 50-59.....                              | 354                       | 262,239                           | 1                         | 1,694                             | 1.88                      | 1,404                             | *                         | *                                 |
| 60-69.....                              | 2,273                     | 1,306,890                         | 22                        | 8,060                             | 32.38                     | 18,580                            | <i>68%</i>                | <i>43%</i>                        |
| 70-79.....                              | 6,687                     | 4,513,383                         | 190                       | 133,390                           | 241.95                    | 167,112                           | 79                        | 80                                |
| 80 and over.....                        | 4,360                     | 3,895,861                         | 403                       | 352,774                           | 462.12                    | 416,071                           | 87                        | 85                                |
| All ages.....                           | 13,728                    | \$ 10,010,759                     | 616                       | \$ 495,918                        | 738.39                    | \$ 603,241                        | <i>83%</i>                | <i>82%</i>                        |
| Years 11-15:                            |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 236                       | \$ 215,713                        | 2                         | \$ 1,255                          | 0.26                      | \$ 484                            | *                         | *                                 |
| 50-59.....                              | 1,606                     | 1,630,607                         | 14                        | 31,131                            | 8.70                      | 9,024                             | <i>161%</i>               | <i>345%</i>                       |
| 60-69.....                              | 10,803                    | 9,087,581                         | 119                       | 66,084                            | 147.28                    | 124,284                           | 81                        | 53                                |
| 70-79.....                              | 18,139                    | 16,849,053                        | 460                       | 408,205                           | 640.46                    | 601,093                           | 72                        | 68                                |
| 80 and over.....                        | 8,652                     | 9,378,746                         | 659                       | 702,254                           | 860.99                    | 930,884                           | 77                        | 75                                |
| All ages.....                           | 39,436                    | \$ 37,161,700                     | 1,254                     | \$1,208,929                       | 1,657.69                  | \$1,665,769                       | <i>76%</i>                | <i>73%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—NONREFUND—FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 11 and over:                      |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 338                       | \$ 99,716                         | 4                         | \$ 375                            | 0.66                      | \$ 220                            | *                         | *                                 |
| 50-59.....                              | 991                       | 356,823                           | 6                         | 2,187                             | 5.12                      | 1,874                             | *                         | *                                 |
| 60-69.....                              | 5,754                     | 1,962,849                         | 94                        | 28,781                            | 81.47                     | 27,452                            | 115%                      | 105%                              |
| 70-79.....                              | 28,134                    | 8,746,307                         | 1,115                     | 314,306                           | 1,106.58                  | 341,384                           | 101                       | 92                                |
| 80 and over.....                        | 56,709                    | 16,530,350                        | 6,881                     | 2,124,309                         | 7,514.91                  | 2,237,457                         | 92                        | 95                                |
| All ages.....                           | 91,926                    | \$ 27,696,045                     | 8,100                     | \$2,469,958                       | 8,708.74                  | \$2,608,387                       | 93%                       | 95%                               |
| Years 6 and over:                       |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 392                       | \$ 132,102                        | 4                         | \$ 375                            | 0.72                      | \$ 294                            | *                         | *                                 |
| 50-59.....                              | 1,345                     | 619,062                           | 7                         | 3,881                             | 7.00                      | 3,278                             | *                         | *                                 |
| 60-69.....                              | 8,027                     | 3,269,739                         | 116                       | 36,841                            | 113.85                    | 46,032                            | 102%                      | 80%                               |
| 70-79.....                              | 34,821                    | 13,259,690                        | 1,305                     | 447,696                           | 1,348.53                  | 508,496                           | 97                        | 88                                |
| 80 and over.....                        | 61,069                    | 20,426,211                        | 7,284                     | 2,477,083                         | 7,977.03                  | 2,653,528                         | 91                        | 93                                |
| All ages.....                           | 105,654                   | \$ 37,706,804                     | 8,716                     | \$2,965,876                       | 9,447.13                  | \$3,211,628                       | 92%                       | 92%                               |
| All years:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 574                       | \$ 315,429                        | 6                         | \$ 1,630                          | 0.92                      | \$ 704                            | *                         | *                                 |
| 50-59.....                              | 2,597                     | 1,987,430                         | 20                        | 33,318                            | 13.82                     | 10,898                            | 145%                      | 306%                              |
| 60-69.....                              | 16,557                    | 11,050,430                        | 213                       | 94,865                            | 228.75                    | 151,736                           | 93                        | 63                                |
| 70-79.....                              | 46,273                    | 25,595,360                        | 1,575                     | 722,511                           | 1,747.04                  | 942,477                           | 90                        | 77                                |
| 80 and over.....                        | 65,361                    | 25,909,096                        | 7,540                     | 2,826,563                         | 8,375.90                  | 3,168,341                         | 90                        | 89                                |
| All ages.....                           | 131,362                   | \$ 64,857,745                     | 9,354                     | \$3,678,887                       | 10,366.43                 | \$4,274,156                       | 90%                       | 86%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.



TABLE C—Continued  
 INDIVIDUAL IMMEDIATE ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 REFUND—MALE LIVES  
 EXPECTED DEATHS ON *a*-1949 ULTIMATE TABLE

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 1:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 292                       | \$ 265,767                        | 2                         | \$ 1,480                          | 0.77                      | \$ 864                            | *                         | *                                 |
| 50-59.....                              | 860                       | 1,018,277                         | 20                        | 16,128                            | 10.10                     | 12,025                            | <i>198%</i>               | <i>134%</i>                       |
| 60-69.....                              | 6,207                     | 6,311,329                         | 155                       | 135,819                           | 145.43                    | 147,532                           | 107                       | 92                                |
| 70-79.....                              | 2,762                     | 3,516,225                         | 95                        | 130,185                           | 135.77                    | 178,701                           | 70                        | 73                                |
| 80 and over.....                        | 665                       | 1,036,424                         | 44                        | 92,771                            | 73.82                     | 117,448                           | 60                        | 79                                |
| All ages.....                           | 10,786                    | \$ 12,148,022                     | 316                       | \$ 376,383                        | 365.89                    | \$ 456,570                        | <i>86%</i>                | <i>82%</i>                        |
| Year 2:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 265                       | \$ 236,989                        | 2                         | \$ 2,400                          | 0.71                      | \$ 743                            | *                         | *                                 |
| 50-59.....                              | 645                       | 786,145                           | 15                        | 12,396                            | 7.59                      | 9,498                             | <i>198%</i>               | <i>131%</i>                       |
| 60-69.....                              | 4,653                     | 4,637,341                         | 125                       | 110,080                           | 113.37                    | 112,222                           | 110                       | 98                                |
| 70-79.....                              | 2,605                     | 3,139,037                         | 116                       | 124,023                           | 129.09                    | 159,767                           | 90                        | 78                                |
| 80 and over.....                        | 663                       | 1,014,524                         | 65                        | 97,366                            | 76.37                     | 117,613                           | 85                        | 83                                |
| All ages.....                           | 8,831                     | \$ 9,814,036                      | 323                       | \$ 346,265                        | 327.13                    | \$ 399,843                        | <i>99%</i>                | <i>87%</i>                        |
| Year 3:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 213                       | \$ 179,475                        | 2                         | \$ 1,465                          | 0.55                      | \$ 584                            | *                         | *                                 |
| 50-59.....                              | 450                       | 547,063                           | 7                         | 5,471                             | 5.25                      | 6,567                             | *                         | *                                 |
| 60-69.....                              | 3,303                     | 3,262,445                         | 76                        | 64,581                            | 83.53                     | 82,025                            | <i>91%</i>                | <i>79%</i>                        |
| 70-79.....                              | 2,151                     | 2,361,409                         | 96                        | 90,475                            | 107.31                    | 119,533                           | 89                        | 76                                |
| 80 and over.....                        | 568                       | 817,547                           | 48                        | 52,190                            | 67.05                     | 95,660                            | 72                        | 55                                |
| All ages.....                           | 6,685                     | \$ 7,167,939                      | 229                       | \$ 214,182                        | 263.69                    | \$ 304,369                        | <i>87%</i>                | <i>70%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—REFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 4:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 159                       | \$ 146,540                        | 1                         | \$ 178                            | 0.43                      | \$ 476                            | *                         | *                                 |
| 50-59.....                              | 339                       | 337,279                           | 2                         | 1,151                             | 3.89                      | 3,952                             | *                         | *                                 |
| 60-69.....                              | 2,185                     | 2,097,165                         | 60                        | 44,946                            | 57.39                     | 54,239                            | 105%                      | 83%                               |
| 70-79.....                              | 1,754                     | 1,876,468                         | 85                        | 107,809                           | 87.42                     | 95,007                            | 97                        | 113                               |
| 80 and over.....                        | 521                       | 697,121                           | 50                        | 63,021                            | 64.55                     | 84,421                            | 77                        | 75                                |
| All ages.....                           | 4,958                     | \$ 5,154,573                      | 198                       | \$ 217,105                        | 213.68                    | \$ 238,095                        | 93%                       | 91%                               |
| Year 5:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 114                       | \$ 92,054                         | 0                         | \$ 0                              | 0.26                      | \$ 300                            | *                         | *                                 |
| 50-59.....                              | 282                       | 252,020                           | 6                         | 3,522                             | 3.22                      | 2,863                             | *                         | *                                 |
| 60-69.....                              | 1,428                     | 1,349,347                         | 39                        | 36,347                            | 38.60                     | 35,754                            | 101%                      | 102%                              |
| 70-79.....                              | 1,495                     | 1,346,495                         | 66                        | 76,771                            | 73.81                     | 67,814                            | 89                        | 113                               |
| 80 and over.....                        | 493                       | 535,756                           | 49                        | 56,738                            | 63.41                     | 68,425                            | 77                        | 83                                |
| All ages.....                           | 3,812                     | \$ 3,575,672                      | 160                       | \$ 173,378                        | 179.30                    | \$ 175,156                        | 89%                       | 99%                               |
| Year 6:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 97                        | \$ 72,176                         | 0                         | \$ 0                              | 0.24                      | \$ 272                            | *                         | *                                 |
| 50-59.....                              | 197                       | 193,024                           | 3                         | 4,656                             | 2.21                      | 2,204                             | *                         | *                                 |
| 60-69.....                              | 793                       | 695,802                           | 24                        | 17,038                            | 19.91                     | 17,569                            | 121%                      | 97%                               |
| 70-79.....                              | 1,703                     | 1,355,001                         | 90                        | 83,155                            | 79.61                     | 63,595                            | 113                       | 131                               |
| 80 and over.....                        | 499                       | 473,711                           | 40                        | 31,653                            | 65.61                     | 59,245                            | 61                        | 53                                |
| All ages.....                           | 3,289                     | \$ 2,789,714                      | 157                       | \$ 136,502                        | 167.58                    | \$ 142,885                        | 94%                       | 96%                               |
| Year 7:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 90                        | \$ 61,334                         | 1                         | \$ 599                            | 0.20                      | \$ 207                            | *                         | *                                 |
| 50-59.....                              | 172                       | 120,522                           | 5                         | 1,869                             | 1.97                      | 1,390                             | *                         | *                                 |
| 60-69.....                              | 549                       | 398,824                           | 14                        | 7,564                             | 13.65                     | 10,010                            | 103%                      | 76%                               |
| 70-79.....                              | 1,494                     | 1,072,828                         | 60                        | 30,377                            | 72.78                     | 53,284                            | 82                        | 57                                |
| 80 and over.....                        | 500                       | 373,505                           | 49                        | 40,765                            | 66.85                     | 49,966                            | 73                        | 82                                |
| All ages.....                           | 2,805                     | \$ 2,027,013                      | 129                       | \$ 81,174                         | 155.45                    | \$ 114,857                        | 83%                       | 71%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C.—Continued—REFUND—MALE LIVES

| ATTAINED AGES BY CONTRACT YEAR | EXPOSURES           |                          | ACTUAL DEATHS       |                          | EXPECTED DEATHS     |                          | MORTALITY RATIO     |                          |
|--------------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|
|                                | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income | Number of Contracts | Amounts of Annual Income |
| Year 8:                        |                     |                          |                     |                          |                     |                          |                     |                          |
| Under 50.....                  | 77                  | \$ 37,979                | 0                   | \$ 0                     | 0.17                | \$ 107                   | *                   | *                        |
| 50-59.....                     | 152                 | 96,560                   | 1                   | 49                       | 1.76                | 1,122                    | *                   | *                        |
| 60-69.....                     | 466                 | 305,910                  | 10                  | 6,878                    | 11.61               | 7,652                    | <i>86%</i>          | <i>90%</i>               |
| 70-79.....                     | 1,425               | 1,012,745                | 68                  | 47,486                   | 73.67               | 54,103                   | 92                  | 88                       |
| 80 and over.....               | 507                 | 356,124                  | 49                  | 44,763                   | 67.35               | 47,443                   | 73                  | 94                       |
| All ages.....                  | 2,627               | \$ 1,809,318             | 128                 | \$ 99,176                | 154.56              | \$ 110,427               | <i>83%</i>          | <i>90%</i>               |
| Year 9:                        |                     |                          |                     |                          |                     |                          |                     |                          |
| Under 50.....                  | 135                 | \$ 50,546                | 0                   | \$ 0                     | 0.42                | \$ 149                   | *                   | *                        |
| 50-59.....                     | 200                 | 80,025                   | 4                   | 1,032                    | 2.16                | 922                      | *                   | *                        |
| 60-69.....                     | 488                 | 270,382                  | 16                  | 6,272                    | 11.95               | 6,823                    | <i>134%</i>         | <i>92%</i>               |
| 70-79.....                     | 1,349               | 908,587                  | 75                  | 46,400                   | 72.70               | 50,719                   | 103                 | 91                       |
| 80 and over.....               | 528                 | 653,236                  | 72                  | 42,941                   | 69.83               | 76,801                   | 103                 | 56                       |
| All ages.....                  | 2,700               | \$ 1,962,776             | 167                 | \$ 96,645                | 157.06              | \$ 135,414               | <i>106%</i>         | <i>71%</i>               |
| Year 10:                       |                     |                          |                     |                          |                     |                          |                     |                          |
| Under 50.....                  | 130                 | \$ 53,999                | 0                   | \$ 0                     | 0.39                | \$ 155                   | *                   | *                        |
| 50-59.....                     | 196                 | 56,899                   | 1                   | 155                      | 2.10                | 647                      | *                   | *                        |
| 60-69.....                     | 475                 | 241,465                  | 12                  | 3,735                    | 11.68               | 6,044                    | <i>103%</i>         | <i>62%</i>               |
| 70-79.....                     | 1,173               | 747,211                  | 59                  | 32,416                   | 65.92               | 43,220                   | 90                  | 75                       |
| 80 and over.....               | 547                 | 697,801                  | 69                  | 77,064                   | 72.13               | 84,305                   | 96                  | 91                       |
| All ages.....                  | 2,521               | \$ 1,797,375             | 141                 | \$ 113,370               | 152.22              | \$ 134,371               | <i>93%</i>          | <i>84%</i>               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued REFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 1-5:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 1,043                     | \$ 920,825                        | 7                         | \$ 5,523                          | 2.72                      | \$ 2,967                          | *                         | *                                 |
| 50-59.....                              | 2,576                     | 2,940,784                         | 50                        | 38,668                            | 30.05                     | 34,905                            | 166%                      | 111%                              |
| 60-69.....                              | 17,776                    | 17,657,627                        | 455                       | 391,773                           | 438.32                    | 431,772                           | 104                       | 91                                |
| 70-79.....                              | 10,767                    | 12,239,634                        | 458                       | 529,263                           | 533.40                    | 620,822                           | 86                        | 85                                |
| 80 and over.....                        | 2,910                     | 4,101,372                         | 256                       | 362,086                           | 345.20                    | 483,567                           | 74                        | 75                                |
| All ages.....                           | 35,072                    | \$ 37,860,242                     | 1,226                     | \$ 1,327,313                      | 1,349.69                  | \$ 1,574,033                      | 91%                       | 84%                               |
| Years 6-10:                             |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 529                       | \$ 276,034                        | 1                         | \$ 599                            | 1.42                      | \$ 890                            | *                         | *                                 |
| 50-59.....                              | 917                       | 547,030                           | 14                        | 7,761                             | 10.20                     | 6,285                             | 137%                      | 123%                              |
| 60-69.....                              | 2,771                     | 1,912,383                         | 76                        | 41,487                            | 68.80                     | 48,098                            | 110                       | 86                                |
| 70-79.....                              | 7,144                     | 5,096,372                         | 352                       | 239,834                           | 364.68                    | 264,921                           | 97                        | 91                                |
| 80 and over.....                        | 2,581                     | 2,554,377                         | 279                       | 237,186                           | 341.77                    | 317,760                           | 82                        | 75                                |
| All ages.....                           | 13,942                    | \$ 10,386,196                     | 722                       | \$ 526,867                        | 786.87                    | \$ 637,954                        | 92%                       | 83%                               |
| Years 1-10:                             |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 1,572                     | \$ 1,196,859                      | 8                         | \$ 6,122                          | 4.14                      | \$ 3,857                          | *                         | *                                 |
| 50-59.....                              | 3,493                     | 3,487,814                         | 64                        | 46,429                            | 40.25                     | 41,190                            | 159%                      | 113%                              |
| 60-69.....                              | 20,547                    | 19,570,010                        | 531                       | 433,260                           | 507.12                    | 479,870                           | 105                       | 90                                |
| 70-79.....                              | 17,911                    | 17,336,006                        | 810                       | 769,097                           | 898.08                    | 885,743                           | 90                        | 87                                |
| 80 and over.....                        | 5,491                     | 6,655,749                         | 535                       | 599,272                           | 686.97                    | 801,327                           | 78                        | 75                                |
| All ages.....                           | 49,014                    | \$ 48,246,438                     | 1,948                     | \$ 1,854,180                      | 2,136.56                  | \$ 2,211,987                      | 91%                       | 84%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—REFUND—MALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 11 and over:                      |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 1,659                     | \$ 521,745                        | 14                        | \$ 11,417                         | 5.46                      | \$ 1,839                          | <i>256%</i>               | <i>621%</i>                       |
| 50-59.....                              | 3,389                     | 1,144,505                         | 37                        | 16,473                            | 37.82                     | 12,674                            | <i>98</i>                 | <i>130</i>                        |
| 60-69.....                              | 9,497                     | 3,041,482                         | 241                       | 110,210                           | 232.49                    | 74,639                            | <i>104</i>                | <i>148</i>                        |
| 70-79.....                              | 19,447                    | 7,272,295                         | 1,148                     | 451,073                           | 1,084.59                  | 409,151                           | <i>106</i>                | <i>110</i>                        |
| 80 and over.....                        | 21,233                    | 8,268,964                         | 3,390                     | 1,342,923                         | 3,174.94                  | 1,215,531                         | <i>107</i>                | <i>110</i>                        |
| All ages.....                           | 55,225                    | \$ 20,248,991                     | 4,830                     | \$1,932,096                       | 4,535.30                  | \$1,713,834                       | <i>106%</i>               | <i>113%</i>                       |
| Years 6 and over:                       |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 2,188                     | \$ 797,779                        | 15                        | \$ 12,016                         | 6.88                      | \$ 2,729                          | <i>218%</i>               | <i>440%</i>                       |
| 50-59.....                              | 4,306                     | 1,691,535                         | 51                        | 24,234                            | 48.02                     | 18,959                            | <i>106</i>                | <i>128</i>                        |
| 60-69.....                              | 12,273                    | 4,954,243                         | 317                       | 151,697                           | 301.29                    | 122,737                           | <i>105</i>                | <i>124</i>                        |
| 70-79.....                              | 26,586                    | 12,368,289                        | 1,500                     | 690,907                           | 1,449.27                  | 674,072                           | <i>104</i>                | <i>102</i>                        |
| 80 and over.....                        | 23,814                    | 10,823,341                        | 3,669                     | 1,580,109                         | 3,516.71                  | 1,533,291                         | <i>104</i>                | <i>103</i>                        |
| All ages.....                           | 69,167                    | \$ 30,635,187                     | 5,552                     | \$2,458,963                       | 5,322.17                  | \$2,351,788                       | <i>104%</i>               | <i>105%</i>                       |
| All years:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 3,231                     | \$ 1,718,604                      | 22                        | \$ 17,539                         | 9.60                      | \$ 5,696                          | <i>220%</i>               | <i>308%</i>                       |
| 50-59.....                              | 6,882                     | 4,632,319                         | 101                       | 62,902                            | 78.07                     | 53,864                            | <i>129</i>                | <i>117</i>                        |
| 60-69.....                              | 30,044                    | 22,611,492                        | 772                       | 543,470                           | 739.61                    | 554,509                           | <i>104</i>                | <i>98</i>                         |
| 70-79.....                              | 37,358                    | 24,608,301                        | 1,958                     | 1,220,170                         | 1,982.67                  | 1,294,894                         | <i>99</i>                 | <i>94</i>                         |
| 80 and over.....                        | 26,724                    | 14,924,713                        | 3,925                     | 1,942,195                         | 3,861.91                  | 2,016,858                         | <i>102</i>                | <i>96</i>                         |
| All ages.....                           | 104,239                   | \$ 68,495,429                     | 6,778                     | \$3,786,276                       | 6,671.86                  | \$3,925,821                       | <i>102%</i>               | <i>96%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C *Continued*  
 INDIVIDUAL IMMEDIATE ANNUITIES  
 ISSUES OF 1931 TO 1966  
 EXPERIENCE BETWEEN 1963 AND 1967 ANNIVERSARIES  
 REFUND - FEMALE LIVES  
 EXPECTED DEATHS ON A 1949 ULTIMATE TABLE

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 1:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 501                       | \$ 516,479                        | 1                         | \$ 319                            | 0.84                      | \$ 996                            | *                         | *                                 |
| 50-59.....                              | 2,162                     | 2,207,154                         | 12                        | 10,843                            | 11.31                     | 11,439                            | <i>106%</i>               | <i>95%</i>                        |
| 60-69.....                              | 7,422                     | 6,320,316                         | 64                        | 83,515                            | 93.01                     | 79,651                            | 69                        | 105                               |
| 70-79.....                              | 5,050                     | 5,129,405                         | 105                       | 114,019                           | 167.60                    | 172,422                           | 63                        | 66                                |
| 80 and over.....                        | 1,248                     | 1,665,063                         | 65                        | 96,744                            | 105.66                    | 140,287                           | 62                        | 69                                |
| All ages.....                           | 16,383                    | \$ 15,838,417                     | 247                       | \$ 305,440                        | 378.42                    | \$ 404,795                        | <i>65%</i>                | <i>75%</i>                        |
| Year 2:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 417                       | \$ 407,032                        | 0                         | \$ 0                              | 0.68                      | \$ 773                            | *                         | *                                 |
| 50-59.....                              | 1,601                     | 1,657,794                         | 6                         | 3,114                             | 8.37                      | 8,607                             | *                         | *                                 |
| 60-69.....                              | 5,890                     | 4,875,855                         | 64                        | 56,756                            | 75.35                     | 62,307                            | <i>85%</i>                | <i>91%</i>                        |
| 70-79.....                              | 4,508                     | 4,290,598                         | 102                       | 94,120                            | 150.82                    | 145,799                           | 68                        | 65                                |
| 80 and over.....                        | 1,249                     | 1,509,593                         | 96                        | 121,296                           | 109.58                    | 134,876                           | 88                        | 90                                |
| All ages.....                           | 13,665                    | \$ 12,740,872                     | 268                       | \$ 275,286                        | 344.80                    | \$ 352,362                        | <i>78%</i>                | <i>78%</i>                        |
| Year 3:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 310                       | \$ 310,989                        | 1                         | \$ 240                            | 0.48                      | \$ 564                            | *                         | *                                 |
| 50-59.....                              | 1,137                     | 1,231,062                         | 9                         | 5,496                             | 5.93                      | 6,502                             | *                         | *                                 |
| 60-69.....                              | 4,333                     | 3,526,026                         | 52                        | 55,273                            | 57.16                     | 46,163                            | <i>91%</i>                | <i>115%</i>                       |
| 70-79.....                              | 3,595                     | 3,176,584                         | 89                        | 81,529                            | 121.05                    | 107,535                           | 74                        | 76                                |
| 80 and over.....                        | 1,136                     | 1,310,546                         | 91                        | 90,027                            | 100.71                    | 118,770                           | 90                        | 76                                |
| All ages.....                           | 10,511                    | \$ 9,555,207                      | 242                       | \$ 230,565                        | 285.33                    | \$ 279,534                        | <i>85%</i>                | <i>82%</i>                        |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—REFUND—FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 4:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 227                       | \$ 228,484                        | 6                         | \$ 1,616                          | 0.33                      | \$ 407                            | *                         | *                                 |
| 50-59.....                              | 788                       | 762,219                           | 3                         | 2,682                             | 4.07                      | 4,019                             | *                         | *                                 |
| 60-69.....                              | 3,102                     | 2,379,427                         | 27                        | 46,875                            | 41.79                     | 31,329                            | 65%                       | 150%                              |
| 70-79.....                              | 2,960                     | 2,399,948                         | 76                        | 62,653                            | 100.26                    | 81,479                            | 76                        | 77                                |
| 80 and over.....                        | 983                       | 1,025,721                         | 58                        | 45,590                            | 88.68                     | 93,651                            | 65                        | 49                                |
| All ages.....                           | 8,060                     | \$ 6,795,799                      | 170                       | \$ 159,416                        | 235.13                    | \$ 210,885                        | 72%                       | 76%                               |
| Year 5:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 161                       | \$ 170,416                        | 0                         | \$ 0                              | 0.21                      | \$ 293                            | *                         | *                                 |
| 50-59.....                              | 574                       | 478,599                           | 4                         | 1,701                             | 2.98                      | 2,509                             | *                         | *                                 |
| 60-69.....                              | 2,290                     | 1,634,241                         | 30                        | 18,699                            | 31.69                     | 21,924                            | 95%                       | 85%                               |
| 70-79.....                              | 2,487                     | 1,825,317                         | 82                        | 62,343                            | 84.92                     | 63,468                            | 97                        | 98                                |
| 80 and over.....                        | 927                       | 789,262                           | 69                        | 48,068                            | 86.20                     | 75,656                            | 80                        | 64                                |
| All ages.....                           | 6,439                     | \$ 4,897,835                      | 185                       | \$ 130,811                        | 206.00                    | \$ 163,850                        | 90%                       | 80%                               |
| Year 6:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 131                       | \$ 109,978                        | 0                         | \$ 0                              | 0.17                      | \$ 175                            | *                         | *                                 |
| 50-59.....                              | 445                       | 351,428                           | 2                         | 4,704                             | 2.26                      | 1,802                             | *                         | *                                 |
| 60-69.....                              | 1,750                     | 1,216,917                         | 20                        | 7,832                             | 23.44                     | 16,043                            | 85%                       | 49%                               |
| 70-79.....                              | 2,427                     | 1,630,961                         | 55                        | 36,484                            | 81.37                     | 56,438                            | 68                        | 65                                |
| 80 and over.....                        | 934                       | 664,176                           | 80                        | 43,876                            | 88.67                     | 65,030                            | 90                        | 67                                |
| All ages.....                           | 5,687                     | \$ 3,973,460                      | 157                       | \$ 92,896                         | 195.91                    | \$ 139,488                        | 80%                       | 67%                               |
| Year 7:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 109                       | \$ 61,891                         | 1                         | \$ 40                             | 0.12                      | \$ 100                            | *                         | *                                 |
| 50-59.....                              | 369                       | 257,245                           | 2                         | 539                               | 1.92                      | 1,320                             | *                         | *                                 |
| 60-69.....                              | 1,424                     | 870,298                           | 18                        | 11,544                            | 19.15                     | 11,603                            | 94%                       | 99%                               |
| 70-79.....                              | 2,202                     | 1,381,965                         | 47                        | 32,323                            | 74.75                     | 47,605                            | 63                        | 68                                |
| 80 and over.....                        | 963                       | 604,208                           | 83                        | 53,681                            | 94.26                     | 58,662                            | 88                        | 92                                |
| All ages.....                           | 5,067                     | \$ 3,175,607                      | 151                       | \$ 98,127                         | 190.20                    | \$ 119,290                        | 79%                       | 82%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued—REFUND— FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Year 8:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 133                       | \$ 64,614                         | 1                         | \$ 80                             | 0.17                      | \$ 109                            | *                         | *                                 |
| 50-59.....                              | 341                       | 235,724                           | 6                         | 6,133                             | 1.79                      | 1,232                             | *                         | *                                 |
| 60-69.....                              | 1,335                     | 788,183                           | 16                        | 7,423                             | 18.11                     | 10,599                            | 88%                       | 70%                               |
| 70-79.....                              | 2,137                     | 1,270,160                         | 62                        | 46,230                            | 74.08                     | 43,999                            | 84                        | 105                               |
| 80 and over.....                        | 1,052                     | 657,078                           | 107                       | 46,780                            | 106.34                    | 66,220                            | 101                       | 71                                |
| All ages.....                           | 4,998                     | \$ 3,015,759                      | 192                       | \$ 106,646                        | 200.49                    | \$ 122,159                        | 96%                       | 87%                               |
| Year 9:                                 |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 127                       | \$ 55,404                         | 0                         | \$ 0                              | 0.20                      | \$ 104                            | *                         | *                                 |
| 50-59.....                              | 302                       | 203,819                           | 0                         | 0                                 | 1.60                      | 1,083                             | *                         | *                                 |
| 60-69.....                              | 1,246                     | 704,696                           | 15                        | 10,973                            | 17.15                     | 9,554                             | 87%                       | 115%                              |
| 70-79.....                              | 2,196                     | 1,257,180                         | 63                        | 40,881                            | 76.14                     | 43,889                            | 83                        | 93                                |
| 80 and over.....                        | 1,101                     | 658,176                           | 125                       | 64,598                            | 113.85                    | 69,166                            | 110                       | 93                                |
| All ages.....                           | 4,972                     | \$ 2,879,275                      | 203                       | \$ 116,452                        | 208.94                    | \$ 123,796                        | 97%                       | 94%                               |
| Year 10:                                |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 99                        | \$ 51,920                         | 0                         | \$ 0                              | 0.14                      | \$ 94                             | *                         | *                                 |
| 50-59.....                              | 294                       | 186,773                           | 4                         | 700                               | 1.50                      | 962                               | *                         | *                                 |
| 60-69.....                              | 1,146                     | 649,362                           | 20                        | 16,967                            | 15.86                     | 8,787                             | 126%                      | 193%                              |
| 70-79.....                              | 2,294                     | 1,190,523                         | 79                        | 33,550                            | 80.06                     | 41,429                            | 99                        | 81                                |
| 80 and over.....                        | 1,191                     | 670,146                           | 127                       | 73,217                            | 124.09                    | 71,151                            | 102                       | 103                               |
| All ages.....                           | 5,024                     | \$ 2,748,724                      | 230                       | \$ 124,434                        | 221.65                    | \$ 122,423                        | 104%                      | 102%                              |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.



TABLE C—Continued—REFUND—FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 1-5:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 1,616                     | \$ 1,633,400                      | 8                         | \$ 2,175                          | 2.54                      | \$ 3,033                          | *                         | *                                 |
| 50-59.....                              | 6,262                     | 6,336,828                         | 34                        | 23,836                            | 32.66                     | 33,076                            | 104%                      | 72%                               |
| 60-69.....                              | 23,037                    | 18,735,865                        | 237                       | 259,118                           | 299.00                    | 241,374                           | 79                        | 107                               |
| 70-79.....                              | 18,600                    | 16,821,852                        | 454                       | 414,664                           | 624.65                    | 570,703                           | 73                        | 73                                |
| 80 and over.....                        | 5,543                     | 6,300,185                         | 379                       | 401,725                           | 490.83                    | 563,240                           | 77                        | 71                                |
| All ages.....                           | 55,058                    | \$ 49,828,130                     | 1,112                     | \$1,101,518                       | 1,449.68                  | \$1,411,426                       | 77%                       | 78%                               |
| Years 6-10:                             |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 599                       | \$ 343,807                        | 2                         | \$ 120                            | 0.80                      | \$ 582                            | *                         | *                                 |
| 50-59.....                              | 1,751                     | 1,234,989                         | 14                        | 12,076                            | 9.07                      | 6,399                             | 154%                      | 189%                              |
| 60-69.....                              | 6,901                     | 4,229,456                         | 89                        | 54,739                            | 93.71                     | 56,586                            | 95                        | 97                                |
| 70-79.....                              | 11,256                    | 6,730,789                         | 306                       | 189,468                           | 386.40                    | 233,360                           | 79                        | 81                                |
| 80 and over.....                        | 5,241                     | 3,253,784                         | 522                       | 282,152                           | 527.21                    | 330,229                           | 99                        | 85                                |
| All ages.....                           | 25,748                    | \$ 15,792,825                     | 933                       | \$ 538,555                        | 1,017.19                  | \$ 627,156                        | 92%                       | 86%                               |
| Years 11-15:                            |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 2,215                     | \$ 1,977,207                      | 10                        | \$ 2,295                          | 3.34                      | \$ 3,615                          | 299%                      | 63%                               |
| 50-59.....                              | 8,013                     | 7,571,817                         | 48                        | 35,912                            | 41.73                     | 39,475                            | 115                       | 91                                |
| 60-69.....                              | 29,938                    | 22,965,321                        | 326                       | 313,857                           | 392.71                    | 297,960                           | 83                        | 105                               |
| 70-79.....                              | 29,856                    | 23,552,641                        | 760                       | 604,132                           | 1,011.05                  | 804,063                           | 75                        | 75                                |
| 80 and over.....                        | 10,784                    | 9,553,969                         | 901                       | 683,877                           | 1,018.04                  | 893,469                           | 89                        | 77                                |
| All ages.....                           | 80,806                    | \$ 65,620,955                     | 2,045                     | \$1,640,073                       | 2,466.87                  | \$2,038,582                       | 83%                       | 80%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.

TABLE C—Continued— REFUND— FEMALE LIVES

| ATTAINED<br>AGES BY<br>CONTRACT<br>YEAR | EXPOSURES                 |                                   | ACTUAL DEATHS             |                                   | EXPECTED DEATHS           |                                   | MORTALITY RATIO           |                                   |
|---|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|   | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income | Number<br>of<br>Contracts | Amounts<br>of<br>Annual<br>Income |
| Years 11 and over:                      |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 2,718                     | \$ 924,598                        | 8                         | \$ 3,034                          | 5.25                      | \$ 1,815                          | *                         | *                                 |
| 50-59.....                              | 6,191                     | 2,413,218                         | 41                        | 13,773                            | 31.46                     | 12,273                            | 130%                      | 112%                              |
| 60-69.....                              | 20,310                    | 7,028,467                         | 297                       | 109,861                           | 279.61                    | 94,889                            | 106                       | 116                               |
| 70-79.....                              | 65,694                    | 19,589,824                        | 2,442                     | 690,449                           | 2,481.21                  | 730,421                           | 98                        | 95                                |
| 80 and over.....                        | 90,087                    | 23,269,732                        | 11,237                    | 2,881,599                         | 11,339.25                 | 2,898,669                         | 99                        | 99                                |
| All ages.....                           | 185,000                   | \$ 53,225,839                     | 14,025                    | \$3,698,716                       | 14,136.78                 | \$3,738,067                       | 99%                       | 99%                               |
| Years 6 and over:                       |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 3,317                     | \$ 1,268,405                      | 10                        | \$ 3,154                          | 6.05                      | \$ 2,397                          | 165%                      | 132%                              |
| 50-59.....                              | 7,942                     | 3,648,207                         | 55                        | 25,849                            | 40.53                     | 18,672                            | 136                       | 138                               |
| 60-69.....                              | 27,211                    | 11,257,923                        | 386                       | 164,600                           | 373.32                    | 151,475                           | 103                       | 109                               |
| 70-79.....                              | 76,950                    | 26,320,613                        | 2,748                     | 879,917                           | 2,867.61                  | 963,781                           | 96                        | 91                                |
| 80 and over.....                        | 95,328                    | 26,523,516                        | 11,759                    | 3,163,751                         | 11,866.46                 | 3,228,898                         | 99                        | 98                                |
| All ages.....                           | 210,748                   | \$ 69,018,664                     | 14,958                    | \$4,237,271                       | 15,153.97                 | \$4,365,223                       | 99%                       | 97%                               |
| All years:                              |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Under 50.....                           | 4,933                     | \$ 2,901,805                      | 18                        | \$ 5,329                          | 8.59                      | \$ 5,430                          | 210%                      | 98%                               |
| 50-59.....                              | 14,204                    | 9,985,035                         | 89                        | 49,685                            | 73.19                     | 51,748                            | 122                       | 96                                |
| 60-69.....                              | 50,248                    | 29,993,788                        | 623                       | 423,718                           | 672.32                    | 392,849                           | 93                        | 108                               |
| 70-79.....                              | 95,550                    | 43,142,465                        | 3,202                     | 1,294,581                         | 3,492.26                  | 1,534,484                         | 92                        | 84                                |
| 80 and over.....                        | 100,871                   | 32,823,701                        | 12,138                    | 3,565,476                         | 12,357.29                 | 3,792,138                         | 98                        | 94                                |
| All ages.....                           | 265,806                   | \$118,846,794                     | 16,070                    | \$5,338,789                       | 16,603.65                 | \$5,776,649                       | 97%                       | 92%                               |

NOTE.—Mortality ratio in italics where 10-49 contracts terminated by death.

\* Fewer than ten contracts terminated by death.