

## OUR VISITORS

The following members of the Order called at the Supreme Secretary's office during the month:

Rev. Samuel Cunningham, Supreme Marshal, Waterford; B. Hoover, Leader Markham Circle, No. 83; E. H. Caddy, Leader London Circle, No. 48; Bro. R. Moyer, Norwich, No. 75; Bro. J. M. Torrance, East Toronto; Bro. L. G. Mathews, M. Y. Keating, St. Catharines; E. B. Snively, Financial Secretary, Oil Springs; W. Jenkins, Unionville; W. H. Godwin, P. L., Circle No. 105, Kingston; A. A. Colthurst International Bridge, No. 112.

Bro. F. N. Raines, M. A., Uxbridge, of the Supreme Committee on Laws, called at the Supreme Secretary's office during the month.

Bro. John Askew, Leader, Circle No. 130, Oil Springs, called at the Supreme Secretary's office while in the city attending Grand Lodge of Oddfellows.

Dr. R. J. OUGH, Supreme Vice-Leader, Millbrook, called at the Supreme Secretary's Office. We learn that the Doctor has disposed of his Drug Store and practice in Millbrook. The Doctor may decide to make Toronto his home in the near future.

## THE ADVANCING AGE FALLACY

Extracts from an Address delivered by the late Alexander Gardner of Washington, D.C., before the Fifth Annual Convention of Mutual Benefit Societies in 1880.

In my investigation of the mortality tables with reference to their application to an ordinary, everyday working association, I was amazed at the slow increase of the maximum average age of an association, and consequently, the slow increase of the maximum death rate. Taking the experience of a century, I found that the death rate of associations that had existed one hundred years was not even so high in the past year as in any of the first ten years of their existence. I find that the death rate of the Mutual of New York was last year 1.24, although it has existed as a company for thirty-five years.

This idea of the age of the membership increasing rapidly, with its consequent increasing mortality rate, has been a common and favorite form of argument used by the opponents of the assessment plan associations; but to Mr. Welch, I believe, belongs the honor of the discovery that it will increase in geometrical ratio. It seems never to have entered into the minds of these skilled mathematicians and actuaries that, like a community or country, there is a time and age beyond which the total years of an association will never increase.

It will then have attained its maximum average age and, consequently, its maximum average mortality rate. To determine this does not require a vast amount of algebraical or mathematical skill. The four ground rules, and not much of them, will do, for whenever the total number of years of those who fall out of an association equals the total number of those who have grown older who remained in the association, together with the total number of years of those who come into it, you have arrived at a point where the average age will remain stationary.

Let me illustrate by taking an association of 1,000 members, at age of 30 years, and that between deaths and lapses 100 members drop out annually, and the lost members are replaced by 100 new ones at the age of 30 years. At what age will the association have reached its maximum average age? We take in 100 members at age 30, representing 3,000 years. The 900 remaining members have become each one year older, representing 900 years, which, added to the 3,000 years of the 100 new members gives a total of 3,900 years. Deduct from the 3,900 years 3,000 years for the 100 members who fall out under 31 years of age, and you will have 900 years to add to the total years of the association. Go on repeating this process and the average age of the association will gradually increase till you reach 39 years. At 39 years of age 100 members

will represent 3,900 years, and you can go on till Gabriel blows his horn adding 3,900 and deducting 3,900, but the average age of the association will never grow any older.

For simplicity of illustration 10 per cent. has been assumed as the number dropping out. It makes no difference, however, what per cent. is taken; the result will be similar. Take 2½ per cent.: 25 members at 30 years gives 750 years; 975 members one year older makes 975 years, which, added to the 750, gives 1725 years; 25 members at age 69 years give 1725 years. When, therefore, an association on a basis of 2½ per cent. forfeiture, reaches the average age of 69, it has arrived at its maximum average age, and will never become any older.

Instead of 2½ per cent., take 5 per cent.: 50 members at 30 years of age give 1,500 years; the 950 members who have grown each one year older give 950 years; 950 years added to the 1,500 years of the 50 new members give 2,450 years; 50 members at 49 years give 2,450. The one equals the other, so that an association on a basis of a 5 per cent. forfeiture will, when its members average 49 years, have reached its maximum average age, and can never grow any older.

We have already seen that on a 10 per cent. basis, when the members average 39 years it had reached the maximum average age, and could never grow any older.

On a basis of 20 per cent. dropping out to be replaced as before with 200 members at age 30, will give 6,000 years. The 800 remaining members growing each one year older give 800 years, which added to the 6,000, give 6,800. 200 members dropping out at 34 years give 6,800. The one equals the other, and the average age of the association can never grow any older than 34 years.

Take it at 25 per cent., 250 members at age 30 give 7,500 years; the 750 members who have each grown one year older, give 750 years, which, added to the 7,500, give 8,250; 250 members at age 33 give 8,250. The one equals the other, and the average of the association must remain at 33 years.

And last of all let us test it at 33½ per cent. 333 members at 30 years of age give 9,990 years; the 667 remaining members, who have each grown one year older, give 667 years, which, added to the 9,990 years gives 10,657 years; 333 members at 32 years of age give 10,656, so that for all practical purposes, the maximum average age of the association would be 32 years—and for the purpose of demonstrating what I have now been telling you, I have prepared a table on the 33½ basis.

The percentage has been adopted for two reasons: First, because it takes fewer figures to illustrate the principle, and, second, because the experience of the Mutual Life of New York shows that in a period of thirty years and eleven months it insured 101,967 lives, and lost from death 2,385, from lapse and surrender 27,984, making a total of 33,270, at the rate of 32.64 per cent. As the record of the Mutual of New York for business tact and capacity is quite as good as any other company, its experience may be taken as a fair type of all the others.

In the table I have assumed that 1,000 individuals at age of 30 form an association. I then assume that, between lapse and death, 333, or one-third, fall out during the first year, and their places are filled by 333 at age 30. In the second year I assume that 222, or one-third of the 667 fall out, and 111, or one-third of the 333 also fall out, and that the loss is made up by 333 new members, at age 30 years. In the third year I assume that 148, or one-third of the 445 fall out, and that 74, or one-third of 222 fall out, and that 111, or one-third of the 333 also fall out, and that the loss is made good by 333 new members at 30 years of age, and so on.

Here then, we have a table on the 33½ per cent. basis which clearly demonstrates that it takes seventeen years to reach a point where the association will not become any older, and that, although the association has been in existence seventeen years, the average age of the members has only increased two years. If, instead of 33½ per cent. basis, we take the 10 per cent. basis, we will find that not until the association has been seventy years in existence will it have reached its maximum age, and then the average age of its members will be only 39 years, with a death expectation in strict accordance with what the mortality tables call for.