MEDICO-ACTUARIAL INVESTIGATION OF MORTALITY OF AMERICAN AND CANADIAN LIFE COMPANIES.

(Arthur Hunter, A.I.A., F.F.A., in the Journal of the Institute of Actuaries.)

The final volume (V) of the Report on the Medico-Actuarial Mortality Investigation has recently been published. A synopsis of the principal contents of the volume is here given.

FAMILY HISTORY OF TUBERCULOSIS.

Policyholders with a family history of tuberculosis were divided into seven classes, but in the three following classes the amount of data was too small to be of value.

1. Tuberculosis in both parents and one or more brothers or sisters;
2. Tuberculosis in one parent and two or more brothers or sisters;
3. Tuberculosis in both parents.

When a member of the family suffered from tuberculosis at date of application for insurance, it was considered to have the same weight as a death in the family from that disease.

Cases treated as sub-standard for physical condition or personal history were excluded, but cases sub-standard for family history alone were included.

TUBERCULOSIS IN ONE PARENT AND A BROTHER OR SISTER.

When all the insured in this class ranging from 45 pounds underweight to 45 pounds overweight, and from 5 feet 3 inches to 6 feet 2 inches were put in a single group, the mortality was only 11 per cent. in excess of the normal (the M. A. Select Table). The relative mortality for the three main plans of insurance. Ordinary Life, Limited, Payment Life, and Endowment, was 114 per cent., 107 per cent., and 111 per cent. respectively.

Weight statistics indicate that a history of tuberculosis in one parent and a brother or sister is accompanied by a decided increase in the mortality at the younger ages at entry.

TUBERCULOSIS IN ONE BROTHER OR SISTER.

This is a large group, consisting of more than 114,000 entrants, among whom there were 6,317 deaths. The statistics were divided into four weight groups, and sub-divided according to the three main plans of insurance—Ordinary Life, Limited Payment Life, and Endowment Insurance. There was a much larger proportion of entrants at the younger ages of entry under the higher priced, than under the lower priced plans. No serious distortion of the facts results from combining the various plans of insurance. The statistics indicate that for ages at entry above say 35 the death of one brother or sister from consumption may be disregarded. It should be remembered, however, that a more severe selection was probably exercised among those underweight than among those of or above average weight. In the detailed tables it is shown that the mortality ratios among the underweight groups tend to decrease with the increasing duration of the insurance, while the reverse holds good among overweights. The Committee points out that this should be carefully considered in ascertaining the extra premium to meet the additional hazard.

In the underweights class, and also the one comprising a family history of tuberculosis in one parent, an investigation was made of the effect of height on mortality. If the number of pounds departure from the average weight is considered, it appears that tall men at the younger ages at entry among underweights experienced a relatively higher mortality than short men.

TUBERCULOSIS IN ONE PARENT.

In this class there were nearly 95,000 entrants, and 4,405 deaths. While a subdivision was made of the data into the three main plans of insurance already mentioned, the synopsis for all plans of insurance only is given, as there did not appear to be a marked variation in the mortality under the different plans. As already noted in connection with the preceding class some of the companies limited the poorer risks to the high premium plans, which is shown by the large proportion of higher priced policies at the young ages at entry.

The striking feature is the very good mortality at the older ages at entry except in the overweight groups. It is probable that this low mortality was largely due to a severe selection on account of the family history. The same conditions were found with regard to the young ages at entry as in the class of those with a family record of one brother dead or suffering from tuberculosis—namely, a high mortality among the light weights. It is apparent from the above that tuberculosis in one parent seems to be of comparatvely little moment except at the younger ages at entry, provide as severe a standard of selection is practised in the future as in the past.

The average age at entry in the group of those 25 to 45 pounds under the average weight is much higher than in the group of those 5 to 20 pounds under the average weight. This indicates that the companies delayed the acceptance of many risks distinctly underweight until it was thought that the hazard from the tuberculosis family history was past.

An endeavour was made to determine whether a family record of tuberculosis in a parent or in a brother or sister was the more serious. A comparison of the experience in the two classes shows that the incidence of mortality is similar. At the younger ages of entry a family record of tuberculosis appears to be of more consequence in the case of a brother or sister than of a parent, but this may be due to a more rigid selection in the latter class. At ages at entry 15 to 29 in the group of men from 5 pounds to 20 pounds under the average weight, 52 per cent. of the total deaths during the first ten policy years were due to tuberculosis of the lungs in the class of the insured with a family history of tuberculosis in one brother or sister; while the corresponding percentage was 48 in the case of those with a family record of tuberculosis in one parent.

MALARIAL FEVER.

Reports are given of the mortality among men who gave a history of having had malarial fever. Three different types of malarial fever were investigated: (*a*) pernicious, (*b*) remittent, (*c*) all other kinds of malarial fever, including ordinary chills and fever. There was a large amount of data under (*c*), sufficient to enable a division according to States, and frequently according to sections of States. This matter is not of a great deal of moment to those living outside the United States, and it is therefore only necessary to mention that a distinctly high mortality prevailed among residents of the seven