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The Fifth and Sixth Schedules of the Life Assurance Companies Act, 1870

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The Fifth and Sixth Schedules

OF THE

Life Assurance Companies Act, 1870:

BEING

THE INAUGURAL ADDRESS FOR SESSION 1878-79

BY

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MANAGER CALEDONIAN INSURANCE COMPANY ;

HONORARY PRESIDENT OF THE SOCIETY.

THE FIFTH AND SIXTH SCHEDULES OF THE LIFE ASSURANCE COMPANIES ACT, 1870.

(Read before the Actuarial Society 14th November 1878.)

GENTLEMEN,—Permit me, in the first place, to offer you my most sincere thanks for the honour you have conferred upon me in electing me President of your Society for this Session. It is an honour which I highly value, although I am fully sensible of my inability to discharge, as I should wish to do, the duties which it involves.

When considering as to a subject on which to address you, I was led to think that an examination of those portions of the Life Assurance Companies Act which relate to valuations might probably prove interesting to you, and I accordingly selected that as the basis of my paper for to-night.

It is to be noted that the aim of the Act is limited mainly to securing publication by the Companies of their accounts and valuation statements in a clear and intelligible manner and on a uniform system, and that there is an important difference between its principles and those embodied in the legislation of the United States of America, under which a test-valuation is prescribed, and practically a Government certificate of solvency is provided.

In very many respects the forms and requirements of the Life Assurance Companies Act are admirably suited to secure the objects aimed at; and I know few more useful exercises for the junior student of Life Assurance than the study of the various questions, and of the mutual relation of the Schedules.

The chief requirements relating to valuations are to be found in the Fifth and Sixth Schedules. The Fifth, as you are aware, requires statements to be furnished of the particulars of the periodical valuation and its results, while the Sixth requires a classification of

the business and various other details to be given, with the view of enabling any actuary, if so disposed, to make an independent valuation of the principal classes of assurance, and to form an estimate as to the other classes.

In examining these Schedules I propose to take the questions one by one, to consider what the intention of each was, and how far this intention has been understood or complied with by the Companies, and to suggest certain additions and alterations which I think deserving of consideration in the event of further amendment of the Act being resolved on. I may state here that I found it necessary in the course of my examination to tabulate the answers given by the Companies in a form suitable for reference and comparison, and I have thus been enabled to notice some matters which might otherwise have escaped my attention. It would however be impossible, within the limits of a paper such as the present, to refer to all the points which have presented themselves in this way, and I can only attempt to bring before you this evening those which I consider the most important.

Taking the Fifth Schedule first, it will be found that question No. 1 simply requires "the date up to which the valuation is made," and calls for no special remark.

2. "The principles upon which the valuation and distribution of profits among the policyholders are made, and whether these principles were determined by the instrument constituting the Company, or by its regulations or bye-laws or otherwise."

Let us first consider the portion of the question relating to the principles upon which the valuation is made. It appears unlikely that the answer to this part of the question was intended to embrace the points separately dealt with under Nos. 3, 4, and 5, unless in the rare instances in which these are directly prescribed by the Company's deed of constitution; indeed, it may be considered that the last-mentioned questions refer to the practice of the Company rather than to its principles. The answer to the part of question 2 which we are considering should, I think, include a verbal description of the formula according to which the ordinary policies are valued, with a statement of the manner in which the *age at valuation* is arrived at, and information

as to the period at which the next payment of premium is assumed to be due. I estimate that if the age be taken as at next birthday the reserve brought out will probably be greater by $2\frac{1}{2}$ per cent. than would be the case if the valuation were made as at the exact age; and a change from the former to the latter plan at any quinquennial valuation might unduly enhance the profit of the period by from 30 to 40 per cent. I am not expressing any opinion here as to whether the valuation should be made on the one principle or the other. What I desire to point out is the importance of requiring that the principle adopted should be stated.

Another point of some importance is the time after death at which the sum assured is assumed in the valuation to be payable. The tables ordinarily used in valuations are calculated on the assumption that the assurance is payable *at the end of the year in which the life fails*, and they are therefore suitable enough for cases in which the actual period of payment is fixed at six months after death. But in the majority of cases I believe it is now the rule to pay at the end of three months after proof of death has been furnished, while in the case of some offices the time fixed is even earlier. The returns show that certain Companies have made an addition to the reserve brought out by their valuation, in consequence of their rules prescribing a period of payment earlier on the average than the time assumed in the tables, but it is probable that in many instances this necessary correction has not been applied.

In addition to giving information on the above points, the answer to the first part of this question should include a statement of the manner in which permanent extra premiums added on account of health or family history have been dealt with.

Passing to the second part of the question, which refers to the principles of distribution of the profits among the policyholders, I have to remark that in the case of Shareholding Companies it must be intended that a statement should be given here of the manner in which the proportion of profits falling to the policyholders is arrived at, as well as a brief description of the mode in which this proportion is distributed. In regard to both points I conceive it is intended that the principles should be clearly stated here, and that the manner of their application should be given further on in the return.

In the case both of the principles of valuation and of those of distribution, the authority for their adoption ought to be clearly stated.

On examining the returns great varieties are seen in the character of the replies. One office answers merely that "the principles on which the valuation is made are *not* defined by the instrument constituting the Company, or by its regulations or bye-laws." There is not a word more in the reply. From this extreme specimen of an apology for an answer, we ascend gradually, the replies next in order being those in which a positive statement is made that the principles are defined by the deed of constitution, or by resolutions of the Company or of its directors, but without giving any indication of what these principles are. Next we come to an instance in which, in addition to the foregoing information, we are told that the values are calculated precisely. Then follow cases in which descriptions more or less vague are given as to the principles of valuation, a favourite description being that they are such as to exhibit the difference between the value of the future premiums and the value of the sums assured and bonuses as the present liability. In many cases the additional information is given that the net premiums alone are valued, or that certain percentages of loading have been deducted from the premiums. We next come to a comparatively small number of cases in which information more or less distinct is given as to the manner of arriving at the *age at valuation*, and a smaller number in which we are told what assumption has been made as to the date at which on the average the next premium is held to be due, or in which we are informed as to the formula employed in the valuation.

The Companies might all have answered this question fully without giving themselves much trouble, and it is I think very unfortunate that they have not done so. No doubt in many cases part of the information wanting in the reply to this question may be gathered or guessed at from the answers given to other questions, but even if the whole of the desired information could thus in every case be obtained, it would not justify the omission to state it in the proper place.

Before passing to the next question, it may be noticed that while in many cases of Shareholding Companies the share of profit belonging to the assured is defined in the deed of settlement, we learn from the returns that in several instances the directors have

the sole regulation of this matter ; and in one case the share of profit allotted to the policyholders and the allocation thereof are entirely in the discretion of the actuary.

“ 3. The Table or Tables of Mortality used in the valuation.”

It is no doubt intended that, where more than one table has been used, the classes of business to which each has been applied should be clearly defined in the answer. This however is not strictly required by the wording, and as the information has not in all cases been given by the Companies, it would I think be well to add a note to the question, explicitly requiring it to be furnished. Where the table used is a special one, it is desirable it should be published in full, with specimens of the reserve values brought out by it for policies of various ages at entry and durations. One Company has already published in full the special mortality table on which its valuations are based. Some of the special tables are stated to be deduced from the premiums charged by the office, and it is believed that certain of these tables require a high reserve ; but whatever be their merits in this respect, they are open to the serious objection that they require explanation and testing before one can judge of the effect of using them. The returns show that since the passing of the Act several offices have abandoned Davies' Equitable Experience Table, and others the Carlisle Table, in favour of the Institute of Actuaries' Tables, deduced from the mortality experienced among assured lives. At the present time nearly one-third of the whole number of British Companies base their valuations on the Institute Tables.

“ 4. The rate or rates of interest assumed in the calculations.”

When more than one rate of interest is employed in the calculations, it is most important that the classes of business to which each rate is applied should be clearly defined, and I think a note specifically requiring this might with advantage be added to the question. It appears from the returns that the rates of interest on which the calculations are made range from $2\frac{1}{2}$ per cent. to 5 per cent. In general a higher rate of interest is made use of for annuities than that employed for assurances, but in some instances the contrary is the case. The lowest rate of all, $2\frac{1}{2}$ per cent., is applied by an office in the case of its annuities on female lives. Probably the explanation is that the assumption of this rate is the

mode employed of adjusting the mortality table to adapt it to female life. A similar peculiarity is noticed in the case of certain of the Companies, which adopt a different rate of interest for non-participating policies from that used for profit policies. Where a distinction is made the rate used for non-participating assurances is almost invariably the higher; but here too there are instances where the opposite plan is followed, and a higher rate is adopted for profit policies than that used for those non-participating. On examination of these cases, it is found that by the plan adopted, the value of future bonus is estimated as a present liability, and thus, notwithstanding the higher rate of interest employed, the reserve made for participating policies is on a greatly higher scale than that made for the classes which do not participate.

“5. The proportion of the annual premium income, if any, reserved as a provision for future expenses and profits. (If none, state how this provision has been made.)”

The meaning of this question is quite clear—it is the proportion reserved of the *gross* annual premium income which is required to be stated, but comparatively few of the Companies have given a direct answer to the question as put. It would almost appear, from the character of some of the replies, as if the Companies were afraid to state the proportion of the gross premiums reserved, from the idea that it might lead to the belief that their valuation has not been strictly a net-premium one. Many offices content themselves with stating that the whole of the loading on the net premiums has been reserved; and others, in addition to this, state what proportion the loading bears to the net premiums. Of the offices which state the proportion of the gross premium reserved, some give separately the proportions reserved on participating and non-participating assurances, and to this no exception can be taken,—indeed, it would be an improvement if these were required to be stated in all cases. Occasionally temporary extra premiums are included in reckoning the amount of margin or loading; and in the case of permanent extras, if the lives are not treated at the rated-up ages, it is possible that there may be a more important overstatement of margin not readily noticeable.

The second part of the question, “(If none, state how this pro-

vision has been made),” has been of use in bringing prominently before those offices, which have not hitherto made any sufficient reserve for future expenses or profits, the great importance of taking both into account in estimating the value of their future liabilities.

The correspondence published along with certain of the returns shows that the Board of Trade have been most active in pointing out to those offices which are considered by them to be defaulters in this respect, their duties and responsibilities. It may be remarked here, with reference to the functions performed by the Board of Trade in connection with the Act, that the officials of the Board seem, in some instances, to have gone considerably beyond the powers which were originally intended to be intrusted to them. It is certainly to be deprecated, as being contrary to the spirit of the Act, that a public department should express opinions on matters of principle connected with valuations on which competent authorities are not agreed. I think, however, that it is unadvisable to prevent the Board of Trade from pointing out obvious omissions in the replies, or errors in the forms used. But for their efforts in the directions last mentioned, there can be no doubt that the returns would not have been so complete or uniform. That there is warrant for some action on their part in connection with the forms of the Act, is apparent from section 9, by which it is enacted, “The Board of Trade, upon the application of, or with the consent of, a Company, may alter the forms contained in the schedules to this Act, for the purpose of adapting them to the circumstances of such Company, or of better carrying into effect the objects of this Act.”

“6. The Consolidated Revenue Account . . . ” seems to call for no special remark.

“7. The liabilities of the Company under life policies and annuities at the date of the valuation, showing the number of policies, the amount assured, and the amount of premiums payable annually under each class of policies, both with and without profits, and also the net liabilities and assets of the Company, with the amount of surplus or deficiency. (*These returns should be made in the forms annexed*).”

Taking first the summary and valuation, and running down the first column—*description of transactions*,—we find the heading “for whole term of life” given under both *with* and *without profits* assurances. The general description “for whole term of life” embraces not only ordinary assurances payable three or six months after death, *on which equal annual premiums are payable during the whole term of life*, but also those on which the premiums cease after a limited number of years, and those on which ascending or descending scales of premium are payable. If, however, we consider the relation which this heading bears to questions 2 and 3 of the Sixth Schedule, it is seen that the last-mentioned descriptions of assurance cannot have been intended to be included under the heading referred to. It was evidently intended to provide, in the answers to these questions of the Sixth Schedule, a ready means of checking the valuation, given in the summary under the heading we are now considering, of the large class of ordinary policies *with equal annual premiums payable during remainder of life*. There is evidence that a large number of Companies have understood the heading as if it had been limited by the addition of the words above mentioned; but it would be rash, looking to the terms of the question, to infer that all have done so, and I think it is desirable that an authoritative explanation of what is meant should be appended to the form. It may be remarked that there is no important objection to including under this heading, as has been done by some offices, whole-term assurances carried out by single payment,—also cases in which the payments have now ceased altogether, the premiums having been paid up,—and assurances effected on ascending or descending scales of premium, which have now become fixed for the remainder of life. All such cases are capable of being valued along with ordinary policies by the classification method; and on some grounds it is desirable to return them under the heading we are considering; but if they are so included here, it is essential they should also be included under headings 2 and 3 of the Sixth Schedule.

Lower down in the summary we come to “extra premiums payable,” and in connection therewith we have the following footnote:—

“The term *extra premium*, in this Act, shall be taken to mean the charge for any risk not provided for in the minimum contract premium. If policies are issued in or for any country

at rates of premium deduced from tables other than the European mortality tables adopted by the Company, separate schedules, similar in form to the above, must be furnished."

What is meant by the expression "Minimum Contract Premium"? Is it the normal premium for unexceptional lives, or is it the minimum rate specified in each contract? The latter seems to be the interpretation generally put upon it by the Companies, as in the returns it is evident in most cases that the extra premiums stated consist entirely of temporary additional charges for climate or occupation, and do not include permanent additions made on account of bad family history or personal weakness. I have no fault to find with that interpretation, where the office values all assurances with permanent additions at the rated-up ages; but where these have been valued at the actual ages, it is highly important that the additional premiums should be stated separately from the normal premiums. Although actuaries may differ as to the necessity, where the valuation is a net premium one, of valuing at the increased age, there must, I think, be entire unanimity of view as to the imprudence of relying on a gross premium valuation, where extras of the description last mentioned are valued as annuities at the actual ages, and are thus taken credit for as assets.

The returns disclose a variety of methods of dealing with temporary extra premiums. A large number of Companies make no reserve whatever on account of these. Others reserve the exact unexpired proportion of the current year's extra premiums. A considerable number of offices adopt a method which is equivalent to that last mentioned, their reserve for extra risks being fixed at one-half of the extra premiums for the current year. Others, again, reserve one year's extra premiums, while several make a much larger reserve. In one case it is explained that the reserve made under this head is equal to 50 per cent. of the total amount of extra premiums received on existing policies from their commencement.

In a few cases no extra premiums appear in the summary, although it is found, on examining the Sixth Schedule, that such are payable.

The next heading calling for notice is "Adjustments (if any)." This has been made use of by several Companies to exhibit the extra reserves which they have made beyond the amount required by the valuation. One Company, for instance, is bound by its

deed of settlement to adopt a certain basis of valuation, but its present management consider it desirable to maintain a higher basis, and they add as an adjustment an amount equal to the extra reserve required according to the basis which they prefer. In other cases the adjustment consists of an addition to the liability on account of loading prepaid on single and limited premiums, and in a few instances it is composed of an addition in consequence of claims being payable within a shorter time after death than that provided for in the tables. The adjustments appearing in the returns do not, however, invariably consist of additions to the liability. There are cases in which deductions have been made under that heading of sums apparently representing balances of accounts for purchase of business. These, if shown at all as separate items, ought, I think, rather to have appeared in the ordinary balance-sheet as assets, although that course would also have been open to some objections. But a preferable plan to either of these would be simply to diminish the reserve of "loading" by an amount equal to the adjustment.

Passing to the next columns, I think it unnecessary to dwell on *number of policies, sums assured and bonuses, and office yearly premiums*. The column immediately following is headed, *net yearly premiums, if ascertained*. This is left blank in a number of the returns, as was to have been expected, it being no part of the design of the Act to force a net premium valuation on the Companies. But it is worthy of notice that in certain cases, although the column is completely filled up, there are indications that the valuation has not been strictly a net premium one. In several instances this is distinctly stated, in others we gather it from slight alterations made on the headings. Instead of the term *net yearly premiums*, we have "estimated net yearly premiums;" "net yearly premiums as valued," etc.; and, in addition, we find instances in which the net yearly premiums have been calculated at a lower rate of interest than that adopted in the valuation. Perhaps these last have some slight claim to be entered under the heading we are considering; but it would at least have been preferable if, in all cases of the kind, the valuation had been returned as a gross premium one, with specific deductions for expenses and profits. The remarks made as to this column are also applicable to the corresponding valuation column giving the *value of the net yearly premiums if computed*.

While, as already stated, there is no obligation on the part of

the offices to give the results of a net premium valuation when they do not act on such, there is, on the other hand, no indication in the Act that it is optional to the Companies to give or to withhold the value of sums assured and bonuses, and the value of the office yearly premiums. In a considerable number of the returns, however, these are not given, which is, I think, matter for regret.

The last column is headed *net liability*. Where the valuation is a net premium one, and the columns are all completed, the net liability in each class of assurances is to be found by deducting the value of the net premiums from the value of the sums assured and bonuses; but the question arises—How is the net liability to be arrived at where the value of the net premiums is not computed? If the value of the gross premiums has been given, the addition of an intermediate column, giving either the value of the margin reserved, or the value of the office yearly premiums after deducting said margin, would tend to make the summary more complete. A column of this description has been introduced by one or two offices. It may be mentioned here that a Company, valuing on the net premium principle, and which was one of the first to make a return of its valuation, made the mistake of supposing that the Act required the net liability to be arrived at by deducting the value of the office yearly premiums from the value of the sums assured and bonuses, and it accordingly made the return in that way; but added a foot-note, by way of protest, to the effect that the Company had never on any occasion valued the gross premiums for the purpose of arriving at the net liability.

We next come to the form of valuation balance-sheet. This, it will be observed, is framed for the purpose of bringing together the results shown in the ordinary balance-sheet and in the summary and valuation. Only three entries are contemplated. On the debtor side must be placed the “net liability under assurance and annuity transactions (as per summary statement provided in Schedule 5),” and, on the creditor side, “Life Assurance and Annuity Funds (as per balance-sheet under Schedule 2 or 4).” If these entries be equal in amount, the balance-sheet is complete without further entry; but if there be a balance on one side or the other, it must be entered as *surplus* or *deficiency*. Several offices have made an additional entry of the nature of an adjustment on the ordinary balance-sheet; for instance, accrued interest

has been added in this way to the Life Assurance Fund ; but all such entries are inadmissible in the valuation balance-sheet, and if the items to which they refer are to be brought into account at all, they ought to be passed through the revenue account and annual balance-sheet in the usual way.

The "Summary and Valuation," and the "Valuation Balance-sheet," are designed to show the surplus available for distribution as at the date of the valuation. In the majority of cases this surplus represents the profit made during the period since the preceding valuation ; but this is not always the case, as in numerous instances the surplus is *less*, and in a few instances it is *greater*, than the actual profit of the period. I shall refer to these cases under No. 9, to which we may now pass, without waiting to look at No. 8.

"9. The Results of the Valuation, showing—(1.) The total amount of Profit made by the Company. . . ."

Several Companies have added here, *since last investigation*. The object of this addition has perhaps been partly to indicate that the profit returned was not *the total amount of profit made by the Company from the date of its institution*, as might otherwise have been inferred from reading the clause without reference to the line above. But in most cases there has also been another object for the addition, namely, to enable the Company to include in its reply a statement of disbursements of current profit during the valuation period, consisting usually of what are termed prospective or intermediate bonuses. In such cases the "total amount of profit" returned here represents the profit of the whole valuation period, and differs from that brought out in the valuation balance-sheet, which is only the balance of profit remaining undivided at the end of the period. A reply of this kind scarcely comes within the scope of the question ; but I think it is only fair that Companies paying prospective bonuses out of current profits should have an opportunity of stating these in the returns, and there does not appear to be any more suitable place for giving the particulars of such payments than in connection with the reply to No. 9. It may be noticed that prospective or intermediate bonuses are in some instances paid out of a fund taken from the profits of preceding valuation periods, and where such is the case (if the amount of this fund is not added to the liability under adjustments, or stated separately

from the Life Assurance Fund), the result is that the surplus brought out in the valuation balance is greater than the actual profit of the period. In a case of the kind I think the Company, in replying to this question, may properly deduct from the surplus, as per valuation balance-sheet, the intermediate bonus fund in so far as it is provided from profits ascertained at former valuation periods. There are also cases in which Companies are entitled, by the provisions of their deeds of constitution, to allocate to the shareholders a preferential dividend out of current life profits, over and above the interest yielded by the investment of the capital and proprietors, and in all such cases the surplus brought out, according to the form of valuation balance-sheet, does not properly represent the profit of the period. Several of these Companies state, with more or less clearness, the amounts so withdrawn. One gives the amount "paid as dividend to shareholders in excess of interest for five years, at the average rate (say $4\frac{1}{2}$ per cent.), obtained on investment of capital and other funds." Another states the sum paid to the proprietors as bonus during the period, "besides the usual dividend of 10 per cent." It is, I think, very desirable that information such as that voluntarily given in the above instances should be required from all Companies similarly situated.

There is still another class of Companies to which the form of valuation balance-sheet scarcely does justice, and in whose case an explanation is desirable under question 9. I allude to those offices which make an annual valuation, and distribute their profits in the form of a reduction on the next annual premium, but which (notwithstanding that the declaration is limited to the ensuing year) regard it as an essential principle to assume in the valuation that the reduction is to continue during the whole of life. In these cases the valuation balance-sheet exhibits as surplus a sum which is not the profit distributed, but merely the excess of profit beyond the sum necessary to provide for the current and all future years' reductions. For the purpose of comparison it is desirable in such cases to have the amount of the current year's profit stated in answer to question 9, in addition to the balance referred to above. Or it might be admissible to make an adjustment on the value of the reductions, so as to exclude from the reserve for future profits, stated in answer to question 5, the amount requisite for the current year's declaration.

The remaining portions of question 9 do not require much attention. Subdivision No. 2 requires a statement of the amount of profit divided among the policyholders, and the number and amount of the policies which participated. Here also, as in the case of the first portion of the question, disbursements during the valuation period, on account of intermediate or prospective bonuses, ought to be stated when these form a charge against the profit of the period. Subdivision No. 3 requires specimens of bonuses allotted to policies for £100 effected at the respective ages of 20, 30, 40, and 50, and having been in force for 5 years, 10 years, and upwards, at intervals of 5 years respectively. It seems unnecessary to remark that these specimens must relate solely to the division of profits to which the remainder of the return applies; but in several instances the Companies have not so understood the question, as the specimens of bonuses which they have furnished evidently include the amounts added at all preceding divisions, as well as at the present one. The remainder of the same subdivision proceeds thus: "Together with the amounts apportioned under the various modes in which the bonus might be received." Several Companies have interpreted this as requiring statements of the total amounts apportioned under the various modes, and some of these have stated their inability to give the information at the date of the return, explaining that the policyholders have some time given them, within which they are at liberty to exercise the options mentioned in the bonus certificates. Although the wording of this part of the question, when considered by itself, bears out the foregoing interpretation, I think there can be little doubt that what is intended is simply a tabular statement of specimens of bonuses, according to any of the additional plans which the insured has the option of selecting.

I have now to ask you to turn to the Sixth Schedule, which the time at our disposal will only admit of my treating in the briefest manner.

- "1. The published table or tables of premiums for assurances for the whole term of life, which are in use at the date above mentioned."

It is presumed one of the objects of this question is to bring out any cases in which insufficient rates are charged, and it may be remarked that rates which are quite sufficient in the case of one Company which spends a small proportion of its premium income

in charges of management and commission, and which obtains a good rate of interest on its investments, may be far from sufficient in the case of another Company where these conditions are not to be found. In ordinary circumstances it is probably enough, in replying to this question, to give the participating and non-participating tables of yearly premiums, payable for the whole of life, for assurance of £100 at death; and that course has been followed by nearly all the Companies. But the question has a wider range than this, and cases exist in which it is desirable that the answer should not be restricted to the tables above mentioned. Where, for instance, a large proportion of the business has been carried out on scales of premium ceasing after a fixed number of payments, it is important that the return should include these scales of premium.

Questions Nos. 2 and 3 are as follows:—

“2. The total amount assured on lives for the whole term of life, which are in existence at the dates above mentioned, distinguishing the portions assured with and without profits, stating separately the total reversionary bonuses, and specifying the sums assured for each year of life from the youngest to the oldest ages.”

“3. The amount of premiums receivable annually for each year of life, after deducting¹ the abatements made by the application of bonuses, in respect of the respective assurances mentioned under heading No. 2, distinguishing ordinary from extra premiums.”

In the replies to these questions there is rarely any precise information as to the principle on which the age is reckoned. The column is usually headed “age,” which may represent *age at last birthday*, *age at next birthday*, or *mean age*. It appears to me that the direction in the question, “for each year of life,” points to a classification in which the number in the age column represents the current *year of life* or *age next birthday*. I may add here, when referring to age, that if under-average lives are not returned at the rated-up ages, it is of importance to see that in all such cases the additional premium is excluded from the column headed *ordinary premiums* and stated under *extra premiums* along with climate and other temporary extras. As before remarked, in connection with part of question 7 in the Fifth

Schedule, the expression *Assurances for the whole term of life*, if strictly interpreted, must include cases effected by a limited number of payments, or on ascending or descending scales of premium; but it is impossible that such cases could have been intended to be returned in answer to the two questions we are considering, as, if classified along with the ordinary policies, on which the premiums remain fixed during life, they would make it impossible to use these answers for the purpose of testing the valuation, and thus an important part of the design of the Act would be frustrated. A large proportion of the offices seem to have disregarded the precise wording of the questions on this point, and to have acted on a common-sense view of the subject, but it is impossible to say definitely that all have done so. It seems, therefore, to be necessary that in question 2, after the words "*for the whole term of life*," there should be added "*with equal annual premiums payable during remainder of life*." One Company, by the exercise of some ingenuity, has succeeded in complying both with the letter and spirit of the question. It has given for each year of life,—*first*, the ordinary assurances with premiums payable during whole period of life,—and *next*, those assurances with premiums terminating after a fixed number of payments, arranged according to the dates at which the premiums cease. As already stated in regard to the corresponding portion of the Fifth Schedule, I see no important objection to including under this heading policies with premiums extinguished, and those also on ascending or descending scales of premium which have reached the last stage, and have become fixed for the remainder of life.

Nos. 4, 5, and 6 need not be dwelt on at length. Their object is to enable the actuary to check roughly the values stated for each of the special classes of policies by comparing them with the total premium paid on existing policies in that class. I notice in the Parliamentary return, issued in March 1874, that one Company has withheld the information required by question 6, but has given, instead, complete particulars of all the special policies, classifying them in such a form as to admit of a complete valuation being made on the data given. These particulars relate to 1153 policies, divided into 15 classes, and it is interesting to note that the whole extent of space occupied by the answers to the questions in the Sixth Schedule is $11\frac{1}{2}$ pages, which includes separate returns for East Indian risks. This is, no doubt, very

complete, but for the purposes of the Act it would have been much more useful to have had the returns in the abbreviated forms indicated in Nos. 4 and 5, with the total premiums paid required by No. 6, as the labour of going over these special calculations would be so great as to form an obstacle to any check being attempted.

Nos. 7 and 8 require similar information regarding annuities with that required in respect to assurances under Nos. 2 to 6, and they scarcely call for separate notice.

“9. The average rate of interest at which the Life Assurance Fund of the Company was invested at the close of each year during the period since last investigation.”

In order to answer this question correctly, it seems to be necessary to take the separate loans and investments of the Life Assurance Fund as shown in the ledger, including cash in bank and in the office, and agents' balances, and to apply to each a year's interest at the rate (if any) which it is expected to realise for the next year. The total amount of interest thus obtained, when compared with the Life Assurance Fund, will exhibit the average rate of interest required. Plans differing materially from the above have been adopted by a considerable number of the Companies. In some cases the interest received during the year has been apparently compared with the funds at the beginning of the year, or with their estimated amount at the middle of the year. In others, what I have indicated above as the correct plan has been partly adopted, but certain of the funds which produce no return have been excluded in deducing the average rate. It may be added that there are cases in which the average rate for the whole period since last investigation is lower than the rate of interest assumed in the valuation.

“10. A table of minimum values, if any, allowed for the surrender of policies for the whole term of life, and for endowments and endowment assurances, or a statement of the method pursued in calculating such surrender values, with instances of its application to policies of different standing, and taken out at various interval ages from the youngest to the oldest.”

The foregoing question has scarcely a direct bearing on valua-

tions, excepting in so far as it may be held that no system of valuation is admissible which involves a lower reserve for any policy than that for which the Company has made itself liable as surrender value. It is to be observed, however, that the Act does not require Companies to give surrender values.

The last paragraph of the Sixth Schedule is as follows:—

“Separate statements to be furnished for business at other than European rates, together with a statement of the manner in which unhealthy lives are dealt with.”

This is not numbered as a question, and from its position it would naturally seem to form a note to question 10, that is to say, it would seem merely to require separate statements in regard to the surrender values allowed on business effected at other than European rates, with a statement of the manner in which policies on unhealthy lives are dealt with in valuing them for surrender. In support of this view there is also the fact, that at the commencement of the Sixth Schedule there is already a general direction (in regard to the numbering of the answers and as to separate statements of re-assurance) to which the paragraph we are considering would naturally have been added if it had referred to the whole of the questions in the Schedule. Still, judging from the nature of the paragraph, I am inclined to think it must have been intended to apply to more than merely to question 10, and that by some slip of the draughtsman or printer, it has become disconnected with the general directions at the top. As may be inferred from what I have stated in a previous portion of this paper, I consider it to be of great importance that the information asked for in this paragraph as to unhealthy (or under-average) lives should be given in reference to questions 2 and 3; and, for a similar reason, it is equally important that assurances taken at other than European rates, and valued by corresponding tables, should be returned separately. Although it appears from the answers that the Companies have generally adopted this latter interpretation of the paragraph, I think it is desirable that some more definite explanation should be given of what is intended. The expression *unhealthy lives* given here is not a very well-chosen one,—‘under-average lives,’ or ‘lives accepted at additional rates on account of unfavourable family history or impaired health,’ would be preferable. The following remarks made in one of the returns put the sub-

ject of extras in a fresh light :—"In valuing in the aggregate the outstanding liabilities of an Assurance Company, it is impossible to distinguish between healthy and unhealthy lives, many of those who when originally assured were placed in the former category having since passed into the latter, and *vice versa*."

I have now gone over the main points of the Fifth and Sixth Schedules, but there are one or two matters not directly touched upon in these Schedules, to which I desire to draw your attention.

The first of these is *Negative Values*. It is very much to be desired that in any future amendment of the Act these should be dealt with. Mr. Sprague has proposed that every item of the kind should be struck out of the balance-sheet, and that the principle should be laid down that if, when all such assets are struck out of the account, the remaining assets are less than the liabilities, the Company is insolvent.

Without entirely agreeing in this test of solvency, I readily admit that negative values are at best doubtful assets, and that it is of great importance the public should at least know the extent to which these affect the result brought out in the valuation balance-sheet.

In connection with this matter a valuable suggestion was made by Mr. Sprague, to the effect that each Company should be required to state the reserve brought out by its method of valuation for policies taken out at the ages of 20, 30, 40, 50, 60, after they have been in force for one, two, three, four, five, etc., years. This would indicate at a glance the cases in which negative values arise, and it would form a most useful addition to question 9 of the Fifth Schedule. It would not however of itself be a sufficient guide as to the total amount of these negative values, and it would therefore be desirable to require, by a foot-note, that where negative values are brought out for any policies, a return of the total amount of such values which have been treated as assets in the valuation should be separately given. As a check on this, it would also be advisable to require that in such cases the returns of the ordinary assurances given in answer to questions 2 and 3 of the Sixth Schedule should be analysed so as to give for all policies recently issued (say within ten years), the particulars stated separately for each age at entry.

EXAMPLE.

Age at Valuation.	Age at Entry.	WITH PROFITS.		
		Sum Assured.	Bonus Additions.	Annual Premium.
<i>Next Birthday.</i>	<i>Next Birthday.</i>	£	£	£ s. d.
41	31 and under }	15,000	1,305	319 10 2
	32	2,200	120	59 8 0
	33	2,000	110	55 5 0
	34	3,800	200	108 17 6
	35	3,200	180	93 1 0
	36	5,000	250	148 15 0
	37	6,500	...	203 2 6
	38	8,000	...	257 6 8
	39	7,000	...	231 11 5
	40	9,000	...	316 0 0
	41	10,000	...	350 8 4
		£71,700	£2165	£2143 5 7

This would cause very little additional trouble to the Companies concerned, as the classification books in common use give the policies arranged in a suitable form, the only operation required to obtain the information referred to above being simply the addition of the particulars for each age at entry, which are to be found in consecutive order.

The return when analysed in this way would enable any actuary to verify the statement given of the total amount of negative values.

Another matter in connection with which some addition to the present requirements of the Act seems called for, is the regulation in section 4 of the Act, under which it is enacted that a separate account shall be kept of all receipts in respect of the Life Assurance and Annuity Contracts of the Company, and the said receipts shall be carried to and form a separate fund, to be called the Life Assurance Fund of the Company. Although under this section a separate fund is to be formed and maintained, there is nothing to require the Companies to have separate investments for that fund, and without this I think the mere separation of funds (that is, of accounts) would not be entirely effectual for the object aimed at. In the case of Shareholding Life Assurance Companies, it might likewise be of advantage to require a separate account to be

rendered for the proprietors' fund, and separate investments for that fund.

It seems also to be an extraordinary circumstance that while many details are required as to the valuation of the liabilities, no valuation of the assets is provided for in the Act. It would at least have been in harmony with the other requirements of the Act, if along with the returns under the Fifth Schedule, a special report on the assets had been required, made as at the date of the valuation of the liabilities, giving more complete details than those stated in the balance-sheet, and certifying that the various items are of the present values stated therein. Such a statement would naturally be signed by the auditor of the Company, as well as by the chairman and two directors, and by the principal officer.

In conclusion, I would remark that the analysis of the valuation returns which I found it necessary to make preparatory to writing this paper has amply confirmed my previous impression of the great value of the Act, and the soundness of its leading principles. There is evidence of a growing tendency on the part of the Companies,—large and small, strong and weak,—towards the maintenance of increased reserves, and although this may in some degree be due to the operation of other causes, it is to a large extent directly traceable to the Act. This general strengthening of reserves may temporarily lessen the profits, but it will insure greater permanency of the Companies, and in that view it must be regarded as an important public benefit. It is not for the interests of the public that a Life Assurance Company should declare a bonus on too sanguine an estimate of its position, and the Act affords what in many cases must prove an effectual counter-active to this, as its requirements make it nearly as unpleasant for a Company to distribute a bonus which is not warranted by the circumstances as it would be to make no distribution at all.

As has been seen, there is in some instances an indefiniteness in the questions which has affected the value of the answers; and there are besides several points of more or less importance which are not dealt with at all in the Act. But these slight blemishes do not detract from the credit due to the framers of the Act. Indeed, I think it is matter for surprise that the defects were not much more numerous and important, seeing that the Act dealt for the first time with a business carried on in a great variety of ways, and involving in its management considerable technical knowledge.

EXTRACTS from the LIFE ASSURANCE COMPANIES ACT, 1870
(33 and 34 Vict. Chap. 61).

FIFTH SCHEDULE.

STATEMENT respecting the VALUATION of the LIABILITIES under LIFE
POLICIES and ANNUITIES of the , to
be made by the ACTUARY.

(The answers should be numbered to accord with the numbers of the
corresponding questions.)

1. The date up to which the valuation is made.
2. The principles upon which the valuation and distribution of profits among the policy holders are made, and whether these principles were determined by the instrument constituting the company, or by its regulations or bye-laws or otherwise.
3. The table or tables of mortality used in the valuation.
4. The rate or rates of interest assumed in the calculations.
5. The proportion of the annual premium income, if any, reserved as a provision for future expenses and profits. (If none, state how this provision is made.)
6. The consolidated revenue account since the last valuation, or, in case of a company which has made no valuation, since the commencement of the business. (This return should be made in the form annexed.)
7. The liabilities of the company under life policies and annuities at the date of the valuation, showing the number of policies, the amount assured, and the amount of premiums payable annually under each class of policies, both with and without participation in profits; and also the net liabilities and assets of the company, with the amount of surplus or deficiency. (These returns should be made in the forms annexed.)
8. The time during which a policy must be in force in order to entitle it to share in the profits.
9. The results of the valuation, showing—
 - (1.) The total amount of profit made by the company.
 - (2.) The amount of profit divided among the policy holders, and the number and amount of the policies which participated.
 - (3.) Specimens of bonuses allotted to policies for £100, effected at the respective ages of 20, 30, 40, and 50, and having been respectively in force for five years, ten years, and upwards, at intervals of five years respectively, together with the amounts apportioned under the various modes in which the bonus might be received.

SUMMARY and VALUATION of the POLICIES of the
(FORMS referred to under heading No. 7 in Fifth Schedule.)
as at 18

Description of Transactions.	Particulars of the Policies for Valuation.				VALUATION.			
	Number of Policies.	Sums Assured and Bonuses.	Office Yearly Premiums.	Net Yearly Premiums if ascertained.	Value by the			per cent.
					Sums Assured and Bonuses.	Office Yearly Premiums.	Net Yearly Premiums if computed.	
ASSURANCES.								
I. <i>With participation in Profits.</i>								
For whole term of life, . . .								
Other classes (to be specified), . . .								
Extra Premiums payable, . . .								
Total Assurances with Profits, . . .								
II. <i>Without participation in Profits.</i>								
For whole term of life, . . .								
Other classes (to be specified), . . .								
Extra Premiums payable, . . .								
Total Assurances without Profits, . . .								
Total Assurances, . . .								
Deduct Re-assurances, . . .								
Net amount of Assurances, . . .								
Adjustments, if any, . . .								
ANNUITIES.								
Immediate, . . .								
Other classes (to be specified), . . .								
Total of the results, . . .								

The term "extra premium" in this Act shall be taken to mean the charge for any risk not provided for in the minimum contract premium. If policies are issued in or for any country at rates of premium deduced from tables other than the European mortality tables adopted by the company, separate schedules similar in form to the above must be furnished.

VALUATION BALANCE-SHEET of 18
as at

<i>Dr.</i> To Net Liability under Assurance and Annuity transactions (as per Summary Statement provided in Schedule 5), £	<i>Cr.</i> By Life Assurance and Annuity Funds (as per Balance-Sheet under Schedule 2 or 4),. £
To surplus, if any,	By deficiency, if any,
£	£

SIXTH SCHEDULE.

STATEMENT of the LIFE ASSURANCE and ANNUITY BUSINESS of the
on the 18

(The answers should be numbered to accord with the numbers of the corresponding questions. Statements of re-assurances corresponding to the statements in respect of assurances, under headings 2, 3, 4, 5, and 6, are to be given.)

1. The published table or tables of premiums for assurances for the whole term of life, which are in use at the date above mentioned.

2. The total amount assured on lives for the whole term of life, which are in existence at the date above mentioned, distinguishing the portions assured with and without profits, stating separately the total reversionary bonuses, and specifying the sums assured for each year of life from the youngest to the oldest ages.

3. The amount of premiums receivable annually for each year of life, after deducting the abatements made by the application of bonuses, in respect of the respective assurances mentioned under heading No. 2, distinguishing ordinary from extra premiums.

4. The total amount assured under classes of assurance business, other than for the whole term of life, distinguishing the sums assured under each class, and stating separately the amount assured with and without profits, and the total amount of reversionary bonuses.

5. The amount of premiums receivable annually in respect of each such special class of assurances mentioned under heading No. 4, distinguishing ordinary from extra premiums.

6. The total amount of premiums which has been received from the commencement upon all policies under each special class mentioned under heading 4 which are in force at the date above mentioned.

7. The total amount of immediate annuities on lives, distinguishing the amounts for each year of life.

8. The amount of all annuities other than those specified under heading No. 7, distinguishing the amount of annuities payable under each class, the amount of premiums annually receivable, and the amount of consideration money received in respect of each such class, and the total amount of premiums received from the commencement upon all deferred annuities.

9. The average rate of interest at which the life assurance fund of the company was invested at the close of each year during the period since the last investigation.

10. A table of minimum values, if any, allowed for the surrender of policies for the whole term of life, and for endowments and endowment assurances, or a statement of the method pursued in calculating such surrender values, with instances of its application to policies of different standing, and taken out at various interval ages from the youngest to the oldest.

Separate statements to be furnished for business at other than European rates, together with a statement of the manner in which policies on unhealthy lives are dealt with.