

THE ACTUARIAL PRINCIPLES OF INVESTMENT

By J. B. H. PEGLER, F.I.A.

Investment Secretary of the Clerical, Medical and General Life Assurance Society

[Submitted to the Institute, 26 January 1948]

INTRODUCTION

THE purpose of this paper is to discuss the actuarial principles on which the investment policy of life assurance offices should be founded. The policy considered relates, firstly, to the principles on which the selection of investments should be made and secondly, to the basis of their subsequent valuation.

In regard to the selection of investments, orthodox actuarial doctrine still appears to be firmly founded on the principles put forward by A. H. Bailey in his paper read before the Institute in 1862 and published in *J.I.A.* Vol. x. These principles are generally referred to as 'Bailey's Canons' and are too well known to need reproduction here. The only *Journal* paper on investments included in the Institute's present course of reading, W. Penman's paper *A Review of Investment Principles and Practice*, *J.I.A.* Vol. LXIV (1933), summarizes the canons and goes on to state the opinion that 'whilst their precise application has no doubt varied considerably from time to time in the intervening years, they remain as applicable to our business today as they were in 1862'; the rest of the paper is in harmony with this view. In the discussion it was affirmed that 'undoubtedly Bailey's five principles remained as applicable today as they were in 1862'. Although this view was directly criticized by two speakers in the discussion and some others appeared to cast some doubt on its complete correctness, Mr Penman, in his reply, reaffirmed his belief that these canons 'constituted a good starting point for a discussion on investment matters' although he claimed to have 'dealt with the subject in much greater detail and extent than had Bailey'. One must, I think, conclude that the generally accepted view is that Bailey's canons are basically correct as principles, even if their application has changed with changing conditions.

The view of the Faculty appears to be the same. In addition to Penman's paper, its Course of Reading includes *The Investment Policy of Life Assurance Offices*, by A. C. Murray, M.C., F.F.A., *T.F.A.* Vol. xvi (1937), which is even more uncompromising. The part of this paper which deals with the selection of investments quotes Bailey's canons with approval and ends with the statement of seven rules which 'under modern conditions... should form the basis of life office investment policy'. The first two rules are identical with Bailey's first two canons and the third is substantially a restatement of the third canon.

These views did not, as I have suggested, escape criticism. C. R. V. Coutts in summing up the discussion on Penman's paper attacked the first two canons with vigour, as might have been expected from the opinions which he put forward in his own paper in 1925, and I should like to quote from his remarks, as reported in the *Journal*: 'Bailey's principles hardly touched the fringe of present investment problems. On a strict interpretation of Bailey's conditions every penny should be invested in short-term Treasury Bills, and

offices would be insolvent in a few weeks. The rate of interest varied inversely with the safety of investment and the difficulty lay in determining the minimum degree of security which could be accepted.' Similar criticisms were advanced by F. B. Swift.

At the Faculty's meeting the orthodox view was attacked by J. Sharp; G. H. Recknell summarized his opinion in the words 'Personally I confess these famous canons of Bailey known as 1 and 2 give me very little degree of satisfaction' and R. J. Kirton wrote a letter expressing similar views.

Nevertheless, Bailey's canons, particularly the fundamental conception expressed in the first and second, remain enthroned as the basis of the orthodox doctrine and the foundation on which actuarial students must therefore be instructed in the subject of 'Investments'. It is the contention of this paper, however, that the criticisms referred to are largely justified and that the canons do not, in fact, form the best basis on which to found investment policy; if there is any truth in this contention, there is, I feel, some justification for an attempt to formulate alternative principles as the basis of a coherent and consistent theory.

Bailey states quite uncompromisingly in his first two canons that the first consideration must be security of capital and all other considerations must be subject to this. On the surface such a view undoubtedly appears to be a sound one, and wholly in keeping with the best traditions of British life assurance. A little further consideration, however, suggests that if the assets are invested, no matter how safely, to provide a yield less than that assumed in the calculation of premium rates, the 'soundness' of the investments is somewhat illusory. Can it, therefore, be rightly asserted that this primary and overriding principle is really the best guide to a sound policy?

Further, as Coutts has pointed out, though it is clear that Bailey must have envisaged in practice some relaxation of the rule of absolute security of capital to the exclusion of all other considerations, the canons give no indication as to how far one may legitimately depart from the theory in pursuit of a remunerative income. The first part of this paper will, therefore, be devoted to the discussion of suggested alternative principles which, while retaining as their primary aim the pursuit of sound finance, recognize the practical need for securing an adequate income.

PART I. SELECTION OF INVESTMENTS

In order to meet its contractual obligations, a life office must earn on its invested funds a yield at least as great as that assumed in the calculation of premium rates, annuities and other classes of contract. Moreover, like any other trading undertaking, a life office will wish to earn the maximum profit consistent with sound trading, in the interests of those entitled to share therein, and to be able to provide the benefits of life assurance at the minimum cost. Since surplus interest is one of the main sources of profit, the aim must be to earn the maximum yield consistent with security.

So long as the office remains in the normal condition of a continuing fund, where the outgo is less than the income, or does not exceed it by any substantial sum, the necessity for substantial realization of capital does not arise. For the present, consideration will be restricted to funds where this condition is fulfilled, and the question of the modification which may be required where this condition is not fulfilled will be discussed later in the

paper. In these circumstances it is submitted that it is not, as Bailey has stated, security of capital which is the primary consideration, but security of income, and that the achievement of the latter will, of itself, ensure that the capital value is maintained.

Subject therefore to this requirement of security, the first consideration of life office investment policy will be stated as the earning of the maximum yield on its invested assets. In this connexion, however, the term 'yield' requires some further discussion, since the word is somewhat loosely used in popular writing. In the case of redeemable fixed-interest stocks it is commonly used to mean the gross (or 'grossed-up net') redemption yield and sometimes the 'flat' (or 'running') yield. For equity stocks the yield is usually stated as the ratio of the last year's actual or next year's expected annual dividend to the purchase cost.

To an actuary, however, the 'yield' of an investment can have only one meaning. It is the net rate of interest (or its gross equivalent) at which the sums invested are exactly equal to the present value of all future net interest or dividend payments plus that of all capital returned, whether this takes place by drawings or repayment in a lump sum, by return of part or all the capital on liquidation, by sale or transfer of the investment, or in any other way. In this calculation allowance is made for expenses, and for the tax on income or capital increments borne by the fund or funds for which the investment is made. The actuarial conception of yield is exact and unambiguous and it is with this meaning that the word will be used throughout this paper, except where otherwise stated.

The yield on an investment is the annual equivalent of the total net profit earned over the whole duration and can only be determined with certainty when the investment has finally terminated and all capital has been realized. It is thus a conception similar in some respects to that of the profit on a life assurance contract which likewise cannot be measured until the contract has terminated.

Since the yield can, initially, only be estimated, it is evident that the aim of investment policy should be to earn the maximum 'expected' yield, where the word 'expected' has the meaning familiar to actuaries. In assessing the 'expected' yield, one must take into account not only all the future net payments theoretically receivable from the investment, but also the chance of their being, in fact, received. It is not, of course, suggested that a complicated mathematical calculation be made in the case of every investment considered in order to determine the value of the expected yield. The data available are not of sufficient certainty or accuracy to justify any such procedure. It is, however, contended that a rough assessment on these lines is in fact carried out, consciously or instinctively, every time an investment is considered. The statement in the 'expectation' form merely gives the theoretical actuarial basis underlying this practical assessment.

PROPOSED FIRST PRINCIPLE

The First Principle, then, may be stated as follows:

'It should be the aim of life office investment policy to invest its funds to earn the maximum expected yield thereon.'

From the preceding definitions of the terms used it is hoped that two possible criticisms will have been forestalled. The first is the objection that to postulate

'high yield' as a primary aim will encourage the investment of life office funds in (so-called) high yielding securities, that is, the most speculative class of investment. The conception of yield which has been employed, however, should make it clear that account has been taken not merely of the return on the current level of dividends, but also of the chances of the long-term maintenance of this rate.

The second possible objection is that the Principle makes no reference to the security of capital. While it is admitted that no explicit mention of capital is made, the element of capital return implicit in the yield ensures that any failure on the part of the investment to return the capital in full is reflected in a reduction in the yield produced. Thus the safety of capital, so far from being ignored, is surely given its exactly correct weight, since, it is contended, it is misleading to assign to capital safety any greater importance than that arising out of its contribution to the investment's yield. The maintenance of capital 'intact' does not, of itself, ensure the maintenance of a satisfactory income, since it may be very adequately secured by the investment of funds in Treasury Bills, Bank Deposits, etc., where the interest income is very low and there is no chance of capital appreciation, or in the extreme case by the retention of the funds in cash, where the yield will be nil. On the other hand, if a security is bringing in an assured income it will inevitably command a capital value assessable, in general, at so many years' purchase (according to the degree of certainty with which the maintenance of the income is assured) of that income. The capital may not be readily realizable; it may, for example, be in the form of a mortgage tied up for a number of years or a security not quoted on a Stock Exchange, but it can hardly be said that no capital value exists. This fact is recognized by the statement of the First Principle in the form given above, which might alternatively be rendered 'look after the income and the capital will look after itself'. The converse is not true, and this, I feel, is the fundamental weakness of Bailey's first canon.

It will be seen that the First Principle makes no distinction in importance between capital and income but recognizes that contributions to the investment's yield will frequently be received from both. This may appear somewhat unorthodox, but it is contended that the two are interdependent and, in general, inseparable until after the investment has been realized.

Where it is known in advance that the 'income' from an investment contains an element of capital, the transfer is merely a matter of book-keeping. The same principle applies to assets whose income is liable to diminish, such as mining securities or properties let initially at a rent which may not be maintained on the expiry of the lease. Here the amount of the transfer required can only be estimated in advance. On the other hand, where, for example, a company pursuing a conservative financial policy distributes a comparatively small part of its equity earnings and applies the balance to enlarge its real capital, the equity shareholders will receive a comparatively small annual 'income' (from the dividend) but the capital value of their investment will increase. The contribution made to the investment's yield by the appreciation of its capital value cannot logically be ignored, although its exact amount can only be determined when the security has been realized.

In calculating the expected yield, the size of which, by the First Principle, is the criterion of an investment's suitability, it is necessary as already mentioned to take account not only of the quantity popularly termed the 'yield', but also of the chance of its being maintained, or the risk of its failure to

materialize in the immediate or more distant future. The calculation may be considered as involving the assessment of a 'risk coefficient', to be applied to the 'apparent yield', which will be equal to, or a little less than, unity for the so-called 'high class' securities and a comparatively small fraction for those of a highly speculative nature.

This conception of 'risk' suggests an analogy between investment contracts on the assets side and underwriting contracts on the liabilities side. Actuarial theory cannot be applied to the underwriting of a single contract but only to a substantial body of risks sufficiently numerous to produce an average. A similar principle applies in the case of investment risks and the application of actuarial theory to investments requires the spreading of investment contracts over a wide field so that, here also, the risks may be averaged.

In the case of the most speculative securities it will often be impossible to assess the risk coefficient with sufficient accuracy to make a reasonably sound estimate of the expected yield. In these cases it is impossible to determine whether the expected yield will be high enough to satisfy the criterion imposed by the First Principle, and such securities are, therefore, unsuitable for inclusion in the investment portfolio.

I suggest, however, that possibly too many investments have, in the past, been condemned as unsuitable for life office funds on the grounds that they are too speculative. Translated into more exact terms one presumes that the objection is that the income which will arise from them may, if the worst happens, fall below that which it is necessary for the fund to earn in order to meet the contractual liabilities. On the other hand, offices appear not only to view with equanimity the investment of a substantial part of their assets in securities whose net income must inevitably be less than the net rate of interest assumed in the calculation of premiums on current and new contracts, but even to take credit for the 'fact' that the holding of such investments increases the 'security' of the fund. I consider that this attitude is illogical.

PROPOSED SECOND PRINCIPLE

The factors which influence the profitability of investments are mainly political or economic, or a combination of both, and I would therefore state the Second Principle thus:

'Investments should be spread over the widest possible range in order to secure the advantages of favourable, and minimize the disadvantages of unfavourable, political and economic trends.'

The classification and analysis of these trends would require a lengthy treatment which lies outside the scope of this paper, but I would suggest a few headings as an illustration of some of the factors which must be considered.

(1) The 'trade cycle', that is, fluctuations in economic activity which may be expected to recur in the future on somewhat the same lines, if not to the same extent, as in the past.

(2) Fluctuations in the price level affecting the relative value of goods and services and of money (inflationary and deflationary trends).

(3) Changes in the long-term rate of interest.

(4) Changes in the level of international trade affecting the demand for, and profitability of, exports, and in the rates of foreign exchange.

(5) Schemes of nationalization or confiscation.

(6) State restriction and control of supplies of labour, raw materials, output and profit.

(7) Changes in taxation policy, especially the introduction of taxes of a discriminatory nature.

(8) Other state policies aimed at the redistribution of incomes (e.g. subsidies, social insurance schemes, etc.).

Several of these influences are directly and several more indirectly inter-related, but to attempt to examine their mutual dependence would involve a lengthy inquiry into the workings of the economic system and the probable lines of future political policy in that field. It is thought, however, that the headings suggested are sufficient to suggest some of the types of risk whose influence must be considered, when attempting to estimate the vulnerability of various classes of investment and to ensure that too large a proportion of the funds is not invested in securities liable to loss from the same cause.

Consideration of the method by which securities should be selected in order to minimize the loss which may be brought about by the risks considered above is also outside the scope of this paper, whose aim must largely be limited to the discussion of principles. To illustrate the Principle, however, it is perhaps desirable to mention one or two examples.

Many of the safeguards against adverse influences are, of course, well known and in almost universal use today. Perhaps the most obvious example is that of the provision to be made for changes in the long-term rate of interest by the holding of a proper balance between investments where the capital is tied up on the borrower's or issuer's side for a long period and those where it is repayable, for certain or at the investor's option, within a comparatively short period. The requirements of maximum expected yield will be met by long-term investments when interest rates are falling and short-term when they are rising.

Investment contracts which contain an option of early repayment on the borrower's or issuer's side alone secure for the investor the advantages of neither long- nor short-term investments. Such options against the office are just as undesirable in investment as in underwriting contracts and should be kept to a minimum.

Almost equally familiar is the safeguard against the effects of inflation or deflation by investment in equity or fixed interest securities respectively. It is suggested, however, that the principle of averaging should be applied much more widely. In selecting investments there should be a spread over industrial undertakings and real property, over industries producing goods and those providing services, over producers of primary necessities and of luxury and semi-luxury goods, and so on. Within these classes there should be further diversification, between different industries and different undertakings within these industries, in real property by spreading with regard to type, user, size, situation, etc.

The Second Principle is a precautionary one, and for that reason it might be argued that it should have been put first and declared to be of pre-eminent importance. The truth is, however, that an attempt to 'play for safety' all the time in investment, as in all other forms of enterprise, must inevitably result either in very small profits or, more probably, in no profits at all and this, as we have seen, so far from producing safety, will lead to insolvency. The first two Principles must be considered and applied together and it is not possible to

lay down any general rule as to the relative weight which should be attached to each, just as in any other trading enterprise one cannot propound any general rule to indicate the risks which the trader may legitimately take in attempting to earn his profit. The best one can do is to state the principles of maximum profit and avoidance of unreasonable danger of loss and leave the proper blending of these two principles to be made by those responsible for conducting the enterprise in the light of the prevailing conditions.

PROPOSED THIRD PRINCIPLE

The requirement that offices should, within the limits of prudence, make the most profitable use of the knowledge, skill and opportunities available to them in the investment of their funds is embodied in the Third Principle:

‘Within the limits of the Second Principle, offices should vary their investment portfolios and select new investments in accordance with their view of probable future trends.’

The qualification ‘Within the limits of the Second Principle’ needs, perhaps, some further examination. If the Third Principle were successfully applied there would be no need for the Second Principle at all. In retrospect it always seems simple to choose the time at which investment policy should be varied, and those who study the past are encouraged and emboldened to apply the fruits of their study to the present and future. Unfortunately, however, the present is always abnormal and the future invariably obscure, and it is doubtful whether life offices can or should credit their investment managements with more than a limited degree of skill and judgment in the determination of future trends.

Perhaps the ‘trade cycle’ presents the clearest example of this. For many years past it has been noted that equity prices, as a whole, rise and fall more or less in conformity with the trade cycle, and it has been pointed out that the investor who got in near the bottom, sold near the top, and then stayed out of the market until the bottom had once more been reached or passed, made enormous profits. Mr Hargreaves Parkinson, who has discussed this question in some detail in his book, *Ordinary Shares*, has stated his opinion that ‘investors should buy equities, with very few exceptions, for capital reasons or leave them alone’, and the moral which he draws from his study and experience is that all investment in equities should be directed to the timing of purchases and sales in accordance with the secular trend.

This may well be true in theory, but it is doubtful whether there are many actuaries who would care to state with confidence at any particular moment the position which equity prices occupy in the cycle. Much space is devoted to the discussion of the question by financial journalists and there are a number of ‘chart-readers’, ‘Dow theorists’, followers of the ‘Hatch system’ and others, who profess to make predictions with regard to the probable future trend. I doubt whether actuaries have much confidence in their methods. If there is anyone prepared to predict with confidence that over the next few years the net movement of equity prices will be substantially upward or downward he would be right to make his purchase of equities abnormally large or abnormally small in accordance with the Third Principle. Nevertheless, however confident he is and however sound his arguments may appear to be, there are so many unknown and uncertain factors that he would be wise to bear in mind the

possibility that he may be wrong. He would be wise, therefore, though a 'bull' to confine his purchases within reasonable limits, and if a 'bear' to continue to invest at least a small proportion of his funds in equities.

It may be argued, perhaps, that at the present time the outlook is, for various reasons, more than usually obscure and that in 'normal times' it is possible to make a reasonably accurate forecast of the trends. It may be that times have seemed more 'normal' in the past, though judgment on this point is apt to be hopelessly biased by after-knowledge. Even if this be true, however, I doubt whether prediction is ever going to be much easier in the future. I consider that the most an actuary can hope to do is to follow a basic policy of spreading his investments among those selected for the best prospect of a good yield, in such a manner as to minimize his loss if 'the worst happens', while backing his judgement to a limited extent by biasing his selection in favour of those securities which seem likely to benefit from the trend which he expects. The more confident he is that he is right, the more he will deviate from the basic average policy, but he should never deviate so far as to expose the fund to serious loss if his view turns out to be incorrect. In this connexion I should like to recall the remarks of Sir William Elderton, who, on the occasion of Penman's paper, suggested that although offices 'would go on making inevitable mistakes, he was afraid, because it was not given to any of them to see into the future' nevertheless they must go on investing.

PROPOSED FOURTH PRINCIPLE

There is one further major principle which I consider should guide the investment policy of a life office and this may be stated as follows:

'Offices should endeavour to orientate their investment policy to socially and economically desirable ends.'

In stating this as the Fourth Principle it might at first sight appear that I have strayed from the path of expediency into that of morality. This is not the place to discuss the ethics of investment policy or to what extent offices should sacrifice the narrower interests of their policyholders or shareholders for the wider public good. It may be doubted whether, in view of the very large funds which life offices have available for investment and the influence which the employment of these funds must have, they would want, or be able, to escape the responsibility for using them in the wider public interest, so far as this is not wholly inconsistent with the interests of their policyholders. Offices certainly failed to escape that responsibility during the war. Nevertheless, whether or not this Principle is justifiable on purely moral grounds, it is contended that it is essential purely on the grounds of expediency.

The reasons are twofold. With the steady increase of State interference in economic affairs, it is obvious that enterprises which are considered contrary to the public interest will be discouraged and those which appear to promote it will be encouraged. This interference may take many forms such as prohibition, restriction, discriminatory taxation, subsidy, direction of labour, allocation of materials, etc., and it is hard to believe that future Governments will not employ at least some of these means to further their social and industrial policies. The repercussions on investment policy are obviously of considerable importance.

Secondly, a policy tending to increase economic and social welfare will not only benefit the company's policyholders and shareholders with the rest, but

will also, in the long run, promote the prosperity of the country as a whole, and this will react favourably on the prosperity of the office. Thus those for whom ultimately investment policy is planned will benefit directly and indirectly.

It might also be mentioned, perhaps, that the furtherance of the public interest has good publicity value, and such a policy may therefore be considered to conform to one of Bailey's minor canons, which advises that investment policy should, where possible, aid the business of life assurance.

GENERAL COMMENTS

These, then, I suggest, are the Principles, the basic rules which should be the actuary's guide at all times. In order to make them of universal application in times of slump or boom, inflation or deflation, left-wing or right-wing Government, it has been necessary to state them in the most general terms. They are not intended to provide a detailed and specific guide in the choice of individual investments, but a broad standard by which investment policy should be judged.

The traditional emphasis on capital rather than income is perhaps partly responsible for the persistence of a widely held view upon the method of assessing the value of securities which I believe to be largely fallacious. Investors are still frequently urged to judge equities on asset or break-up value and fixed-interest securities on the capital value of the assets producing the income from which the interest or dividend is to be paid. Where the investor has a charge on these assets this approach is merely a rather less accurate method of assessing the underlying security, but where the investment is a share (whether equity or fixed-interest) whose income depends on profits the method is, I submit, wholly fallacious.

When a share is bought, save in the few exceptional cases where the company concerned has for some reason ceased to trade and liquidation is expected in the near future, the investment is made because the company is doing well and is expected to continue to do as well or even better. Of what relevance then is the break-up value of the share when the last thing the shareholder expects or wants is the break-up of the company? If the investor's view of future prospects be mistaken and the company starts to decline, one may be certain that the readily saleable assets, whose estimated value has contributed so generously to the break-up value, will have been realized and the proceeds either lost or converted into unmarketable assets long before the shareholders can force a winding-up and a sale and distribution of assets. This is not to say that the presence of free reserves in a balance-sheet is irrelevant to the problem of valuing an equity security; such reserves are evidence of a sound financial policy in the past and presumptive evidence that such a policy will be continued in the future. The presence of free liquid assets means that funds will be readily available for expansion, conversion and the general requirements of the business. It is often suggested, however, that reserves are only of value if invested outside the business. Surely a trading company is likely to provide the best profits for its shareholders by employing the largest possible part of its resources in the trade it is carrying on, and, provided the necessary liquidity is arranged for, then, in my opinion, reserves can be most profitably employed in the business itself.

Where the investor has a fixed charge on the assets, as in the case of a

mortgage or mortgage debenture, he is in a stronger position than a shareholder when things go wrong, since his 'security' cannot be touched without his consent. If his interest is unpaid he can, in theory, foreclose or sell the assets charged, but this action only serves to show that here, again, the income-producing power of these assets is his real security, and since he is interested in the minimum income needed to cover his interest it is the net maintainable revenue which must be taken into account. If he exercises his right and takes over ownership of the assets himself, their value to him will depend on the income which he may expect to derive from them. If he sells them to repay his loan, the price they will realize will depend on the income which the purchaser will expect to derive from them.

The importance of expected yield rather than capital value is likewise evident when existing investments are reviewed for the purpose of deciding which shall be retained and which realized. One still frequently hears the statement that it is 'always right to take a profit', and considerations of capital tend to suggest the desirability of realizing an asset whose market value shows a substantial appreciation over cost, although it is evident that this feature can, of itself, have no relevance to the future profitability of the investment on which alone the decision should be taken. By the First Principle, an investment will be made when the expected yield, calculated according to the best information available at the time, is high enough to make it appear profitable. It should be sold, according to the Principles put forward in this paper, for one of three reasons:

(1) Because the market value has risen to such a figure that the expected yield, calculated on the price at which it could be realized, shows that the investment is no longer profitable.

(2) Because, as a result of fresh information which has become available since the investment was bought, a recalculation of the expected yield shows that it is now too low for the investment to be profitable.

(3) Because, as a result of changes in economic or political trends, it now appears that the office has too large a holding in the class within which the investment falls, and this is one of the least profitable of that class.

The comparison of present market price and cost is a matter of history; it is a very important factor in determining how profitable the investment has been in the past but affords no reliable indication of its future profitability, which alone should determine whether it be retained or sold. All one can say of this comparison is that a substantial appreciation over cost, especially if it has taken place rapidly, should suggest the advisability of an early review of the investment by the recalculation of the expected yield on the latest information available, including its market price.

There remains to be considered the possibility that the foregoing principles may require modification in circumstances in which the need may exist or arise of substantial capital realization to meet an excess of future outgo over future income.

Such need may arise from the following causes:

(1) A reduction or cessation of new business, the extreme case being that of a closed fund.

(2) An abnormally large amount of maturity claims.

(3) An abnormally large amount of death claims.

(4) An abnormally large amount of surrenders.

Of these causes, (1) and (2) are unlikely, to the extent that they cannot be foreseen, to give rise to any really serious consequences, and it is only (3) and (4) that call for further consideration.

The situation visualized in (3) could only occur through a major epidemic of unprecedented severity or a major war. Both contingencies would inevitably have financial repercussions whose effect would swamp those of any minor modification of investment policy. It is suggested, therefore, that these contingencies must be ignored in framing investment policy, because it is, in fact, impossible to provide for them in advance by any means.

As regards (4), a sudden increase in surrenders might occur as the result either of a loss of confidence in the financial stability of the individual office or of a general financial crisis. The danger of the former, if it can reasonably be considered to be a danger at all, can best be avoided by the pursuit of a sound investment policy (coupled, of course, with sound management and life underwriting) on the lines suggested in this paper, both by the correct selection of investments ensuring a good yield and by building up substantial 'free' reserves in the manner to be considered later.

In the event of a severe general financial crisis, can it be doubted that there would be some effective State assistance in the form either of a moratorium on surrender payments or of other appropriate measures?

In any event, an office is theoretically protected against a 'rise in surrenders' unless, in defiance of traditional actuarial policy, it has guaranteed surrender values on a substantial portion of its contracts, since the amounts paid out could, and in equity should, be adjusted to conform with the proceeds of the realization of securities which the surrenders make necessary.

For these reasons, therefore, I submit that it would be wrong for an office to modify the investment policy which is best suited to the types of contract it exists to carry out, namely life assurance contracts terminable on death or maturity, in order to provide the more easily for meeting a possible, but unlikely, large-scale cancellation of such contracts by its policyholders. In other words, a life office is entitled to assume, when a policyholder takes out a policy, that he wishes his premiums to be invested on the basis that the contract will run its normal course, and to reduce the profitability of such a contract or increase its cost by modifying investment policy to provide for early surrender is incorrect. It will, in my opinion, be sufficient if a fairly substantial portion of the funds are invested in readily realizable assets, and if the Second Principle is properly applied this will inevitably be the case.

It will be seen that the importance of the Principles lies primarily in the manner of approach to the consideration and selection of investments. The criticism of the existing canons is not that the safety of capital is unimportant—it is obviously of vital importance as has been noted above—but that to aim primarily at safety of capital will not secure remunerative investments but may well eventually lead to insolvency or uncompetitive premium rates. An examination of current office premium rates inevitably suggests doubts as to whether actuaries can still claim that their investment policy is, in practice, based on Bailey's canons.

PART II. VALUATION OF ASSETS

It has been noted earlier in this paper that it is impossible to determine the profit on life assurance and investment contracts until these contracts have been terminated. In order to take stock of the position from time to time it is therefore necessary to determine

(1) What is the value of the liabilities on underwriting contracts and of the assets in investment contracts.

(2) How much of the difference between these two quantities must be reserved for future contingencies, and how much may be considered to be available for distribution, now or in the future, to those entitled to share in it.

Many hundreds of pages of the *Journal* have been devoted to the consideration of the principles and methods to be applied to the valuation of liabilities, but few to the valuation of assets. This disparity of attention is, of course, largely due to the fact that the calculation of policy reserves involves technical actuarial problems which have no counterpart on the assets side. I think, however, that there has also been a feeling that while the correct and accurate valuation of liabilities is a matter of vital importance, the valuation of assets is not a problem deserving equal attention.

In the volume on *Valuation and Surplus* in the *Consolidation of Reading Series* only a brief reference is made to 'Treatment of Assets', and the author, after implying that the correct method of valuation is to take whichever is the lower of cost or present market price, sums up the relation between the valuation of assets and liabilities as follows:

'the treatment of assets arises from a distinct consideration and should be kept apart from the question of what is the proper value of the liabilities. The two ideas, however, cannot be kept entirely in watertight compartments and, in all reading bearing on the subjects under discussion (*namely, the valuation of liabilities and distribution of surplus*), the possible influence of the treatment of the assets must be kept somewhere in mind.'

I would like to suggest, however, that this statement hardly goes far enough in saying that the two valuations cannot be kept entirely in watertight compartments. The valuation may be considered as an interim assessment of profit earned. The surplus S , which it discloses, is equal to A (the value of the assets) less L (the value of the liabilities). If the best estimate of S is to be made, A and L must first be estimated as accurately as possible and, I suggest, the two estimates must be made on similar bases. If A and L are calculated on different bases, the value of $A - L$ will be hopelessly distorted and the resulting figure for S will be virtually meaningless. An accurate and realistic value for the surplus is, however, a necessary preliminary to the consideration of the manner of its disposal.

The first and most influential factor which must be determined in the valuation of liabilities is the rate of interest to be used, and I feel that some of the difficulties in the choice of this rate have arisen through keeping the valuations of assets and liabilities in separate watertight compartments. It is sometimes suggested that where the yield on existing funds is higher than that obtainable on new investments the valuation rate may be influenced by the former, and some argument has been devoted to the question of what is a proper mean between the two. If, however, the yield on existing assets is

calculated on the market values of these assets, it will be precisely the same as that obtainable on new investments and the whole problem disappears. It is only when the yield on existing assets is distorted by an unrealistic valuation that the discrepancy arises and unscientific guesses have to be made as to how the valuation rate of interest should be determined. It should perhaps be made clear at this point that it is not suggested that the valuation rate of interest will necessarily be the same as the yield on existing assets and current investments. It may be desirable to have a margin for a fall in the current yield and to provide a reserve for future bonuses, but that is a different problem, consideration of which should, in my opinion, be postponed until after the current net yield has been determined.

To allow the higher yield on existing assets, brought out by using artificially low book values, to increase the valuation rate above that indicated by the yield on new investments is in effect to use part or all of the existing appreciation to inflate the yield which can be earned in the future—in other words, to draw on existing capital to compensate for the expected deficiency in future income. Such a policy of 'living on capital' may be perfectly justifiable, but it is essential that its implications should be recognized and that it should not be adopted without a clear understanding of the effect of such a decision. It may be noted here that since the rate of interest, which has such a considerable influence on the value of the liabilities, is itself dependent on the yield produced by the assets, the valuation of the liabilities, however refined the methods used, cannot be more accurate than the valuation of the assets. In so far as the assumptions regarding future mortality and expense experience may be faulty, and approximate methods are used, the value of the liabilities will be less accurate. It would appear, therefore, that there is no great value in a high degree of refinement in the technical methods used in the valuation of liabilities.

It is, I think, clear that the only basis for valuation of assets which will harmonize with that of the valuation of liabilities is market value, and this is only to be expected when it is considered that there is no other realistic basis on which the assets can be valued. Objection to the market value basis is sometimes made on the grounds that the market value may at the date of valuation be abnormally high or low and that this value relates to a single day only. As regards the last-named objection, since the valuation itself is being made on a particular day it is surely the market value on that particular day which is relevant. It is certainly more relevant than the market value on some day in the remote past, which is the only significance now attaching to the cost.

As regards the objection that market value on the valuation date is abnormal, it may be possible to assert this afterwards, but I doubt whether on the actual day in question anyone would care to affirm positively that market prices are either abnormally low or abnormally high. Indeed, it is doubtful whether this conception of 'normality' has any real validity.

To value at cost is to assign to the market value at some date in the past a continued significance and importance which would appear to be quite unjustified. This can easily be seen by considering that to value, at cost, holdings of a security bought at different dates involves the valuation of portions of exactly the same asset at different prices. It is difficult to see how any logical defence of such a basis can be made and it is strange that some actuaries appear to be prepared to follow the dictates of convenience and expediency in a matter of such vital importance, especially when it is customary to aim at great 'accuracy' in the assessment of liabilities.

This illogical attachment to 'cost' is somewhat one-sided, since if the market value of the assets has fallen below their cost it is generally agreed that their book value must in total be written down at least to that market value. It is indeed doubtful whether in practice an office which failed to do so would be held to have complied with the statutory requirements, and in any case it would probably have to face awkward questions from its auditors, the Board of Trade, and possibly its policyholders. The attachment to the principle of 'writing down but never writing up' is, I suspect, really due to the illogical hope that such a course will automatically solve for the actuary that most difficult problem of deciding how much appreciation must be retained as a reserve against possible future depreciation. It would almost seem that the followers of this rule regard the original cost of an investment as a minimum below which the market price, once it has risen above it, will never again fall. It would obviously be pure coincidence if this were so.

It should perhaps be made clear that the market value basis should be applied not only to quoted Stock Exchange securities but to all assets. Where an investment is certainly redeemable or callable within, say, six months or a year, the market value will be the same to all intents and purposes as the nominal or redemption price. If, however, the asset is a loan at a rate of interest substantially in excess of the present market rate for similar loans, and is tied up for several years, its market value is obviously substantially in excess of the nominal value. The view is sometimes advanced that redeemable stocks should not be valued above their redemption price. This method, however, would not appear to be entirely logical, since no distinction is made according to the life of the stock and the method undervalues those with a high coupon rate relatively to those carrying a lower rate.

Assuming that 'market values' be used as the basis of valuation we are left with two main problems to solve:

- (a) How much of the disclosed surplus may be regarded as disposable?
- (b) How shall that part of the surplus which is not disposable be treated in the published accounts?

The second problem is the simpler and will be treated first. It is a question of book-keeping which cannot in the long run affect the profit or solvency of the office, and its solution is therefore purely a matter of expediency. There appear to be three courses which may be adopted:

- (1) To write down the book values of the assets to the full extent of the surplus, thus creating a hidden reserve.
- (2) To publish the full market values, and set up a reserve in the published accounts or increase the undivided surplus carried forward.
- (3) To employ some combination of (1) and (2).

Method (1) has the effect of concealing the full strength of the office from public knowledge, a course which appears to be officially tolerated, in view of the exclusion of life offices from the provisions of the recent Companies Act regarding hidden reserves. It leaves the actuary free to draw upon this reserve at a later date without the necessity of disclosing that he has done so, or justifying this course to the policyholders and shareholders.

Method (2) has the advantage of advertising the strength of the office, but its adoption means that when the reserve has to be used for the purpose for which it was designed, for example to meet depreciation, the office has to admit depreciation of its assets and that it has 'drawn on reserves' to meet it.

This, of course, is a perfectly justifiable policy, but perhaps, in the minds of the less intelligent members of the public, it implies some suggestion of weakness in comparison with the office which can meet the situation without apparently having to reduce its reserves. In practice the choice must depend on the amount of surplus to be reserved and the circumstances obtaining at the time, but I would suggest that notwithstanding the dictum 'freedom with publicity' the traditional bias of the actuary in favour of concealing at least a part of the strength of his reserves is, on the whole, a healthy one.

The question of how much surplus ought to be reserved is the major problem in the treatment of surplus, and is a much more difficult question than that considered in the previous paragraphs. In recent years the greater part of this surplus has usually been represented by appreciation of security values, and consideration of the problem appears often to have been clouded by two fallacies.

The first fallacy has already been mentioned, namely the view that by valuing at original cost price exactly the right provision is automatically made for the depreciation which may be expected. The second is that while book appreciation is a nebulous and hypothetical conception whose temporary existence depends only upon the accident of enhanced market values on an arbitrary date, realized profit is something actual and substantial which makes it very much more suitable for distribution. In fact, of course, it is quite impossible to draw any valid distinction whatever between the two. This may be easily seen if it is considered that book appreciation may, in theory and at some cost, be transformed into realized profit by the sale of all the appreciated securities and the immediate reinvestment of the proceeds in exactly the same securities. Such a transaction obviously makes no difference to the financial position of the office (except to the extent of the cost of carrying it out), but the whole book appreciation will have been reduced to nil and the realized profit correspondingly increased.

One further argument against the long-standing and still widely prevalent impression that capital appreciation is sacrosanct and untouchable lies in the impossibility, mentioned earlier in this paper, of drawing any sharp distinction between capital and income. One may have made investments which provided a low annual income and substantial accretions to capital, or those which gave a high annual return with some depletion of capital. In the case of redeemable fixed-interest securities, one may, perhaps, make some transfer between capital and income on the basis, say, of the original assumptions as to yield on which the security was bought. Such an assumption is somewhat arbitrary, but it is mathematically possible. In the case of equities it is difficult to see on what principle any such distinction can be made.

Depreciation in capital may arise primarily from two causes, a rise in the market rate of interest, or a real or supposed diminution in the income-earning power of the asset. That arising from the first cause can largely be balanced by the reduction in reserves brought about by a corresponding increase in the rate of interest at which the liabilities are valued. In theory it is probable that, provided assets and liabilities are approximately 'matched' as regard outstanding life, the balance is very nearly an exact one and danger of depreciation due to a rise in the market rate of interest may largely be ignored.

In practice, however, we must recognize that offices will always be more reluctant to raise the valuation rate than to lower it, and will not wish to reduce the amount of the liabilities by the full amount which is theoretically

justifiable. It would appear, then, that an additional reserve must be held against the depreciation which would not be balanced in this way; for example, one might set up a reserve roughly equivalent to the reduction in market values of fixed interest securities which would be brought about by a rise of, say, $\frac{1}{2}\%$ in the yield. Alternatively one might try to apportion the effect of a rise of about this amount in the gilt-edged long-term yield between short- and long-term securities and between the extremes of gilt-edged securities and, say, the less well-secured preference stocks.

In the case of depreciation due to a reduction, whether real or supposed, in the income-earning power of the security or its underlying assets, no balancing reduction can be made in the value of the liabilities. It is mainly this type of depreciation with which we have to deal in the case of equities, and we have no option here but to try and estimate the level to which market prices may fall and hold a reserve against such a fall.

The task of estimation, like that of selecting individual securities, is one which is beyond the scope of the discussion in this paper, since the answer will depend on the type of shares and property held and on the actuary's view of future economic and political conditions.

Past fluctuations of the trade cycle have shown falls of about 50% in the average market value of 'good class' equities from the top to the bottom. Perhaps it may be hoped that future fluctuations will be somewhat smoothed by the operation of a full employment policy and other forms of State planning, and that the troughs will not be so deep, or, perhaps, that our own particular holdings will be more resistant to depreciation than the average. Whatever view is taken, however, it is suggested that this problem calls for serious consideration and merely to leave these assets standing in the books 'at cost' will not solve the difficulties.

The conception of a reserve against future depreciation is, of course, similar to that underlying the 'notional price' valuation advocated by L. G. Whyte, F.F.A., in his paper read before the Faculty last March. Whyte suggested, in effect, the holding of a reserve for fixed interest securities equivalent to a rise of $\frac{1}{2}\%$ in the yield for those of the highest class, and a rather larger allowance for those of lower standing. His paper, however, does not offer any suggestion as to how the allowance for the depreciation of equities should be estimated.

The contention of this part of the paper, then, is that the assets should be valued at the price which they command at the valuation date, not at that which applied in the past when they were bought, or at that which it is thought they may have at some time in the future. From the surplus so disclosed provision must be made for the extent to which the values of the assets may be expected to fall relatively to the value of the liabilities against which they are held. Market price may be a somewhat imperfect indicator of value, but it is, in general, the best independent estimate available at the valuation date. It is the price at that date which would have to be paid for similar assets and that for which they could be sold assuming that market conditions remained unchanged. Moreover, it is the only consistent method in harmony with the current yield on new investments, on the basis of which the rate of interest to be used in the calculation of current premium rates and in the valuation of liabilities should largely be determined.

The reserve required for depreciation below cost can only be provided from the margin between the yield earned and that assumed in the calculation of

premiums. The principles of investment outlined in the first part of the paper are directed to ensuring that this yield shall be as high, and the depreciation to be provided against as low, as possible.

In conclusion, I must confess that no originality is claimed for any of the ideas set forth above. Most have, I think, been propounded explicitly or by implication by past writers or speakers as recorded in the pages of the *Journal*, and for the remainder I have drawn on the opinions of my colleagues in my own and other offices, to all of whom I would wish to acknowledge my debt. My aim has been to give more prominence to the criticisms which have been made of what I understand to be the orthodox doctrine, and to select those ideas which in theory I consider should, and in practice I believe do, form the basis of modern actuarial investment policy.

ABSTRACT OF THE DISCUSSION

Mr A. F. Murray, in opening the discussion, said that the author had taken as his starting-point the principles enunciated by A. H. Bailey in 1862, which were now, and had been for a long time, dignified in the Institute by the name 'Bailey's canons'. Bailey's fundamental conceptions, as the author himself suggested, were contained in the first two canons, and he thought that the present paper made out a strong case for their abolition. It should in fairness be recognized that when Bailey stated his First Principle—that the primary consideration was the safety of capital—he doubtless had in mind the comparatively wide opportunity which existed at that time for investment in mortgages and similar securities, where an adequate margin of capital was absolutely essential; but Bailey's subsequent remarks on the unsuitability of Government stocks as life assurance investments, on account of their inconvenient fluctuations in value, could only be construed as implying that Bailey was not prepared to face the problems which arose from those fluctuations, even though the assets were to consist of securities the long-term income from which could not be called in question. He had always felt that the profession, in accepting a proposition which assumed such a low standard of competence on the part of the actuary, had done itself less than justice. Bailey's Second Principle—that the highest practicable rate of interest should be maintained, always subject to his First Principle—had been described as a platitude. It was obvious that the rate of interest must in general vary inversely as the security of capital; hence to lay down a rule that the investor should endeavour at the same time to maintain a high degree of security for capital and also obtain a high rate of interest on his investment was to insist on two things which were usually mutually incompatible. He agreed with the author that the time had come to cease paying attention to Bailey's canons, except as historical curiosities, and to attempt to formulate a coherent set of principles which had some relation to present-day conditions.

The author's claim that his proposed First Principle gave proper regard to the relative importance of capital and income was a fair one, and avoided the difficulty which Bailey encountered in trying to divorce two conceptions which were mutually interdependent. The author's Second and Third Principles were based on a recognition of the fact that those responsible for the investment of large funds were faced with such a complex set of factors, many of them of opposing tendencies, that mistakes were bound to be made. Investment was more of an art than a science. It was a mixed game of skill and chance, where the stakes were very high, and hence it was not possible to lay down fixed rules. If that had been possible, the author would not have spent his time in writing the present paper; he would be enjoying the proceeds of a large fortune. The best that the investor could do was to formulate principles which would keep within manageable dimensions the adverse factors arising from influences which could not be foreseen, and at the same time give those who had the responsibility of management a measure of scope to back their own judgment. It seemed to him that the proposed Second and Third Principles did together have that effect.

The proposed Fourth Principle was a somewhat novel one and might startle an older generation of actuaries, but, whatever one's political persuasion might be, it did appear that the Government would in the future take a much more active part in the political, economic and social life of the nation. Assurance companies, as the possessors of large funds, ought to bear in mind that this influence was bound to be of increasing importance in investment work. It had to be assumed that the State would attempt to influence the distribution of capital towards socially desirable ends. In so far as this was so, it seemed to him inevitable that assurance companies should for their own benefit keep this factor constantly in mind. He felt that this would prove to be such an important factor in future that it deserved to be ranked as a principle, along with the others which the author suggested. He broadly agreed, therefore, with the author's statement of principles. They did not pretend to be the final word on the subject. It was probable that other members would put forward other principles which had an application wide enough for them to rank with those suggested in the paper, but the paper was a reasoned,

and in his view a successful, attempt to establish a set of principles in place of the outmoded canons which had held the field for so long.

Part II of the paper was devoted to the valuation of assets, and its thesis could be fairly summed up as a plea for using market values, but at the same time setting up suitable reserves to avoid the practical objections to raising the valuation rate unless a major and lasting rise had taken place in interest rates. It was at this point that he parted company with the author. In the first place, it seemed to him that the use of the market valuation with the adjustments suggested, in order to determine distributable surplus, raised almost as many difficulties as it solved. For example, in deciding on the deduction to be made from market values for determining the distribution of surplus, no one rate of interest, as the author agreed, could be applied over the whole range of investments. A $\frac{1}{2}\%$ rise of interest rates might be the basic rate which was considered to be appropriate, but that $\frac{1}{2}\%$ would obviously not be applied to a British Government stock redeemable in two or three years and also to a long-term debenture which might not be redeemed for 30-40 years. It was clearly necessary to make a choice as to the spread of this basic $\frac{1}{2}\%$ rate of interest, and he thought that the way in which that spread was chosen, always within the region of what was reasonable and practicable, could substantially affect the values that were brought out. That was a very serious objection to the method.

Another very practical difficulty was the fact that revaluation on an interest basis, $\frac{1}{2}\%$, say, higher than that operating at the time of valuation involved new assumptions about the operation of optional redemption dates. For instance, if 3% Savings Bonds 1955-65 were standing on a $2\frac{3}{4}\%$ basis, it had to be assumed that the redemption would take place in 1955, but if they were valued on a $3\frac{1}{4}\%$ basis, giving a value under par, was it still to be assumed that redemption would be in 1955? If not, would the valuation on a $3\frac{1}{4}\%$ basis be carried to its logical conclusion, the assumption that they would be redeemed in 1965? Obviously the term chosen had a big effect on the price, and this kind of difficulty had to be faced all through. In passing, he wished to point out that this was another argument for the avoidance of long optional redemption dates. It was all very well, however, to say they were not wanted, but if during the war insurance companies had gone to the Government and said 'We do not like this long-term option on Savings Bonds, 1955-65 or 1965-75; we want something shorter', he did not think that they would have got very far. That brought out the difficulty of laying down principles, because acceptance of the Government's contention that 1955-65 was correct would be acting in agreement with the author's Fourth Principle, and yet there would be this difficulty over the options. It showed how difficult it was to lay down any set of principles which could be applied over a wide range of circumstances.

As a more serious criticism, he put forward the argument that in the case of some offices, and probably very many, the average life of the asset was considerably longer than the average life of the liability. Moreover, the acceptance of the author's proposed First Principle would generally tend to lengthen rather than to reduce the average life of the assets. In such a case it seemed that the harmony which the author anticipated between the new valuations of assets and of liabilities would not in fact exist. It could also be argued against the use of market values that with the present-day divorce of management from ownership, market values were really only the result of the ideas of a lot of ignorant people, and actuaries should therefore be very careful about attaching any serious weight to them.

His main quarrel with the market-value theory would be directed against the last sentence on p. 190, where the author said 'If, however, the yield on existing assets is calculated on the market values of these assets, it will be precisely the same as that obtainable on new investments and the whole problem disappears'. That sounded very well, but he suggested in fact the problem did not disappear. Any actuary considering the distribution of bonus would have in mind the maintenance of that bonus over some reasonable space of time and would consider what the future premiums in respect of the existing business would contribute to that bonus. He should, therefore, consider what the future earnings rate would be on the funds in respect of existing business. That rate might be entirely different from the current market rate. In deciding on his

distribution of surplus the actuary should base the value of his assets on the value that would be brought out by using the expected yield on the present and future assets in respect of existing business over a period corresponding with the term of the liabilities. As in the market-value method, adjustments would be required in the case of ordinary shares and irredeemable stocks. He was rather surprised that the author had not advocated this method, as it accorded with the earlier part of his paper where he proposed to make investments on the basis of expected yield. Moreover if this method were adopted he thought many of the problems arising from the market-value method would disappear.

He admitted that any of the three methods—the standard book-value method, the market-value method which the author proposed, and the expected-yield method which he himself had suggested—might be used, though each had its particular difficulties. He thought, however, that any actuary who was in doubt about the amount of surplus he ought to distribute would have in mind a valuation on all three bases. It was possible that owing to variations in the rate of interest on the assets side and on the liabilities side the three answers would come out not very far apart. If they did, the actuary would be a very happy man and would confidently proceed to his distribution of surplus. If they did not, the most logical method, and that most approaching to reality, would be a valuation based on what the actuary expected the assets to earn; any other method was artificial, and might well conceal the true position in cases where there had been major changes in interest rates.

Mr F. W. Bacon found himself very largely in agreement with the principles which the author had laid down. It seemed to him that the object of investment for assurance funds and for pension funds was to turn capital into income, although that might not be the object for individuals, who might be much more concerned with capital profit. If for a fund the object was to turn capital into income, he thought that the First Principle must be accepted, especially in the alternative form in which the author had put it—'Look after the income and the capital will look after itself'. The author's argument, if he understood it correctly, was that it was necessary to go outside Government securities to get the yield assumed in the calculation of premiums, and that involved taking additional risks. Those risks must be incorporated as risk coefficients in the calculation of the expected yield, but that raised the interesting question whether, if those risks were incorporated, the expected yield so calculated would in fact exceed the rate on gilt-edged securities; after all, was it not the case that the excess yield on any class of security was the market's estimate of the extra risk involved? Unless, therefore, the market's estimates were wrong, why should there be any extra yield when the risks were incorporated in the calculation of the expected yield? He thought the answer to be that if there were no extra yield there would be no point in going outside the gilt-edged market at all, from which it followed that, although there would be a tendency for the expected yield to fall to the gilt-edged rate, it would never completely reach it. The difference was the payment which it was necessary to receive in order to make it worth while to take the risks at all. That extra yield or risk premium would depend on the degree of confidence which was felt that the probabilities incorporated in the expected yield had in fact been correctly estimated. The more speculative the security, or the more uncertain the general outlook, the less the degree of confidence felt and therefore the greater the risk premium which would be required; from which it would follow that, provided enough individual investments were held to form a spread, a higher expected yield should be obtained from the more speculative classes of security. On the other hand, the greater also was the catastrophe risk, and therefore the smaller the proportion of the fund which should legitimately be invested in them. He felt that that concept of a structure of risk premia, with its corresponding structure of yields to be obtained from different classes of security, was perhaps sufficiently important to be embodied in a separate principle.

So far he had assumed that market estimates were correct, but that was not necessarily the case. In the first place, the circumstances of an individual fund might differ from those on which the market's estimates were based. An obvious example was the tax

position. A tax-free fund like a pension fund might find some securities attractive which were definitely dear to a fund which was taxed, and vice versa. With regard to equities, the market might be dominated by investors whose object was capital profit rather than income; and, since the former was mainly influenced by the short-term outlook, the market might push shares too high or too low from the long-term point of view, and the investor who was concerned with the long-term point of view could take advantage of the discrepancies so produced. It was true, of course, that a fund could not sell all its holdings in equities if it thought that they were too high, but it could stay out of the market temporarily so far as new money was concerned, and in his view it should do so if it felt that the yield from equities did not provide an adequate risk premium. From that point of view, he wondered whether the author had not underestimated the importance of timing; in fact, it seemed to him that the qualifications which the author made to his Third Principle were very much more emphasized than the principle itself. Even when the trend of equities was upward, there were fluctuations within that general trend, and if the actuary felt that equities were too high he could confine his purchases to the periods when the trend was reversed, even if only temporarily; even then he should keep out of equities if he thought that the risk premium was still inadequate, particularly if he could get the expected yield to cover the rate required in the calculation of his premiums without going into equities. Another reason why the market's estimate might be incorrect was that through better knowledge or skill the actuary might be able in individual cases to make a better estimate of probable future income than the market was able to do. In such cases he would buy securities which were undervalued by the market and sell those which were overvalued. The working principle of investment, therefore, might perhaps be summarized as to buy cheap and to sell dear, meaning by that to buy where the risk premium seemed more than adequate to cover the extra risk involved and to sell where it appeared inadequate.

The First Principle emphasized the importance of estimating expected yield. The actuary had one great advantage; he could calculate the yield on the basis of the expected income even if that income was not constant from year to year or if the conditions of repayment of the capital were complicated. That technical knowledge was, of course, no substitute for sound judgment but, combined with the theoretical understanding of what a yield meant, he thought that it did form one of the essential bases of a sound judgment.

Mr Lewis G. Whyte, F.F.A. proposed to direct his remarks to the two main features of the paper, namely the four proposed principles and the part dealing with the valuation of assets. Before doing so, however, he would single out one item for special commendation; that was the author's definition of yield. He hoped, however, that the author realized that he had admitted the possibility of a negative yield.

The author's four principles were codified and accompanied by fairly extensive explanations, but he thought that there was a risk that in time to come the author's four principles might be taken out of their surrounding explanations and quoted in isolation. It was very important, therefore, that there should be no misunderstanding as to exactly what they meant. Dealing with the four principles one by one, the First Principle was obviously correct, so obviously that it lost some of its value. It was rather like telling a novice at golf to take as few shots as possible. The operative word, however, was the word 'yield', and the definition put upon it was essential to an understanding of its meaning. He thought, therefore, that the principle would have gained very much in value if the author could have incorporated in it some abridged version of his definition, then this principle would have some real strength in it. He very much liked the Third Principle in which the author brought in his thesis that judgment should be used. Judgment should be used at all times; not just when the security was purchased; not just when it came up for consideration with a view to sale. He wished that the author had gone further and said that the retention of existing investments should never be regarded as a way of merely doing nothing, but rather as the taking of a deliberate and positive decision. Coming back to the Second Principle, he was a little doubtful about its exact meaning. The author used the words 'the widest possible range', and by that

he was presumably saying that there was merit in spread, and that the greater the spread the greater the merit. He himself approached the matter from a different angle. He thought that it was desirable to fix an upper limit to the amount to be invested in any one security, in any one industry, in any one group; a limit comparable in objective to the limit acceptable at risk on any one life in life assurance and annuity contracts. That would automatically provide for a certain amount of distribution and would obviate any conflict between the Second and Third Principles. The Fourth Principle was that 'Offices should endeavour to orientate their investment policy to socially and economically desirable ends'. He liked that up to a point, but he wondered who exactly was to decide what were socially desirable and economically desirable ends; indeed, who was to know? Was not it a fact that more often than not those two were in conflict with one another?

He came next to the very important question of valuation. If he read the paper aright, the author placed a great deal of emphasis on the importance which the valuation of assets played as a factor in deciding the amount of surplus to be distributed. He entirely agreed there. The author then established a direct link between the rates of interest used in valuation, the rates of interest used in premium calculations, and the yield on existing investments. He was in entire agreement with that. The author then proposed that securities should be valued at market value less a reserve for depreciation. He did not disagree at all with that approach. The author went on to compare the method by which assets were valued and liabilities were valued, and said 'there is no great value in a high degree of refinement in the technical methods used in the valuation of liabilities'. That was a pretty direct statement to come from an actuary and was to some extent a confession of failure. The author was pleading for some equality of accuracy between the methods of valuing on each side of the balance sheet, but, if there was to be equality, surely they should strive to achieve it at the higher and not the lower end? He himself thought that it could be done.

The author's definition of yield could be summarized by saying that it was net accretion whether it came by income or by capital profit. He believed that the author implied that there was sanction to distribute capital profits by way of surplus, where they were earned. He based that interpretation on the author's reference on p. 193 to the 'impossibility . . . of drawing any sharp distinction between capital and income'. If his interpretation was correct, the author was opening up new and potentially very dangerous ground. He did not think that any actuaries wanted to go out of their way to encourage the distribution of capital profits; on the other hand, he did not see why they should say that that should never be done, that capital profits should always be put to reserve year after year. If assets were reasonably matched, particularly as regards the term of the liabilities, he thought that there were two distinct kinds of capital profit which might be thrown up. The first group would include those due directly to any lowering of yield, or to the general upsurge in the trade cycle. These should never be distributed by way of surplus. In the second group he would put those which arose directly from an active and successful investment policy, and here he thought that there might be some case for distribution, but, as was well known, such profits were not easy to come by, they were not always easy to recognize, and they were very difficult to determine.

If the valuation was to be made on market value less a reserve for depreciation, everything seemed to hinge on the calculation of the reserve. If the reserve was to be calculated by a really scientific method, he thought the author's suggestions were good. If, on the other hand, it was to be little more than a very intelligent guess, it was probably safer to rely on the more traditional methods of valuation.

Mr J. Plymen supported the author in what he described as a courageous challenge to the 'Bailey canons' and in the attempt to define alternative principles. The suggested First Principle was one with which probably all actuaries would agree; it was really a principle to which, consciously or subconsciously, actuaries had been working for many years. Mr Whyte had just mentioned the analogy between the selection of investments and the underwriting of life assurance risks. In practice, the procedure

employed to assess the yield from an investment closely resembled the corresponding process used to determine premiums for a life assurance contract. In both cases they tried to balance up the combined effect of a number of good and bad features and to express the result in financial terms. Frequently they had to decide that the investment risk was unacceptable, just as they had sometimes to conclude that a life was uninsurable. He would like to develop that interesting analogy a stage further. On the underwriting side, extensive research had been undertaken to develop the numerical rating system whereby the various medical features were readily combined and automatically given their due weight. Did the author envisage a similar system for investments, whereby salient features such as class, industry and so on were all expressed in numerical terms, so as to derive the risk coefficient? Personally, he doubted whether such a system was practicable. Although the paper dealt with principles, he would have liked to see some suggestions from the author as to how the risk coefficient would be estimated. As an example, he would consider a 'blue chip' ordinary share. Past experience would suggest that the coefficient there should be greater than one, but on a cautious view of future industrial prospects the value should be less than one. How were those conflicting views to be reconciled?

The principle of spreading the investments so as to minimize the risk of loss had been recognized by actuaries for many years, but the author inserted an important additional proviso by aiming to secure the advantage of any favourable trends. This could be done only by investing a considerable proportion of the funds in equity shares. The usual life assurance fund contained, say, 10% of equities and 40% of redeemable Government securities, and thus could hardly be said to be invested in accordance with those requirements. With regard to the Third Principle, he subscribed thoroughly to the author's cautious attitude to the problem of forecasting future trends. The fact had to be accepted that a mass of industrial securities and mortgages could never be rapidly switched so as to correct an unfavourable distribution. These investments should therefore be carefully distributed so as not to be too inappropriate in any circumstances. There was nothing more dangerous than to take too definite a view of the future and to be found to be wrong. He considered, however, that to some extent it was legitimate to back one's judgment with regard to the distribution of gilt-edged securities; these stocks were so readily negotiable on a large scale that errors could sometimes be corrected before too much damage was done.

With regard to the final section of the paper, he did not feel that the basis for valuing the assets could very well be discussed independently of the corresponding basis for the liabilities. If a net premium valuation was carried out with the usual arbitrary assumptions as to interest and expenses, there was little point in trying to be too precise in the valuation of the assets. If a bonus reserve valuation was made, however, the assets should be included at market price less a suitable depreciation reserve, as suggested by the author. Under present conditions, the profit margin was so small and the future so obscure that the correct practice seemed to be to publish the net premium valuation and to use the market-value basis in conjunction with the bonus reserve valuation for internal purposes only.

Mr H. O. Trouncer remarked that his first reaction on reading Part I of the paper (to which he proposed to confine his comments) was one of regret that the author misused the word 'actuarial'. He was sure that there were no 'actuarial' principles of investment. He thought that there were certain basic principles of investment which any investment adviser took into account when looking at any fund, whether a private client's fund, an investment trust or an assurance office fund. It was necessary to take into account the spreading of risks; and on this he agreed entirely with the comment made by Mr Whyte. After all, a life company selected its lives, and there was no reason why the investment department should not show the same discretion in selecting its investments. Secondly, the adviser took into account the liabilities and responsibilities of the fund or the client. These might vary from office to office and from client to client, but it was a basic principle to take them into account in every case. Thirdly, he would take account of the degree of activity to be exercised. That would vary from fund to

fund, and again he strongly agreed with Mr Whyte's comment, so far as the supervision of the funds of a life company or an insurance company was concerned. Just how often the investments were going to be reviewed would make a lot of difference to investment advice and investment decisions, and that would raise questions such as marketability and the size of the investment. He did not think that there were very many other basic principles of investment, except for the most important one—which he himself was mentioning last, but which the author put first—that, subject to those first three principles which he had just mentioned, they should try to invest their funds to earn the maximum expected yield thereon. That maximum yield would, incidentally, take account of the taxation status of the fund, and on that point he strongly disagreed with Mr Bacon's suggestion that there was a different set of principles necessary for the institutional investor and the private client. Mr Bacon inferred that the private individual was looking for capital profits, whereas what he was looking for was expected yield, taking account of his sur-tax position.

Personally, he found that the basic investment principles in which he believed conformed very largely with those of the author. Because he believed that those principles were basic to all fields of investment, he would like to digress for a moment to hope that the time might come when there would be a Chartered Institute of Investment Advisers, with an examination which would have to be passed not only by stockbrokers but by those who served in the investment departments of insurance companies, investment trusts and banks.

The only principle on which he had not touched was the author's Fourth Principle. All that he would say about that was that he felt sure that all companies did orientate their policy to socially and economically desirable ends, because he knew for a fact that the industry which was most popular with insurance companies so far as equity shares were concerned was the brewing industry!

Mr L. Ginsburg, F.F.A., suggested, as a compromise between Bailey and Pegler, that the first criterion of life office investment should be security of income. If, having regard to that criterion, the average yield on the life fund was less than that assumed in the premium basis, it was perhaps logical to conclude that it was the soundness of the premium basis which was illusory and not, as the author suggested, the soundness of the investments. If the income was secure, fluctuations in capital would depend only on variations in the fundamental rate of interest, and the remedy then seemed to lie in adjustment of the valuation basis. The conception of what income was secure and what was not had, he thought, undergone a marked change since Bailey's day, when the production and distribution of the national resources were carried out almost entirely by small commercial units. These units were keenly competitive, their profits were subject to violent fluctuations, and there was a considerable element of risk attached to investment even in their prior charges. The economic set-up today, on the other hand, seemed to be characterized by the large-scale organization which controlled immense resources and which had achieved a degree of stability quite unknown to Bailey. The profits of these big battalions of industry might still be subject to fluctuation, but their ultimate prosperity was so integrated with that of the community as a whole that sensational collapse might safely be disregarded. In normal times, interest on their prior charges was covered many times over by earnings, and those charges offered a field for investment providing a security of income which was relatively unknown 86 years ago, when Bailey promulgated his well-known canons.

The principle of security of income should not necessarily rule out investment in the ordinary shares of these very high-grade concerns, but it did imply that a purchase of such ordinary shares should be made only on a yield basis which contained a margin over the minimum remunerative yield sufficient to cover fluctuations in dividend. The adequacy of the margin would depend on the view taken of probable future economic and political trends. It might even be negative, and of necessity its amount could be arrived at only by purely qualitative methods. The attempted precision of the author's risk coefficient seemed to him to be fallacious when applied to a problem which bristled with unknown and largely indeterminable quantities. The risk coefficient appropriate

to an untried concern or to one with an erratic record would, he felt, defy definition, and he would hesitate to suggest what would be an adequate margin in yield to cover fluctuations. He gathered that it was in just such concerns of unproven stability (which were not by any means highly speculative) that the author would invest a proportion of his funds. Personally, he was doubtful whether the result would be entirely satisfactory, even if fortified by the author's Second Principle of spreading the risk.

So far as the second part of the paper was concerned, the fact should not be overlooked that the market value of a security was a function of the amount of the stock or the number of the shares which it was desired to buy or to sell. He would like to know what value the author would have placed on, say, I.C.I. ordinary shares in August 1947, when the market quotation was 42s.-43s., in 500 shares, and what value would he have placed on those shares if his fund held as many as 25,000 or 50,000 of them?

Mr W. Perks said the last speaker had seemed to suggest that the author's First Principle failed for vagueness and at first sight that seemed to be correct. This First Principle turned on the concept of 'expected yield', and actuaries were invited to interpret 'expected yield' in probability terms. He had not expected a meeting of practical men to approve a principle which depended upon a flagrantly subjective view of probability. That seemed to him, however, to be the essence of the author's First Principle, and it was significant that no arithmetical examples had been given. Nevertheless, he was sure that behind that First Principle there was a useful idea, a way of viewing an investment proposition, and he thought that it was this, rather than the Principle itself, about which the author was really talking. An investor, anticipating a yield of, say, 4 % might say, 'I may get that rate of 4 %, but I may get 3 % or I may get 5 %; I may perhaps get 6 % or 2 %. I am more likely, however, to get 4 % than 3 % or 5 %, and I am more likely to get 3 % or 5 % than 2 % or 6 %.' In other words, he had a sort of probability distribution in his mind, and what the author had indicated was that the first criterion of investment should be the mean value of such a probability distribution. He was, however, disappointed that the author did not go on to say that the next things to think about were the standard deviation of that distribution—how uncertain the yield was likely to be—which would sum up the possibilities and risk of the investment and the skewness of the distribution, which would sum up the nature of the investment. It seemed to him that for a British Government security on a current yield basis of 3 %, the 'expected yield' would be somewhat less than 3 %. Nobody could say what it was, except on a subjective basis. The distribution would be compact but highly skew. In the case of an ordinary share, on the other hand, the yield on the basis of the current dividend might be 5 %, but there would be a widely spread distribution, i.e. a large standard deviation, and the distribution would probably be cocked-hat. Negative yields would not, of course, be ruled out. He could not think that there was anything more in the First Principle suggested in the paper than some such subjective ideas as those.

The other point to which he wished to refer concerned valuation. The author, so far as he could gather from the paper, had not been clear about the purpose of the valuation. He assumed that what was being discussed was the valuation of a well-established British life office, whose solvency was not in question, and that the real issue was the amount of bonus to be declared in respect of an inter-valuation period—one year, three years, or five years. He suggested that in such conditions it was proper for an actuary to take the view that no Stock Exchange security was worth more than had been paid for it until it had been sold, and that it might, even then, be inappropriate to take credit for realized profit if the proceeds were immediately re-invested. He did not exclude amortization of premiums or discounts in the case of dated securities. He also suggested, as a matter of sound finance, that no actuary should capitalize his future underwriting profits or his future interest profits. The whole philosophy of valuation behind the second part of the present paper and certain other writings on these subjects in recent times was confined to the prospective view of a life assurance fund and neglected a proper regard to the retrospective view. It was significant to realize that, apart from this country and certain countries in the Commonwealth and Empire, most countries

had insurance legislation which required the valuation to be made on the basis of what was commonly called in those foreign countries the mathematical reserve—in other words, a net premium valuation. A net premium valuation took a retrospective view. He believed that to confine oneself to a retrospective view or to a prospective view was wrong; regard should be had to both. The idea behind the author's approach to valuations really depended on some sort of bonus reserve valuation. Bonus reserve valuations were first introduced into actuarial literature by Coutts in the years between 1900 and 1914, years of considerable financial stability. In those days it was possible to get appropriate results by taking a prospective view, but he wondered how many wars and how many economic depressions would be necessary before the actuarial profession would decide that the bonus reserve method was an unsatisfactory instrument for the distribution of life office profits. He wanted to suggest that the fundamental idea behind a bonus reserve valuation—namely, the maintenance of some given rate of bonus—was quite inappropriate to the actual world of today, and that the most that an actuary could do, and what he should do, was to maintain unimpaired his future profit sources and have nothing in his valuation procedure which capitalized future profits.

One peculiar idea which ran through a good deal of actuarial literature on valuation was the assumption that the valuation of the liabilities of a life office must be made on a single basis. There was no reason whatever why a life office should not value each year's new business on a different basis, or value the business on a given prospectus on one basis, and the business on another prospectus on a different basis. If those prospectuses were on different interest bases, there was a great deal to be said for that. Anybody who had had to face the problem of the first year's reserve on single premium business or annuity business would understand what he meant. The last word on the question of bonus reserve valuations had been said by Sir William Elderton in his classic paper on *Valuations in Modern Conditions*. In that paper, Sir William brought his readers back to the realities of life office valuations, and said that if they were going to have a bonus reserve valuation the basis should be such that they could justify their office premiums on it. That was, in effect, to return full circle to a net premium valuation.

Finally, he would suggest that if an office made a valuation of its liabilities on the same basis as its previous valuation, and valued its assets according to its book values based on cost, producing a certain surplus, what it did with that surplus was its own business. If it decided to distribute it, well and good; if it decided to use some of it to strengthen its valuation basis, well and good; but as soon as it brought into the picture any writings up of assets, if it was distributing any part of the result, it was on a dangerous path; if, on the other hand, it used it to strengthen its valuation basis, it was indulging in mere book-keeping.

Mr G. H. Recknell mentioned that the author had attributed to him some remarks made some years ago expressing dissatisfaction with Bailey's canons. He did not remember what the canons were to which the author referred, and he had not looked them up, so that he could not compare his present dissatisfaction with that which he had felt ten years ago. He thought, however, that in the exposition of the new principles which the author proposed the arguments had been put forward cogently and conclusively, and he was prepared to accept them and to join in any ceremony which the Institute might thereafter arrange for the canonization of Pegler and the dethronement of Bailey. He supposed that in investment, as in life itself, it was really better to have principles than to attempt to proceed without them, but he must confess to some sympathy with Mr Murray when he said that successful investment was a combination of craft and skill. This recalled to his mind a statement which a very distinguished actuary of a former generation made some years ago, when he said, after a long experience in the field of investment, 'there are no golden rules, and successful investment is nothing more than enlightened and intelligent opportunism'.

He also shared Mr Trouncer's sense of unease and thought that the author had attributed actuarial significance to the principles put forward in the paper where in fact none existed. He wished that the author had touched upon the different techniques of

investment, of which broadly speaking there were probably two kinds. He was talking of fixed interest investments. First, there were those who were prepared to sit on their investments and who declined to take a view about changes in the rate of interest, in the hope or expectation that if they were more or less in equilibrium on both sides of the account, any depreciation that they suffered because of a rise in interest rates would be balanced on the other side of the account. Secondly, there was the school of thought which attempted consciously, wisely or unwisely, to forecast changes in interest rates. A great deal of publicity had been given to the question of what had formerly been called an *active investment policy*. In his experience, it was impossible to operate the active investment policy theory in its entirety; because of the size of the funds which were being dealt with, it was practicable to operate it only in respect of British Government securities. They all had too many British Government securities, unfortunately, at the present time, so that that restriction did not cramp their style at all. In operating the policy, however, there was one very important distinction which ought to be made. If they invested long, and the rate of interest moved against them by rising, they suffered depreciation, but, as he had said before, that depreciation was not or should not be a real loss, if it was balanced by a reduction in the value of their liabilities. If, on the other hand, they invested short at a time when the interest rate moved against them by going down, they would inflict on themselves what might be irreparable damage.

Mr Leslie Brown, in closing the discussion, said that when he read the paper first it became immediately apparent to him that it would give rise to a most interesting discussion. After all, tilting at the pundits was always an amusing and entertaining occupation, and they could all join in that amusement, or in the present case, if they felt the other way about it, they could attack the author. He thought, however, that most of them would agree with the majority of the author's criticisms, until they came to the particular pet fad which they believed in themselves. As he had said, he had expected that there would be an interesting and entertaining discussion, and the author could be congratulated on the fact that that expectation had been realized. It was quite clear, however, that the author had hoped for much more than that; he had hoped to get established, for the benefit of students and others, a new conception of the Institute's views on the principles to be adopted in dealing with investments. From the discussion which had taken place that evening, it seemed to be fairly clear that those who spoke were almost, if not entirely, unanimous in thinking that some improvement was necessary, and most of them felt favourably inclined towards the author's suggestions, with some reservations regarding possible amendments 'on the Committee stage'.

He himself would like to add a little to those possible amendments. Mr Whyte had remarked that, good though the paper was, the thoughts behind it were very much better. Personally, so far as he could read those thoughts, he believed that they were in fact much better than the wording adopted in the general principles. There, he thought, the author came up against the almost insuperable difficulty, in dealing with an involved and complicated subject, of covering the whole ground and putting his views into the form of a few simple principles. Criticisms had already been made of the wording of those principles. The First Principle really depended on the conception of expected yield. Although that, as a conception, was a very valuable idea and helped enormously to simplify the discussion, he thought that the author himself would agree that generally speaking the expected yield was an incalculable item. It had been said that evening that the actuary had the advantage of being able to calculate yields, but he would suggest that anybody who did calculate the expected yield was not an actuary but a magician. If the expected yield was the main basis for determining investment, presumably any two investments which gave the same expected yield were equally suitable. That was a contention with which he was in fundamental disagreement. Two securities which gave the same expected yield might be of widely different class. With one there might be reasonable certainty all the way through of having consistent income and capital return, where the risk probability was very low; in the other case the risk probability might be very high, and there might be a relatively small possibility of receiving a very high return. Those factors of low risk and low return or high risk and high return might

combine to give the same expected yield, but beyond all question the second type of investment would not be acceptable, while the first would be. In other words, as had already been said by Mr Bacon, if an extra risk were taken an extra profit was required which would be sufficient not merely to cover the estimated risk but to provide a margin to justify entering into those risks at all. In that sense, he thought that the wording of the First Principle was capable of substantial improvement. He agreed with the Fourth Principle in a negative sense; he would prefer it to be expressed the other way round, that offices should avoid securities which were contrary to socially desirable ends. He did not think that it was their business in life assurance to attempt to impose their ideas about what were improvements in social conditions. He hesitated to think what the difficulties of the investment manager might be if each of his directors were allowed to have a say on such a subject!

He had expressed his agreement with the suggestion that the author's thoughts were better than some of his words, and he felt that the same might be said of Bailey. The words which Bailey used were now out of date, but the thoughts which Bailey had behind them would, he did not doubt, be more acceptable were they restated in the light of modern conditions. If too much emphasis were not laid on the literal interpretation of Bailey's words, but an attempt was made to get at the conception which lay behind them, he confessed that he still had a lingering affection for Bailey. Bailey's main conception was security, and it was on that conception of security that British life companies had been built up to their present strength. He would not like to adopt a set of principles today, whether for the instruction of students or for presentation to the outside world as representing the beliefs of the Institute, which did not put security first. By 'security' he did not necessarily mean security of capital only, as Bailey used the words. That might have been appropriate at the time, but he would largely accept the comments of the present author on what was real security. The second principle which he would adopt, then, would be to achieve the highest possible yield commensurate with adequate security. Then—to cover the wider thoughts which were apt to cloud the issue when an attempt was made to define principles—he thought that it would be necessary to consider the wider class of investments which normally gave a lower degree of security, and to measure that deficiency of security more or less on the lines suggested by the author, by estimating whether the expected yield was higher than that obtainable on a more secure class of investment to an extent which would justify taking the risks involved. In dealing with securities of that nature, it was very definitely necessary to think of limitations on the proportion of funds which should be invested in the securities of the various classes involved, and essential that a good spread amongst securities of each type should be achieved.

Coming to the second part of the paper, it seemed to him that the author's remarks were an attack on the use of cost or lower market value for the valuing of assets in the published accounts of a company. Whether anyone did that today, or could do it, he did not know, but he was quite sure—or at any rate he hoped—that nobody would adopt that basis in the private investigations and calculations which were made before a published valuation was achieved. If it were suggested that they should treat as a principle the use of cost for investments, he would definitely join in the attack. On the other hand, market values for this purpose had been justified by different people on the ground that the market value represented a real value, and the author had gone so far as to say that it represented the price for which the assets could be sold or for which similar assets could be purchased. That had already been commented on in the discussion. They were concerned today with funds of very large size. Could anyone suggest that on 31 December last they could have sold, say, £10,000,000 of British Government securities at anywhere near the market price? Could it be imagined that one of the large companies could sell £100,000,000 of such securities at anything like the market price? It had already been mentioned that the possible selling price of (say) £50,000 of an equity share bore no relation to the market price, while the possible buying price did not exist unless the securities happened to come on offer.

He found it almost impossible to summarize the discussion on this section of the paper. It seemed to him that if security was the main principle on which they should

base their investment policy, then stability was the main principle on which they should base their valuation policy. By that he meant that as market values fluctuated widely, apart from or in addition to any trends in the interest rate, he thought it undesirable to allow those fluctuations to affect the distributable surplus. In view of the size of their funds today, he also suggested that it was undesirable to publish figures which would show the variations in market value of the assets. In the year which had just passed, those variations would have to be measured in millions, and possibly even in tens of millions. The publication of such figures must react against the reputation for solidity which they had achieved, and which it was very important that they should maintain. To achieve stability, it was obviously necessary to make calculations and investigations on the lines suggested by the author and by others, to make bonus reserve valuations (*pace* Mr Perks), and any other such investigations as would enable them to measure the probable trend over a period of years, and, on the basis of those calculations, to spread the effect of changes during the valuation period over a longer period, and thus achieve steady progress—which might be downwards, of course—with regard to bonus. Those private calculations, he suggested, should not be published. The main problem was to keep the right margins and to see that the surplus emerged smoothly. In that sense, therefore, the use of cost or some other arbitrary figure for valuing the assets is justifiable. It should not be treated as a principle, nor could it be suggested that it necessarily gave an indication of the right margins to be held. It was an expedient, and an expedient which enabled them to build up the margins which they required. After all, if their investment policy was to spread their investments over a wide range of classes of security, taking a greater degree of risk than might be called absolute security, then part of the extra yield which they obtained was in effect a risk premium, and part of the extra income should be reserved for that purpose, against the losses which were bound to come. Again, with the expansion in the current volume of new business, it was essential for them to add something to their reserves with each valuation, even if only in order to maintain the present proportionate margin on the much larger figures. Moreover, at the present time, the conditions in which they operated were such that there was a much narrower trading margin than had existed at some periods in the past. It behoved them, therefore, to build gradually on to their security margins with a view to maintaining the position for the future. Fundamentally, it was not important where they kept those margins in their valuations, as long as they had them. When market values fluctuated widely, there was much to be said for keeping the majority of the margins in the valuation of the assets; in other words, to use an arbitrary value in the balance sheet; but those margins so retained must not be looked upon as sacrosanct in any way. We had been going through a period of continually falling interest rates, and the time must come when it was desirable to lower the valuation rate to keep in line with current conditions. When that time came, it was probably better to shift a part of the margins from the capital side of the balance sheet to the valuation side, rather than to attempt to build up the additional reserve required solely out of surplus, should this produce inequity to the policyholders. Similarly, the position might arise in future, and theoretically must be considered, that the trend of interest rates would be upwards again. Should that occur, they must have an open mind on the possibility of increasing the valuation rate, releasing reserves and using them to protect the capital value. Fundamentally, the problem was one of maintaining adequate margins and maintaining a reasonable balance in all directions.

The President (Mr A. H. Rowell), in proposing a vote of thanks to the author, said that the discussion had ranged very widely over a subject on which actuaries ought, in his opinion, to come out into the open, and on which students were entitled to the clearest possible guidance. The author of the venerable canons which had been so freely referred to would have been, he hoped, the first to agree that conditions had changed considerably since 1862, that his views had had a very good run, and that they were ripe for reconsideration. He thought that that reconsideration had been administered with commendable gentleness. He was sure that members would wish to accord a very hearty vote of thanks to the author for his paper.

Mr Pegler, in reply, thanked the President for his kind remarks about the paper. Mr Murray had pointed out that, at the time when Bailey's canons were first enunciated, offices were putting most of their funds into mortgages, and to that particular class of investment the canons, and particularly the first of them, were not inappropriate. Mr Brown had confessed to a lingering liking for Bailey's canons, although, he was relieved to note, with qualifications. He would like to emphasize that his main criticism was not of the original canons as they were enunciated, but rather of their continued acceptance without adequate examination whether they still applied. He felt, however, that even in Bailey's day those canons were not the best expression of the principles to be applied to the selection of investments generally. If one had to take a principle which had been laid down and say, in effect, 'This principle, of course, looks wrong on the face of it, but as long as you apply it in the right way and make certain reservations it is quite sound', that was not a commendation but rather a criticism of the principle. He had to confess to Mr Whyte that he did contend that in certain circumstances it was permissible to distribute capital profits for the reason which he had indicated in the paper, namely that, in his opinion, it was not really possible in the long run to draw a valid distinction between 'capital profits' and 'income profits'.

Mr Trouncer criticized the use of the word 'actuarial' in the title of the paper. He felt that this adjective was used there in much the same sense as in the case of the Institute's official text-book entitled *Actuarial Statistics*. He agreed that the fundamental principles were the same for all classes of investor, though their interpretation might have to be modified in their application to each particular case; but in using the term 'actuarial' he meant to imply, perhaps rather presumptuously, that his paper was intended to deal with those aspects of investment policy which were of particular interest to actuaries, and he had hoped that he had dealt with them in a manner which would appeal to actuaries by reason of their training and outlook. With regard to the second point, he was afraid that Mr Perks had put him right rather vigorously.

It remained for him to express his gratitude to all those who had taken the trouble to consider the questions raised in his paper, for the criticisms which they had made, and to the President both for the encouragement which he gave him to put his views (whether he agreed with them or not) before the Institute, for the criticism of his professional colleagues, and for all the help he had given him in the preparation of the paper, for which he had made no formal acknowledgement.

Mr Pegler has subsequently written as follows: I should like to deal first with the comments and criticisms of the second part of the paper, which discusses the valuation of assets. Apart from Mr Perks who, I gather, would reject the proposed method as wrong in principle, the main criticisms appeared to relate to the suitability of market price in certain circumstances and to the difficulty of making a satisfactory estimate of the reserve for depreciation. Mr Ginsburg stated that the market price was a function of the number of shares to be bought or sold. I should have thought the middle market price was, in general, independent of these considerations. In answer to his question as to the price at which I would value £50,000 of Imperial Chemical Industries Ltd. Ordinary Stock when the market quotation for a £1 unit was 42s. to 43s. in £500, I would unhesitatingly say 42s. 6d. The reasons for using the market price are that it is, so far as I know, the best independent estimate of value available and that the yield which it gives is in harmony with that applicable to new investments on which, I contend, the rate of interest for the valuation of liabilities should be based. It is no part of the argument for market prices that the whole of the assets could be sold or bought at these prices, nor do I think it is either necessary or desirable to try to estimate a figure at which either of these purely hypothetical operations could be carried out.

I must confess that I have not succeeded in formulating a concise set of rules for making estimates of the depreciation reserves. My primary object in the paper was to urge the necessity of making such an estimate instead of valuing securities at an arbitrary figure, such as cost, and shutting one's eyes to the future. Normally I would suggest that, for fixed interest securities, the reserve would be calculated by reference to the effect of a change in the rate of interest, varying for different classes, and, for equities, as a

proportion of the current market value, again varying according to class. The estimate would be retrospective to the extent that the magnitude of past fluctuations would be taken into account, but the over-riding consideration must be the view taken as to what may reasonably be expected in the future; the difficulty of the correct method is not a good reason for using instead some method unrelated to reality. I cannot, however, claim to have in mind any methods which would achieve great accuracy in such estimates, and for this reason I would still adhere to the views stated in the paper that a high degree of refinement in the methods of valuation of liabilities is of doubtful value. I can see no theoretical objection to the distribution of capital profits, other than those arising from a fall in the market rate of interest (which will be required to strengthen the basis of the valuation of liabilities), but I agree with Mr Whyte that one must be very careful about doing it in practice. I agree with Mr Murray that the amount of the reserve for depreciation of fixed interest securities may vary fairly substantially according to the way in which the differential rate of interest is spread over different classes. I do not feel, however, that this is a serious objection to the method provided that care is taken in judging the relative variability of the market prices of the classes concerned. I cannot see his difficulty in regard to optional redemption dates. There is no discontinuity involved in the change from one to another at the critical rate of interest, and I would always choose the date on the assumption that the option will be exercised against the investor.

Regarding the principles on which investments should be selected, dealt with in the first part of the paper, I feel that an important point was made by several speakers in connexion with the reliability of the estimate of expected yield. Mr Perks suggested that the skewness of the distribution was relevant as well as the position of the mean, and Mr Brown pointed out that the fact that theoretically two securities had the same expected yield did not necessarily mean that they were equally suitable as investments for life offices. I do not think that this point has been entirely ignored in the paper but I agree that it is perhaps insufficiently emphasized in the Principles, though I am not quite clear how they should be modified in order to meet this objection. Several speakers suggested that the calculation of the expected yield was impossible in practice and Mr Perks, in criticizing the whole conception, remarked that it was significant that no arithmetical examples had been given. As I pointed out in the paper, it is not suggested that a complicated mathematical calculation of an 'exact value' be made in each case. It is, however, I contend, possible to group securities into classes according to a reasonably accurate comparative estimation of their expected yield, and I am convinced that most investors, when exercising their judgment in the selection of an investment, do in fact make some such estimate of the future return obtainable. It is significant, in my view, that no critic suggested what alternative basis should govern the selection of securities where there is anything but a nominal risk involved. Mr Perks criticized the basis as being subjective. If I understand this correctly to mean that it depends on the judgment of the actuary, then I am quite impenitent. I agree most strongly with Mr Whyte that not only is the actuary entitled to exercise his judgment in all matters relating to investment policy but that it is imperative that he should do so. It is the emphasis which is laid on judgment in the training of an actuary which makes him peculiarly fitted for the management of investment affairs. Regarding Mr Trouncer's interesting suggestion of a Chartered Institute for Investment Advisors, I agree that such training would be most valuable. I hope he would be prepared to grant actuaries exemption from at least a part of the examination.

I agree with Mr Whyte that the words 'spread over the widest possible range' may be misleading. It is a combination of two ideas; one that the investor should bring the whole range of available securities under review when making his selection and not confine himself only to those traditionally considered 'suitable', and two that, notwithstanding his conviction that one or two classes will be specially profitable, he should not limit his investments to these classes alone. It is only to the first conception that the superlative is appropriate. I agree strongly with Mr Recknell's remarks about the dangers of investing too great a proportion of the funds short. I hope he would agree, with Mr Murray, that the emphasis in the paper is rather on long-term investments

except where indications of a rise in the rate of interest are very clear, and even in that case that due allowance must be made for the possibility of a different trend.

Finally, with reference to the basic conception of the paper, it has been suggested that if it is not possible to select investments which will earn with safety the yield assumed in the premiums, it is the latter which are unsound and not the investment policy. I hope no one thinks that I advocate the fixing of the interest basis for premiums before estimating the yield which can be earned on new investments. It must be remembered, however, that for existing contracts the rate of interest in the premium is already fixed and unalterable and if the assets, invested primarily with a view to safety of capital, failed to produce at least this rate, the office would be headed for insolvency as certainly as if the capital were unsafe. I am in complete agreement with Mr Brown that 'security' must come first. As he points out, however, this does not mean security of capital only; the earning of an adequate yield to cover the rate of interest assumed in existing contracts is an essential element in this conception of security, and it will not be attained by a narrowly applied policy of capital safety first.

It has been suggested that the principle of 'security of income' would provide a bridge between my views and those of Bailey. I cannot agree. As stated in the paper security of income—and by that I mean an adequate income, since security of income is meaningless unless the amount is in question—is in my view the primary aim of investment policy, but it is directly opposed to the aims expressed in Bailey's canons. I contend that the best way to ensure security of income is to aim directly at the earning of an adequate yield. The principles enunciated are an attempt at indicating how this should be done. If an adequate yield is secured, security of capital must follow inevitably, but there are, alas, only too many examples of securely invested capital earning an inadequate yield. It is clear from the discussion, however, that, as I suspected, the principles as stated are very far from perfect as a summary of the aims and guiding rules of investment policy. The concise statement of these aims and rules is a matter of great difficulty but I hope that vigorous attempts to achieve it will be pursued.

Mr T. S. Swaminathan has sent the following note:

Extending the author's definition of yield, if the 'expected yield' of an investment may be taken to mean the rate of interest at which the amount invested may be equated to the discounted value of all receipts (positive or negative) expected to be received on account of the investment, whether by way of capital or income, taking into account in respect of each such receipt the probability of its being received, Bailey's first two canons of investment could be restated in the following form:

- (i) The expected yield on any investment should not be negative.
- (ii) Subject to the above the aim of life office investment should be to obtain the maximum expected yield.

In trying to enunciate new principles of investment in place of the traditional canons, the author has only succeeded in restating them in more modern, but more obscure, language. The attack on Bailey's first canon appears to be without any justification whatsoever particularly at a time when almost all investors are familiar with the idea that capital profit or loss likely to be experienced in any investment should be appropriated to or set off against the income in order to get at a proper valuation of the investment. The objections to the first canon seem to overlook the two important considerations viz.,

- (i) interest is not an essential element in life insurance transactions and life assurance is possible even if no interest can be earned, and
- (ii) if, having regard to all considerations, funds can only be invested safely to provide a yield less than has been assumed in the calculations, it is the calculations that are unsound, not the investments.

The idea of an expected yield which would take into account the probability of each instalment of future income or capital repayment being received is superficially attractive, but it is very doubtful how far such a conception can be used in practice to give results in any way different from the appreciation of investments on the basis of the

redemption yields, or running yields in case of equities. Market prices of securities appear not only to take into account all possibilities of capital profit or loss, but also to anticipate variation in interest income in future, and calculations of expected yield on the lines indicated by the author could result in an appraisal of investments differing from the market appraisal only to the extent that the estimate of probabilities of receipt of future income or capital payments differs from that of the market.

It is equally difficult to agree with the author's view that no differentiation is possible between the income and capital and that the break-up value of a share based on the capital values of the assets has no significance whatsoever to an investor. The break-up value of a share may be considered to represent the capitalized value of that portion of the income from the investment income which represents 'rent' (unearned income of capital) and is independent of the contribution to the income made by labour and skilled management. It cannot be said with any degree of certainty that income of the latter type, even if secure, can be capitalized at so many years' purchase in the same way as 'rent'.