

OBJECTIVES AND METHODS OF FUNDING DEFINED BENEFIT PENSION SCHEMES

by

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*"Let me not to the marriage of true minds admit
impediments"*

1. INTRODUCTION

The objective of funding

1.1. As every actuarial student is taught¹:

"Pay-as-you-go is acceptable for a State pension scheme because the State is, for practical purposes, assured of a continuing existence".

However:

"The position is quite different in the case of an occupational scheme, since an employer's business may cease to exist".

1.2. It seems to us to follow, therefore, that the prime purpose of funding an occupational pension scheme must be to secure the accrued benefits, whatever they might be, in the event of the employer being unable or unwilling to continue to pay at some time in the future. To that end, the contributions would have to be sufficient both to pay the benefits as they fell due for as long as the scheme continued, and also to establish and maintain a fund which would be sufficient to secure the accrued benefits in the event of contributions ceasing and the scheme being discontinued, whenever that might occur.

1.3. In order to control funding on this approach it is necessary to:

- (a) Determine exactly what the accrued benefits are, so that their value now and in the future may be estimated by the actuary.
- (b) Make estimates of the future workforce, and the future membership of the scheme, in the employer's continuing business.

Methods of funding currently in use

1.4. In 1984, the Faculty of Actuaries and the Institute of Actuaries jointly published a Report on Terminology of Pension Funding Methods² prepared by a Working Party of the Pension Standards Joint Committee. That Report was intended only as a factual statement of actuarial practice and thus gave no indication as to the relative suitability of the various methods in use. None of the methods described in that Report had the objective described above.

1.5. The prospective methods described in the Report treat the pension scheme as a closed fund and are directed towards determining a level contribution rate thought appropriate for the present members in that closed fund. The resulting asset accumulation is secondary to determining the level contribution rate and is given the name "standard fund". In a supplement to the Report issued in May 1986 the same figure was defined as an "actuarial liability", although it is not necessarily a liability in any legal sense.

1.6. The accrued benefits methods described start with the same actuarial value of prospective benefits as in paragraph 1.5. They then separate out the part of that value which is attributable to past service, and call that the "actuarial liability" by the Projected Unit Method or the Projected Accrued Benefit Method. Alternatively, that value of past service liabilities may be reduced by assuming no increase in pensionable salaries after the valuation date and the result described as the "actuarial liability" by the Current Unit Method. In neither of these cases is the "actuarial liability" necessarily a liability in any legal sense. *It should be borne in mind that the provisions in the Social Security Acts for early leavers and for contracted-out pension schemes now effectively impose a higher accrued benefit entitlement than under the Current Unit Method, so that that method would no longer be used in practice.*

1.7. With accrued benefits methods of valuation, the contribution rate is obtained by estimating the "actuarial liability" at some future date and equating the value of future contributions during the intervening period with:

- (i) the value of benefits paid in the period, plus
- (ii) the value of the change (usually an increase) in "actuarial liability".

1.8. The period chosen could be one year but increasingly a longer "control period" is chosen so as to avoid inconvenient and unnecessary fluctuations in the contribution rate.

1.9. New entrants might, or might not, be allowed for during the control period. If they are *not* allowed for and a long control period is used, the method effectively becomes a prospective closed-fund method as referred to in paragraph 1.5.

1.10. The prime objective of funding identified above would be met by the accrued benefits method *if* the “actuarial liability” reflected the members’ actual entitlement on wind-up under the Trust Deed and Rules and *if* new entrants were allowed for during the control period used for calculating the contribution rate.

The purpose of this paper

1.11. It is our conclusion that the profession’s apparent difficulty in deciding upon the “relative suitability of the various methods” of funding currently in use, and the consequent difficulty of the Accounting Standards Committee in deriving a suitable accounting standard to accommodate the various methods, can be attributed to a general failure of pension fund Trust Deeds and Rules to record the true intentions of employers in a wind-up situation. As a consequence, traditional funding methods have come to disregard the provisions in the Trust Deed, which typically would grant no greater entitlement to members in service caught in a wind-up situation than to an early leaver.

1.12. It may be thought that one solution would be for the *actual* liability for accrued benefits according to a scheme’s Trust Deed and Rules to coincide with the “actuarial liability” under one of the methods described in the Working Party’s Report, thus meeting the prime objective for that scheme at the valuation date. However, under the Projected Unit Method, for example, the accrued benefit is the value of past service rights in a prospective valuation, allowing for future withdrawals, promotions, etc. It is not a defined benefit to which the member would or could be entitled as of right in the event of the scheme winding up. That, in our view, makes it difficult to explain to the member and renders the method conceptually inappropriate in the context of a defined benefit scheme.

1.13. Our purpose in writing this paper is to draw attention to the method of valuation which has been in use for some time in our own office and to commend it for general use in meeting the prime objective of funding as stated in paragraph 1.2.

1.14. The first stage of the method is to explain to employers the prime objective of funding as identified above and to indicate that we

correspondingly adopt what might be called a *defined* accrued benefit approach to valuation. The liability valued is thus the true accrued liability in accordance with the rules and not an "actuarial liability".

1.15. The second stage is therefore for the employer to decide what the members' entitlement should be on winding up and to make that secure by specifying the entitlement in the Trust Deed and Rules.

1.16. The maximum entitlement which we recommend for adoption is an accrued benefit based on past service and current pensionable pay revalued in line with expected increases in the general level of earnings up to normal pension age. This corresponds to what the member might have expected to receive on retirement for that same period of service had the scheme not wound up. Allowance could conceivably also be made for the actuary's salary scale (which would have allowed on an *average* basis for promotions, etc., in the ongoing scheme) but we do not think it either necessary or appropriate to add this in determining *individual* entitlements on winding up. It must not be forgotten that, in this context, the Inland Revenue also have views on the maximum entitlement.

1.17. The minimum entitlement on wind-up would be the statutory minimum benefit for the early leaver, namely, an accrued benefit based on current pensionable pay revalued up to normal pension age:

- (a) in line with the general level of earnings or one of the permitted alternatives on that part of the pension (if any) which represents the Guaranteed Minimum Pension to be provided by a contracted-out scheme, and
- (b) at 5% per annum or in line with the cost of living (as measured by the index of retail prices) if less on that part of the remaining pension attributable to service from 1st January 1985.

1.18. An intermediate entitlement could be chosen, for example, revaluation of (b) in the foregoing paragraph could relate to the whole of past service, including service before January 1985. Revaluation could also be at a higher rate than 5% per annum, for example, in line with expected increases in the cost of living even where these exceeded an overall rate of 5% per annum.

1.19. It will be appreciated that although the word "entitlement" is used here, the situation on actual wind-up would be that members

would receive their full entitlement only if the assets were sufficient. Otherwise, some benefits would have to be scaled down. The defined benefit on wind-up is thus effectively a target benefit for funding purposes, unlike benefits awarded in other circumstances which would be paid in full as long as the scheme continued.

1.20. Contrary to what we have seen suggested elsewhere, it is not our practice to encourage employers to adopt one of the lower wind-up benefits and corresponding funding targets. Neither is it our practice to present without comment actuarial reports which show an "actuarial liability" which is higher than a scheme's true accrued liability. For a scheme where a conscious choice of wind-up benefit has yet to be made, what we do is to indicate the present funding level in relation to the minimum and maximum targets and to an intermediate target, and then show in each case what the contribution rate should be in future in order to keep the fund on target or to bring it on to target within a stated period.

1.21. In making the calculations, new entrants are allowed for so as to maintain the workforce and scheme membership at their present level, unless there are good reasons for making a different assumption. This enables the employer to appreciate the financial implications for his continuing business of adopting one target wind-up benefit or another.

1.22. Membership projections reflecting the employer's continuing business are invariably made for 40 or 50 years ahead, with intermediate "snapshots" at the end of each decade. This is necessary in order to determine whether there is sufficient stability for a single contribution rate to apply in all future years. No business has an absolutely stable workforce in terms of age and length of pensionable service; in real life the contribution rate is bound to fluctuate or to exhibit an underlying trend upwards or downwards for a period of time. If the instability is material, a higher or lower contribution rate would be applied for a time, in order to avoid the funding level falling below target or getting too far above target.

1.23. Our experience is that it is a minority of employers who choose the minimum security benefit. The majority adopt the maximum target or one intermediate between the maximum and minimum. However, whatever the choice, it has to be accepted, since it is for the employer and not the actuary to decide upon the wind-up benefit provisions in the scheme, which in turn determines the accrued liabilities.

A brief outline of the paper

1.24. In the next section of the paper we present some background material, including reference to recent events which have a bearing on the matters under discussion, such as:

- (a) The prevalence of surpluses, some large, in pension funds.
- (b) The statutory valuation basis to be used for identifying (for tax purposes) excessive surpluses³.
- (c) Exposure Draft 39 on accounting for pension costs in company accounts⁴.
- (d) The Judgment in *Hillsdown Holdings Limited v Imperial Foods Limited*⁵.

1.25. This is followed by sections dealing in more detail with:

- (a) taking steps to get the legal framework right,
- (b) indicating, with numerical comparisons, how the various methods of valuation in use fit the legal framework, and
- (c) deriving a suitable accounting standard.

That, in our view, is the correct sequence. The first thing is to get the legal framework right, so that actuaries may then operate within that framework and, in this more orderly situation, make it easier for the accountants' needs to be met.

2. BACKGROUND

2.1. The method of valuation outlined above, to which we have given the name "Defined Accrued Benefit Method", is not new. As already mentioned, it has been in use in our office for many years—in fact since 1970. The method's first public airing was at an international conference in September 1978, reported in *Pensions World* in November of that year⁶. Since then it has had wider publicity in numerous articles in the accounting, pensions and financial press (e.g. *Setting a Standard for Pension Costs, Accountancy*, March 1980)⁷. One reaction to these articles was outright rejection in the paper "Valuation of Final Salary Pension Schemes" presented to the Institute of Actuaries on 26th April 1982 by R. B. Colbran.⁸

"I believe that a strong lead should be given by *Council* to discourage members from any association with the Discontinuance Target Method" (the general category into which he had placed the method).

2.2. The paper by Mr Colbran included a number of statements

which in our view did not explain matters as fully as they might, such as:

- (i) "The general effect of the (Discontinuance Target) Method is to produce a lower contribution rate, often appreciably lower, than results from the Aggregate Method."

It was perfectly true that the method had produced a lower contribution rate than the Aggregate Method for new schemes starting up. If the actuary's assumptions turned out to be correct, though, the first would gradually rise and the latter fall, so that the contribution rate by the Aggregate Method would ultimately be the smaller. However, variations from the actuary's assumptions have been quite dramatic in the past 20 years or so and have affected differently the results obtained by the two methods so that today, in practice, it is impossible to generalise on the relativity of the contribution rates. The contribution rate resulting from the Aggregate Method is inversely related to the ratio of existing assets to total projected liabilities for past and future service of present members and could lie anywhere within a very wide spectrum.

- (ii) "It would be natural to fear that the Projected Unit Credit method would result in a steadily rising cost as a percentage of salary."

The essence of the Projected Unit Credit Method (or Projected Unit Method) is that, even with a new scheme, it may be expected to produce a *stable* percentage contribution rate for a stable workforce, although within that rate the cost of each year's accrual is smaller for young employees than for elderly employees. To fear an increase in the contribution rate is thus to foresee a dramatic aging of the membership, not a very realistic prospect for an ongoing scheme and certainly not of general application.

2.3. Mr Colbran's rejection of the accrued benefits valuation method appeared to stem mainly from his disapproval that:

"many employers have installed insured final salary schemes without being aware of the potential cost for the *present membership*."

The words in italics (by us) are important. They indicate that it is *not just the increasing contribution rate for an immature scheme, which would result from the use of some accrued benefits methods, to which Mr Colbran would object; to be acceptable to him, and to others who supported him in discussion, a method would have to build up sufficient funds to avoid any increase in the contribution rate in the unlikely situation of the scheme being closed to new*

entrants and yet continuing in operation until the last of the aging present members retired.

2.4. Much more could have been said in favour of accrued benefits valuation methods in general, and the method described in the article in *Accountancy* in particular, than was brought out by Mr Colbran, both as regards the principles involved and the implications for contribution rates and funding levels. A paper, "A Financial Framework for Pension Funds", was therefore presented to the Faculty of Actuaries on 21st February 1983⁹, which dealt more fully with both these aspects but it is apparent to us that there still remains a substantial measure of opposition to the method by some and misunderstanding of it by others, so that a further presentation is needed.

2.5. Only one of us was involved in the events described above, i.e. in developing and adapting the method and in explaining its use in various articles and in the paper presented to the Faculty in 1983. The other, only occasionally concerned with occupational pensions during a long career in Government service, had nevertheless harboured doubts for some time about the appropriateness of using the Entry Age or Aggregate Method for an ongoing valuation (as most actuaries did) yet transferring only the value of past service liabilities when a scheme had to be apportioned (as most actuaries did). Moreover, the allegation that there was something reprehensible about adopting an accrued benefits method became less convincing as time passed. (It had been made much earlier than in Mr Colbran's 1982 paper.) This raised the questions as to which method was "right" and, if both were admissible, how and by whom was the choice of method to be made. These questions, of considerable importance to the profession, remain unanswered.

2.6. Although not concerned with the finances of individual pension funds, long-term projections of the totality of occupational pension provision were made on a somewhat simplistic basis for purposes of the paper "Pension Problems and their Solution" submitted to the Institute of Actuaries on 24th January 1983¹⁰. More detailed estimates were made in an article contributed to the *Journal* by Mr J. L. Field (J.I.A., 110, 243)¹¹. A major difficulty in making such estimates is deciding upon the level of funding to be assumed for the future.

2.7. Should it be assumed that actuaries generally will be persuaded to use only prospective methods, with the consequence,

in our view, that schemes would generally build up funds well above what was required to cover their liabilities in respect of past service? Would funding to this level be reasonable from the point of view of individual employers, and desirable or undesirable from a macro-economic point of view? A closed-fund-level-contribution funding criterion for all pension schemes individually would mean that the combined funds would be sufficient to cover the closure of *all* occupational schemes to new entrants and their gradual run-down. Would this be a realistic funding target to adopt, or over cautious?

2.8. If ever there was a time when the need for a closed-fund-level-contribution approach to pension funding would be put to the test, that time would be in the difficult economic conditions of the present. But there is no evidence that we know of which suggests that funds have been closing and running down gradually. On the contrary, the weight of evidence points to redundancy, high turnover, contribution reductions and surpluses in pension funds. One estimate puts the total surplus in pension funds relative to the "actuarial liabilities" at £8 billion. Another estimate of the total surplus is given as £50 billion, but doubts have been expressed about that result so it must be viewed with some caution. However, if an accrued benefits approach had been used as standard in estimating "actuarial liabilities" in the first of these estimates, it would presumably have produced a larger figure than £8 billion.

2.9. Among recent converts to the accrued benefits approach to valuation has been the British Government (presumably advised by the Government Actuary). Under new regulations to be prescribed under Schedule 12 of the Finance Act 1986³, liabilities will have to be valued by the Projected Accrued Benefit Method on stated assumptions. If the assets, also valued on a prescribed basis, exceed that value of the liabilities by more than a specified percentage, the surplus will be deemed excessive and the scheme will be required to take steps to reduce it or suffer tax on part of the fund's investment income.

2.10. It is possible that a prospective valuation, including the future service liabilities and the value of future contributions of the present members but calculated on weaker assumptions than in the statutory basis, would produce an actuarial liability no higher. Nevertheless, the Finance Act 1986 appears to postulate that, in principle, prospective valuation methods result in overfunding and that the accrued benefits approach to valuation should therefore be used.

2.11. That means that in almost all cases a real liability calculated by our Defined Accrued Benefit Method should be acceptable. The statutory method sets a *maximum* for the liability or the "actuarial liability". A smaller figure would be of no concern to the Inland Revenue unless the employer sought a refund of a surplus calculated by reference to the lower liability figure.

2.12. In a Statement of Financial Accounting Standards No. 87 published in December 1985¹², the Financial Accounting Standards Board in U.S.A. announced that, for consistency between companies, all companies should, after a transitional period, show in their financial statements either an asset or an unfunded pension liability, according to the extent to which their pension fund's assets exceeded, or fell short of, accrued liabilities calculated by the Projected Unit Method. Here is a further endorsement of the accrued benefits method of valuation, although only indirectly applicable to some schemes in the U.K.

2.13. In Exposure Draft 39 published in May 1986⁴ the Accounting Standards Committee in the U.K. has invited comments on its proposals for this country. In general, the proposed accounting standard would be met by any actuarial method which resulted in the cost of pensions being charged against profits on a systematic basis over the service lives of the employees in the scheme *and* produced a regular pension cost which was a substantially level percentage of current and expected future pensionable payroll.

2.14. Accounting standards are considered further in section 5 of the paper. We examine there the extent to which methods currently in use satisfy the criteria of ED 39 and might therefore appear suitable in the eyes of the Accounting Standards Committee.

2.15. A recent Judgment by Mr Justice Walton at the Royal Courts of Justice⁶ concerning apportionment of the funds of the Imperial Foods Pension Scheme and payment of a bulk transfer value to a new scheme set up by Hilldown Holdings Limited appeared to us to highlight the present unsatisfactory situation concerning levels of funding and the definition of accrued benefits in Trust Deeds and Rules. A detailed examination of that Judgment will form a suitable introduction to the next section of the paper on getting the legal framework right.

3. THE LEGAL FRAMEWORK

*Hillsdown Holdings Limited and others v.
Imperial Foods Limited and others*⁵

3.1. The Judgment in this case by Mr Justice Walton, dated 7th February 1986 at the Royal Courts of Justice, received a great deal of publicity. It was reported at the time in the national press and this was followed by detailed consideration in the pensions press, so that most actuaries will by now be aware of the Judgment's reasoning and conclusions. A brief note is to be published in JIA, 113, Part 2. In our view, one of its most important features was that it showed clearly the present inadequacy of pension fund Trust Deeds and Rules concerning the rights of members on winding up or on apportionment of funds and bulk transfer to another scheme. Only one scheme was, of course, under consideration, the Imperial Foods Pension Scheme, but, in our experience, that scheme was typical of pension schemes in general.

3.2. The circumstances were that two subsidiary companies of Imperial Foods Limited were being sold to Hillsdown Holdings Limited. The employees were to be transferred to a new pension scheme and the matter to be determined was the amount of the transfer value to be paid from the Imperial Foods Pension Scheme. (There were other matters before the Court but we shall confine our attention to this one.) As the Trust Deed did not say what should happen in this event, it was up to the actuary of the Imperial Foods Scheme to decide what was best in the interests of all concerned.

3.3. The exact words of the Judgment concerning the actuary's duties are important. They were:

"The function of an actuary in any situation which is not governed precisely by the provisions in the Trust Deed is to achieve the greatest possible degree of fairness between the various persons interested in the scheme."

This confirmed the conclusion in a previous Judgment by Buckley J. in 1969¹⁹ in a somewhat similar situation in (Re George Newnes Group Pension Fund, 3rd July 1969, J.I.A., 98, 251). On that occasion the Judgment had said:

"The function of an actuary in advising how a pension scheme of this kind should be dealt with on the determination of the scheme is to achieve the greatest practicable degree of fairness between various persons interested under the scheme consistent with the Rules governing the scheme."

He cannot ignore or contravene those Rules, and in the pursuit of fairness he may also have to pay regard to the spirit of those Rules in respects which are not controlled by their express terms or necessary implication, but, consistently with the Rules, he must do his best to achieve as fair a distribution of benefits as the size of the available fund, the character of the scheme and the circumstances of the contributors make possible."

3.4. In 1969, as in 1986, the Trust Deed and Rules had not determined what should happen on winding up or on apportionment and recourse to the Courts was necessary because the actuaries concerned had formed different opinions on what was fair and reasonable. We have indicated in italics, in both Judgments, the words which seem to us to get to the heart of the matter. Of course actuaries are well able to express an opinion and even exercise a judgment when the interests of the various parties are uncertain, but what a pity that pension fund Trust Deeds and Rules are not as definitive on members' entitlement on winding up or apportionment as they are on retirement, death and withdrawal. Why should such an important matter rest on an actuary's opinion?

3.5. The Imperial Foods actuary, Mr L. J. Martin, told the Court that, in theory, he could have used any of the following methods of apportioning the funds or calculating the amount of the transfer payment:

- (1) Numbers of members.
- (2) Cash accumulations.
- (3) Value of accrued rights calculated by reference to current salaries.
- (4) Past service reserve with allowance for future salary and pension increases.
- (5) Total (past and future) service reserve method.
- (6) Share of fund.

3.6. We recognise that whilst, for example, Method (1) might have been acceptable *in theory*, it is obvious that Mr Martin would not have considered employing it in practice. However, in our view, what he told the court should be seen as a serious indictment of pension scheme design, in that the wording of the Trust Deed and Rules apparently was so indeterminate that any one of these significantly different methods could be regarded as legally admissible. We would stress that whilst this criticism is levelled against the particular Deed

referred to in the Judgment, our experience suggests that such provisions are widespread.

3.7. In the event, Mr Martin chose method (4). There was apparently a substantial surplus in the fund over and above the liabilities for all members calculated by this method. Of particular interest from an actuarial point of view are Mr Justice Walton's remarks concerning the nature of this surplus, which he thought "temporary" and to "err on the side of being in credit".

"This really represents, of course, additional payments made by the companies above and beyond the "balance of cost", which is what they have strictly undertaken to meet. But, certainly, at the moment in question, the fund was in excess of the actuarial liabilities of the scheme in respect of service to 18th May 1982 attributable to the whole membership of the scheme."

"But what is called, in this connection, a surplus, having no existence in reality, represents, in a case of the present nature, what may be termed a temporary surplus funding by the employing company."

3.8. We do not know what method of funding had been employed for the Imperial Foods Pension Scheme but, had it been the Entry Age Method or the Aggregate Method, at least part of the surplus as defined above would *not* have been temporary and would *not* have resulted from an explicit intention to err temporarily on the high side of (4) but from the pursuit of a different funding objective. Apparently nothing was said in the proceedings to inform Mr Justice Walton that, even if it was not relevant to the case before him, it was nevertheless customary practice, and not temporary or exceptional, for schemes to be funded by method (5) on Mr Martin's list. He remained unaware that many actuaries adopted a higher funding objective than is implied by "the obviously generous treatment afforded by the Past Service Reserve Method" used for apportionment.

Defined Accrued Benefits

3.9. We advocate that all pension schemes should state clearly in their Trust Deed and Rules what the members' entitlement would be on winding up, or on apportionment and bulk transfer to a different scheme. We take the Judgments referred to above as saying that, in that case, in the eyes of the court there would be no uncertainty and therefore nothing to be left to actuarial judgment except where necessary to put a value on the accrued benefits.

3.10. In our view, that is how it should be, but we are aware that many actuaries would disagree with us. They would appear to take the view that, once a scheme has decided that the retirement pension is to be, say, one-sixtieth of final pensionable pay for each year of service, there is an unwritten rule that the scheme should then secure for each member an amount equivalent to the value of the accrued benefits based on service to date which would have been payable on death, withdrawal or retirement in the ongoing scheme, allowing for future pay increases. A sufficiency of assets to meet this "reasonable expectation", irrespective of what the rules might say, would be secured by adopting the Projected Unit Method of valuation and they would require other actuaries to do as they do by having the Faculty and the Institute forbid their members to use a weaker valuation method than that. Some would wish to go further and outlaw even that method, insisting upon the closed-fund-level-contribution method.

3.11. The question which must be answered is this: Is it admissible in law for a pension fund's Trust Deed and Rules to define the members' entitlement on winding up or apportionment, or is it not? Believers in the "unwritten rule" mentioned above are clearly of the opinion that it is not admissible and that members of all schemes have a reasonable expectation which overrides any choice which a scheme might attempt to exercise in the matter. We do not share that view, and we do not think that employers or their legal advisers would find it acceptable if it were put to them in those terms. Only primary legislation can properly deny employers the right to choose, for example as the provisions in the Social Security Act 1985 for revaluation of early leavers' deferred pensions overrode pension scheme rules providing smaller benefits. We do not believe that actuarial convention can deny schemes the choice.

3.12. If we are right—and it is a matter of law and not of the weight of actuarial opinion which will decide whether we are or not—then it is the Defined Accrued Benefit Method of valuation which fits this legal situation by acknowledging that there is a difference between schemes which have consciously chosen different benefit entitlements on winding up.

3.13. If the unwritten law were to become written, by a scheme providing in its Rules for each active member's entitlement on winding up to be the Standard Fund for that member calculated by the Projected Unit Method, that would convert the "actuarial liability" to a true liability. Valuation by the Projected Unit Method

would then become equivalent to valuation by the Defined Accrued Benefit Method, although the defined accrued benefit would be the calculated amount of the member's claim on the available assets on winding up rather than the amount of pension to be secured for him. The result in practice could be higher than our recommended maximum defined benefit if the use of a salary scale allowing for promotion, etc., was more than sufficient to offset the result of allowing for withdrawals; otherwise the result would be lower than our maximum.

3.14. We have seen suggested a method of valuation which goes some way in the same direction as the Defined Accrued Benefit Method which we advocate. While this method agrees that it is for the employer to decide, it is the funding target which the employer decides, and therefore the level of backing for the accrued benefit, but the accrued benefit itself is not defined. Moreover, the employer also reserves the right to reduce the funding target, subject to notifying the members. The virtue seen for this method is that, by reducing the target, the employer's contribution liability could be eased in times of difficulty. If the members' jobs were insecure, it is argued that they might welcome their jobs being put before their pensions and some of the insecurity being transferred to the backing for their accrued pensions.

3.15. We appreciate the reasoning behind this approach. Indeed, as our own method evolved over the years it was considered whether the choice of benefit need be made secure in the Trust Deed and Rules or if it would be sufficient merely to notify and record the choice of accrued benefit. However, the danger seen in this approach was that the same employer, or a new employer, could reduce the defined accrued benefit for reasons other than job security. Perhaps this could not be done easily or painlessly in terms of employer/employee relations. Perhaps, in the light of the previously established intention, the Trustees would oppose the action. However, in the last resort, that might not prevent a reduction if the employer or new employer were determined. To be truly secure, the employees' accrued rights would have to be made firm in the Trust Deed and Rules.

3.16. What has been said above concerns the accrued benefits of those not yet retired. We must also address the difficult situation where it is the practice to award discretionary increases when pensions are in payment. The difficulty lies in deciding when the practice of making such increases has been sufficiently regular for

the members, both those retired and those not yet retired, to have a sufficiently strong expectation that the practice will continue for it to have become a commitment from which the scheme cannot realistically escape. ED 39⁴ would make it compulsory for the actuary to assume that an established practice of paying such increases would continue. The new statutory valuation basis⁵ also refers to allowing for such increases.

3.17. Where the employer has recognised such a commitment by electing to fund in advance for similar pension increases in future, it is our practice to recommend that the additional funds built up should be made secure for the purpose intended by providing for the increases in the Trust Deed, i.e. by making them part of the defined wind-up benefit.

3.18. Where there is at present no pre-funding for future increases, but the actuary is of the opinion that there is an established practice which it is reasonable to suppose will continue, and that it would be difficult while maintaining good employer/employee relations for it to be terminated, it would be appropriate in our view for the actuary to draw this to the employer's attention. It would then be for the employer to decide whether to increase contributions so as to pre-fund the liability in future and make it part of the defined wind-up benefit.

3.19. It is not feasible, in our opinion, to deny the employer the final decision in this matter, as ED 39 seeks to do. We would expect employers to react reasonably when it was drawn to their attention that they had created expectations in their employees' minds but any attempt at compulsion which the employer thought unreasonable could ultimately be thwarted by his changing the practice of previous years so that it was no longer an established practice and therefore no longer a commitment for the future.

The present form of Trust Deeds and Rules

3.20. In our experience, it would be typical at present for a pension scheme to provide that, on winding up, the assets available should be applied, broadly in the following order, towards:

- (i) meeting the expenses of winding up
- (ii) securing the continuation of pensions already in payment, including any promised increases in those pensions
- (iii) (a) securing the payment in due course of the deferred

pensions promised to those who have already left service, and

- (b) making similar provision to that in (a) for those in active service, as if they had left service on the date of winding up.

To the extent that the deferred pensions in (iii) related to Guaranteed Minimum Pensions under the arrangements for contracting out of the State scheme, those deferred pensions would rank prior to other deferred pensions if the assets were insufficient to meet all claims on winding up.

3.21. Any assets surplus to meeting those minimum requirements would be disposed of by the Trustees in accordance with the provisions in the Trust Deed. Those provisions might take one of the following forms:

- (i) application to provide augmented benefits to scheme members, usually subject to upper limits set by the Inland Revenue, but with no possibility of the employer benefiting from the surplus until those limits had been reached
- (ii) application partly as in (i) and partly in a payment to the employer, wholly at the Trustees' discretion
- (iii) as in (ii), but subject to the Trustees' obtaining the employer's consent
- (iv) payment to the employer.

In considering each of these, we have to bear in mind that a scheme may choose to aim at a funding level higher than the minimum, so that a significant surplus on winding up could be pre-planned and not fortuitous.

3.22. In form (i), even if the members happened to know that the employer was overfunding, and had formed an expectation that their accrued benefits would be augmented, this would last only as long as the employer continued to fund at the higher level. We have already indicated our view that it is preferable for the defined benefit to be improved so as to reflect the higher funding level which the employer is willing to adopt, thus making the higher benefit secure. Where that is done and the member's entitlement on winding up is significantly improved as a result, we would think it reasonable as a *quid pro quo* that the whole of any surplus should thereafter be earmarked for the employer—unless of course the employer chose to relinquish that right and allow the Trustees to augment benefits instead.

3.23. We have misgivings about form (ii). In the absence of prior agreement with the employer, by reference to what criteria could a

Trustee decide how much of a surplus should properly go to the employer rather than to the members? Even with such an agreement, how binding would it be in the last resort if it was not incorporated in the Trust Deed itself? If the Trustee had been appointed by the employer in the first place, would there be a conflict of interest affecting his decision?

3.24. In form (iii) it is quite clear that the employer has the last word and nobody should be surprised if the whole of any surplus, pre-planned or fortuitous, were to be handed over to the employer, particularly if the company was bankrupt and the employer had been replaced by a liquidator with an obligation to collect as much money as possible in order to satisfy the company's creditors.

3.25. Form (iv) is the only one which makes it clear what benefits it is intended members should enjoy on a winding-up. In our experience it is rare to find Trust Deeds worded in this way. While this is the *form* we recommend, it should not be inferred that the *level of benefit* is the one which we favour.

3.26. It is sometimes asked why the employer should benefit at all from moneys which have been put in trust for pension scheme members. The reason is that, whereas the member typically pays a fixed contribution to the scheme, the employer meets the balance of the cost, whatever that might be, which is usually the major share. If the assets available on wind-up are more than sufficient to meet the wind-up benefits, it therefore seems to us to be quite reasonable for the excess to be returned to the employer. Borrowing the words of Mr Justice Walton⁵ quoted in paragraph 3.7, "This really represents, of course, additional payments made by the companies above and beyond the 'balance of cost', which is what they have strictly undertaken to meet".

3.27. To summarise:

Form (i) in practice leaves the level of the wind-up benefit to be determined by the employer's funding strategy which, in our experience, frequently means it is determined, in effect, by the actuary.

Form (ii) places the Trustees in the position of having to choose between the employer and the scheme members—an invidious choice.

Form (iii) holds out to members a prospect of participation in surplus which, in the circumstances when it is most likely to occur, may be more illusory than real.

Form (iv) states clearly what benefits will be provided for members and that any surplus belongs to the employer.

4. COMPARISON OF VALUATION METHODS

Terminology and funding objectives

4.1. The Report on Terminology of Pension Funding Methods² was an important step forward. It answered the plea in the 1983 Faculty paper⁹ which began with the words:

- “1.1. This paper is written at a time when, I believe, the greatest challenge facing actuaries engaged in pension work is to communicate.
- 1.2. We must communicate with Trustees, with members, with employers, . . . ; we must also communicate with each other.”

4.2. We therefore sought first to discover whether the methods described in the Report included the one which we advocate above, and whether it was described in the same words. This method has three distinguishing features. The first is that the accrued liability from time to time is the value of the wind-up benefit specified in the rules of the scheme. The second is that the name “security benefit” is given to that benefit, as an indication that, while it can be the same as the early leaver's benefit, it will usually be greater. The third is that, in calculating the contribution rate, allowance is made for new entrants, so as to reflect the reality of the employer's continuing business.

4.3. The first item in the Report's Glossary defined “accrued benefits” as the benefits to which a member was “entitled” for service up to a given date. It went on to say that those benefits “may be calculated in relation to current earnings or projected final earnings”. However, benefit entitlement in a pension scheme is related specifically to the happening of certain events, such as death, retirement, withdrawal or termination of the scheme. In each event, the appropriate entitlement should be clearly defined. It was not immediately obvious that such an approach was implicit in the Report which appeared to offer the concept of a “general” entitlement, optionally related to either current or projected final earnings.

4.4. A more careful reading of the Report showed that it did not envisage “accrued benefits” as being a member's entitlement under

the rules, except where the wind-up benefit happened to borrow the definition of the early leaver's benefits on which scheme rules are usually specific. The Projected Unit Method and Partly Projected Unit Method envisaged the accrued benefits as a parcel of benefits payable in an ongoing scheme, allowing for the possibility of future withdrawal from the scheme. With the Partly Projected Unit Method, an assumption was also made about the extent to which future earnings increases might be allowed for. This did not fit our defined "security benefit" entitlement under the wind-up provisions. Sticking as closely as possible to the recommended terminology, we have therefore used in this paper the name Defined Accrued Benefit Method, a name which we hope indicates the important respect in which it is different from other accrued benefit methods.

4.5. In our approach to pension fund valuation we acknowledge the fact that the employer may terminate the scheme, or terminate contributing to the scheme, at any time or at short notice as specified in the Rules. The fact that the actuary may have used a prospective valuation method, which we prefer to think of as a closed-fund-level-contribution method, places no greater obligation on the employer to continue to contribute at the level rate produced by that valuation than at the rate produced by any other method. It is therefore our conclusion that, in law, the accrued liabilities from time to time are those specified in the Rules relating to termination of the scheme. We find support for this conclusion in the Judgment in *Re George Newnes Group Pension Fund (J.I.A., 98, 260)*¹⁸:

"Once the scheme has been terminated, the Trust Fund becomes the source not of normal benefits under the scheme but of dissolution benefits, and only those provisions relating to dissolution are relevant."

These words serve to remind us that the prime objective of funding should be to secure the wind-up benefits.

4.6. That does not mean, as we understand it, that any surplus in a fund should not be used to augment benefits if the Trustees have such a discretion. But it does suggest to us that any valuation method in which the "actuarial liability" exceeds the value of dissolution benefits must be regarded as having the objective of building in a pre-planned surplus.

4.7. The Report on Terminology² described most of the methods of valuation currently in use but it did not consider their "relative suitability". Nor did it discuss their objectives. However, it is

characteristic of valuation methods that they are aimed either at securing the accrued benefits, with the contribution rate taking second place, or they aim to standardise on a particular contribution level with the level of asset accumulation taking second place. In judging the relative suitability of the different methods, we look first at the assets accumulated towards meeting the accrued liabilities, which we regard as the primary objective, and then at the future contribution rates which achieve this accumulation.

Asset accumulation

4.8. The objective of our Defined Accrued Benefit Method is to enable a fund to accumulate assets sufficient to meet the wind-up benefits specified in its Trust Deed and Rules, i.e. sufficient to meet what we regard as the scheme's actual liabilities.

4.9. In contrast, the May 1986 supplement to the Report on Terminology describes as "actuarial liabilities" the liabilities against which assets are accumulated by other methods. We think the distinction between actual liabilities and actuarial liabilities is apposite.

4.10. Projected and Partly Projected Unit Methods aim to build up bigger funds than would be required to meet typical wind-up benefits. This is because scheme Rules usually provide only for the same benefits on wind-up as would be given to the early leaver whereas it is normally considered that the "stayer" deserves a better benefit. This is achieved by building up a surplus which the Trustees might use to augment the benefits, rather than by amending the Rules so as to secure a better defined benefit.

4.11. Prospective Methods aim to produce a level contribution rate over the remaining working lifetime of the present members of the scheme, assuming the fund to be closed to new entrants. The resulting build up of funds is an accidental by-product of the method of calculating the contribution rate. However, we know that in normal circumstances the funds produced are even greater than under the Projected Unit Method. Unlike that method, though, not all of the surplus is intended to produce better benefits for the deserving stayer. From the Imperial Foods case and other similar cases of partial termination and bulk transfer, it is apparent that any surplus assets in excess of actuarial liabilities calculated by the Projected Unit Method perform the function of a contingencies reserve financed by the employer.

Contribution rates

4.12. Accumulating sufficient assets to meet the accrued liabilities is the primary objective. The contribution rate required in order to achieve that is secondary. Any desire to regulate the contribution rate to an extent that would be at variance with meeting the primary objective would, in our view, have to give way.

4.13. As we have introduced the name “Defined Accrued Benefit Method” we take the liberty of also specifying that the standard contribution rate by this method is the rate required to enable a fund to match its actual accrued liabilities over a period of 5, 10 or more years, or indefinitely, it being assumed to be “on target” at the valuation date. Allowance would *always* be made for new entrants. The calculations would always be made well into the future and, if this indicated that a material change in the contribution rate was to be expected later on, this would be disclosed. Such disclosure is now required by paragraph 3.1.8 of GN9¹⁴.

4.14. The contribution rate on the Unit Methods is the rate required in the year, or period of years, following the valuation date in order to purchase the benefits which will accrue in that period. It is said in the Report on Terminology² that replacements may, or may not, be allowed for. We have already expressed our view that, to be realistic, replacements have to be allowed for. Whatever our dislike for the concept of the “actuarial liability” as a funding target, at least by allowing for new entrants the contribution rate would be appropriate for the particular “actuarial liability” and would not have an inbuilt tendency to accumulate assets above that level.

4.15. The primary objective of prospective methods of valuation is to produce a level contribution rate if the scheme were to be closed to new entrants. Given that constraint, they achieve their objective but that is not what we would regard as the primary objective of pension funding. Furthermore, we contend that by pursuing *their* objective, such methods have a built-in tendency, in practice, to result in the accumulation of unnecessary surplus, measured against accrued liabilities. There are of course other causes which give rise to surpluses (or deficits) in pension funds but we believe it is significant that the Chancellor of the Exchequer, presumably advised by the Government Actuary, has used an accrued benefit method in the statutory basis to be applied for tax purposes.

4.16. In our view, it is *always* appropriate to allow for new entrants in calculating a contribution rate, unless the scheme is in

practice a closed fund. It may make no difference one way or the other if the Entry Age Method of valuation is used, but that is not true of the Aggregate Method and the Attained Age Method of valuation. Under those two closed-fund valuation methods it is known that new entrants come in with either a higher or a lower contribution rate than necessary so that the methods themselves generate surplus or deficiency if the funds are in practice open to new entrants.

4.17. We find it confusing to find references to “ongoing schemes” or “ongoing valuations” in the context of closed-fund valuations making no allowance for new entrants. In order to avoid this confusion, we suggest abandoning those descriptions and making a clear distinction in future between closed-fund valuation methods and open-fund valuation methods.

Numerical comparison of valuation methods

4.18. So far we have discussed in general terms the various valuation methods presently in use, including our own, and have indicated their different objectives. In order to see what these differences mean in practice for the amount of assets built up in pension funds and the associated contribution rates it is necessary to present some numerical illustrations. We suggest that the assets accumulated to meet the scheme’s actual accrued liability by our Defined Accrued Benefit Method—our primary objective—should be taken as the yardstick against which the assets accumulated by other methods, as their secondary objective, should be compared.

4.19. The paper submitted to the Faculty of Actuaries in February 1983⁹ included a number of illustrations showing the going funding rates and the asset accumulations for a typical mature defined benefit pension scheme. A real rate of return on investments of about 1% p.a. was assumed (9% p.a. interest; 8% p.a. increase in the general level of earnings). These illustrations showed how little the contribution rate varied from one valuation method to another in an ongoing scheme, although there could be a significant difference in the amount of the fund. A switch from one valuation method to another, or a radical change in the experience such as a change from high rate of turnover to a complete cessation of all withdrawals, would produce a serious disturbance whatever the method in use.

4.20. Rather than refer the reader back to T.F.A. 38, a new model is presented on this occasion. The principal changes from the previous model are:

- (i) The annual increase in the general level of earnings is taken as 7%, so that the corresponding real rate of return on investments is now 1.87% p.a.
- (ii) Modest rates of withdrawal have replaced the very high rates used in 1983. (The result of trebling the rates adopted is considered in Appendix D.)
- (iii) The minimum target must now allow 5% p.a. revaluation of the early leaver's accrued benefit up to normal pension age, in compliance with the Social Security Act 1985.
- (iv) Benefits on death in service have been excluded. It is intended to consider them separately.
- (v) Although in practice we are mainly concerned with existing schemes, in order to make the illustration as complete as possible figures are shown for a new scheme starting in 1986.

4.21. As with the previous model, contracting out of the State scheme and guaranteed minimum pensions have been ignored, with the aim of presenting as clearly as possible the results of using different valuation methods. Also, as before, retirements and withdrawals are treated as exits from the scheme so that outgo is the capital value on exit of the pension or deferred pension awarded. The balance in the fund therefore corresponds to the accrued liability for active staff only.

4.22. Particulars of the benefit provisions in the model scheme and of the valuation assumptions are given in Appendix A. A profile of the stable membership, showing age, length of service and annual "offs" and "ons", is given in Appendix B.

4.23. Four sets of results are shown, on three different valuation methods:

- Method A1. The Defined Accrued Benefit Method, where the accrued benefit includes the minimum of 5% p.a. revaluation of current pensionable pay up to normal pension age.
- Method A2. The Defined Accrued Benefit Method, where the accrued benefit is our recommended maximum, including revaluation up to normal pension age in line with expected increases in the general level of earnings (assumed to be 7% p.a.).
- Method B. The Projected Unit Method.
- Method C. The Aggregate Method.

It will be appreciated that, with no variation in experience, the only difference between the Aggregate Method and the Entry Age Method is effectively in the manner in which the latter method runs off the initial deficiency in a new scheme. Thereafter, the standard contribution rate and accumulated assets are the same by both methods.

With the Attained Age Method, the standard contribution rate is obtained by applying the Aggregate Method to the *future* service of the present members and remains constant throughout. The standard fund is the value of past service liabilities calculated by the Projected Unit Method. The standard contribution rate is more than sufficient to meet the accruing liabilities, so that each valuation reveals a surplus. If this surplus is run off over the intervaluation period of 3 years or less, the *net* contribution rate and accumulated assets are close to those on the Projected Unit Method. If the surplus is run off over the average remaining period of active membership, the results will ultimately be the same as under the Aggregate and Entry Age Methods. With a longer run-off period, the net contribution rate will be *smaller* and the accumulated assets *greater* than under those methods.

4.24. The fund balances and contribution rates in the first 41 years of a new scheme starting in 1986 on these four bases are shown in Appendix C(i). On Methods A1 and A2 the contribution rates are the annual rates required to keep the fund on target year by year to meet the actual accrued liabilities on our minimum and maximum bases. These two sets of results are thus the yardsticks against which we may judge the amounts of assets built up by the other methods. With no variations from the actuary's assumptions, the contribution rates on Methods A1 and A2 form a smooth progression without any need for averaging. The contribution rate on Method B remains the same throughout.

4.25. On Method C, actuarial valuation every three years is assumed and a step down in the contribution rate to reflect the fact that the scheme has not, as the method assumes, been closed to new entrants and that those leaving have in fact been replaced. Table 1 shows a selection from the figures in Appendix C(i).

TABLE 1

Assets accumulated and the associated contribution rates by different valuation methods (expressed as a percentage of payroll for the year)

	Year 1		Year 21		Year 41	
	Contn. Rate	Fund Balance	Contn. Rate	Fund Balance	Contn. Rate	Fund Balance
Method A1	11.01	5.4	14.67	166.8	15.43	201.7
Method A2	14.32	7.1	14.60	204.2	14.69	242.3
Method B	14.61	7.3	14.61	208.3	14.61	246.9
Method C	15.97	8.0	14.68	224.8	14.31	266.7

Note: With Method C, after 41 years the figures have not quite reached their ultimately stable state (14.21% contribution and 267.8% fund).

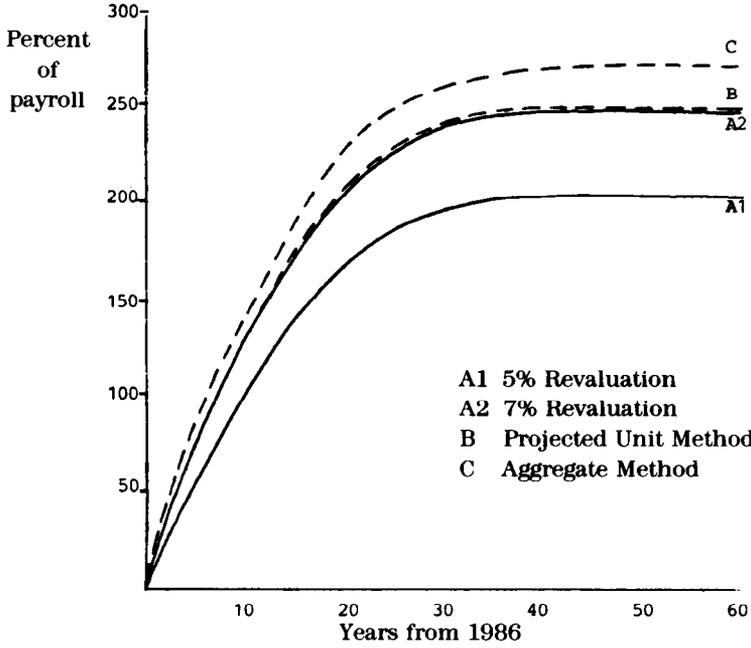
4.26. For those who prefer it, the run of the figures is also shown pictorially in Diagram 1. The balance in the fund by Method A2 (see paragraph 4.33). Under the Attained Age Method the standard almost indistinguishable from that by Method B on our Model (but contribution rate remains at 15.97% throughout but after each valuation following the first there will be a reduction to eliminate the surplus. The period over which the surplus is eliminated will determine the size of the fund and of the *net* contribution rate in the stable state.

4.27. In practice, relatively few new schemes are encountered but if one were starting up in 1986 we suggest that it would be unlikely to envisage doing so with a contribution rate increasing every year or two. If 5% revaluation had been chosen for the defined wind-up benefit (i.e. Method A1), then instead of starting off with an 11% contribution, an alternative might be 12.5% for 15 years, to be followed by 15% or a rate thereabouts, depending upon circumstances at that time. (To postulate exactly 15.43% would show overconfidence concerning the actuary's ability to predict the future.)

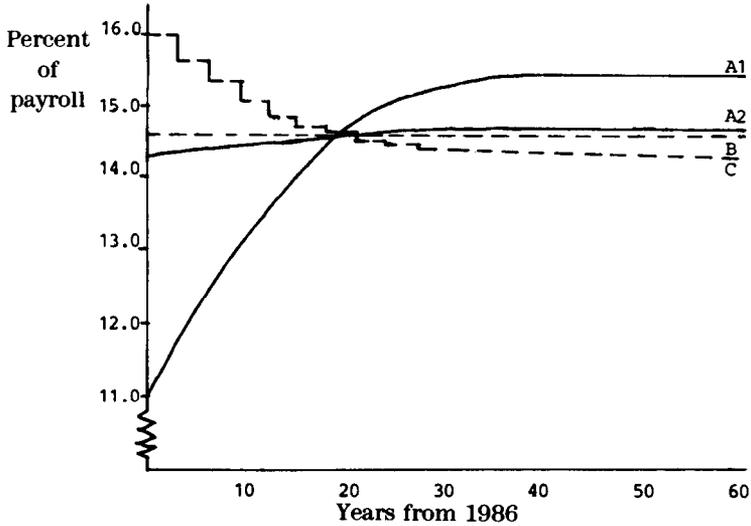
4.28. A level rate of 12.5% for 15 years would clearly involve a degree of overfunding during the early part of that period. The overfunding could be reduced by starting lower than 12.5% and going up in two, or even three, steps but an increase in the contribution rate is unavoidable if the asset accumulation is to be controlled in line with the corresponding build-up of the liabilities.

DIAGRAM 1

ACCUMULATED ASSETS



CONTRIBUTION RATES



4.29. To complete our understanding of the combined contribution rates which apply to the whole membership, we must also consider the rates on a cohort basis, i.e., the contribution rate required from age to age for each member in order to meet the cost of that member's accruing benefits. Figures showing age-related rates in year 1 and year 41 are given in Appendix C(ii). Those for year 41 are also the rates age by age for a cohort of members entering at age 25, allowing for entrants to and exits from the cohort during the following 40 years. Selected figures from Appendix C(ii) are shown in Table 2.

TABLE 2
Percentage contribution rates by age by different valuation methods

Age	Method A1		Method A2		Method B		Method C	
	Year 1	Year 41	Year 1	Year 41	Year 1	Year 41	Year 1	Year 41
	%	%	%	%	%	%	%	%
25	4.40	4.40	8.99	8.99	8.08	8.08	12.43	12.43
35	6.42	7.38	11.02	10.65	11.27	11.27	14.71	14.71
50	11.50	15.51	14.96	15.43	15.46	15.46	17.37	17.37
60	17.78	27.20	19.17	20.25	19.34	19.34	18.43	18.43
All Ages	11.01	15.43	14.32	14.69	14.61	14.61	15.97	14.21

4.30. In Method A1, the contribution rate for age 25 must be sufficient to secure a pension of one-sixtieth of pensionable salary, revalued at 5% p.a. for 40 years, i.e. the same as the deferred pension that would be awarded on withdrawal from the scheme. At age 26 in year 1, one-sixtieth revalued for 39 years must be secured, a rather higher percentage contribution because only 39 years' interest at 9% will be obtained. However, in year 2, the second year's contribution for a member then aged 26 must not only secure his extra sixtieth, but must additionally meet the extra cost arising from his pay having increased by 7% (plus possibly promotion) and not 5% as assumed in year 1.

4.31. In year 41, the contribution required from those aged 64 must not only secure an extra sixtieth, it must additionally meet the

extra cost on the 29 sixtieths accrued on average by those members up to that age, which arises from pay increasing by more than 5% in the final year of service.

4.32. In Method A2, the contribution rates are higher than in Method A1 at the young ages, because the defined accrued benefit includes revaluation at the higher rate of 7% p.a. Compared with Method A1, those contributing at later ages will benefit from the higher rates paid earlier on, so that the rates increase less steeply and end up considerably lower than in Method A1. Comparing year 1 and year 41 in Method A2, the rates at the younger ages are lower in year 41 because the benefit which those who do *not* withdraw gain from those who *do* is increased as average past service increases in the maturing scheme.

4.33. In Method B, the contribution rate must be sufficient to bring the value of accrued benefits to the appropriate number of sixtieths of estimated final pensionable salary allowing for promotion, etc., which, other things being equal, would require higher contribution rates than with Method A2. However, the accrued benefits on Method B allow for a proportion of the members withdrawing with an entitlement only to a preserved pension with 5% p.a. revaluation. The net result is a series of values of accrued benefits and therefore of contribution rates at different ages much the same as under Method A2. The reader is reminded that the closeness of these two sets of rates is fortuitous. With different withdrawal rates and a different salary scale—or no salary scale at all, e.g. for a works scheme—the result would have been different (see also Appendix D).

4.34. The concept of the Aggregate Method is different from the other three methods. The figures shown at different ages for Method C are the level contribution rates for new entrants at that age. The Aggregate Method initially gives the same contribution rate as under the Attained Age Method. Ultimately, if the actuary's assumptions are borne out by events, the contribution rate becomes the average rate for new entrants, i.e. the same as under the Entry Age Method.

4.35. It will be perfectly clear from Appendix C(ii) that if a scheme were to be closed to new entrants and yet were to continue as a closed fund with no other deviation from the actuary's assumptions until the last of the aging present members retired, a gradual increase in

the percentage contribution for the declining number of members remaining would be unavoidable on Methods A1, A2 and B. That has never been in dispute. The issue has always been how realistic is the assumption that a fund will be closed to new entrants and yet run on for many years with a declining, aging membership.

4.36. If the employer's business was continuing, a new fund would most likely be opened for new entrants so that, taking the two funds together, the contributions as a percentage of total payroll would not necessarily increase. Although unlikely, it is conceivable that *no* new fund would be set up for new employees, in which case the cost as a percentage of *total* payroll would decline. If there *were* no new employees and the employer's business was in decline, the closed fund would be unlikely to continue as normal for long; it would most likely be terminated, or taken over by a new employer, or members would leave to seek more secure employment and thus hasten the termination of the scheme and the employer's business.

Effects of increasing or declining membership

4.37. Appendix C(iii) shows the effect on the accumulated assets and on the contribution rates under each of the four methods if a scheme which had become stable found itself with a large decrease, or increase, in the number of new entrants and consequently a steadily falling membership, or a steadily rising membership. It is assumed that the average age of new entrants and the withdrawal rates at each age would be unaltered. For convenience it is assumed under Method C that the scheme has been in existence for more than 40 years and has reached a stable state.

4.38. As the average age at entry is unchanged, the contribution rate on Method C is unchanged whether the membership halves or doubles over the next 25 or 30 years. There is some variation in the contribution rate on Methods A2 and B, but not very much. With membership declining, it increases from 14.69% to a peak of 15.87% on Method A2 and then falls back a little. With membership increasing, it falls to about 14%. On Method B, the changes are very similar to those on Method A2.

4.39. On Method A1, the contribution rate is, as we might expect from the age-related rates shown in Appendix C(ii), more volatile with a changing membership profile. The ageing in the following 30 years which results from new entrants being halved pushes the

contribution rate up from 15·43% to over 18% before it begins to fall back a little. The reverse happens when new entrants are increased by 50%; the contribution rate falls to below 14% to reflect the youthful membership of the growing scheme.

4.40. The assets accumulated by the Aggregate Method remain significantly higher than on the other methods. Selected figures from Appendix C(iii) are shown in Table 3. If the Aggregate Method included pre-funding for death-in-service benefits, the extra assets would be even greater.

TABLE 3

Comparison of fund balances, as a percentage of payroll, by different valuation methods, with declining and increasing membership

Years from start	Balance in Fund (percent of payroll)				Extra assets on Aggregate Method compared with other methods		
	Method A1	Method A2	Method B	Method C	Over Method A1	Over Method A2	Over Method B
	%	%	%	%	%	%	%
<i>(i) Membership declining</i>							
40	201·7	242·3	246·9	267·8	66·1	25·5	20·9
50	250·0	296·5	302·0	326·4	76·4	29·9	24·4
60	280·8	326·2	331·6	354·3	73·5	28·1	22·7
70	272·0	314·7	319·6	341·4	69·4	26·7	21·8
<i>(ii) Membership increasing</i>							
40	201·7	242·3	246·9	267·8	66·1	25·5	20·9
50	165·3	208·9	212·9	233·4	68·1	24·5	20·5
60	159·2	195·9	199·9	221·1	61·9	25·2	21·2
70	163·2	201·2	205·4	227·3	64·1	26·1	21·9

Treatment of benefits on death in service

4.41. Actuaries familiar with traditional methods of pension fund valuation may have wondered why the stable fund by Method C, (267·8%) was only one-twelfth higher than by Method B (246·9%). Their experience would have led them to expect a much larger excess than that. The answer is in our decision to exclude and look separately at the treatment of benefits on death in service in pension fund valuations.

4.42. A common provision in the private sector would be for a lump sum of four years' salary plus a widow's pension of one-quarter of a married man's pensionable salary. Under Methods A1, A2 and B there would be no advance funding for those benefits as there is usually no accrued liability on wind-up. The cost would be met from year to year on a pay-as-you-go basis.

4.43. E. M. Lee's text-book on pension schemes¹ makes special reference to the possibility of insuring a lump sum death in service benefit:

"The cost of the year's cover as quoted might well be less than the first year amount of the contribution as calculated above. What advice should the actuary tender to the trustees?"

As in many other issues related to the pace of funding, there is much to be said for the trustees' deciding the matter as a point of policy providing that the issues are understood."

4.44. We would agree with Mr Lee, although we would see the decision as one for the employer rather than the trustees. Also, we would put the widow's pension on death in service in the same category. We have the impression, however, that when a prospective valuation method is used, it is common for the closed-fund-level-contribution concept to be carried to its logical conclusion and for death in service benefits to be funded in advance—as in theory they should be, if the closed-fund concept was valid.

4.45. What surprises us is that, when the closed-fund concept of valuation is explained to trustees and employers, the latter decide to put the additional money into their pension funds. The permanent additional capital commitment would amount to 28·1% of payroll on our model. By financing those benefits on a year-by-year basis instead, the same amount could have been released for the employer's business.

4.46. Mr Colbran also referred to this subject in his 1982 paper:

"It would be consistent with the other methods described in this Section to also express the expected cost of death-in-service benefits as a stable percentage of salaries and this seems to be the traditional approach of the consulting actuary. If, however, it is accepted that these other methods

involve some degree of unnecessary advance funding, there is a case for retaining the current cost approach to lump sum death-in-service benefits. Admittedly this produces an arbitrary compromise result between the methods but as a pragmatic approach it appears to have attractions. When widows' pensions are related to service, a funded approach has more justification . . .”

4.47. If the wind-up rules provided for an accrued widow's pension to be payable on the former member's death after wind-up but *before* reaching normal pension age, then that accrued benefit should be funded in advance on all four methods. Otherwise, we take the view that there is no more need to fund in advance for a widow's death-in-service pension related to service than there is to fund in advance for a lump sum benefit.

4.48. Our recommended maximum target for wind-up benefits and funding level—that on Method A2—would lead to a fund amounting to 242.3% of payroll. The conventional prospective method of valuation, Method C, including advance funding for death in service benefits, would, on our model, produce a fund of 295.9% of payroll. The excess, 53.6% of payroll, would represent a significant diversion of resources from an employer's business to his pension fund. Compared with the minimum on Method A1, the excess would amount to 94.2% of payroll.

Reactions to a surplus

4.49. Appendix C(iii) showed the effect on contribution rates of changes in the membership profile. Appendix C(iv) shows the effect on contribution rates of the sudden appearance of a substantial surplus, from whatever cause, in each case amounting to half as much again as the liability or actuarial liability in a stable situation. It may be said that a surplus of this size is far from typical, but it is certainly not unheard of at the present time.

4.50. Method C, the Aggregate Method, would not acknowledge that there was a surplus at all. The enhanced fund would meet a much larger portion than before of the total liabilities, including liabilities in respect of future service, in the ongoing closed fund. Method C would react to the windfall by reducing the contribution

rate from 14·21% of payroll to 3·14% of payroll for 3 years, then 5·36% for a further 3 years, increasing gradually thereafter but still with some of the surplus remaining in the fund after 40 years because it is part of the method for each new valuation to spread the remaining surplus in declining amounts over a further 40 year period until the retirement of the last of the members included in that valuation.

4.51. Methods A1 and A2 would acknowledge the windfall and afford the opportunity of a complete contribution holiday for 7 years under Method A1 and 9 years under Method A2. Alternatively, the surplus might be spread over a longer period. For example, if it were to be spread over 14 years (the average future period of service of the present members) the contribution rate would be reduced from 15·43% to 7·26% for 14 years under Method A1, and from 14·69% to 4·87% for 14 years under Method A2. In practice, the level of the employees' contribution and the new statutory provisions relating to excessive surpluses would impinge on an employer's freedom of action.

4.52. Another possibility would be to improve the scheme benefits. If this were to take the form of using about two-fifths of the surplus under Method A1 to improve the wind-up benefits to the level of Method A2, this would result in a *reduction* in the long-term contribution rate from 15·43% to 14·69% as well as affording a contribution holiday for 4 years. Any other improvement in benefits would ultimately mean an increase in the long-term contribution rate under all methods.

4.53. A sudden substantial surplus could arise in a number of ways. It could come from variations in the experience, such as a flood of members being made redundant and receiving only withdrawal benefits, or from an upsurge in dividends on the fund's investments in equities. Another possibility is that a potential purchaser of a company whose scheme was funded by Method C, including death-in-service benefits (assets 295·9% of payroll on our model—see Appendix D) might be aware that there was no legal obligation for that scheme to fund beyond the minimum level of Method A1 (assets 201·7% of payroll). This purchaser might regard the difference between these two figures—94·2% of payroll—as a potential surplus.

4.54. This spectre haunts us all. It adds urgency to *our* attempts to draw attention to the fact that for most schemes there is no legal

obligation to fund beyond the level of Method A1. It also explains the earnestness with which we advocate *recording it in the Trust Deed* when it is already the declared intention to provide more generous benefits on wind-up and additional funds are in fact being built up in the hope of achieving that objective. This is of concern not only to members who hope to benefit from the scheme but also to employers who have paid the extra contributions in the past in order to achieve the higher funding target. The spectre cannot be exorcised merely by members of the actuarial profession, however well-intentioned, saying that it is not "respectable" to fund by Method A1 or suggesting that the method should be banned. If it is legal, it cannot be banned.

*An American study of valuation methods*¹⁵

4.55. In 1985 a Committee of the American Academy of Actuaries completed a study aimed at providing the Financial Accounting Standards Board in U.S.A. with a basis for evaluating the degree to which "pension expense for defined benefit plans may be expected to vary" from valuation method to valuation method. The objective was to compare the contribution rates. Funding levels were secondary to this objective but we may nevertheless discover the resulting funding levels, in which we are more interested, among the figures published in the Committee's extensive report on each scheme.

4.56. The Committee selected ten actual schemes for their study. Seven of those were final salary schemes and it is these which are of relevance to our paper. The financial position of each of these schemes was projected for twenty years into the future using several valuation methods, but the same actuarial assumptions for all schemes for both assets and liabilities and all methods. The pension expense, i.e. the company's contribution, was taken as the ERISA defined minimum contribution each year for each method. We do not think a detailed knowledge of ERISA is necessary in order to appreciate the broad implications of the figures in the Committee's report.

4.57. An outline of the membership profiles of the seven actual schemes chosen is as follows:

- Scheme A A normal membership, growing at 2% per annum and therefore expected to increase by one-half in 20 years. A moderate level of funding to start with.
- Scheme A2 The same scheme as A, but starting with only half the fund.

Scheme C	A mature membership, stable and with low turnover. A low level of funding to start with.
Scheme D	Somewhat similar to C, but membership older and with longer pensionable service. A moderate level of funding to start with.
Scheme E	A young membership, growing at 2% per annum, but with a high rate of turnover and therefore average pensionable service remaining low. A fairly high level of funding to start with.
Scheme F	An older mature scheme with high turnover and membership declining at 2% per annum i.e. a fall of one-third over 20 years. A low level of funding to start with.
Scheme H	A new company with a bulge of experienced employees at fairly high ages. Turnover high but membership expected to increase at 2% per annum. A high level of funding to start with.
Scheme J	A stable mature company with a cluster of older members with long service. A low level of funding to start with.

4.58. The reader's first question will be to ask what we mean by the "level of funding". From a variety of figures published in the Committee's extensive numerical results for each scheme we have selected for this purpose the ratio of assets to the "total liability for all employees' benefits" determined under "plan termination concept". This concept is not defined in the report but the liability is generally a little higher than the actuarial value of vested benefits and its tendency towards 100% on the Current Unit Credit Valuation Method suggests that it is, or is close to, the value of the actuarial liability under that method.

4.59. Selected figures from the Committee's report are given in Table 4. These show the level of funding and the contribution rate at the end of the 20 year projection period by the Entry Age Method, the Aggregate Contribution Method, the Current Unit Method and the Projected Unit Method.

TABLE 4
American Academy of Actuaries
Selected figures from analysis of pension fund cost methods

	A	A2	C	D	E	F	H	J
Growing or falling membership	gr.	gr.	—	—	gr.	fa.	gr.	—
Percentage funded at outset	111	55	72	101	118	75	160	70
Percentage funded after 20 years:								
Method:								
Entry Age	143	137	129	126	160	103	159	106
Aggregate								
Contribution	142	138	113	121	166	119	149	90
Current Unit	102	97	103	111	95	90	104	92
Projected Unit	120	114	118	116	121	92	145	99
Percentage contribution after 20 years:								
Method:								
Entry Age	5.22	5.58	7.80	6.39	2.14	5.60	7.92	11.21
Aggregate								
Contribution	4.88	5.09	7.47	5.87	1.93	4.35	7.74	10.27
Current Unit	4.98	5.26	6.51	5.23	2.32	5.34	8.26	10.25
Projected Unit	4.80	5.16	7.62	6.07	1.93	5.44	7.72	11.07

Note: Percentage funded represents the ratio of assets to the value of termination benefits.

4.60. The Committee's "General Overview" is directed towards answering the question put to them on comparability of contribution rates. Their conclusion was that the rates under the first two methods were generally comparable but that the results by the Unit Methods differed from each other and from the results under the first two methods. That conclusion is not surprising since the target level of funding is ultimately the same under the first two methods and different under each of the other methods.

4.61. For schemes A, E and H the contribution rates by the Projected Unit Method were found to be significantly lower than the rates obtained by the Entry Age Method. These are the three schemes with a growing membership and a high initial level of funding. We would therefore expect these two features to generate a significantly

lower contribution rate for the Projected Unit Method than the Entry Age Method. On the other hand, with C, F and J starting with low levels of funding, we find as we would expect some measure of correlation between the two methods, as both sets of contribution rates seek to build up the funding level towards target.

4.62. The General Overview does not comment particularly on the Aggregate Contribution Method but it is not surprising to find, generally speaking, a very high contribution rate to begin with when the initial funding level is low.

4.63. There is a wealth of statistical information in the Committee's report which would repay study. The fact that we have looked somewhat narrowly at their results does not diminish its importance and usefulness. Nevertheless, since we start from the premise that funding levels are more important than stability or comparability of contribution rates, we hope we may be forgiven if it is to that aspect of their results that we have addressed our attention. It may satisfy accounting needs to discover how "pension expense" varies from scheme to scheme in a variety of circumstances but we are convinced that liabilities must come first and that the contribution rates required from time to time so that those liabilities may continue to be covered come second.

4.64. We think that both actuaries and accountants should be concerned as to the validity of different valuation methods when they produce such disparate funding levels as those varying from 102% to 143% for Scheme A and from 95% to 166% for Scheme E. The fact that contribution rates under the different methods may be reasonably close should not be allowed to divert attention from the significance of the much bigger differences in funding levels. We look at accounting standards in the next section of the paper.

5. ACCOUNTING FOR PENSION COSTS IN COMPANY ACCOUNTS

5.1. The accountancy bodies on both sides of the Atlantic have been developing their views on the measure of a company's pension costs which should be shown in the company's accounts. The most obvious measure is, of course, the actual contribution made each year to the pension fund but that has been thought unsatisfactory for two reasons:

- (i) changes in the contribution rate resulting from changes in the valuation method used, the scheme *apparently* remaining unchanged.
- (ii) irregularity of the contribution rate from year to year arising from changes in the experience, in valuation assumptions, etc.

5.2. Our views on the main issue are unchanged from those expressed in the Faculty paper in February 1983. We favour the company's actual contributions to the pension fund being accepted as the pensions charge in the company's accounts. The accounts could be accompanied by a "stability certificate" from the actuary to the effect that, if the provisions of the scheme were unchanged (including the wind-up benefit which determines the funding target), the contribution rate would, in his opinion, not vary outside defined margins for a specified period. Where, however, the current contribution rate was expected to change, the certificate would instead indicate what the likely pattern of change was.

5.3. Throughout this paper we have been at pains to show that the funding target reflects the actual or presumed wind-up benefits. Thus when a change of funding target occurs it represents a *benefit change* and not an unexplained change of valuation method for an unchanged scheme. We hope that our explanations of this matter will have put the accountants' minds at rest on the first of their concerns mentioned in paragraph 5.1 above.

5.4. The Financial Accounting Standards Board in U.S.A. issued FASB 87 in December 1985¹² setting out in great detail the method which they will in future require to be applied as standard. The corresponding proposals of the Accounting Standards Committee in this country were issued, for comment, in May 1986 in Exposure Draft 39⁴. The approaches of the two bodies are similar to the extent that both see a need to use the company's balance sheet to even out any volatility in the contributions which a company elects to pay to its pension fund rather than rely on disclosure of the variations.

5.5. The fundamental difference between the two approaches is that ED 39 places "no limit on the methods and assumptions used by the actuary" so long as the cost of pensions is "charged against profits on a systematic basis over the service lives of the employees in the scheme whereas FASB 87 requires each of the actuary's "significant" assumptions to be "the best estimate solely with respect to that individual assumption" and stipulates the use of the Projected Unit Credit Method and no other. As FASB 87 looks through to foreign

subsidiaries of American companies, it is of concern to actuaries in the U.K.

FASB 87

5.6. FASB 87 requires the use of a single valuation method. Companies are to be allowed a transitional period, which for practical purposes we may take to be 15 years, to come into line. Where the assets accumulated in a company's pension fund do not at present correspond with the actuarial liability calculated by the Projected Unit Credit Method, FASB 87 prescribes the contribution path to be followed during the transitional period. The company may choose not to follow that path in its actual contributions to the pension fund, in which case the differences would be accumulated in the company's balance sheet as either an asset or an unfunded pension liability.

5.7. This may be illustrated by reference to the figures in Appendix C(i). FASB 87 would wish a pension fund in a stable state to hold assets amounting to 246.9% of payroll (Method B) supported by an annual pension charge of 14.61%. Interest would amount to a further 4.57%. However, if the scheme was actually funded by Method A1, its assets would amount to only 201.7% and interest income to 3.74%. The asset shortfall would have to be amortised by an additional charge to profits of 3.01% a year for 15 years, plus interest on the asset shortfall amounting in the first year to 0.83% of payroll. The total pension charge in the first year would thus be $14.61\% + 3.01\% + 0.83\%$, i.e. 18.45%.

5.8. There are two possibilities:

- (i) The company decides to pay the contributions on FASB 87's charted path, the pension fund gradually increases, the interest shortfall declines and, after 15 years, when the amortisation payments have ceased, the scheme is funded on Method B, with assets amounting to 246.9% and a contribution rate of 14.61%.
- (ii) The company decides to continue to fund its scheme on Method A1, continues to pay a contribution of 15.43%, the extra 3.02% (approx.) in the charge is applied to build up a liability of 45.2% of payroll in the company's balance sheet, and after 15 years, when the amortisation payments have ceased, FASB 87's prescribed charge of $14.61\% + 0.83\% = 15.44\%$ is (rounding errors apart) equal to the company's actual pension contribution under Method A1.

5.9. The unfunded pensions liability in a company's balance sheet of almost half a year's payroll has no bearing on the security for members' pensions. It represents a purely notional provision which would disappear the moment it was needed, namely when the company's business had failed. We therefore find ourselves out of sympathy with the system proposed in FASB 87. The objective of the Financial Accounting Standards Board is to standardise accounting practice, whatever the rules of the scheme might say, and to this end it intends to force all schemes to make a charge to profit and loss which will take them along one path or another towards the Projected Unit Method level of reserving. However, this serves no useful purpose so far as pension scheme members are concerned unless the resulting reserves are built up in the pension fund, rather than in the company's balance sheet. Even then, it would take legislation to earmark the extra assets for the members' benefit.

ED 39

5.10. ED 39 does *not* require a single valuation method to be used in all circumstances. We therefore consider how each of the methods described above meets the requirements of the proposed accounting standard.

5.11. ED 39(74)

"The accounting objective is that the cost of pensions should be charged against profits on a systematic basis over the service lives of the employees in the scheme."

Appendix C(ii) shows age-related contribution rates on all four methods. On Methods A1, A2 and B the cost of pension increases systematically over an employee's service life, to reflect the increasing defined benefit accrual under Methods A1 and A2 and the increasing actuarial liability under Method B. By definition, the contribution rate is level throughout service under Method C. Thus it can be seen that all four methods satisfy the requirement that it should be systematic.

5.12. ED 39(76)

"For defined benefit schemes the method of calculating the regular pension cost should be such as to provide a substantially level percentage of the current and expected future pensionable payroll in the light of the current actuarial assumptions."

Appendix C(i) shows that Method A2 meets this requirement. Method B also meets it, so long as new entrants are allowed for and it

is not effectively a closed-fund valuation method for a curtailed period. Method A1 meets the requirement in a mature scheme but not in a new scheme, because the prime objective is to match the actual accrued liability which demands that the contribution rate should increase. Method C also fails the test in a new scheme because the contribution rate is inflated for a time so as to build up what we show to be an unnecessary surplus.

5.13. Suppose a new scheme were to be introduced, funded by Method A1, and each of the new members was given a starting credit of a few years reckonable service. If the starting credit were regarded as part of the scheme, the result might be that the contribution rate would be 15.43% throughout because the cost of meeting the starting credit filled in the "wedge" in the early years of the new scheme. If this were considered satisfactory, it would seem very odd to rule out the use of Method A1 where there was no starting credit, just because the contribution rate increased for a time.

5.14. The case for admitting Method A1 seems incontestable in that it reflects the pension scheme's true liabilities and, if that does not fit the accounting standard, we respectfully suggest that it is the validity of that standard which should be questioned.

5.15. ED 39(30)

"No one particular actuarial valuation method can be held to produce the "correct" pension cost charge in all circumstances."

From what has just been said, it will be apparent that we would not agree with this statement. We would credit the Defined Accrued Benefit Method with being the correct method as its objective is to enable the fund to meet its actual accrued liabilities as defined in the Trust Deed and Rules. Unlike most other methods, it does not seek to recognise non-existent liabilities above that level. The pension fund has no such additional liability and we see no justification for seeking to recognise an equally non-existent liability in the company's balance sheet.

5.16. ED 39(83(i))

"Other disclosures would include the contribution rate needed to maintain or to achieve the target level of funding, . . ."

The contribution rate (or going funding rate) arrived at by Methods A1, A2 and B is the rate needed to maintain the target level of funding, assuming the fund to be on target at the valuation date.

Where there is a deficiency or a surplus, the amount will be disclosed and an adjustment made to the contribution rate so as to bring the fund on to target over a stated period. This seems to be exactly what ED 39 requires, subject to determining what the stated period should be.

5.17. Method C does not have a target level of funding so it is difficult to see how the disclosure requirement in ED 39(83(i)) could be satisfied.

5.18. ED 39 (83(i))

Disclosure should include:

“an outline of the results of the most recent formal actuarial valuation or later review of the funding of the scheme on an ongoing basis. This should include disclosure in percentage terms of the relationship between the scheme assets, as valued for actuarial purposes, and the actuarial value of accrued benefits, in each case taking account of future salary increases and an explanation of future intentions regarding any material deficiency or surplus so identified”.

We are mystified by the second sentence of this disclosure requirement. The references to “accrued benefits” and to allowing for future salary increases appear to us to relate to a valuation by Defined Accrued Benefit Method A2. On the other hand, the reference to allowing for future salary increases in the valuation of assets appears to refer to a valuation of future contributions in Method C. Apart from confusion between the two methods, we wonder why the disclosure requirements should try to dictate the method to be used when any one of a number of methods would be acceptable so far as the pensions charge is concerned. Perhaps we have misunderstood the intention of ED 39 and all that is required is some clarification of the proposed accounting standard.

5.19. ED 39(5)

“Pension schemes may also be classified by the way in which they are financed, i.e. funded schemes or schemes where the benefits are paid directly by the employer. The same accounting principles apply to both types of scheme.”

Our paper is intended to consider only funded pension schemes but if “the same accounting principles” are to apply to unfunded schemes we ought to consider what this might mean, even if the possibility of encountering such a scheme outside the public service is somewhat remote.

5.20. So far as we can see, ED 39 would not admit such a system. It would not meet the accounting objective of charging the cost on a systematic basis over the service lives of the employees because the entire cost would be met *after* the employee had retired. But what pensions charge would ED 39 impose on the company instead? Presumably it would require the company to account for its pension costs by any method which *was* acceptable. This would inevitably mean building up a liability in the balance sheet where, as we believe, no liability truly exists.

5.21. We wonder why it would not be thought sufficient in this case, as we have suggested should be done in other cases, merely to disclose the facts. As readers rather than preparers of accounts we would accept that a true and fair view of a company's present and prospective pension obligations had been given if a note forming part of the audited accounts stated that:

- (i) Pensions promised by the company will be paid only for so long as the company remains in business.
- (ii) At present these pensions cost 10% (say) of payroll. According to the latest actuarial review this cost is likely to increase gradually to 19% of payroll over the next 20 years. The effect of this increasing liability on the company's future profitability must be borne in mind.

The above is written with a truly pay-as-you-go group pension scheme in mind, in which it can be made perfectly clear that the company's obligations cease in the event of its business ceasing. A situation more likely to be encountered in practice is where individuals have been promised pensions in terms which appear to commit the company but in which its exact obligations are unclear. We can appreciate that in such cases, where the employees might be creditors on a liquidation, the accountant would wish to provide for advance funding in the company's balance sheet. However, there remains the difficulty of determining exactly what the company's accrued liability is.

Treatment of surplus or deficiency

5.22. Leaving on one side restrictions likely to be imposed by the Finance Act 1986 on surpluses deemed to be excessive, we may consider how ED 39 would affect a scheme funded by Method A1 which found that it had a 50% surplus. Appendix C(iv) shows that, on our model, such a surplus would amount to about one year's payroll.

5.23. In ordinary circumstances, ED 39 would require the benefit

of the surplus to the company to be spread over 14 years in the pensions charge to profit and loss (the expected average remaining service life of the present members of the scheme). Ignoring interest, this represents a level annual reduction of around 7¼% of payroll, although the actuary would quote a figure nearer to 8¼% of payroll.

5.24. Be this as it may, even if the company takes a complete contribution holiday (which could save almost 15½% of payroll for 7 years) the accountant would not reflect more than 7¼% (or 8¼%) reduction in the accounts and the difference would accumulate to a provision of around half a year's payroll at the end of 7 years, falling again to zero over the subsequent 7 years. (We examine the difficulty of allowing for interest in regulating the pensions charge in company accounts in Appendix E.)

5.25. In "*extraordinary*" circumstances, the surplus "should be recognised immediately and treated as an extraordinary item" (ED 39(37)). This would presumably mean the company setting up a *prepayment* amounting to a year's payroll straight away, which would then release the saving caused by the 7 year contribution holiday over that 7 year period, thus maintaining the charge to profits at the level of the regular pension cost. (The complication of interest has again been ignored.)

5.26. If the surplus were to be deemed partly ordinary, and partly extraordinary, the company's accounts would apparently have both a *prepayment* and a *provision* at the same time. One might even envisage a situation where there was no apparent surplus or deficiency, because an ordinary deficiency was offset by an extraordinary surplus, yet variations in the regular pension cost would be produced!

5.27. We do not see that a presentation of figures on the system intended for an ordinary surplus would be sufficient to put the reader of the company's accounts fully in the picture. The regular pension cost which would return after 14 years would have to be disclosed and some explanation given of the composition and variation of the pension provision or prepayment in the company's accounts.

5.28. Nor do we see that regulation of the reporting of a company's profits in the manner suggested in ED 39 presents a truer or fairer view of a company's prospects than full and frank disclosure of any departure from the regular pension cost resulting from deficiencies or surpluses in the pension fund. Indeed, we think that the

complications introduced by provisions and prepayments in the company's balance sheet may serve more to obscure than to clarify the situation.

5.29. In working out how ED 39 would apply, we had difficulty in making up our minds whether the figure in the balance sheet should be a provision or a prepayment. Intuitively we felt that, if there was a *surplus* in the pension fund and the employer was to receive this back in the form of a contribution holiday, then this ought to be an *asset*. Paradoxically, where there was a *surplus* being returned to the company, it would be required to show a *provision*, i.e. an additional *liability* in its balance sheet—not as a true liability, but as a device for delaying taking credit for the surplus. On the other hand, if a pension fund were in deficit and, in a manner of speaking, the company was making good the *shortfall in its past contributions* as quickly as possible, ED 39 would oblige the company to show a *prepayment* in its balance sheet, i.e. an asset.

5.30. We found this confusing, and so too may others. But apart from problems of comprehending the figures disclosed in the accounts, we wonder whether regulating the profits in this way is necessary or can really be justified. It might be pointed out that, if a pension fund is in surplus, the present shareholders may be presumed to have contributed to the surplus by forgoing profits in the past. Why, then, should they not be allowed to benefit from the surplus as quickly as it is released from the pension fund, instead of being made to wait and share it with new shareholders?

5.31. The opposite situation can also arise. Consider the situation where there is a substantial *deficiency*. Assume that the company, out of concern to protect the security of the members' benefits, injects a lump sum into the pension fund. ED 39 would delay recognition of the lump sum injection, with the result that the balance sheet would show a misleadingly healthy situation. The "distributable profits" available to pay dividends according to the accounts might not therefore properly reflect the company's true ability to pay. In the extreme, a cash-flow crisis might result, leading to bankruptcy, in spite of the rosy picture painted in the balance sheet.

5.32. It appears to us that the rights of shareholders are being unnecessarily subordinated to accounting convention in the complicated system of deferred recognition of an ordinary surplus proposed in ED 39. We wonder what real objections there could be to our proposed "stability certificate" or, where appropriate, allowing

the pension charge to vary from its regular amount, subject to proper disclosure and explanation of the reasons. We have already stated our preference for this approach because it reflects the company's real liabilities. The alternative treatment proposed for an "extraordinary" surplus, namely of recognising straight away the full amount of any surplus which is to be returned to the company, would be preferable to that proposed for an ordinary surplus which means introducing a liability to the balance sheet. However, both methods could produce market reactions affecting unreasonably the company's share price.

Conclusion

5.33. In Section 4 of the paper we identified 3 main valuation methods:

- (i) The Defined Accrued Benefit Method, in which the funding objective was to be able to meet the wind-up benefits, which we described as the scheme's true liabilities.
- (ii) The Projected Unit Method, in which the funding objective was often (though not always) higher than with the Defined Accrued Benefit Method, so that there could be a pre-planned surplus. With suitable Trustee discretion, this could be for the members' benefit on an actual wind-up.
- (iii) The Aggregate Method, in which the assets accumulated were higher than with the Projected Unit Method, the excess not being intended for the members' benefit.

A change in valuation method would therefore presumably have the explicit intention of producing, or reducing, a surplus of the kind mentioned in (ii) or (iii).

5.34. ED 39 (83(d)) requires disclosure of the actuarial valuation method used. We wonder whether those reading the name of the method used will appreciate that there are liable to be hidden surpluses of the nature which we describe in paragraph 5.33. ED 39 (83(h)) only requires disclosure of "the amount of any deficiency on a discontinuance actuarial valuation". We ask again the question¹⁶:

"Might there be some truth in the suggestion that a general practice of funding to a higher level than would be required in the event of discontinuance is not only futile, but counterproductive as it obscures a need to improve the accrued rights of stayers in pension scheme Rules?"

We think the new disclosure requirements for company accounts will do nothing to reduce the obscurity.

6. CONCLUSION

6.1. A company may cease contributing to its pension scheme at any time. When this happens, the Trustees must be content with the assets already in the fund and must dispose of those assets as provided in the Trust Deed and Rules.

6.2. We therefore conclude that a company has no legal liability extending in time beyond the present—the valuation date—or in amount beyond what it has already contributed to the fund.

6.3. At present, most Trust Deeds provide no better benefit on winding up than for the individual early leaver, yet most actuaries use valuation methods which implicitly assume a greater liability than that and consequently build up bigger funds than are strictly necessary.

6.4. We see no harm in this provided that the company, which has to meet the cost, has consciously decided to put in extra funds with the intention of enabling Trustees, exercising their discretion under the scheme Rules, to augment the wind-up benefits provided in those Rules.

6.5. We have declared our strong preference for Rules which do *not leave this matter to the Trustees' discretion* but instead reflect the intention in the definition of the wind-up benefit.

6.6. However, where it is left to discretion, the intention would usually be to assume similar augmentation of benefits in calculating the amount of a transfer value payable to another scheme when a group of members came to be transferred to a new employer. We have some hesitation about this if the terms of the transfer agreement are such as to vest in the transferring members a *right* to augmented benefits on a subsequent winding-up of the *other* scheme, which would remain only a *possibility* for the remaining members on a subsequent winding-up of *their* scheme. Whether or not it would be proper for Trustees to discriminate in this way is a legal question, not an actuarial one.

6.7. With some valuation methods, the resulting accumulation of assets is bigger even than would be required to meet any likely intentions on augmentation of benefits. In such a case, there would effectively be a margin for contingencies, such as the contingency that the fund might be closed to new entrants and that the company would wish, in that event, to avoid any increase in the percentage

contribution rate to be applied to the payroll of the remaining members as the funds ran down. Alternatively the margin may be regarded simply as a general contingencies margin, for example against the possibility of future benefit improvements.

6.8. We would have no objection should a company wish to incorporate a margin intended to cover the contingency that the fund's experience might prove to be unfavourable compared with the actuary's valuation assumptions, provided that the nature of the contingency and the amount of the margin were disclosed.

6.9. We would think it wrong if, without the company realising it, margins were to be incorporated in pension funds by their actuaries as a conventional practice. If it were thought that the company's freedom of decision in this respect *should* be constrained, then any margin should be explicit and imposed by law, in the same way as applies to commercial concerns issuing insurance contracts to the general public. We do not see that any such need exists.

6.10. The new statutory valuation basis (for identifying excessive surpluses) limits the scope for contingency margins of any kind in pension funds.

6.11. We are not in a position to gauge the extent to which Trustees and companies understand the explanations given to them by their actuaries of the different valuation methods and of the choice available to them. We suspect that many companies do not fully appreciate the situation as we have described it in this paper. We have encountered companies whose pension funds have been valued by the Aggregate Method and who were unaware that, by any other valuation method, a very substantial surplus would have been disclosed.

6.12. What is needed is for all companies, with the trustees and actuaries in attendance, to reconsider the wind-up provisions in their schemes' Trust Deed and Rules. Where those documents do not reflect the company's intentions the provisions should be changed.

6.13. Once those provisions have been made definitive, that should settle what members are entitled to expect from the scheme and what would be expected of the trustees in the event of the scheme's termination. It should also determine the nature of the accrued liability and therefore the funding target for the actuary to aim at.

6.14. Where a company decided to continue to operate with a level of funding higher than the actual accrued liabilities, as most apparently do at present, this should be disclosed, as a warning of the vulnerability which goes with the flexibility implicit in this approach.

6.15. Throughout this paper, and particularly in this concluding section, we have sought to draw attention to matters which are for the *company* to decide. It is important that the company should realise which matters are properly matters of actuarial professional judgement and which are not. Undoubtedly in the natural course of their work actuaries also advise clients on the benefit design of pension schemes: we believe that wind-up provisions and funding targets fall into this category. However, given the complications of funding defined benefit pension schemes, it is all too easy for the client to fail to appreciate the distinction and for the actuary, in practice, to be drawn into taking decisions which we contend are not his to take. The approach to funding advocated in this paper would remove the present blurring of those separate responsibilities and would also remove much of the present complication, so difficult for non-actuaries to understand.

ACKNOWLEDGMENT

We are grateful to our colleague, Miss June Marshall, for her support in producing the many figures we required for the numerical comparisons shown in the appendices.

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APPENDIX A: MODEL SCHEME

1. *Summary of Benefits*

Retirement age:	65 (males only).
Final pensionable salary:	Average salary over last 12 months before retirement.
Retirement pension:	1/60th of final pensionable salary for each year of service, payable monthly in advance and guaranteed for five years.
Widow's pension:	On death after retirement: 50% of member's pension.
Withdrawal benefit:	Deferred pension of 1/60th of final pensionable salary for each year of service, revalued at 5% p.a. to retirement age. No benefit payable on death after withdrawal but before retirement age.
Death in service benefits:	Nil.
Pension increases:	5% p.a.
Member's contributions:	Nil.

2. *Valuation Assumptions*

Rate of interest:	9% p.a.
Increase in general level of earnings:	7% p.a.
Mortality: in service:	A 1967-70 less 3 years.
in retirement:	PA (90) less 1 year.
Wife's age:	3 years younger than husband at retirement.
Proportion married:	90% at retirement.

Other factors:

Age x	Salary scale at x	Withdrawal rate at x	Proportion of new entrants x to x + 9
25	10,000	·086	·67
35	12,070	·035	·26
45	13,267	·016	·07
55	13,911	·003	—
65	14,260	—	—

APPENDIX B: STABLE MEMBERSHIP PROFILE

Age	No. of members	Pensionable service (years)	Deaths	Withdrawals	New entrants
25	93	0·0		8	93
26	178	0·5		15	93
27	247	1·0		19	84
28	303	1·5		22	75
29	346	2·0		24	65
30	378	2·6		25	56
31	400	3·2		25	47
32	412	3·8		24	37
33	425	4·3	1	23	37
34	438	4·9		22	37
35	444	5·5		16	28
36	456	6·1	1	15	28
37	468	6·7		15	28
38	481	7·2	1	14	28
39	494	7·8		14	28
40	508	8·3	1	14	28
41	512	9·0		12	19
42	519	9·6	1	12	19
43	525	10·2		11	19
44	533	10·8	1	11	19
45	540	11·4	1	9	19
46	539	12·2	1	8	9
47	539	13·0	1	8	9
48	539	13·7	2	7	9
49	539	14·5	2	6	9
50	540	15·2	2	5	9
51	533	16·2	2	5	
52	526	17·2	2	4	
53	520	18·2	3	3	
54	514	19·2	3	3	

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55	508	20·2	3	2	
56	503	21·2	3	1	
57	499	22·2	4	1	
58	494	23·2	4	1	
59	489	24·2	5	1	
60	483	25·2	5	1	
61	477	26·2	5		
62	472	27·2	6		
63	466	28·2	7		
64	459	29·2	7		(Retirements 452)
Totals	18339		74	406	932

APPENDIX C(i): CONTRIBUTION RATES AND FUND BALANCES BY DIFFERENT VALUATION METHODS
FIRST 41 YEARS OF A NEWS SCHEME, WITH NO STARTING CREDITS

(All figures expressed as percentages of payroll in year beginning *t*)

Years from start	A1 Security Benefit 5% p.a. revaluation		A2 Security Benefit 7% p.a. revaluation		B Projected Unit Method (b)		C Aggregate Method (b) (c)		Expenditure
	Contn. Rate	Mean Fund	Contn. Rate	Mean Fund	Contn. Rate	Mean Fund	Contn. Rate	Mean Fund	
0	11.01	5.4	14.32	7.1	14.61	7.3	15.97	8.0	0.07
5	12.23	57.6	14.36	73.6	14.61	75.2	15.61	82.2	3.64
10	13.25	102.4	14.45	128.8	14.61	131.6	15.12	142.9	6.98
15	14.06	139.1	14.53	172.2	14.61	175.9	14.79	190.3	10.19
20	14.67	166.8	14.60	204.2	14.61	208.3	14.68	224.8	13.20
25	15.07	185.7	14.65	225.2	14.61	229.6	14.51	247.4	15.72
30	15.30	196.6	14.68	237.0	14.61	241.7	14.40	260.5	17.67
35	15.41	201.2	14.69	241.8	14.61	246.3	14.36	265.7	19.00
40 and later	15.43	201.7	14.69	242.3	14.61	246.9	14.31	266.7	19.17
							(14.21)	(267.8)	

NOTES: (a) Represents revaluation of accrued benefit in line with the general level of earnings.

(b) Value of accrued benefits allows for withdrawals and pay increases on promotion.

(c) Valuations at three-year intervals. Not yet stable after 40 years.

APPENDIX C(ii): CONTRIBUTION RATES BY AGE BY DIFFERENT VALUATION METHODS
(All figures expressed as percentages of payroll)

Age	A1 (5% revaluation)		A2 (7% revaluation)		B Projected Unit Method		C Aggregate Method	
	Year 1	Year 41	Year 1	Year 41	Year 1	Year 41	Year 1	Year 41
25	4.40	4.40	8.99	8.99	8.08	8.08	12.43	12.43
30	5.32	5.82	9.97	9.59	9.78	9.78	13.68	13.68
35	6.42	7.38	11.02	10.65	11.27	11.27	14.71	14.71
40	7.77	9.54	12.16	12.07	12.65	12.65	15.63	15.63
45	9.41	11.88	13.44	13.36	13.95	13.95	16.51	16.51
50	11.50	15.51	14.96	15.43	15.46	15.46	17.37	17.37
55	14.17	20.19	16.79	17.44	17.12	17.12	18.16	18.16
60	17.78	27.20	19.17	20.25	19.34	19.34	18.43	18.43
All Ages	11.01	15.43	14.32	14.69	14.61	14.61	15.97	14.21

NOTE: In Method C, the contribution rates for different ages are the level rates required for entrants at that age. The average age at entry in year 1 is much higher than the average age for entrants in subsequent years. The Aggregate Contribution Rate is therefore higher in year 1 than it will be ultimately, when the aggregate rate is the same as the contribution rate under the Entry Age Method.

APPENDIX C(iii): CONTRIBUTION RATES AND FUND BALANCES BY DIFFERENT VALUATION METHODS

A once stable fund (i) now declining, only half of exits replaced by new entrants

(ii) now increasing, 50% more new entrants than exits

(All figures expressed as percentages of payroll in year beginning t)

Years from start t	A1 Security Benefit 5% p.a. revaluation		A2 Security Benefit 7% p.a. revaluation		B Projected Unit Method		C Aggregate Method		Expenditure	Change in payroll from year 40 (b)
	Contn. Rate	Mean Fund	Contn. Rate	Mean Fund	Contn. Rate	Mean Fund	Cont. Rate	Mean Fund		
40	15.43	201.7	14.69	242.3	14.61	246.9	14.21	267.8	19.17	1000
<i>(i) Membership declining</i>										
45	16.49	225.6	15.17	270.3	15.05	275.5	14.21	312.3	21.86	882
50	17.45	250.0	15.56	296.5	15.36	302.0	14.21	326.4	23.98	779
55	18.32	277.0	15.84	323.8	15.54	329.4	14.21	353.1	27.23	679
60	18.43	280.8	15.87	326.2	15.54	331.6	14.21	354.3	31.67	583
65	18.12	272.6	15.73	315.9	15.44	321.0	14.21	343.0	34.30	496
70	17.95	272.0	15.59	314.7	15.30	319.6	14.21	341.4	36.95	420
<i>(ii) Membership increasing</i>										
45	14.80	187.9	14.43	226.1	14.36	230.4	14.21	251.5	17.95	1083
50	14.13	165.3	14.13	208.9	14.11	212.9	14.21	233.4	15.72	1219
55	13.76	162.6	13.98	198.7	14.01	202.5	14.21	223.1	14.98	1371
60	13.70	159.2	13.99	195.9	14.03	199.9	14.21	221.1	13.22	1541
65	13.74	159.1	14.03	196.6	14.07	200.7	14.21	222.4	12.23	1726
70	13.93	163.2	14.12	201.2	14.14	205.4	14.21	227.3	12.89	1926

NOTES: (a) For purposes of this table, the Aggregate Method is assumed to have become stable by year 40.

(b) Change in payroll is shown in terms of constant earnings, i.e. 7% p.a. increase is eliminated.

APPENDIX C(iv): CONTRIBUTION RATES AND FUND BALANCES FOLLOWING A 50% SURPLUS IN THE FUND AFTER 40 YEARS

(All figures expressed as percentages of payroll)

Years from start	METHOD A1 (5% revaluation)				METHOD A2 (7% revaluation)				METHOD C Aggregate Method	
	(a)		(b)		(a)		(b)		Contin. Rate (d)	Mean Fund
	Contri. Rate	Mean Fund	Contri. Rate	Mean Fund	Contri. Rate	Mean Fund	Contri. Rate	Mean Fund		
40	7.26	299.3	—	296.1	4.87	359.6	—	357.8	3.14	396.2
43	7.26	278.6	—	253.9	4.87	336.0	—	319.1	5.34	370.7
46	7.26	258.9	—	209.4	4.87	311.1	—	278.2	7.10	350.3
49	7.26	237.0	15.43	201.7	4.87	284.7	14.69	242.3	8.51	334.0
52	7.26	213.8	15.43	201.7	4.87	256.8	14.69	242.3	9.64	320.8
55	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	10.55	310.3
58	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	11.27	301.8
61	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	11.88	295.1
64	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	12.32	289.7
67	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	12.70	285.3
70	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	13.00	281.9
73	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	13.24	279.1
76	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	13.43	276.8
79	15.43	201.7	15.43	201.7	14.69	242.3	14.69	242.3	13.59	275.1
									(14.21)	(267.8)

- NOTES: (a) Surplus eliminated over 14 years.
 (b) Contribution holiday for 7 years.
 (c) Contribution holiday for 9 years.
 (d) Valuation, and revision of contribution rate, every 3 years.
 (e) Scheme membership constant.

APPENDIX D: RESULT OF AN INCREASE IN
WITHDRAWAL RATES

1. In the paper submitted to the Faculty of Actuaries in February 1983 results were shown on the basis of a model scheme with a very high rate of turnover and also where there were no withdrawals at all. The high rate of turnover overall was 14.5%. The model scheme this time, again with an all-male membership, assumes more modest though realistic withdrawal rates, giving an overall rate of turnover of 2.2%.
2. The main reason for such a low overall rate lies in the adoption, for convenience, of a minimum age of 25 for membership. The typical scheme encountered in practice would have a much larger proportion of members under age 30 than in our model and the high rates of turnover experienced at these ages would produce an overall rate significantly higher than our 2.2%.
3. In the circumstances, we thought it appropriate to test how dependent our results were on the level of withdrawals assumed. The model was therefore changed by trebling the number of withdrawals at each age in Appendix B, and adding the same number of new entrants, leaving the number of members at each age the same as before but reducing the average length of pensionable service.
4. The resulting percentages of payroll in the stable state may be compared with those in Appendix C(i) as follows:

		Model scheme		Withdrawals trebled	
		%	%	%	%
		Contn. Rate	Mean Fund	Contn. Rate	Mean Fund
(i)	Method A1 (5% revaluation)	15.43	201.7	14.21	152.0
(ii)	Method A2 (7% revaluation)	14.69	242.3	13.67	180.8
(iii)	Method B (Projected Unit)	14.61	246.9	13.70	179.5
(iv)	Method C (Aggregate)	14.21	267.8	13.25	203.8
(v)	(iv) - (ii)		25.5		23.0
(vi)	Addition to C for death-in-service benefits		28.1		22.7
(vii)	$100 \times (v)/(ii)$		10.5		12.7
(viii)	$100 \times ((v) + (vi))/(ii)$		22.1		25.3

5. The ultimate mean fund on Method C, the Aggregate Method, is 10·5% higher in our model than on Method A2, with the maximum defined benefit. When withdrawals are trebled, the excess is increased to 12·7%.
6. When death-in-service benefits are assumed to be funded in advance in Method C, the excess over Method A2 is increased to 22·1% in the model scheme and to 25·3% when withdrawals are trebled.
7. These figures would appear to indicate that, within reasonable limits, the level of withdrawals does not disturb the relativities unduly.
8. We note that, when withdrawals are trebled, Method A2 ultimately has a *lower* contribution rate and *higher* mean fund than Method B.

APPENDIX E: ALLOWANCE FOR INTEREST IN REGULATING
THE PENSIONS CHARGE IN COMPANY ACCOUNTS

1. In this appendix we consider the situation where a scheme is funded on Method B, and has assets amounting to 316.7% of payroll. It therefore has a surplus of 69.8% which it intends to run off over 5 years by taking a contribution holiday.
2. ED 39 would defer recognition and spread the surplus over 14 years. Allowing for compound interest, this would mean a reduction of 5.66% of payroll for 14 years instead of 14.61% for 5 years. Both series of reductions are equivalent in capital value to the surplus of 69.8%.
3. This would imply that the pensions charge should be 8.95% of payroll for 14 years (14.61% – 5.66%). However, the balance sheet provision could not be a simple summation of 8.95% a year for 5 years, followed by a run down of 5.66% a year for 9 years. This would mean a build up to 44.75% after 5 years, followed by a run down to *minus* 6.19% after 14 years (9 times 5.66% = 50.94%). These figures are shown in columns (1) to (3) of Table E1.
4. *Allowing for compound interest*, the 5 transfers to the provision would amount to 46.90% after 5 years, followed by a run down to zero after the full 14 years. The amounts of the provision year by year on this basis are shown in column (4) of Table E1.
5. One must presume that it is the intention of ED 39 that the pensions charges should be based on column (4) instead of column (2), leading to the figures shown in column (6). These vary from 9.00% of payroll to 9.79% of payroll.
6. It would seem odd to us to “regulate” a company’s pension charges to amounts which varied in this manner. One possibility would appear to be to allow for interest on the balance in the provision *within* the company’s accounts, so as to maintain the pensions charge at 8.95% as in column (2).
7. Another possibility would be to ignore the amount of the surplus altogether and base the calculation on the actual reduction in the contributions to the scheme, namely 5 times 14.61%, a total of 73.05%. Dividing by 14 gives a reduction of 5.22%, which converts the 5 year holiday followed by 9 years at 14.61% to a pensions charge of 14.61% – 5.22% = 9.39% a year for 14 years. This would

build up a provision in the balance sheet of 46·95% after 5 years, falling again to zero over the following 9 years, at 5·22% a year. The arithmetic is straightforward but of more importance would be the principle of having a mandatory accounting standard on such a simplistic approach.

TABLE E1

Year	Contn. to pension fund	Pension charge allowing for interest	Provision in company's balance sheet		Differences in column (4)	Pension charge based on column (5)
			Ignoring interest	Allowing for interest		
	(1)	(2)	(3)	(4)	(5)	(6)
1	—	8·95	8·95	9·04	9·04	9·04
2	—	8·95	17·90	18·24	9·20	9·20
3	—	8·95	26·85	27·62	9·38	9·38
4	—	8·95	35·80	37·17	9·55	9·55
5	—	8·95	44·75	46·90	9·73	9·73
6	14·61	8·95	39·09	42·07	-4·83	9·78
7	14·61	8·95	33·43	37·14	-4·93	9·68
8	14·61	8·95	27·77	32·13	-5·01	9·60
9	14·61	8·95	22·11	27·02	-5·11	9·50
10	14·61	8·95	16·45	21·81	-5·21	9·40
11	14·61	8·95	10·79	16·51	-5·30	9·31
12	14·61	8·95	5·13	11·11	-5·40	9·21
13	14·61	8·95	(-0·53)	5·61	-5·50	9·11
14	14·61	8·95	(-6·19)	—	-5·61	9·00
15	14·61	14·61	(-6·19)	—	—	14·61

DISCUSSION

Mr C. M. Stewart, introducing the paper, said.—It is a rare privilege for a Library Member of the Faculty to be able to present a paper here. It also gives me the opportunity to say how much I have appreciated being a Library Member; receiving advance notice of meetings; pre-prints of the papers; taking part in meetings; and receiving the Transactions afterwards with a record of the proceedings. I did actually use the Library on one occasion but that is not really what one becomes a Library Member for, is it?

I have attended a number of meetings here over the years and have made some good friends in the process, including of course my absent co-author, David McLeish. We first met here in February 1983 when his previous paper on this subject drew me to Edinburgh. The fact that we are now presenting a joint paper on the subject is therefore directly attributable to my being a Library Member.

As you know I have until now had relatively little direct involvement with occupational pension schemes. My main concern in government service was with insurance supervision and social security. I was, however, aware of the disagreement within the profession on methods of pension fund valuation and I tried to discover the cause. The conclusion I reached was naturally coloured by my experience in those other fields.

Involvement in the supervision of insurance companies had taught me how essential it was for the actuary to have regard for the legal framework within which he operated. I therefore thought it a mistake and fraught with danger to disregard the wind-up provisions in scheme rules, and approach funding as if those rules did not exist, or did not matter.

Instead of turning our backs on the discontinuance approach to funding, we should instead have embraced it as the one method which actually fitted the legal framework and we should have made it work by ensuring that the wind-up provisions in the rules reflected the intentions of those responsible for the scheme's design.

Financing social security schemes showed me a new dimension to funded occupational schemes. As a student, I was taught to use the Entry Age Method, and no other. New entrants would be cost-neutral, and could therefore be ignored. But this would not do in financing partly-funded state schemes. It was always necessary to allow for new entrants in the form of births, or school leavers, or immigrants. The closed-fund concept was not valid.

The General Average Contribution Method is seldom used nowadays, but a State scheme funded by that method used the fund as a device for equalising the contribution rate from one generation to another. The size of the fund had nothing whatever to do with accrued liabilities. Nor, it would seem, have the Aggregate Method and other prospective methods, very much to do with matching accrued liabilities. They have a different objective, but is it the right one?

Approaching the subject from our quite different backgrounds, David McLeish and I had nevertheless reached much the same conclusion on the correct approach to financing occupational pensions. Following the Faculty meeting in 1983, we found ourselves expressing similar views on the subject at pension meetings in London. What could be more natural than that we should now join forces to put those views to the profession in writing, here this evening and at the Institute in January.

Our philosophy on funding as described in the paper can be summarised briefly as follows:

1. The principal reason for putting capital in trust is to provide security against possible wind-up.
2. The benefits to be provided on wind-up can be modest or generous, but this is a decision for the company to take—not the actuary.
3. The intended level of wind-up benefits should be reflected in the Trust Deed and Rules.
4. The company's funding strategy should be to maintain the scheme's assets at a level sufficient to cover the chosen wind-up benefits in the ongoing scheme.
5. The actuary should advise on the contribution rate necessary to achieve that funding strategy.
6. If the company consciously funds beyond that level, it should be quite clear as to its reasons for doing so and should be aware of its vulnerability as a result of doing so.

This approach to pension funding results from our conviction that the answer to the question in paragraph 3.11 of the paper is:

"Yes, the written rule on winding up must prevail. There is no actuarial principle, or unwritten rule based on reasonable expectations, which can override it".

The question asked in paragraph 3.11 is at the heart of the matter before us. David McLeish and I have given our answer. We hope that those contributing to the discussion this evening will do the same.

Mr G. Pollock, opening the discussion, said:—It is my privilege and pleasure to open the discussion tonight on this most interesting and timely paper by Messrs McLeish and Stewart. It is a pity indeed that Mr McLeish cannot be here with us tonight. I wish him a speedy recovery.

I must admit, however, that before reading the paper I did just wonder what I had let myself in for. The reason for all this was that, just a few weeks ago, we had a dress-rehearsal for tonight when Mr McLeish addressed the Students' Society at their inaugural meeting. The subject matter, as some of you may know, is left to the speaker, and can be any topic relating to the profession. Well, you will never guess—Mr McLeish chose to speak on the subject of the funding of pension schemes. My problem was that at the beginning of this address Mr McLeish made five fundamental statements regarding pension schemes and then asked the audience if they agreed or disagreed with these statements. I agreed with all five—Mr McLeish disagreed with all five. What is more I still agreed with all five after Mr McLeish's explanation. I therefore thought I might have a difficult task tonight. On reading the paper, however, I did find some areas in which I was in broad agreement. Perhaps, this is Mr Stewart's influence.

Seriously, I must start by thanking the authors for producing this paper and thereby enabling continuing discussion and debate on a most important subject. As mentioned in paragraph 2.4 one of the authors presented a paper primarily on the same subject to the Faculty in 1983. Perhaps now, however, the subject is more topical following the publication of Exposure Draft 39 on Accounting for Pension Costs in Company Accounts and also following the introduction of a statutory valuation basis and method for identifying surpluses from the Inland Revenue's point of view.

The authors have put forward a method of funding which they name as the "Defined Accrued Benefit Method". This is the method Mr McLeish advocated in his previous paper "A Financial Framework for Pension Funds" presented

to the Faculty in 1983. The method is described in paragraphs 1.14—1.23 and is designed to satisfy what the authors see as the prime purpose of funding, namely that on the scheme being discontinued the assets are sufficient to purchase the accrued benefits as defined in the wind-up clause. First of all, therefore, the employer must decide what each category of members' entitlement should be in the wind-up. Recommended maximum and minimum levels are set out in paragraphs 1.16 and 1.17 respectively. The authors then suggest that the level of entitlement chosen is made secure by alteration to the wind-up clause of the Trust Deed and Rules if necessary. The object of the method is to fund for this level of wind-up benefits. So far so good, although I will return to the wind-up clause later.

I would certainly agree that one of the objectives, or even perhaps by-product of any method of valuation, should be to ensure that on wind-up the scheme's assets are sufficient to secure the members' entitlements—assuming of course that these are defined. Whether or not the employer chooses to fund to that level is, subject to statutory limitation, up to him. I would question, however, whether the authors' method necessarily meets that objective. Mr McLeish's previous paper suggested that under this valuation method assets would be valued on a discounted income basis. Similarly liabilities would be valued using a level rate of interest. Whilst it is not clear from the present paper what method the authors would use to value assets, the liabilities as defined under methods A1 and A2 described in paragraph 4.23 are valued using a flat rate of interest. It seems to me to be logical that, if the prime objective of the method is to ensure that on a potential wind-up there are sufficient assets to secure the defined wind-up liabilities, the methods of valuing the assets and liabilities should have regard to what would actually happen on the wind-up. On an actual wind-up of a scheme the assets would be sold—so what we need is the realisable value of the assets. Ignoring GMPs the liabilities would probably be bought out with an insurance company. Insurance company deferred and immediate annuity rates should be the yardstick here. Any method which measures assets and liabilities on a different basis runs the risk of suggesting the scheme is solvent when in certain market conditions this would not be the case.

Another point which concerns me here is that, subject to what I have just said, the assets accumulated under this method should be sufficient on average, to provide the defined wind-up benefits. In the case of active members on the minimum target basis this represents the benefits they would have been entitled to on leaving service at that date. If a fund was on target at the valuation date and if the experience was subsequently unfavourable, the wind-up benefits would not be able to be fully secured. Now whilst it can be argued that over a long enough period investment returns and salary inflation rates are in some way correlated this certainly need not necessarily be so in the short term. An examination of the last few years experience testifies to that. It seems to me therefore that the authors are attempting to hit a fast-moving target and as a consequence could miss this target by a considerable margin at any point in time. Also, in view of the recent disclosure requirements, it will be necessary to publish the solvency level of the scheme in the actuarial statement to be included in the Trustees' report to members. I wonder if many employers will be happy with the possibility of having to declare a solvency level of less than 100% on a number of occasions.

Another relevant point here may be that prior to a fund actually reaching a wind-up situation the employer may well have gone through a lean period where full contributions to the pension fund could not be afforded. Typically therefore if the employer was, prior to this difficult trading period, just

funding for the authors' minimum approved benefit then, at the actual wind-up date, the fund could be less than that required to produce the defined wind-up benefits. As a consequence of all this I would certainly favour the adoption of some form of contingency margin if the minimum target basis had to be adopted. Alternatively it seems to me that the more logical conclusion of the authors' method would be to fully match the assets to the discontinuance liabilities.

I would now like to return to the objectives for funding. In paragraph 1.2 the authors state that "the prime purpose of funding an occupational pension scheme must be to secure the accrued benefits whatever they might be in the event of the employer being unable or unwilling to continue to pay at some future date". If I was a member of the pension scheme I would certainly not disagree with that statement. I would wonder, however, if it went far enough. I believe I would initially be more concerned as to the ability of the scheme to pay the benefits as and when they fell due on an ongoing basis. As such I would disagree with the authors' comments in paragraph 1.12 where they suggest that this is conceptually inappropriate in a defined benefit scheme. I believe many employees would find it difficult to rationalise the scheme's funding method being totally designed round an event which may never happen. I must say I personally have some sympathy with that view. I appreciate that the authors' method does not imply that the benefits due in the future may not be able to be paid. As examples in Section 4 amply demonstrate, however, other things being equal, higher contributions will be required when a steady state is achieved. I just question whether employees will be able to understand all of this and whether perhaps the finance director of the future will pay for it.

From the employer's point of view I have no doubt that, subject to statutory limitations, he would wish to retain the right to decide the level of funding for his particular scheme. Many may feel morally bound to ensure that as a minimum the wind-up benefits could be secured. Others, however, may wish their actuary to adopt a method whereby as far as reasonably can be measured the cost of each year's pension accrual is paid in that year. Now in all other aspects of the company's business the company is operated on the basis that it will continue to trade. Each year's trading results are calculated on that assumption, not on the assumption that each year the company will cease trading at the end of the year. Why operate the pension scheme in a different manner? Under this method, therefore, the assets and liabilities of the scheme should be valued on the basis that the scheme is continuing unless the contrary is a known fact. I would suggest the Projected Unit Method would most logically fit this requirement.

Finally there is the employer who wishes to operate on a reasonably steady ongoing contribution basis which may allow surpluses to emerge for the indexing of immediate and deferred pensions. Indeed in the UK I would suggest that a substantial number of employers fall into this category. I believe therefore that with proper explanation different employers will arrive at different conclusions as to what is their prime funding objective. The actuary should then adopt the valuation method most appropriate to this objective.

I cannot therefore agree with the authors' comments in paragraph 1.11 that the profession's difficulty in deciding upon "the relative suitability of the various methods of funding can be attributed to a general failure of Trust Deeds and Rules to record the true intentions of employers in wind-up situations". Using the employer who wishes to fund a steady ongoing contribution basis as an example, it would make no difference whatsoever if the Trust Deed and Rules are explicit on the employer's pension on a wind-up

since a client's real benefit objectives are defined on the basis that the scheme is continuing and expected to continue.

In Section 2 of the paper the authors describe the background to their method. In particular they contrast the accrued benefits type of approach with prospective valuation methods. In paragraph 2.9 it is suggested that the British Government, no less, has recently been converted to an accrued benefits approach. I must admit I was not aware that the British Government previously had any approach to valuation methods. Also I feel it is very much overstating the case to say that, as is suggested in paragraph 2.10, "the Finance Act 1986 appears to postulate that in principle prospective valuation methods result in overfunding". My view is that quite simply at this very favourable point in time for pension funds the British Government wish to raise some tax from these funds and as a consequence quite logically chose an accrued benefit method. If prospective methods had been allowed the amount of tax raised would have been very little indeed, since surplus built up in respect of past service could simply be spread over the future working lifetime of the scheme's active members. Also it seems to me that from the Joint Office Memorandum on the treatment of surplus issued recently, the Inland Revenue seem to accept that there are schemes for which projected accrued methods are not appropriate, namely, those closed to new entrants and those within the first fifteen years of life.

I must admit I cannot fully understand the authors' reasoning in paragraphs 3.7 and 3.8 where they are discussing the *Hillsdown Holdings v Imperial Foods* case. In a scheme where the employer is meeting the balance of cost I personally can see no contradiction in defining in the Rules that bulk transfers will, as a maximum, be based on accrued service and projected salaries, notwithstanding the fact that a by-product of the clients' main funding objective has been to build up funds at a higher level. I do agree with the authors' comments, however, in paragraph 3.9 that the Trust Deed and Rules should clearly state the members' entitlements. As a consequence of the case referred to, I understand many employers are reviewing the relevant clauses of their Trust Deed and Rules. Where I disagree with the authors is with regard to the wind-up clause itself. It seems to me to be illogical, for example, to define a member's entitlement to post-retiral pension increases in the wind-up clause when they are not so similarly defined or guaranteed under the Rules on an ongoing basis. The same argument applies to pre-retiral increases to deferred pensions. I personally would prefer not to define either pre- or post-retiral increases in excess of a normal leaver's or pensioner's level in the wind-up clause since I believe that the Trustees and the employer thereby retain greater flexibility to direct the surplus assets, if any, to where they might be needed most at the particular point in time.

With regard to employees' security on wind-up, I feel this may be more illusory than real. The authors state in paragraph 3.15 "to be truly secure, the employees' accrued rights would have to be made firm in the Trust Deed and Rules". What good is that if the employer has effectively power to amend these rules or if, at the end of the day, through non-payment of employer contributions, the fund is insufficient to provide the benefits? I would agree with the authors' comments on the wind-up clause itself in that if an employer's prime, or perhaps should I say, sole objective is to provide the wind-up benefits it would seem logical for the wind-up clause to reflect this and allow for any surplus assets to be returned to the employer. However, as I have suggested, this is not in my view the main funding objective of many employers and as such they may well find another type of wind-up clause more attractive.

In Section 4 the authors compare various valuation methods and in particular produce detailed calculations on four bases, namely: A1 and A2 being the authors' preferred method using their minimum and maximum target bases: B is the Projected Credit Method: C is the Aggregate Method. It is interesting to note that the Aggregate Method is one of the examples chosen because, contrary to what the authors suggest, I am not aware of many practitioners who use this method in its pure form. I believe it is always necessary to split the liabilities into past and future service regardless of which method is used. I would have thought that the most popular prospective method is probably the Attained Age Method or some modified form thereof. In paragraph 4.10 the authors suggest that the Projected Method builds up bigger funds than their preferred method because it is normally considered that the stayer deserves the better benefit. I would have thought the method builds up bigger funds because it is expected the stayer will actually receive a better benefit when he retires or whatever in due course. The objective of this method is not to fund for discontinuance.

In paragraphs 4.12 to 4.17 the authors state that in calculating contribution rates allowance should always be made for new entrants. Whilst I believe consideration should be given to the effect of new entrants I do not believe it is absolutely essential to allow for these explicitly. In any analysis or surplus I have ever seen, the new entrants' contribution to the surplus or deficit is usually a relatively small item. Also in passing I just wonder what new entrants assumption should be deemed appropriate at this point in time in view of the changes being introduced in 1988.

The numerical examples amply demonstrate the effects of the actuarial methods chosen. I did not find any of the results in Appendix C(i) surprising in the sense that other things being equal if you pay less today you will have to pay more tomorrow. It is interesting to note the significant differences in the asset build-up especially if, under the Aggregate Method, death-in-service costs are not funded on an annual cost basis. I personally favour the lump sum death benefits at least being costed on an annual charge or pay-as-you-go basis since in practice it is quite common for these benefits to be reinsured. As far as I am aware, even under prospective methods this is a much more common approach than funding in advance. Whether or not this should be extended to widow's or widower's pensions is another matter, especially as widows GMPs as a minimum must be secured for members leaving service.

Appendix C(iii) illustrates the effects of increasing and decreasing membership and demonstrates that, as you would expect, on the minimum target basis A1, the required contribution rates are more volatile. This in itself need not necessarily cause problems so long as the employer understands the possible effects of this particular method. In any event some smoothing pattern could be incorporated in the required changes. Personally I would like to have seen the relative effects of varying the major economic actuarial assumptions. If this had been shown I feel that the differences between the various methods could have been put into perspective. As has been said before, 15% of payroll is 15% of payroll. The combination of, say, the Aggregate Method with weak actuarial assumptions could conceivably produce the same answers as the authors' method with strong assumptions. This is, I believe, a fundamental point and does in my view demonstrate the need that, where possible, funding methods and actuarial assumptions should be fully discussed with the Trustees and the employer prior to the calculation of any figures. I appreciate this is not possible for a large number of insured schemes but it is certainly possible and indeed expected with the larger more sophisticated clients. My practice is to carry out calculations after discussion with the employer and Trustees using various actuarial

assumptions. The results are then examined and discussed fully prior to the publication of the formal valuation report.

Section 5 covers the very important and topical subject of accounting for pension costs in company accounts. The authors state their preference in paragraph 5.2 where they suggest that accounts should be accompanied by a stability certificate relating to the employer's contributions. Whether or not you agree with this method I feel may be immaterial as it is difficult to believe that accountants will so radically change the methods proposed in Exposure Draft 39.

As the authors mention, the position in the United States is also changing following the issue of Financial Accounting Standard No.87. It is, I believe, instructive to consider the history of this subject in the United States. This latest statement is part of an evolution which has been going on for some 20 years following the issue by the Accounting Principles Board of Opinion No. 8 in 1966. What is interesting is that that document advocated accrual accounting for pensions based on the assumption that companies would continue to provide such benefits. The statement issued recognised the great diversity of actuarial methods and accordingly rather than seeking to define a single acceptable method merely narrowed the range. In 1974 the Financial Accounting Standards Board initiated a project on accounting for pension costs. The pressure for this arose through:

1. Dissatisfaction in some quarters with the range of costs which could be reported under the 1966 statement, and
2. Criticism that the standard did not deal adequately with the extent to which an employer's ultimate obligation to pay pension benefits was covered by the existing assets of the Plan.

Hence in 1985 FAS 87 (as it is known) was issued prescribing a single actuarial method, the Projected Unit Credit Method, and also detailing how certain of the actuarial assumptions should be computed. The interesting point for the UK was that the 1966 US statement was in many ways similar to ED 39. I will leave it to other speakers to speculate where we will be in 20 years time.

In paragraphs 5.10 to 5.21 the authors justify their method in relation to the various requirements under ED 39. Indeed in paragraph 5.15 they claim that the Defined Accrued Benefit Method is the correct method in relation to producing a proper pension charge for accounts in all circumstances. I would strongly disagree with this claim. I feel you need go no further than the two sentences from the Exposure Draft following that quoted by the authors—"the most important consideration in determining the pension cost is the strength of the overall valuation, namely the actuarial valuation method and the assumptions taken together. Different valuation methods with different sets of assumptions may equally well satisfy the accounting objective."

Finally, it is interesting to note that a Joint Working Party of young accountants and the Students' Society at Staple Inn suggested that in principle certain methods were not acceptable for pension cost measurements. Among these were the Current Unit Method, the Aggregate Method and the partly Projected Unit Method. I believe we could anticipate the authors' view on that suggestion.

In conclusion I would like to thank the authors again for the considerable work that must have gone into the production of this most interesting paper. I hope they are rewarded with a lively discussion.

Mr B. R. Macdonald:—I find myself broadly in agreement with the conclusions of this paper which really are saying

1. Discretion over the surplus on a wind-up should not be left with the Trustees: after all, on what basis can they decide between the beneficiaries, one of whom may be the employer?
2. The amount the employer puts into the fund is up to him (in consultation with his employees).
3. Employers do not understand funding in detail.

However, the paper also deals with what the actuary might suggest is a reasonable amount to put into the fund and how to calculate the funding rate, what should go into the accounts and the legal position.

I will only deal with my two main areas of disagreement with the authors. First, how much should go into the fund itself? If the Rules specify precisely what benefits have to be provided on wind-up, then it is not worth putting more into the fund than this except perhaps to provide a contingency margin and I agree that the Rules should be changed to be more specific. What should the Rules provide then? The authors argue for withdrawal benefits plus a bit, the bit to be decided by the employer, but in practice the employer will often look to the actuary for advice. The arguments for their choices of security benefits appear to be:

- in paragraph 1.16: that this corresponds to members' expectations.
- in paragraph 2.12: what the accountants regard as accrued liabilities.
- in paragraph 3.7: what Mr Justice Walton regarded as accrued liabilities.
- in paragraph 2.10: what the Government Actuary regards as excessive.

I do not think we should base our arguments on the basis of what a lawyer or an accountant say and the Government Actuary was answering a different problem. One assumes his problem was: if this basis is chosen, how much money will the Exchequer get back? Therefore the authors' argument rests solely on expectations. What are the employees' expectations? These vary but another reasonable one is that pension fund monies are there to protect their prospective benefits should the company go bust. I believe that in theory members' expectations imply new entrant funding.

Take an example of a winding up scheme with the authors' new wind-up rule. I am aged 64 and am to get 39/60ths of my salary plus increases to age 65 according to the rule. To make this up to my expected pension at 65 would cost me anything from one quarter to the whole of my next year's salary depending on which target the scheme is on, whereas the new entrant rate might have been about 15%. A reasonable expectation? I doubt it. Surely my reasonable expectation is a cost of 10% or 15% salary at most. This implies new entrant funding with the wind-up rule amended to grant past service reserves on the new entrant method. Therefore I do not really accept the authors' theoretical arguments. However, in practice, given current legislation it would be daft to put more money in than will be allowed tax relief, but there is no reason why higher benefits should not be provided on wind-up if there is enough money.

My other main disagreement is on accounting. Traditionally actuaries have calculated the *cost* of pensions and this has been put in the fund. On the other hand, the paper says: "decide how much is in the fund and call this the cost."

In the extreme, the authors regard the cost of an immature unfunded pension scheme as nil. I do not think accountants will accept the basis of net realisable value for valuing ongoing companies and so this is no good. If we have two identical companies except that one offers an unfunded pension scheme and the other pays 10% more salaries, then the company with the

pension scheme would look much more efficient on the authors' approach. In theory since this company could turn round and cancel its scheme at no cost at all, so it should be shown in the accounts at nil. However, in practice no company can do this without enormous upheaval and therefore there is an ongoing cost. What is the ongoing cost? Well there is no time to go into it tonight but I think the logical accounting provision is by new entrant funding—this expresses the cost per life as a sensible stable cost over each member's period of productive service.

Finally I rather like the arguments in paragraphs 5.10 onward. The authors seem to argue that aggregate funding is no good because it cannot satisfy ED 39; but in paragraph 5.14 they respectfully suggest ED 39 is deficient as it does not allow their choice of funding method.

Mr I. M. Aitken:—Congratulations are due to the authors for preparing and presenting this stimulating and thought-provoking paper. It has made many of us go back to first principles and consider some fundamental reasons about funding.

When I am asked to make a valuation of a pension scheme, one of my first tasks is to read the Trust Deed and Rules. What does the Trust Deed say about the valuation of a scheme? I believe that a not untypical wording is:

The Principal Employer with the consent of the Trustees shall instruct the Actuary to prepare a valuation report on the actuarial position of the Scheme.

This wording makes reference to the actuarial position without being specific. The authors would suggest that it must be the actuarial position on wind-up. May I beg to differ. The pension scheme is an ongoing entity established by the employer with certain objectives. Indeed these objectives are described in the preamble to the Trust Deed, for example:

The Principal Employer has determined to establish a retirement benefits scheme to provide relevant benefits.

Relevant benefits is defined in the 1970 Act as:

"any pension, lump sum, gratuity or other like benefit given or to be given on retirement or on death, or in anticipation of retirement" . . . etc.

You will note that there is no reference to wind-up. It is an event which may happen; however, it is a special case and therefore should not be the *prima facie* objective of funding.

The pension scheme provides the employees and their dependants with pensions and ancillary benefits on the happening of certain eventualities. The events are set out in the Rules, such as:

- Ordinary Retirement
- Early Retirement
- Ill-health Retirement
- Death in Service
- Withdrawal

The actual level of benefit to be provided is described in the individual rule. Thus, the primary objective of funding, on whatever basis, must be to ensure that there are sufficient assets in the pension scheme to provide the level of benefits on the happening of the various eventualities.

The financial assumptions incorporated into the valuation basis are agreed upon after discussion with the employer and they have a significant bearing on the build-up of assets.

It is often suggested that there can be no place for the Aggregate Method or

Attained Age Method as both methods overfund the benefits. This statement is factually correct, but only if all the financial and demographic assumptions used by the actuary in the valuation process are borne out in practice. It is possible for the actuary to use a slightly less stringent valuation basis and for this to be compensated for by the slight overfunding which results from his funding method.

I discuss my valuation method and assumptions (on two or more bases) with my client. As the authors say, it is for the client to decide—the actuary can only tender advice. In my discussions I believe that it would be incorrect of me to say that I am funding in order to achieve a certain financial position on wind-up—this event may never happen. On the other hand, I do know that members will retire, die or leave service. Hence, I believe that it is my duty as the actuary to make valuations at periodic intervals to ensure that the assets are sufficient to meet these liabilities which will occur from time to time in the future. This is the financial position in which my client is interested.

Mr J. S. R. Ritchie:—I agree that in very many schemes the benefits on wind-up (over and above normal withdrawal benefits) are not laid down with precision. I am less sure that I agree with the authors' statement in paragraph 1.11 that this constitutes "a general failure of pension fund Trust Deeds and Rules to record the true intentions of employers in a wind-up situation".

It seems to me that the "true intentions" of most employers may well involve maintaining maximum flexibility. Why should it be assumed, for instance, that in a hypothetical wind-up many years hence member A who was in service on the day of wind-up should get a better pension to that of member B, who is identical to member A except that he was made redundant a month before the wind-up? Surely that kind of judgement is best left to the discretion of the employer and/or the Trustees at the time of wind-up, bearing in mind the circumstances at the time.

The remainder of my remarks come under the deliberate heading of "pace of funding" and not "funding methods". The reason for this is that I take a pragmatic approach based on my own experience with employers.

Most employers I talk to simply wish to ensure that the contribution rate is the minimum which is necessary on a best estimate of future experience, (including the new entrant assumptions) but calculated in a way which avoids the need to increase the contribution rate at future reviews if the estimates are fulfilled. In practice these objectives are blurred by large deviations between the assumptions and the experience, and also in recent years by legislative changes. The situation is to some extent redeemed, however, by the fact that actuarial reviews are now done every three years or at even shorter intervals, if circumstances require it, so any necessary changes in contribution rate can be that much less extreme.

Any funding method which allows in theory for the current wind-up solvency position to be tight should, in my view, build in a margin. The reason for this is the volatility of modern investment conditions. A cursory glance at the movement of Market Level Indicators for 1986 shows a difference of more than 10% between the values applicable to a scheme if it wound up on 1st April compared to the position on 28th February.

In conclusion, I thank the authors for their paper. It demonstrates that a funding method based on the wind-up liabilities is not automatically inferior to one based on ultimate retirement in service.

Mr A. C. Martin:—I would initially like to thank the authors for presenting tonight's paper. I share the view that one of the greatest challenges facing actuaries engaged in pensions is to communicate. The authors have provided

a timely opportunity for us to communicate with each other although I suspect not to agree with each other.

My comments tonight are divided into two sections. The first section is concerned with general comments on the situation of pension scheme funding. The second section deals with more specific comments on a particular group of pension schemes which I hope will add to the discussion and the appreciation of the points involved.

1. General Comments

As a maiden speaker at Faculty meetings I do not think I could be accused of being on a "hobbyhorse" but I have to say that I fundamentally disagree with the short-term view of discontinuance funding.

I believe there is a real danger of this view disguising the long-term cost of benefits which will not of course be diminished by manipulating the funding method. I do not therefore agree with the suggestion that the prime objective of pension scheme funding should be to secure the wind-up benefits. I do not agree with the suggestion that funds accumulated over and above those required for immediate discontinuance benefits in any way form an unnecessary surplus. In my experience finance directors do not plan their businesses on the basis of the firm winding up tomorrow. I do not therefore feel that pension funding should be primarily geared to the immediate wind-up situation. I believe that most finance directors correctly take a long-term view and feel this is reflected in the current situation.

One good reason why a long-term view is appropriate is that the discontinuance benefits are increasing. Over the last 15 years we have had preservation, contracting-out, anti-franking and 5% revaluation. I believe that this trend will continue until we will get to a situation where withdrawal benefits equal the ongoing reserves—transfer clubs and industry wide schemes will help this process.

I am not convinced that the funding plan should be included in the Trust Deed and Rules. I view the Trust Deed as the contract between the Trustees/fund and the employees/beneficiaries. In a general insured arrangement the other contract is obvious—the insurance policy—the contract between the insurance company/fund and the sponsoring employer. It is this separate contract that I feel should be more openly discussed and/or documented to cover funding levels.

2. Local Government Superannuation

I would like to make a few comments on the situation affecting local government superannuation arrangements.

There are 95 local government schemes in the U.K. with funds ranging from £2.5m to £1.5bn. The basic benefits are funded in advance with pensions increases being paid from revenue on a "pay as you go" basis. Incidentally the main superannuation regulations do not make any provision for the wind-up of the schemes.

The regulations do, however, interestingly automatically provide for bulk transfers on a "share of fund" basis. The actual mechanics involve the actuary in certifying an "apportionment fraction". Clearly this "share of fund" approach might be useful in other schemes for bulk transfers and avoid problems as experienced in the Hillsdown case.

The regulations also provide for the actuary to certify two contribution rates. The first is called the primary rate. The second rate is employed to take account of adjustments to the primary rate and is, not surprisingly, called the secondary rate. This rate may be positive or negative.

The primary rate is, by statute, required to ensure the solvency of the fund having regard to the existing and prospective liabilities and the desirability of maintaining as nearly constant a rate as possible. Some would say that with

quinquennial valuations the rate would by nature be fairly constant! In any case this rate is a useful statutory medium for the presentation of the long-term cost of benefits.

The secondary rate caters for adjustments re surplus or deficit or specific features of a particular employer, e.g. age profile or decrement experience. Generally the current secondary rates are negative reflecting the healthy situation of most fully funded schemes—reflecting the high real returns experienced this decade and not I would suggest reflecting unnecessary accumulation of high previous contributions.

I feel the quotation of the long-term cost together with an adjustment rate is a useful method of illustrating the true superannuation cost and current adjustments. I feel this practice will fit in closely with the provisions of ED 39 with similar spread periods currently being employed for the adjustments to 'regular pension cost'.

Mr H. A. R. Barnett:—I am glad the last speaker mentioned insured schemes because all the way through the paper I was not really quite certain whether the authors had such schemes in mind. I think that a lot of people reading it might have thought they were only referring to self-administered schemes. I think this probably was not their intention but I am glad it was mentioned and I am mentioning it because I do know it quite frequently happens that a broker will come along, approach an employer and say "I can cut your pension costs by, say, 50%". I knew a case where a broker wrote to a client of mine and said "I could save you £100,000 a year". I approached them and asked them where they got the figure from and they had just conjured this up out of the air without having any particulars of staff or salaries or anything.

If the employer is given the choice of a large reduction in his immediate costs he may jump at the idea even though he will then not be providing a very great deal for any benefits either on retirement or on wind-up—and I shall come back to that in a moment. The extreme case—it was not an insured scheme, it was a so-called self-administered fund—which I came across, (fortunately at the time it was about to change its basis) had its Trust Deeds and a set of Rules. It had no contributions either from the employee or the employer during the employee's working lifetime but on retirement the employer would pay the required lump sum to the insurance company to purchase an annuity. This, of course, meant that anybody leaving got nothing. In the event of wind-up there would not be anything in the fund. I doubt now whether any schemes are run on this basis. That was the extreme case of reducing the pace of funding to a dangerous or a nil level. Now all that is covered because insured schemes have at last been mentioned.

Coming to a matter on which I agree with the authors, and yet I also agree with Mr Edgar; in another place I have got the name for mixing my metaphors and in this particular instance I have my feet firmly planted on both sides of the fence, however undignified and uncomfortable it may be. First of all I believe, as the authors say, that the wind-up benefits should be specified. I believe the assets plus future contributions should be strong enough to provide the benefits specified on retirement or death. I also believe they should be strong enough to provide the defined benefits on wind-up and therefore once the wind-up benefits have been defined the periodical valuations should value the fund both ways and the required contributions should be the greater of the two calculations. The limit permitted, or to be permitted, of a 5% surplus, should be 5% over the greater of the two.

In paragraph 1.16 where the authors say they do not think there is any need for the wind-up benefits to take into account the expected levels of

promotion, I believe if they do not take that into account they are defeating part of the object of a final salary scheme.

Finally, in the approach mentioned in paragraph 3.14, I believe this could operate to the detriment of the benefits of the older employees who are fairly close to retirement unless there is some caveat put in that benefits in respect of service already completed cannot be changed.

Mr C. D. Daykin:—Like some other speakers I do not believe that we can establish funding criteria solely from the standpoint of the security of the wind-up benefits. That may be one perspective on things but we also need to look at the long-term funding position for the benefits which are being earned. I would endorse Mr Barnett's comment, but then it is probably reasonable to check that approach against an approach such as the authors advocate in which you check the adequacy of the fund against the accrued liabilities on a wind-up basis. If that approach forces you to discuss with the employer the wind-up benefits and the winding-up clause, that is a good thing. It is right that the rationale should be thought through on the basis that future salary increases should be allowed for, which is probably seldom the case at the moment.

However, I would take issue with the authors on the principle that looking at it in the way they do actually helps you to assess the security of the fund to meet the accrued benefits. The opener remarked that the assets can move up and down fairly sharply. It seems to me that the only way in which you can come to a sensible conclusion about the security of the benefits on the winding-up basis is by using a stochastic approach to investigate the way in which inflation may move and the way in which the assets may move and to derive from that a security standard based on a probability of ruin, or the inverse of that, the security factor, achieved on the basis of a particular level of assets at a particular time.

Moving on from that to make a couple of remarks on the references to the Inland Revenue rules in paragraph 2.10, the authors suggest that the Finance Act postulates that in principle prospective valuation methods result in over-funding and that the accrued benefits approach to valuation should therefore be used. I am sure the Finance Act does not postulate anything of the sort. Indeed the purpose of the provisions in the Finance Act 1986 is not to lay down a maximum level of funding. They are to lay down a level at which the Revenue considers it reasonable to permit a tax-free build-up of assets.

They are not casting any judgement on what level of funding should be allowed for any other purpose and funds are allowed to continue to fund at a higher level if they wish. They are saying that they will only go so far from the point of view of allowing a tax-free build-up.

One should not draw any conclusions from that as to the Government's view of the proper way to fund pension schemes. Indeed, from the point of view of setting a standard of the sort the Revenue are seeking to establish, it is difficult to conceive how they could use an aggregate type of approach because of the indeterminate nature of what contribution should be taken into account. One is forced almost automatically to a unit credit method. The Projected Unit Method with allowance for pensions increases provides a reasonably satisfactory method of funding for the purpose for which it was intended.

Mr J. H. Devine:—With my background and history you will not be surprised to know that I am in broad agreement with most of the detail in the paper—and I am certainly in full agreement with all the principles which are stated.

I will therefore restrict my remarks to one aspect only, an area of some interest to me, namely the security benefit adopted in a pension fund. In paragraph 1.23 the authors state that "the majority (of employers) adopt the maximum target or one intermediate between the maximum and minimum"—the minimum being in effect leaving service benefits for the active members. I would like to comment on this statement but before doing so I wish to support completely the next sentence in paragraph 1.23—"However, whatever the choice, it has to be accepted, since it is for the employer and not the actuary to decide upon the wind-up benefit provisions in the scheme, which in turn determines the accrued liabilities".

My experience with my clients is slightly different from the authors. It is rewarding to agree with a client that the fundamental reason for funding is security, to give members security that benefits which are accruing for them in the scheme will be honoured, whatever happens in the future to their employer. Indeed most employers would agree that they would hope that the active members would receive better than leaving service benefits if there were to be a wind-up.

However, when I suggest that the next step should be taken, to enshrine their intentions in the Trust Deed, some interesting discussions take place. Many points about the employer's business are brought out, points which the actuary may not know about. At the end of the day the employer's intentions may well be incorporated into the Trust Deed, but quite often the wind-up provision is left with the active members having an automatic right only to leaving service benefits with discretion to apply surplus assets beyond that, usually versions (ii) or (iii) as set out in paragraph 3.21.

The employer may couple this decision with a separate decision to fund deliberately to a higher level, because he feels more prudent or comfortable doing this. But he cannot pretend to his members that their security benefit is anything other than minimum, i.e. leaving service benefits, a particularly important point with disclosure now with us. At the moment of course the minimum security benefit is becoming higher as the pre-retirement escalation for early leavers has more and more effect—and many employers specifically point this out to their members.

You will realise from this that I favour accrued funding methods, in particular the Defined Accrued Benefit Method, and I do not favour prospective methods. The authors are of the same mind although I must say I found paragraph 2.7 very restrained in putting forward their views in favour of accrued funding. I wish they had been more forthright in rejecting as unsuitable prospective methods such as Aggregate Funding.

Mr D. B. Duval:—I have sympathy with both sides of the argument as put today but I think that perhaps they have not been listening to one another enough. The authors have chosen an easy target as did Mr Devine now, in attacking the Aggregate Funding Method as the alternative to their method of funding. The defence of aggregate funding this evening has been—we do not quite agree with the method in principle but we adjust the assumptions so we get the right answer. Entry Age Funding is much more defensible yet the authors lump it in as another closed fund method. It seems odd that the one method that is based wholly on assumptions about new entrants should be defined as a closed fund method.

I think the major point is that there are two separate questions to which people are trying to get the same answer, but I am not convinced they have the same answer. One is the question of how much should be put in the trust fund and the other is the question of how much should be charged against profits in the company. The authors say that what should be put in the fund is

what the fund will provide on winding up (with perhaps margins to cover fluctuations). Certainly, it seems silly to put more than that into the fund. To do so does not protect the employees in any way since the events leading to discontinuance will normally change the employer's view as to how he wants to look after his employees. I would also agree that most companies do not wish to take extra money out of their company and put it into the fund. So I find it rather surprising that so many actuaries have been defending the idea of having a termination rule which provides very little security and yet arguing that companies should put lots more money into the fund. However I cannot agree with the authors that pension schemes costs in a company (when you are trying to account on a continuing basis) should be based on the scheme wind-up benefit. The authors produce this very ingenious distinction that it is a benefit change if you change the wind-up benefits. I did not find this convincing and I am not entirely sure they did either. Their concentration is entirely on the fund and all the comments on the accounting standards of FASB are based on the balance sheet liabilities. They are not based on the charge in the Profit and Loss account. I think that where the accountants got it from was the charge in the Profit and Loss account and that they wish to ensure that appropriate charges are made there.

The authors also suggest that it is inappropriate for a company to reserve for things which it does not have to do on winding up, but companies frequently do this. One example familiar to us all is insurance companies, who reserve future bonuses.

There have been one or two comments about what the employees think and what they understand. I think that we do not disclose anywhere near enough about what we actually do. Employees get a booklet saying that the money is built up in an irrevocable Trust. Nowadays they also get scheme accounts showing the amount in the Trust. They naturally assume that this is all held for their benefit. The fact that three-quarters of it could go back to the employer on termination is kept very quiet indeed. That is no credit to the pensions industry and no credit to the actuarial profession either. At some point we are going to come under serious attack for it and this paper is a timely reminder that we ought to be doing something about it.

I would suggest that there are two consistent systems of funding, neither of which is in common use at the moment. One is the method the authors use, but I think it needs slight amendment. In the pension fund you put in enough to cover wind-up benefits (with additional amounts if the employer wishes). You tell the employees that on termination they will get the lower of what the fund contains and what the target benefit is. If we are doing that then we must also tell them at regular intervals (probably when the actuarial reports are done) the value of the fund and the value of the target benefits so they get a broad feeling of what is happening—it will also give them some understanding of fluctuations. There must then be separate accounting in the company on an ongoing basis, which is the way everything else in the company accounts is done. This would mean a company reserve separate from the pension scheme, which could in theory be negative although this would be unlikely in practice. As to the method to be used for the accounting, I think many of the methods might work. I am sure the accountants would, as in America, wish to see us using a standard method. I do not understand why actuaries are so protective of their individual freedom of method on this sort of thing and I am sure more standardisation should be possible. If we do not standardise our methods the accountants will do it for us and they will probably not do it as well.

The other consistent approach is the traditional one (which got messed up when the Revenue insisted on return of surplus). You start off with the

company's Profit and Loss Account and say how much needs to be charged in that for pension scheme costs. You put all this in the fund, and the fund provides that on termination no money can be returned to the employer (other than on Revenue requirements). That is simple and consistent and I am pretty sure that is what most employees think is the position at the moment. This major misconception is something that we ought to do something about as soon as possible.

Mr R. E. Snelson:—I would concede immediately that variations resulting from experience changes (or for that matter actuarial assumptions) tend to overshadow changes arising from minor changes in funding method. Nevertheless, contrary to paragraph 2.2 of the paper, it is possible to make some generalised comment on the relativity of contribution rates. I also think that members of the actuarial profession are frequently unfair to each other. For example, one actuary may accuse another of using a method which produces an exceptionally high or low contribution rate. However, the actuary concerned will usually be aware of this and will modify his calculations accordingly.

It has always been a source of some disappointment to me that papers on funding rely on numerical examples and pay scant regard to the underlying mathematical situation in spite of the fact that some attention must be paid to the mathematics in order to produce the arithmetical results. I find it helpful to regard the funding of a defined benefit scheme as consisting of three phases. In Phase A the arrangement is in an immature position either as regards the benefit distribution by age or the state of funding, or both. Phase B represents the stable situation with a fixed contribution rate and a stationary population as regards lives, benefits and state of funding. Phase C is the run down situation where the supply of new entrants has ceased with the result that benefits and membership are running down.

I would not claim that any of these phases is anything other than conceptual. Phase A can continue for an indefinite period, particularly if benefits are improved. It is doubtful whether any arrangement is in a truly stationary condition for an appreciable length of time and, on wind-up, the usual practice is for contributions to cease rather than the fund running off as a closed group. However, by considering the three phases, one can see the underlying situation more accurately.

Sometimes the objective of a funding system is stated to be stability of cost and I think it is as well to be aware of what is implied by this phrase. Under the Current Unit Method or the Projected Unit Method for that matter, one of the criticisms often voiced is that in Phase C, the cost will rise. In fact, unless the benefits are immature, the contribution rate expressed as a percentage of payroll in Phase A will exceed that in Phase B. In Phase C the cost expressed as a percentage of payroll may well rise, and in inflationary conditions the absolute cost may rise also. However, the real cost may actually fall. I think the distinction between the cost as a percentage of payroll, the cost in absolute terms, and the cost in real terms is often blurred.

To elaborate, in Table 1 of paragraph 4.25 of the paper, contribution rates and fund balances in the stable state are quoted. It is also stated that the real rate of interest is 1.87%. It will be found that if 1.87% of the fund balance is added to the stable state contribution rate, the same result is obtained in every case. This is as it should be and the answer is 19.2% of payroll.

If in Phase A there were to be no balance in the fund, but complete maturity of benefits, then 19.2% is the rate of contribution required to purchase the benefits every year. In a Phase C situation, because the payroll is likely to reduce faster than the cost of the benefits, the cost as a percentage of

payroll will rise but the cost in real terms will gradually fall. Thus, a contribution rate of 19.2% could, in these somewhat artificial conditions, continue indefinitely while the fund is in a Phase A or Phase B position without ever accumulating a fund. The fund is only needed to protect the members in the event of wind-up.

Methods such as the Current Unit Method or the Projected Unit Method, are simply ways of building up a fund over a period of time. It will be found that if the period for building up the fund is extended to infinity, the cost becomes 19.2% of payroll in each case. Furthermore, any contribution rate paid in excess of 19.2% and continued indefinitely into the future, will first of all achieve a target level of funding in accordance with the Current Unit Method which may take ten years, and then in due course the target level of funding associated with the Projected Unit Method after possibly 15 years. Continuation of a high contribution rate will ultimately lead to such a large fund that all the benefits can be funded out of interest income and no further contributions will then be necessary for ever, unless the equilibrium of the situation is disturbed.

For these reasons it is my contention that unless there is a very young age distribution, there is ultimately a downward pressure on contribution rates for funds in a Phase A position. This theory is supported by practical experience. We used the Current Unit Method for well over 15 years. Sometimes we had a bumpy ride, particularly in the mid-1970's, but this was caused because the assumptions were not fulfilled rather than by the use of an inferior funding method. With the advent of preservation and contracting-out we modified our methods. With the current debate on early leavers, it is now more acceptable socially to include a measure of salary inflation in the leaving service benefits. It is, therefore, more appropriate, to use the Projected Unit Method. We have found it possible in the vast majority of cases to switch from one system to another without increasing the contribution rate.

An employer is unlikely to be indifferent to the level of cost and the actuary will want to keep a weather eye on variations in the contribution rate. However, it must be quite clear that the reason for building up a fund is to protect the members in the event of wind-up, particularly where contributions cease. Of course, an employer has a right to stop a pension scheme at any time and the authors are perfectly correct in stating that the average trust deed is vague on the question of the benefits available in the event of wind-up. Fairness, like beauty, is in the eye of the beholder. In passing, one might observe that it is somewhat absurd for the accounting profession to be bothered about the way pension costs designed to protect a wind-up situation are defined, when they are basically trying to produce accounts in a going-concern situation. It could be argued that an appropriate figure would be 19.2% of payroll in all circumstances, except Phase C.

However, the paper really poses the question as to whether a trust deed should attempt to define the wind-up benefits more closely, and whether the funding approach should be tied to the trust deed. A phrase which is popular in describing the statutory supervision of life offices is "freedom with disclosure". It could be argued that in the case of pension schemes, we have hitherto enjoyed unfettered freedom without any disclosure. Our freedom is now being constrained in various directions and disclosure is required by legislation. Part of the problem of course is that arguably certain employers have chosen to abuse the situation. I do, therefore, have considerable sympathy with the approach adopted in the paper but I am not sure that I am sufficiently masochistic to accelerate the process willingly. However, it may well be that the developments are inevitable. In this event, it is clearly

important for the actuarial profession to be involved rather than be placed in a straitjacket designed by others. We should be grateful to the authors for enhancing our awareness of the issues involved.

Mr R. K. Sloan, closing the discussion, said.—It is evident from the quantity, quality and diversity of the comments made tonight that the authors are to be congratulated for presenting a most thought-provoking paper at a very appropriate time, for which I add my personal thanks to those of the previous speakers.

However, there are still a number of personal points that I wish to make, which I will attempt to intersperse with my general summing up of tonight's discussion. Let me begin by saying that, having lent my support to the broad thrust of Mr McLeish's 1983 paper, I now find my agreement rather more limited to only the basic principles. My main area of agreement is that the funding target is of primary importance, with the resultant contribution rate being secondary.

Perhaps I might be permitted briefly to restate the funding method I described during the discussion on the 1983 paper. The approach I have been using for more than 10 years involves calculating the future compound rate of salary revaluation on accrued benefits that is covered by the existing assets, in other words the extent to which future salary increases have already been pre-funded.

My aim is to get away from the misleadingly oversimplified ratio of assets to accrued liabilities, whether on current or projected salaries, in favour of a method that properly reflects all the characteristics of the scheme membership profile. Because the measure is based solely on this pre-funded rate of future salary revaluation, I refer to it as the PFR method (not to be confused with the equally topical Prototype Fast Reactor!).

The method involves using a discounted income value of assets to determine the ongoing PFR, with the market value of assets being used to determine the wind-up PFR. I believe it would be particularly helpful if actuaries were required in triennial valuation reports to suggest an appropriate rate of revaluation to be applied to accrued benefits in the event of a wind-up. It would then be for the Trustees and the employer, if they thought fit, to adopt some probably lower PFR, or pre-funded rate of revaluation, for use in the event of a wind-up, or a bulk transfer value, during the inter-valuation period. Mr Duval, I think, also suggested he would examine this at the time of valuation and hopefully this would lead to the clearer definition of the current intention of employers in the event of a wind-up.

This then leads on to consideration of an appropriate funding target at which to aim after, say, 5 or 10 years. Like the authors, I would normally recommend a minimum PFR target of 5% per annum, but with a higher maximum of, say, 9% and a realistic objective of perhaps 7%. In this respect, it is interesting to note that the statutory surplus basis introduced by this year's Finance Act effectively specifies a maximum ongoing PFR of 8% per annum, if the permitted 1% extra promotional scale is allowed for on top of the prescribed 7% salary inflation rate.

Let me try now to sum up how I felt tonight's discussion met some of the unanswered questions posed by the authors' paper.

Question: Given that the wind-up provisions in many Trust Deeds are too vague, how would the authors actually define this?

While the authors state in paragraph 1.16 that the maximum entitlement should involve revaluation in line with the general level of earnings, i.e. Section 21 revaluation, surely this would be difficult to guarantee specifically

by the assets available on wind-up? It would therefore seem necessary to use a specific assumption, such as the suggested 7% rate, so that I do not see how this is really so very different from an actuarial liability.

Question: The authors imply that the actuarial liability is almost invariably greater than the wind-up liability, but is this always so?

This distinction is already recognised by the American FASB 87 Regulations which call the actuarial liability the Projected Benefit Obligation, and the wind-up benefit the Vested Benefit Obligation. Taking the case of a contracted-out scheme, the vested benefit obligation will typically involve 8½% revaluation on the GMP and 5% revaluation on the excess. By comparison, the projected benefit obligation, or actuarial liability, may be based on an overall projection rate of 7%, or perhaps only 6%, in which event the actuarial liability will almost certainly be less than the wind-up liability. Furthermore, allowance for withdrawals would in such circumstances result in an *increase* in the actuarial liability.

Question: Should a transfer value for a *group* of members be based on the actuarial liability?

I believe an actuarial liability, with allowance for the possibility of withdrawal, is justifiable on a group basis, provided that the transfer value is not allocated individually to each member. If the benefits transferred consist of "added years" of pensionable service, then the prospect of the anticipated withdrawal release can still be realised in practice. However, I certainly agree that one should resist awarding transferring employees better individual leaving rights after the transfer than those to which they would have been entitled within their own scheme.

Question: The authors refer in paragraph 3.15 to employees' accrued rights being "made firm in the Trust Deed and Rules", but are these not themselves susceptible to alteration?

The answer to this may well depend on how the authors manage to define wind-up benefits, but I would suggest that they attempt to be over-accurate when referring to "Defined Benefit", when what we really have is only a Defined *Basis* of Benefit, which is itself dependent on external factors such as price inflation, earnings inflation and asset values.

Question: Under the authors' very precisely defined method, are client companies permitted to fund at a higher level if they choose, or to reduce the target to keep within budget?

Even if the employer wants to be precisely on target, I would have thought that even the authors' funding basis cannot prevent over-funding on a wind-up, as the current *market* value of the assets might well exceed the discounted income value. In the other direction, the authors state in paragraph 4.12 that "any desire to regulate the contribution rate to an extent that would be at variance with meeting the primary objective would have to give way". Surely budgetary constraints must be allowed to lead to variations in the funding target, however firmly the authors believe their method to be "correct".

Question: Do the authors really believe that prospective methods of valuation aim to produce a level contribution rate solely if the scheme were to be closed to new entrants?

Without wishing to defend the Aggregate, or any other, valuation method, I believe their technical "closed-fund" assumption is only implicit in the overall basis, whose main objective is a stable funding rate in an *ongoing* scheme.

Question: Is it so important to allow explicitly for new entrants?

This point is hammered home time and time again, including in

paragraphs, 1.9, 4.2 and 4.13. Since the projections are to be carried out "well into the future", or even "indefinitely", then considerable reliance must be placed on the validity of the new entrant assumption, which seems rather at odds with the authors' wish to define wind-up benefits, rather than for these to be left to the Trustees' discretion, or to that of the actuary. Since a company is unlikely to try to forecast other much more important aspects of its business so many years into the future, I cannot see the relevance of carrying out pension fund projections so far ahead.

Question: Why do the authors in paragraph 5.20 believe that "no liability truly exists" in an unfunded scheme?

Whenever benefits have been promised, then the statutory preservation rules apply and will be enforced by the OPB, although admittedly there may be no assets available to meet them. Merely because a scheme is unfunded, or under-funded, cannot mean that an accrued benefit liability does not exist, although I accept that the example does highlight some of the drawbacks of the Accountancy Profession's ED 39 proposals. In this respect, it is perhaps unfortunate that comments thereon closed on 31st October.

Question: Do the authors really believe in paragraph 4.50 that no aggregate funding practitioner would ever compare assets with accrued liabilities?

Mr Pollock pointed out quite rightly that he would always look at this whether or not he was using the authors' method which he obvious does not and Mr Snelson also felt it was most unfair to cast aspersions on the methods used by all other actuaries. I feel there is probably a confusion in terminology that what is called *Aggregate* is in practice often the *Attained Age Method*, as has been pointed out and in those circumstances of course the current assets are compared with the accrued benefit liabilities and I think to suggest that no trustees or companies can really appreciate the situation as the authors describe it without using their method is somewhat overstating the case.

Despite the obvious disagreements expressed tonight, or perhaps because of them, I am sure that we will in future see much greater emphasis being placed on comparison of assets with accrued benefits, however defined, quite apart from the requirement to do so imposed by the provisions of the 1986 Finance Act. I very much hope that the greater understanding of funding thereby engendered will lead employers to decide to improve not only their schemes' wind-up provisions, but also the benefits for individual early leavers. If this proves to be the eventual outcome, then one does not have to agree with everything stated by the authors to acknowledge that their paper may well prove to be a significant catalyst to this end. For this, and for the most interesting discussion that it has generated, I am glad to add my personal appreciation and thanks to Mr Stewart and Mr McLeish (with my best wishes for his early recovery).

Mr C. M. Stewart, replying to the discussion, said:—Until I have discussed the comments made this evening with David McLeish it would not be right for me to give a definitive reply, so more perhaps than on other occasions the reply will be fairly short this evening. However you would not expect me to remain totally silent. I shall pick a number of points at random, what Frank Redington would have called "A Ramble Through the Actuarial Countryside".

We must bear in mind, as Mr Snelson did but many other speakers did not, that whichever valuation method is used, it is a fact that for so long as the scheme remains in existence every member retiring, dying or withdrawing will receive in full the benefits promised to him under the rules of the scheme. That is a constant factor which applies to all valuation methods.

What we have been talking about here this evening is what assets should be built up.

The first requirement is that, as an absolute minimum, there must be enough to cover the wind-up benefits in the rules, but to what extent is it right for additional assets to be built up? For what purpose would these additional assets be built up and who should decide? Clearly, financial control of the build-up would be for the actuary but it is certainly for the employer to decide on the level of funding to be aimed for. We have nailed our colours to the mast on this issue but I deduce that the majority of the speakers here this evening take the view that there is, as suggested in paragraph 3.11 of the paper, an unwritten rule which determines a level of funding that it is proper to aim for. The scheme can write a wind-up rule in any terms it likes but the actuary can deem it proper to ignore that and hold higher reserves, albeit for stated reasons. What we have been postulating in the paper is that those reasons are for the employer to decide and not the actuary. If the employer decides that he wants to build up a pre-planned surplus, as we call it in the paper, then that is all right so long as it is disclosed that he is doing it. I would repeat the words I used in my introductory remarks, that "if the company consciously funds beyond that level it should be quite clear as to its reasons for doing so and should be aware of its vulnerability as a result of doing so". We do not say that it is improper for any employer to build up assets beyond the level of the wind-up benefits in the Rules. What we do say is that the employer must know that he is doing this and be aware that after a takeover, for example, a different employer might take a different view.

Again repeating what I said when I introduced the paper, my experience in the supervision of insurance companies leads me to be very respectful of what it says in the Rules of a scheme. Just as in the supervision of insurance companies, the law applies, and at their peril do actuaries or others ignore this reality. However, the message I have from here tonight is that we do not care all that much what goes into the Rules on the wind-up of a pension scheme. If that is the case, then let us say so. Let us say openly that pension schemes need make no attempt to define what the member's entitlement is if the scheme is wound-up. It could be left to depend upon the funding level, hopefully determined by the employer with a full understanding of the valuation method employed by the actuary. This is very important because it is all very well for actuaries to philosophise on the different funding methods in use but I think it must be very difficult for an employer to understand fully the actuary's explanation. I think that in many cases the employer will just nod wisely and then, after the actuary has gone, say "Well I did not understand much of that but the actuary knows what he is doing so I went along with it."

I do feel strongly that we should pay much more regard to the legal framework. If there are doubts about the legal position, why do the Institute and Faculty not get together and ask legal counsel "What is the liability in law of this pension scheme? Never mind what the actuarial liability is (a name now used by the Joint Committee). Here is a test case. Here are a pension fund's Rules and Trust Deed. Tell us please what is the liability today." It is for the actuary to determine the *amount* of that liability but not for the actuary, in our view, to say *what* the liability is.

My erstwhile colleague, Chris Daykin, said that the Government's proposals on the funding level beyond which you go at your tax peril did not imply that there was anything wrong in going beyond that level. He said they were really forced to use one of the Unit Methods rather than a prospective method. I do not see why. It would surely have been possible for the

Chancellor to have specified the Standard Fund according to the Individual Entry Age Method if he was willing to allow a higher threshold than by an accrued benefits method.

Our preference for a Defined Accrued Benefit Method compared with, let us say, the Projected Unit Method, was referred to. An important difference in practice is that although the assets accumulated by our Method A2 are much the same as those on Method B (the Projected Unit Method) in the one case you can tell an individual member of a pension fund what the accrued benefit is which the Trustees will be required to secure by means of an insurance policy if the scheme ever did wind up, whereas under the Projected Unit Method you cannot. All you can say is that you suppose that the Trustees will apportion something like the standard fund calculated by the actuary and incorporating whatever withdrawal rate and salary scale he happens to be assuming at the time. So the individual will have an amount of claim which is not precisely defined in the Rules of the scheme. This is why we say in the paper that this is not really conceptually appropriate, because you cannot tell the employee what is the benefit that the scheme is trying to secure for him if the scheme were to be wound up. If you are dealing with a bulk transfer, as in a takeover or merger, it does not matter. It is just £5,000,000 but the employees cannot be told what the benefit is that the Trustees are required to try to secure for him if the worst comes to the worst. So we favour a Defined Benefit. So far as the size of the fund is concerned it may make no difference at all but we find it preferable conceptually. Mr Sloan asked what exactly is the revaluation rate if the Rules refer to the cost of living, or the general level of earnings. This is a difficulty but we think we may have the answer.

I am not abashed at the apparent resistance to the approach proposed in the paper because I do think that we may have moved a little way towards a realisation that pension actuaries are not operating in a vacuum. There are legal constraints and we must pay a great deal more attention to what goes into wind-up rules. I know there are difficulties but we must make the attempt and, as I said before, why do the Institute and the Faculty not take a specimen pension scheme Trust Deed and Rules to legal counsel and ask what the liability is, or whether actuaries or employers should set greater store by maintaining an absolutely level contribution rate in all circumstances? *What, not how much*, is the liability of the scheme for individual members? I think the outcome could be very interesting. That is as much as I will say tonight. I am quite sure David McLeish will have an equal input when we come to prepare our written reply.

Mr R. E. Macdonald wrote:—The clarity with which the authors have expounded their pensions funding system must surely now remove all possibility of misunderstanding as to the nature of their methods and it remains to consider what objections may still remain.

It has been objected, for example, that the required funding level is so exactly targeted that unforeseen changes in experience or in asset values may bring a fund into deficit. Such problems must be dealt with by selection of suitable margins and no system can reasonably be criticised on the ground of its "dangerous" accuracy.

It can also be objected that if Trust Deeds are designed to specify clearly the members' wind-up entitlement, it is very likely that members will seek to regard that level as their entitlement on withdrawal from service, a level which employers may not find acceptable. Perhaps some pressure on employers in this particular field is not out of place.

No doubt the most likely cause of opposition, in a field which must involve commercial competition, is dealt with in paragraphs 4.27 and 4.28. An

increasing contribution rate is not a serious objection to a funding programme provided it has been set out in initial estimates as a necessary feature of the method and accepted by the employer, but there will be inevitable suspicions that not all practitioners of the system will necessarily emphasise this feature. The system's desirable feature of a fund level related to a postulated benefit cannot be compatible with a level contribution rate and the devices of paragraph 4.28 detract from the main theme of the paper. When the Defined Accrued Benefit Method was first brought to the attention of the profession in 1983, there was no particular pressure to make changes and there would certainly have been strong objections to the imposition of a standard method of valuation. It now seems important to identify a system which will not build up unnecessary surpluses within Funds and to establish it as a 'standard' method on the basis of which other methods can be judged. The authors' Defined Accrued Benefit Method—it is to be hoped they will find a more euphonious title!—seems the ideal instrument for this purpose and a discursive analysis by the Pensions Standards Committee is a matter of some urgency.

Mr McLeish and Mr Stewart subsequently wrote:—In our immediate reply to the discussion we re-emphasised in general terms that the purpose of our valuation method was to fit the valuation method to the legal provisions in a scheme's Trust Deed and Rules. If there was any doubt as to what that legal position was, then it would be advisable to seek legal opinion on the matter. In this written reply, we shall refer to selected comments made by individual speakers, some of which appear to us to show misunderstanding of the method which we advocate and others that there is a genuine difference of opinion.

We may start by asking the question "What is the difference between Method A2 and Method B as presented in the paper?" The two methods produce much the same valuation result—a fund of 2.5 times pensionable payroll and a contribution rate of about 14.6% of pensionable payroll. (It would also be possible to choose an even higher rate of revaluation than 7% p.a. and produce the same valuation result as by Method C). So what is the difference *in practice* between our method and other valuation methods currently in use? It cannot be that the *method* would put the scheme's ability to meet the "ongoing" benefits in jeopardy as suggested by Mr Pollock, who opened the discussion, and by Messrs Aitken, Barnett and others, because it can give the same valuation result as other methods which *would* satisfy them.

We see the main difference between A2 and B as being that on A2 it would not be proper for the actuary to adopt, or the Trustees to accept, a lower funding target. However, Mr Sloan, who closed the discussion, and Mr Pollock are not convinced that this is an advantage. They consider that merely prescribing the intended wind-up benefit in the Trust Deed and Rules would not prevent the employer from changing the Trust Deed and thus lowering the funding target. As with any other benefit provision, the Trust Deed will normally prohibit change which would retrospectively reduce members' entitlements and we therefore remain convinced that our proposal *would* provide members with much greater security, and clarity, of their entitlement.

Mr Sloan is opposed to tying the employer to a fixed target and advocates that budgetary constraints should be allowed to lead to variations in the funding target—in other words, security for the accrued benefits should be allowed to go up and down according to what the employer could afford. We do not share this view. In any case where the employer reserves the right to

reduce the funding level, this should be made quite clear to the members; that whatever they might *expect*, their entitlement is only to what it says in the Trust Deed and Rules. Mr Duval pointed out that, in general, schemes have been somewhat backward in informing their members of this basic truth.

We were interested in Mr Sloan's description of his own customary practice of expressing the funding level actually achieved as being sufficient to secure X% p.a. revaluation of the accrued benefits up to retirement age. We are on common ground here, the difference being that we would see the *objective* of funding as being to secure a chosen value of X, rather than merely disclosing what X happens to be as the result of adopting for the time being a funded method with a different objective. We think the accounting bodies would view unfavourably employers who changed their valuation method, and thus the pensions charge, for a budgetary reasons. Mr Sloan also felt that our recommended maximum of 7% p.a. for X was too low and suggested 9%. We would think 9% excessive in the context of a valuation which adopts 9% p.a. as the valuation rate of interest. It would give a funding target even higher than by the Entry Age Method of valuation, as recommended by Mr Macdonald, which we would also feel to be unnecessarily high. However, we agree with Mr Macdonald's perceptions that the way to secure such a benefit, which he regarded as being in line with members' expectations, would be to specify it in the wind-up rule.

We do not agree with Mr Pollock or Mr Aitken—or indeed with ED 39 which expresses the same view—that the actuarial valuation method and assumptions should be taken together. The reason we disagree is that in our view the funding strategy, i.e. the valuation method, is for the employer to decide, whereas the assumptions are a matter for actuarial judgement. The two should not be confused. We cannot see why an *employer*, having chosen the funding objective, should wish to see a valuation method with a different objective substituted, even if it gave the same result because the actuary had modified his valuation assumptions to compensate. Mr Sloan drew attention to the possibility that the Projected Unit Method might not adequately cover the wind-up benefit for a contracted-out scheme. The Defined Accrued Benefit Method is, of course, tailor-made to cover whatever the accrued liability is.

The principal misunderstanding of our method is in the accusation that it is not an "ongoing" method and that it does not fit the accountants' "going concern concept" that "an enterprise will continue in operational existence for the foreseeable future . . . (with) no intention or necessity to liquidate or curtail significantly the scale of operation". This accusation was either explicit or implicit in the comments made by the majority of speakers. We thought we had demonstrated quite clearly in the paper that we *do* assume no curtailment of the employer's business, or the membership of the scheme, for the foreseeable future. Effectively we assume that the scheme will continue for as long as the employer's business continues and will then perforce have to wind up. We do not know when that might happen so the objective of our valuation method is to set the contribution rate at a level which is intended to secure that, *whenever it happens*, the Trustees will be able to secure the benefits provided in the Trust Deed and Rules.

When our actuarial critics say that our method does not provide adequately for the ongoing benefits on retirement, etc., we think that what they have in mind is that, if the scheme *stopped* going, then in their opinion, irrespective of what the scheme's Trust Deed and Rules might provide on termination, the money available to the Trustees *should be* the cash equivalent of the benefits which would have been paid to members on withdrawal, retirement, etc., if

the scheme had continued in operation. We can only repeat the question in paragraph 3.11 of the paper: Does such an opinion override a scheme's Trust Deed and Rules? Since nobody was inclined to answer that important question, perhaps it should now be addressed to the Pension Standards Joint Committee.

As to whether or not our method might also satisfy whatever accounting standard is ultimately required to be applied in accounting for pensions in company accounts, if the pension charge is allowed to reflect the accrued liabilities our method will meet the required standard, but if that standard enforces reallocation of the cost of pensions over an individual's working lifetime by reference to some other criterion, it may not.

We made no reference to the valuation of assets in our paper but we agree with those speakers who stressed the importance of this subject, in particular Mr Pollock who reminded us that, in testing the security of accrued benefits on wind-up, we should switch from the ongoing valuation basis to the immediately realisable value of the assets and the annuities and deferred annuities which could be purchased therefrom. In this context, we would point out that, if a scheme with a funding target of 2.5 times pensionable payroll finds itself with assets with a market value of only three-quarters of that amount, it is no better off because it happens to be using Method B than Method A2. As to the repercussions of such a fall in market values, that will depend upon whether in the ongoing valuation assets are taken at market value or valued by a discounting method.

We use the discounting method, at present with 4% p.a. growth in dividends in association with our 9% p.a. interest rate. Our experience is that, on that basis, market value fluctuations are not as much of a problem as some speakers implied because in most market conditions the cash value of a typical portfolio of assets of a fund which was solvent on our valuation basis would have been more than sufficient to enable the Trustees to secure the accrued benefits by means of insurance policies. A number of speakers mentioned the need for a solvency margin to cover fluctuating market conditions. There is such a margin with our method of valuing the assets on an ongoing basis. That is not the whole story, of course—we must look also at the effect of earnings movements on the liabilities—but it will serve to remind readers that, in an ongoing valuation, the flow of investment income is more important than market opinion at one point in time, and that on wind-up insurance premiums would reflect the current market in gilts.

Finally we welcome Mr R. E. Macdonald's written contribution and, in particular, his suggestion that our method should be considered urgently by the Pension Standards Joint Committee with a view to its possible wider use throughout the profession.