THE ACTUARIAL ASPECTS OF COMPENSATION FOR LOSS OF SUPPORT

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INTRODUCTION

1. Claims are frequently instituted at common law for compensation for financial support or earnings lost as a result of the death or injury of a breadwinner or, exceptionally, as the result of some other cause.

2. The formulation of a claim, in particular the determination of capital values of financial support or earnings that could have been expected to have arisen in future years, involves inter alia the contingencies of human life and the application of compound interest, aspects that are essentially actuarial in nature. Consequently, actuaries are frequently called upon to assist in the formulation of such claims. The Courts in South Africa appear to afford greater recognition to the evidence of actuaries in these cases than in, for example, the U.K. (see J.H. Prevett, J.I.A. 94, pp. 293 et seq. and an article "Actuarial Assessment of Damages: The Thalidomide Case" by the same author in the March 1972 issue of "Modern Law Review") or Australia (refer remarks to the Actuarial Society of South Africa in 1972 by M.J. Werner, Past President of the Institute of Actuaries of Australia and New Zealand).

3. There would be less need for actuarial advice if the awards in these cases were in the form of an income instead of a capital sum. However, awards in any form other than a capital sum are not at present made by the South African Courts and the need for actuaries to advise on the capitalisation process remains.

4. The main South African writings known to the authors are "The Quantum of Damages in Bodily and Fatal Injury Cases" by Corbett and Buchanan (Juta), and "The Assessment of Compensation for Loss of Support" by Howroyd and Howroyd (S.A.L.J. Vol. LXXV, Part 1, Feb. 1958). Both of these works commence with a statement of principle, generally to the effect that persons who are deprived, as a result of a negligent act, of support to which they had a legal entitlement, are entitled to such compensation as will place them in the same financial position as they would have been had the said act not occurred. However, they then proceed from this point to deal with the ramifications of the subject primarily from the point of view of the legal profession, and the actuarial aspects are really only touched upon in passing. A similar comment can be made on the paper by Prevett referred to above.

5. Possibly because of the absence of actuarial literature on the subject, a divergence of practice has arisen among actuaries engaged in this work in South Africa. While there must always be scope for individual judgement, a real danger exists that, through disenchantment with widely diverging actuarial opinions, the reliance placed by the Courts upon actuarial evidence could well diminish. Also, actuarial aspects of claims often become confused with non-actuarial items, with the consequence that responsibility for differences in results is occasionally laid at the doors of the actuaries advising the opposing parties, even though in fact there may have been reasonable agreement on the technical aspects.

6. It seems therefore that good grounds exist for the preparation of a paper dealing with the part the actuary plays in these cases, in the hope that through this paper, and through contributions to the discussion on this paper by others, some consistency of approach can be evolved.

7. It will undoubtedly seem to some actuarial readers that this paper oversimplifies the subject, and makes a mountain out of what is essentially an annuity calculation. While the authors would accept such criticism,

they nevertheless consider that this approach is desirable because:—

(i) not all actuaries have experience in these matters;

(ii) by going back occasionally to first principles even experienced actuaries often find reason to revise current practices in the light of developments; and

(iii) this paper may be of interest to the legal profession and to short-term insurers, and consequently the actuarial background has been sketched in full.

The later sections of the paper deal with matters which, the authors feel, will interest even persons of long experience. They therefore ask such readers to bear with the basic treatment of the earlier sections.

8. The paper commences with a statement of the legal framework within which the actuary must work; the nature of the assessment is then described and technical bases are discussed in detail. The paper concludes with some observations on matters such as Court appearances and on differences between actuarial reports. For simplicity, the authors have considered only the formulation of a claim for loss of support arising from the *death* of a breadwinner. The methods and bases adopted in cases of *personal injury* do not differ materially, but some special features of the latter form of claim are dealt with in the Appendix to this paper.

THE LEGAL FRAMEWORK

9. The process of events through which actuarial evidence may be brought within the legal framework of these cases in South Africa illustrates the division of responsibilities between lawyer and actuary, and is normally as follows:—

(a) The lawyer establishes the merits of the case, i.e. whether the plaintiff has a legal right to claim compensation, in full or proportionately. This might require briefing an advocate to argue the matter in Court.

(b) The lawyer provides the actuary with the information required to calculate the value of the loss of financial support. This includes both factual information (such as dates of birth) and assumed information (such as the ages to which children would probably have remained dependent upon the deceased).
Assumed information often has to be established in consultation between the lawyer and the actuary, but the final responsibility for such assumptions is the lawyer's.

(c) The actuary applies a technical process to the information provided and reports therefrom on the value of the loss of financial support.

(d) To the value of loss of financial support so determined, the lawyer adds a further amount (i.e. "General Damages") relating to compensation for medical expenses, pain and suffering, etc., to arrive at the total claim.

(e) If the plaintiff and defendant (through their respective legal advisers) are unable to agree on the amount of compensation to be awarded, the matter is taken before the Court. In this eventuality the actuary will usually be required to appear at the Court hearing, to be cross-examined on the contents of his report.

10. It is important to realise that the actuary's conclusions are not accepted uncritically by the Courts. The following quotations from two legal judgements illustrate this:—

"In assessing the compensation the trial Judge has a large discretion to award what under the circum-

stances he considers right. He may be guided but is certainly not tied down by inexorable actuarial calculations".
(Holmes J.A., in Legal Insurance Co. Ltd. vs. Botes).

"It is desirable to test the result of an actuarial calculation by a consideration of the general equities of the case."
(Innes C.J., in Hulley vs. Cox).

With respect, it seems to the authors that their Lordships may not have been fully informed as to the precise nature of the actuarial calculation that is made in these cases. If an actuary is required to translate a specified series of future payments, contingent upon the survival of one or more persons, into a capital sum, his resulting answer is precise (within the framework of the technical bases used) and requires no further adjustment other than on account perhaps of the probabilities of remarriage and interruptions in earnings. The authors cannot support the view that the results of actuary's calculation require adjustment in the light of "discretion" or "general equities".

The authors suspect that the comments from the Bench quoted above may well have arisen from the very situation referred to in the third sentence of paragraph 5, underlining the necessity for a clear distinction between the actuarial and non-actuarial aspects of reports in these cases. Occasionally judges have given interim judgements on the non-actuarial aspects, and the actuaries involved have then translated the facts thus decided into a capital sum; the amounts thus calculated have then been awarded. The authors strongly support such a procedure, and hope that it becomes more widely adopted. Even if both plaintiff and defendant have engaged actuaries, and these actuaries disagree on the technical bases to be adopted, the system described can still be followed, the only difference being that the judge may also have to give a decision on the technical bases to be used. This latter comment raises the question of whether judges should not be assisted by

actuaries sitting with them as assessors. A judge faced with one actuary contending that a 6% rate of interest should be used and another arguing a 7% rate may well be tempted to decide in favour of a 6½% compromise rate; whereas an actuarial assessor may well point out to him that the one rate is correct and the other is wrong. One occasionally hears of judges being assisted by accountants, sitting as assessors, when cases of fraud or embezzlement are heard; and while these are admittedly criminal (as opposed to civil) cases it would seem only logical for the judicial system to permit the similar use of actuarial assessors.

THE NATURE OF THE ACTUARIAL ASSESSMENT

11. The object of the technical process referred to in paragraph 9(c) is to determine, for each dependant with a right to support from the deceased, a capital sum that, if the assumptions as to investment return, mortality, etc., made in determining that sum are borne out in practice, will enable the future support assumed to have been lost to be replaced.

12. The calculation consists of eight steps, applied separately for each dependant:

    (1) The determination of the support (in terms of current money values) that the particular dependant could have expected to have received in each future year of dependency, based on the dependant's assumed share of the deceased's projected "take-home" earnings.

    (2) The adjustment (if this is considered appropriate in the circumstances) of the above support to take into account possible future changes in money values.

    (3) The determination of the probabilities that the breadwinner, had he not been killed, would have survived to render the support assumed, and that the dependant in turn would have survived to be entitled to such support.

(4) The multiplying together, for each future year of dependency, of the projected amount of support and the probabilities of survival, to determine the "expectation of support" for each year.

(5) The discounting of each future year's "expectation of support" to the date as at which the capital value is to be assessed, discounting at the rate of investment yield (after tax) that it is assumed will be earned on any capital amount awarded.

(6) The summation of the resultant series of present values to give the gross capital value of the support lost by the particular dependant.

(7) The adjustment of the gross capital value on account of any special factors, the main ones being allowances for the probability that a widow dependant may remarry and for possible interruptions in earnings due to contingencies such as unemployment.

(8) The possible reduction of the adjusted gross loss to take into account certain of the financial benefits that may have accrued to the particular dependant as a result of the death of the breadwinner.

13. Expressed symbolically, steps (1) to (6) described above reduce to the following expression for the gross capital value, at the date of death of a breadwinner then aged x nearest birthday, of the financial support lost by a dependant then aged y nearest birthday:

$$\sum_{t=1}^{n} v^{t-\frac{1}{2}} \cdot {}_{t-\frac{1}{2}}p_{xy} \cdot S_t \cdot {}_tk_y \cdot (1+f)^{t-\frac{1}{2}}$$

where

n = the assumed number of years for which the dependant could have expected support, measured from the date of death.

v = $\frac{1}{(1+i)}$, where i is the assumed investment yield after tax referred to in step (5).

${}_tp_{xy}$ = the probability that both lives would normally have survived for t years.

S_t = the breadwinner's assumed "take-home" earnings for year t, in terms of current money values.

${}_tk_y$ = the assumed fraction of S_t that the dependant being considered could have expected to have enjoyed in year t.

f = the assumed annual rate of change per unit in the purchasing power of currency.

It has been assumed in the above formula, for ease of calculation, that each year's earnings (which in practice would normally be received over the year) are received, on average, in one amount halfway through each year. In practice it is often possible to resolve the formula into annuity values, in which event continuous functions would normally be used.

TECHNICAL AND OTHER BASES

14. We now consider the technical and other bases, applied through the medium of the formula given above, in order to perform the capitalisation process in practice. The choice of these bases, and the manner in which they are applied, to all intents and purposes constitute the kernel of this paper.

15. A critical question to be decided upon is the extent (if any) to which the actuary should allow his bases and methods to be influenced by what he feels would be acceptable to the Court, in the light of past Court decisions.

One often hears the comment that "no Judge will look at a rate of interest greater than x% ". The authors are in no doubt whatsoever that the actuary's bases and methods must be those that his professional experience and integrity tell him are the correct ones, and which he is able to support with sound reasoning.

The expected period of support ("n")

16. Normally the right of a *wife* to be supported by her husband ceases only on the death of either spouse. In applying the above formula in the case of a widow dependant, "n" would be (i) the period over which the deceased could normally have expected to have continued to earn an income, i.e. up to his expected retirement date, plus (ii) the period after retirement during which the widow could have expected to have been supported out of any post-retirement income. The retirement date is normally determined on the basis of information provided by the deceased's employer, or, if such information is not available or if the deceased was self-employed, on instructions from the lawyer as to a suitable retirement age to be assumed.

17. A *child* is entitled to compensation only in respect of the period during which he or she would normally have been supported by the deceased. This period naturally tends to depend upon factors such as the social status and financial standing of the breadwinner, and any evidence as to the breadwinner's intentions during his lifetime with regard to the maintenance and support of the particular child, in particular that of sending the child to university. These are not matters for the actuary to decide upon and he is normally instructed on this aspect by the lawyer briefing him. Ages of cessation of dependancy most commonly encountered in practice, depending on the factors mentioned above, are 16 or 18 years; ages 21 or 23 may be encountered if it can be proved that the particular child would have remained dependent to these ages, e.g. while at university or while receiving other post-school education or training, or on account of ill-health.

The apportionment of the deceased's expected "take-home" earnings ("t^ky")

18. The assessment of the portion of the deceased's earnings that would have been devoted to the support of each of his dependants, had he lived, depends on the actual amount of maintenance and support furnished prior to his death, the requirements of the various members of the family and the general circumstances of each case. In a normal family some part of the breadwinner's earnings is spent on goods and services (e.g. rent, wages of a servant, fuel and light) which are enjoyed by the family as an indivisible whole and the death of a member of the family does not necessarily mean that there will be any reduction in the cost of these items to the surviving members; this in theory requires an investigation into the household finances.

19. In practice a commonly adopted procedure is to assume that earnings would have been enjoyed in the proportions of one share to each parent and a half share to each child during its dependency. Thus, if the family consisted of a husband, wife and two children, each parent would be assumed to enjoy one-third of the husband's earnings and each child one-sixth. It would also be assumed that when the elder child became self-supporting the share of each parent would increase to two-fifths and the share of the younger child to one-fifth, and that as the younger child in turn became self-supporting the share of each parent would increase to one-half. (The operation of this "rule-of-thumb" approach becomes more complicated if the family derives part of its support from the pre-accident earnings of the widow. The adjustments required on this account are discussed in the Appendix.)

20. The "rule-of-thumb" approach caters adequately for the re-allocation of support that occurs when each child becomes self-supporting. It does not, however, provide for any re-allocation of support that might occur in the event of a dependent child predeceasing the breadwinner. If the circumstances of the particular case are such that a child's mortality cannot be ignored, it is not

unusual (on practical grounds) to assume that the portion of the earnings allotted to each child will, in the event of its death, revert to the parents in equal shares instead of being spread among the parents and the remaining children who may at that time still be enjoying support.

21. The apportionment of the deceased's earnings in any particular case is a matter on which the actuary must be instructed by the lawyer briefing him. In the absence of an instruction, the above "rule-of-thumb" pattern would normally be assumed by the actuary, though it would still be the responsibility of the lawyer to ascertain whether the pattern was appropriate to the circumstances.

The projection of the deceased's "take-home" earnings. ("S_t")

22. The determination of the deceased's assumed future earnings expressed in terms of current money values involves inter alia the following factors:—

(i) The deceased's gross earnings at the date of his death.
(ii) The nature of his work,
(iii) His prospects and capabilities,
(iv) The likely trend of future earnings had he lived,
(v) The deductions reasonably allowed for in determining "take-home" earnings.

23. In order to make a reasonable assessment for the future it is desirable to have a history of the deceased's earnings over the previous 5 or more years, and also a forecast (preferably, in the case of an employed person, by the deceased's former employer) of the manner in which his earnings, ignoring inflation, were likely to have progressed in future. In particular it is extremely valuable to have details of any pay scales according to which the deceased could have expected to have been remunerated.

24. The following miscellaneous points may be mentioned:—

(i) Because, in any particular case, past increases in earnings probably were at least in part granted to compensate for the declining purchasing power of currency, it would not be correct to use the past percentage rates of increase without adjustment to project future "real" increases, due for example to increased productivity or to promotion.

(ii) "Take-home" earnings are generally regarded as gross earnings less income tax and certain other deductions. These deductions include any expenses, such as travelling expenses, which are usually regarded as reducing the income available for apportionment. They also include compulsory deductions from earnings to procure benefits taken into account in assessing the family income. For example, if the actuary has included the value of pension benefits lost in his calculation of compensation, then it would clearly be necessary to deduct the corresponding pension fund contributions from pre-retirement income assumed to have been lost. "Discretionary" deductions such as life insurance premiums and bond repayments, even though they procure benefits for the family, are not usually regarded as reducing the earnings available for the support of a family. They could, however, be taken into account in deciding upon the basis of apportioning the deceased's "take-home" earnings, and all deductions ranking for tax relief (e.g. pension fund contributions and life insurance premiums) are relevant factors in the calculation of the deduction for income tax.

(iii) Only earnings available for the support of a family, and fringe benefits such as free or subsidised housing, are normally taken into account. Allowances for business entertainment, etc., would normally be assumed to be spent on the purposes for which they were intended and not on the support of the family.

(iv) The family may have derived part of its support from the wife's earnings. This income requires special treatment and is dealt with in more detail in the Appendix.

(v) Certain occupations have fairly distinct career-earnings patterns which would normally be taken into account. For example, it would be unrealistic to assume a constant rate of "genuine" increase over a deceased dentist's career, since dentists can earn high incomes while they are able to work at top pace, but with advancing years their earnings usually increase more slowly and may even decline.

(vi) Some persons will show a past earnings history involving a substantial amount of overtime. Depending on the facts in each case, it would be reasonable to allow for continuing overtime but to give some recognition to the fact that the hours of overtime actually worked usually taper off with increasing age or promotion.

(vii) Post-retirement support from a pension is usually allowed for by projecting pre-retirement earnings on the basis assumed and then calculating the emerging pension according to the rules of the particular pension fund. Increases in post-retirement pension income, whether due to inflation or for any other reason, can only be assumed if these are specifically provided for in the fund's rules (e.g. 2% per annum under the S.A. Railways Fund) or if it appears likely that any current ex-gratia increases to pensioners will be maintained in future.

25. Up to this point reference has been made only to the deceased's *earnings*, and it remains to be considered whether income from other sources (the obvious example being investment income) should be taken into account. The special feature of such income is that it does not necessarily cease to be available to the dependants on the death of the deceased.

It seems clear that in general such income should be included when establishing the position that would have applied had the death not occurred, and that thereafter an adjustment should be made for the fact that a benefit may continue to be received from this source after the death of the deceased. This latter adjustment relates only to the period of shortening of the deceased's lifetime, as the benefit would in the normal course have arisen on his death at the expected time. It amounts in fact to the value of the usage of the asset in the estate producing the income in question over the said period of shortening, which in turn equals the value of the acceleration in value of the asset as discussed from paragraph 44 onwards.

In short, it would appear that the income should be included when determining the originally expected future position, and that the normal acceleration process as described later will cater for the continued availability of income after death.

26. Having decided upon projected pre-tax "take-home" earnings, it remains to determine suitable allowances for the income tax to be deducted to obtain the estimated net support available in each future year for the family.

In making a reasonable estimate of future income tax the actuary has only past and present tax bases for guidance. In practice, particularly since calculations are usually made as at the date of death, and since the deceased's earnings at that date are a fundamental element in projecting future earnings, it seems only reasonable to assume the continuation in force in future of the tax bases on which these earnings were actually taxed. If there has been a material change in effective rates of taxation since the date of death, the calculations could, in theory, be made in two stages; the first relating to the period up to the change in basis, and the second relating to the period thereafter, assuming the continuation in force of the amended tax basis. In practice, since increases in tax rates are often followed by compensating increases in gross earnings, which have the effect of maintaining *after*-tax earnings levels, and since all the actuary is striving for is a reasonable allowance for (unknown) future taxation on (unknown) future earnings, he might well feel justified in ignoring the tax change and in basing all his calculations on the tax bases in force at the date of death.

Interest

27. The rate of interest used by the actuary for discounting each future year's "expectation of support" is that which he assumes each dependant could reasonably earn on the investment of any capital sum awarded, taking into account the following:—

(i) The basic principle that the money must be invested in such a way as to enable the dependant concerned to draw from it an income equal to that which has been lost. This determines the period of investment, as well as whether the trend of the income required can be matched by a single type of asset or whether a combination of different types is necessary.

(ii) The fact that, within the bounds of security of the investments and the practical availability of investments, there is a duty on all concerned to seek the maximum yield on the investments.

It must be recognised, in this respect, that even unsophisticated investors can receive the benefits of a sophisiticated investment programme, by approaching say, a trust company to handle their affairs. If any investment management charges are involved these would be reflected in a deduction from the gross yield achieved.

28. In addition to allowing for income tax on the deceased's projected earnings, as discussed in paragraph 26, the actuary must also take into account any tax likely to be levied on the income earned on the investment of the sum awarded in compensation, so that, *after* payment of this tax, each dependant on average has a *net* income from investment (including capital drawings where

necessary) equal to his or her respective share of the deceased's projected after-tax earnings. In other words, in order to calculate the compensation, and unless the taxation element is insignificant, after-tax "take-home" earnings are capitalised at an after-tax interest rate.

This rate will be the gross interest rate assumed by the actuary, less an allowance for income tax appropriate to the particular *dependant's* tax position. For example, if the dependant is a working widow then the interest on the award will be marginal to her existing income and will be taxed accordingly. Hence the allowance for income tax should, in theory, be greater than if she had no other source of income. In practice, it seems that this refinement is seldom made.

29. A further consideration, in arriving at the investment yield to be used, is the likely future trend in yields, in particular the extent to which they can be expected to be influenced by changes in currency values. There is a danger, however, that these considerations, valid though they may be, can be allowed to influence to an unjustifiable extent the decision reached in regard to investment yield, because to all intents and purposes they only come into effect when moneys arising from the original investment(s) have to be reinvested. If the amount awarded in compensation could be invested in such a way as to match exactly the required income, reinvestment will not arise and the future trend of interest rates will be immaterial (other than possibly to improve on the original investment.)

30. Practice at the present time (March, 1974) appears generally to be to assume that a yield of $6\frac{1}{2}\%$ p.a., after deduction of income tax, will be achieved, but the authors have had reason recently to query this rate. In a certain case that one of the authors dealt with not long ago it was found, with the aid of a trust company, that more than a $7\frac{1}{2}\%$ yield after tax could be achieved by investing the lump sum award recommended (calculated on the basis of a $7\frac{1}{2}\%$ yield) in Stewarts and Lloyds Debentures with a coupon of 9.2%. The timing of the debenture's dividends and repayments fitted the desired

income so well that reinvestment problems were minimal. In a subsequent case the trend of income was different, allowing only 50% of the investment in a debenture and requiring the balance to be allocated among shorter term investments – yet a $7\frac{1}{2}\%$ net yield was still achieved.

On the basis of investments actually available at the present time, therefore, and with the influence of reinvestment reduced to a minimum, the authors have concluded that as a general pattern the following net yields are readily available, making proper allowance for the periodical withdrawals from the investment that will have to be made to produce the desired financial support:

Period of investment (years)	**Yield**
Up to 10 years	$6 - 6\frac{1}{2}\%$
10 – 15 years	7%
15 – 30 years	$7\frac{1}{2}\%$
30 years and more	7%

An adjustment may be needed if the dependant is in an unusual tax position or has to meet investment management charges.

The drop in yield for the final category is an allowance for possible reinvestment problems when the longest-term investments mature.

Changes in currency values

31. At present, as it has been for some years and looks like continuing to be for some time, this means currency depreciation or inflation, and the authors thus propose to omit the niceties and refer throughout to inflation.

The reason why this item enters the calculation has been dealt with earlier, and it now remains to be decided how the rate of inflation to be used is to be determined. There seem to be three methods used in practice.

32. The first approach is to try to assess the rate of future currency depreciation as a separate entity. Here opinions can vary widely. At the present time (March, 1974) the annual rate is 6.3% if measured over the past three years and 8.9% if measured over the past twelve months (Financial Mail rates of change in Consumer Price Indices). However if the rate is measured over the past 10 years (on the basis of the published Consumer Price Indices) it is $4\frac{1}{2}\%$ p.a. and this drops to $3\frac{1}{2}\%$ if it is measured over the past 20 years.

Faced with such a range of figures, how is the actuary to approach the matter, bearing in mind that he must at all times be scrupulously fair to both sides? The authors suggest that:

(i) the definition of one's aim should be "making a suitable allowance for inflation", and that

(ii) the "suitable allowance" should be the rate of inflation experienced over a past period equal to the future period being considered.

Such an approach is nothing if not practical, as published Consumer Price Indices enable the rate in (ii) to be calculated easily; and it recognises that influences such as inflation tend to move in cycles.

33. A second approach is to associate the rate of interest adopted with the rate of inflation allowed for, on the theory that the two will tend to go hand in hand. High interest rates usually mean much economic activity, which in turn tends to mean a significant degree of inflation. On this basis a steady difference (usually some $3\frac{1}{2}\%$) between the interest rate and the inflation rate would be adopted, and once the one item had been fixed the other would follow automatically. This again is practical, but encounters the objection referred to when discussing the interest rate, i.e. that by careful selection of investments one can immunise oneself against changes in future investment yields.

A third approach, which the authors do not favour and which does not in fact seem to be much used in South Africa, is to ignore current rates of interest and inflation and to move directly to a "stable money" rate, on the lines put forward by a British judge, Lord Diplock: "In my view the only practical course for courts to adopt in assessing damages under the Fatal Accidents Act is to leave out of account the risk of further inflation on the one hand and the high interest rates which would reflect the fear of it and capital appreciation of property and equities which are the consequence of it on the other hand. In estimating the amount of the annual dependency in the future, had the deceased not been killed, money should be treated as retaining its value at the date of this judgement, and in calculating the present value of annual payments which would have been received in future years, interest rates appropriate to times of stable currency such as 4% to 5% should be adopted." (Lord Reid in a subsequent case felt that Lord Diplock's approach was "based either on an expectation of an early return to a period of stability or on a nostalgic reluctance to recognise change"!)

Mortality

34. In deciding upon the survival prospects referred to in paragraph 12, the actuary ideally seeks to use mortality statistics based on the experience of groups of lives identical in all material respects to the individuals concerned in each particular assessment; for example, identical as to state of health, sex, race, occupation, social status and place of residence. In practice, most actuaries in South Africa would probably adopt the latest published population tables (currently the 1960 South African Life Tables) and then adjust these in the light of any significantly special features material to the lives concerned in the assessment.

    Examples of special features, which might be taken into account, according to the individual judgement of the actuary, are:

    (i) The deceased may have been in poor health before his death.

    (ii) He may recently have been accepted for life insurance at standard rates.

    (iii) He may have come from a family with a history of exceptional longevity, as the Courts recognised in the recent case of Nochomowitz versus Santam.

    (iv) A dependant may have been injured in the accident that killed the breadwinner, with a significant increase in the likely level of the dependant's mortality.

35. As individual South African Life Tables for each sex are published for the White, Coloured and Asiatic population groups, account can be taken of the not insignificant mortality variations by race and sex that are likely to be experienced in practice. No Life Tables are available for the Bantu population group and it is necessary either to adjust one of the tables referred to above or to use another standard table.

36. As regards child dependants, a study of the 1960 population mortality table shows that, for Whites, mortality rates of children are light enough to be ignored in practice in most cases. While the 1960 Life Tables for Coloureds and Asiatics show a substantial improvement over the corresponding 1951 tables, mortality levels of children, particularly in the early years of life, remain significant and are usually allowed for in the actuary's calculations. Of course, if there is evidence that any particular child (whatever the race group) is likely to experience increased mortality because of illness, abnormality or accident, the actuary will adapt his mortality assumptions if the effect on his calculations is likely to be material.

Adjustments

37. The calculations on the foregoing bases produce the gross capital values of support lost. These may be adjusted by the Courts in accordance with certain other features of each case. Factors and contingencies which

the Courts have considered in making such adjustments are set out in the following paragraphs.

Allowance for Contingencies

38. It is the practice of the Courts to make a percentage *deduction* for "contingencies", for example to allow for the fact that the deceased's future earnings and pension (if any) might not have followed the course assumed, on account of illness, temporary setbacks, unemployment, early retirement, or change of job resulting in loss of existing pension rights, etc. Presumably it would also be reasonable for the Courts to take into account the possibility that the marriage might have ended in divorce or annulment in circumstances whereunder the deceased would no longer have been obliged to support his wife. As regards children, the possibility exists that they may have ceased to be dependent on their father at a younger age than assumed, e.g. the early marriage of a daughter. (In the view of the authors, there is no better reason for assuming that the occurrence of the so-called contingencies would *reduce* a calculated loss than that it would increase it – unless, of course, the assumption is borne out by supporting evidence. However, this area is the prerogative of the Courts and our view is mentioned only since it is one which immediately occurs to the actuarial reader used to balancing probabilities.)

39. The percentage deduction allowed by the Courts varies widely from case to case; there is no question of a customary figure applying in all cases, no hard-and-fast rule can be laid down, and the deduction must depend on the particular facts and circumstances of each individual case. (This paragraph summarises the views expressed by Acting Justice Botha in the case of Nochomowitz vs. Santam Insurance Co. Ltd.)

40. Whilst it is the function of the Court to determine the deduction appropriate in a particular case, and whilst such deduction is not usually derived on a scientific basis, the actuary can nevertheless assist by performing his calculations on two or more different assumptions

(e.g. as to likely retirement age, earnings progression, etc.) in order to illustrate the monetary effects of changes in assumptions, thus giving the Court a range within which any "correct" award may lie.

Allowance for the re-marriage of a widow dependant

41. It is settled law in South Africa (but not, since 1971, in Britain) that the fact or prospect of a widow's re-marriage should be taken into account by the Court in assessing her damages, since her re-marriage would reinstate her right of support. There is no hard-and-fast rule as to how this factor is to be evaluated, but the Courts will have regard to the age, health, character and appearance of the widow, the possible handicap of children, and other relevant considerations. The following extract from the judgment of Acting Justice Botha in the case mentioned above illustrates the approach adopted there: "... my impression of the plaintiff as I observed her in the witness box is that she is of presentable appearance for her age, and that she has an intelligent and pleasant personality. It is obvious from her evidence, however, that she had a very high regard and affection for the deceased and that she is in consequence over-critical of all other men. On this basis I consider that the chances of her re-marrying are slender."

42. Clearly, the determination of the deduction is the prerogative of the Court, and in the authors' view the furthest the actuary can reasonably go is to record in his report that the widow's gross loss may have to be reduced on this account. Some actuaries tend to go further and quote a percentage deduction on the basis of the widow having the average re-marriage prospects for her age (e.g. based on census data), so that the Court can have a starting point which is then adjusted in the light of its assessment of the extent to which the particular widow's circumstances differ from those of an average widow of her age. The quoting of an average deduction of course implies that the widow, on re-marriage, would receive the same support as she received

from her deceased husband, though in certain circumstances this assumption might be quite invalid.

43. There appears to be some uncertainty as to whether a deduction should be made from the children's gross compensation to allow for the possibility of their mother's re-marriage. If she were to re-marry in community of property then her children would have a legally enforceable claim through her to support from the income of the second husband; but no such claim would arise if the second marriage were to be contracted out of community of property. It is again for the Courts to decide whether this factor should be taken into account in reducing the children's compensation and, if so, to what extent. It is not suggested that the actuary should become involved in this aspect, which is merely mentioned here for completeness.

Allowance for accelerated values

44. Each claimant's loss, after deduction of any allowances decided upon by the Courts for contingencies and re-marriage, is further reduced if as a result of the death of the deceased there has now accrued to that claimant some benefit of monetary value which that claimant had not previously enjoyed or possessed.

45. The lawyer must advise the actuary of the items to be taken into account in this respect, but in general they appear to consist of the particular dependant's share of the deceased's net estate, plus any accruals outside the estate, less the proceeds of any insurance policies (see Appendix). If the marriage had been in community of property only one-half of the benefits accruing to the widow would be taken into account, since her share of the joint property is not regarded as an accrual arising as a result of the death of her husband.

46. In arriving at the appropriate deduction in respect of any particular benefit it is necessary first to calculate the value of the expectation which the claimant had, immediately prior to the deceased's death, of receiving

the benefit at a later date. A [illegible] respect of what is termed the [illegible] the benefit, i.e. the amount received les[illegible] expectation.

47. The approach normally adopted in determining deductions is perhaps best illustrated by way of an example. Say the estate of a man aged x at death included R1 000 in cash,* and that this amount is now inherited by his widow aged y, to whom he had been married out of community of property. The value of the widow's pre-accident expectation of benefit is 1 000 $\bar{A}^{1}_{xy}$, i.e. the present value of R1 000 payable on the death of the husband, provided the wife was then still alive. The value to the widow immediately *after* her husband's death is obviously the full R1 000 she inherits. The acceleration in value to the widow because of the death of her husband thus amounts to R1 000 $(1-\bar{A}^{1}_{xy})$. This amount is then quoted as a deduction from the widow's gross loss of support.

48. The rate of interest used in calculating the value of the expectation in respect of each asset is the rate used by the actuary in determining the gross loss of support, less the corresponding rate of interest or other investment gain (if any) that would have been added to the asset from the time of actual death to the date of expected death. Thus in the case of the savings account referred to in paragraph 47 the rate of interest addition would be say 4% and the $\bar{A}^{1}_{x:y}$ factor would be calculated at the excess of the interest rate under the main calculation over 4%. The reason is of course to allow for the fact that the asset in question would have been that much greater at the time of death if this had not occurred prematurely.

49. Proper assessment of the deduction appropriate to each asset requires close co-operation between the actuary

*(in a savings account)

from her deceased husband, though in certain circumstances this assumption might be quite invalid.

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46. In arriving at the appropriate deduction in respect of any particular benefit it is necessary first to calculate the value of the expectation which the claimant had, immediately prior to the deceased's death, of receiving

the benefit at a later date. A deduction is then made in respect of what is termed the "acceleration value" of the benefit, i.e. the amount received less the value of the expectation.

47. The approach normally adopted in determining deductions is perhaps best illustrated by way of an example. Say the estate of a man aged x at death included R1 000 in cash,* and that this amount is now inherited by his widow aged y, to whom he had been married out of community of property. The value of the widow's pre-accident expectation of benefit is 1 000 $\bar{A}^{1}_{xy}$, i.e. the present value of R1 000 payable on the death of the husband, provided the wife was then still alive. The value to the widow immediately *after* her husband's death obviously is the full R1 000 she inherits. The acceleration in value to the widow because of the death of her husband thus amounts to R1 000 $(1-\bar{A}^{1}_{xy})$. This amount is then quoted as a deduction from the widow's gross loss of support.

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*(in a savings account)

and the lawyer briefing him, as the precise "expectation" can be significantly affected by legal aspects such as the contents of the deceased's Will and any legal precedents on the subject. A significant example of the latter arises in the case of a house owned by the deceased and occupied by himself and his family. Assume that the house is left to the widow, in terms of the deceased's Will; should it be argued that her expectation in the house should be calculated as in paragraph 47 and the difference between this and the current value of the house deducted from the gross value of her loss of support, or can it be argued that as she was occupying the house prior to the deceased's death and is continuing to occupy it in the same way her expectation and the current value are equal to each other (in which event there is no deduction)? Or is there an answer somewhere between these two extremes?

50. Readers will no doubt find the following extract from a Counsel's opinion on the subject of interest:

"The only benefit which the Plaintiff derived from the estate of her husband was a house together with certain household effects. The net value of this benefit as reflected in the estate distribution account was R29 854,00. The question arises whether any allowance should be made for the fact that Plaintiff has received this benefit at an earlier date than she would have in the ordinary course.

"In *Maasberg v. Hunt, Leuchars and Hepburn, Ltd., 1944 W.L.D. 2 at 13,* Ramsbottom J. in dealing with this problem held as follows:

'As her husband's heiress, the plaintiff has inherited his half of the joint estate. The only asset in the joint estate is a plot of ground, a dwelling house, and furniture, all valued at £872.3s.10d. The property is bonded in the amount of £399.4s.5d. so that the nett value of the joint estate is £473.19.5d., half of which or £237 the plaintiff inherits from her husband. It was contended that a deduction must be made for the value of the accelerated acquisition of the dominium in this half of the property. But as Mr. Jerling, on behalf of the plaintiff, pointed out, although she is getting the dominium in this half, she has always had the use of it, and is not pecuniarily better off. I agree with this argument. During his lifetime, Maasberg supported his wife in their joint home. He did not only provide her with half of his income, he provided her also with a house to live in and with furniture for her comfort. If it is claimed that a deduction should be made for accelerated receipt of the inheritance, an addition must be made for the value of the accommodation supplied by Maasberg to the plaintiff. I think that the one may fairly be set off against the other. The answer to the argument that she can now sell the property and use the money is, I think, that if she did so she would have to provide herself with accommodation elsewhere at her own expense — presumably out of the proceeds of the sale. She has lost the value of the accommodation which her husband provided and whether that is compensated by the share of the house which she has inherited or by what she could get for that share if she were to sell it, the result is the same.

No deduction can be made on this head.'

"A contrary view was expressed by Van Winsen J. in *Snyders v. Groenewald, 1966(3) S.A. 785(C) at 791:*

'(1) House : It was contended on defendant's behalf that the benefit which plaintiff derived from the house over and above the benefit she had enjoyed from the occupation of the house before her husband's death was represented by the value of the dominium of the house, and that the accelerated value of this should be a deduction from the amount due to plaintiff. Mr. Steyn argued that no deduction should be made in this regard, since the changed relationship between plaintiff and this particular asset after her husband's death was a matter of form rather than of substance. It seems to me that the dominium acquired by plaintiff under the will is a benefit over and above that enjoyed by her before her husband's death, and that some deduction must be made for this. The deduction would at most be the accelerated value of a sum representing the difference between the value of the house at the date of the deceased's death and the amount of the bond. The evidence shows that the house was sold some eight months after the deceased's death for the sum of R6 700. There is no evidence that this was its value in June, 1962. It is accordingly not possible to calculate the difference between the value of the house as at June, 1962, and the amount of the bond. The most practical way of dealing with the problem is for the parties to agree to be bound by the certificate of a sworn appraiser – jointly appointed by them – as to its value in June, 1962. The amount of the deduction would then be the accelerated value of the sum representing the difference between the appraiser's figure and the amount of the bond.'

"In my view neither of the above views are entirely correct. Ramsbottom J. is correct to the extent that, in addition to that portion of his income which the deceased husband applied to the maintenance and support of his wife, he also provided her with accommodation and, but for his death, would have continued to do so. In my view, however, the learned judge erred in finding that the *value* of the accommodation which the husband provided was equal to the value of the house. The house provided accommodation for two persons (or possibly a family) while the Plaintiff is entitled only to accommodation for one person.

"The judgment of Van Winsen J. is open to the criticism that it does not take into account the undoubtedly sound reasoning of Ramsbottom J.

"There is of course the practical difficulty of assessing the value of the accommodation which the husband provided for the wife during his lifetime. In the instant case only two persons (the Plaintiff and her husband) would have occupied the house. I would therefore suggest that the net value of the house be apportioned equally between them. In other words, only half the net value should be treated as an accelerated benefit and a deduction made in respect thereof. Thus, in the instant case, half of the net value of Plaintiff's inheritance i.e. R14 927,00 must be regarded as an accelerated benefit and the difference between this figure and its present value, calculated over the life expectancy of the deceased, should be deducted from the total amount of the Plaintiff's damages."

Adjustment for the late settlement of a claim

51. We have thus far approached the subject on the basis that all calculations are performed as at the date of death. In practice, however, claims are often settled only after a period of time has passed and two matters then arise:

(i) The correct method of adjusting the initial result on account of the time-lag, and

(ii) The extent to which events occurring since death should be taken into account.

Where the likely date of settlement is unknown, the usual practice is to make the calculations as at the date of death and to mention in the report that the value at any subsequent date may be obtained by increasing the results at the valuation rate of interest. This approach is reasonable if the delay is not long. Where the likely date of settlement or award is known, it is preferable to perform the calculations as at the known date, accumulating past losses and discounting future losses to that date.

It is settled law that events material to the claim, occurring between death and settlement, should be taken into account. Thus, for example, because a dependant had survived to the date of settlement, the mortality element would be ignored in accumulating past losses. Whichever method is adopted, any deductions for contingencies or for re-marriage determined by the Court would be those considered appropriate at the date of settlement, rather than as at the date of death.

SOME GENERAL REMARKS

Conduct at a Court appearance

52. It may well be that the factors standing in the way of settlement of a claim relate not so much to the losses dealt with by the actuary, as to other aspects of the claim e.g. damages for medical expenses, pain and suffering, etc., or to the basic merits of the case. Be that as it may, if the matter becomes the subject of a Trial the actuary will be required to repeat the contents of his report, or to give a fresh report if the facts have changed since any original report, verbally from the witness box, and answer questions thereon put by the Counsel for the parties and possibly by the judge.

53. To any actuary who for the first time finds himself in this position the authors offer certain suggestions based on their own experiences:

    (i) The actuary is in Court as an expert witness, to give the Court the benefit of his technical knowledge and experience. He is not an accused and has no need to be on the defensive.

    (ii) Equally, however, the actuary should avoid getting on the offensive. He should answer only the questions put to him and avoid volunteering additional information. The one author, through volunteering information, found himself asked to prove, verbally, why

    $$a_{\overline{e_x}|} \neq a_x$$

    in a way that would convince the judge!

    (iii) The actuary should keep to his own home ground. He should not argue with Counsel or the judge on points of law, or express opinions on non-technical matters, such as a widow's re-marriage prospects, unless in addition to his actuarial knowledge he is experienced in such other directions.

    (iv) He should insist on a meeting with his Counsel a few days before the Trial, to go over his report and ensure that both Counsel and the actuary are perfectly clear on all points. The Counsel will, at the same time, explain how he intends leading the actuary's evidence.

Differences between actuarial reports

54. It often happens that an actuary reports on a case of loss of support or income, and is subsequently informed that an actuary advising the other side has produced a vastly different figure.

55. The obvious way to resolve this matter is to obtain a copy of the other actuary's report and to establish the points of difference. In the majority of cases it will be found that the facts (actual and assumed) upon which the reports have been based differ materially. The one actuary may, for example, have been told that the deceased would have retired at age 60, whereas the other actuary may have been instructed that the deceased would have worked until age 70. The first step is therefore to isolate such differences, and for the lawyers then to resolve them.

56. Differences in technical bases may remain, and it is necessary to consider the best method of resolving these; in essence, whether this should be done in Court or out of Court. Here it should be borne in mind that judges in this country are nothing if not practical; they will not normally take kindly to two actuaries absorbing Court time arguing over a $\frac{1}{4}$% difference in the rate of

interest. Alternatively, if there is a wide difference on a particular technical point, the judge may decide to take the mean of the two views. Bearing this likely judicial attitude in mind it is clearly preferable for the two actuaries to try to reconcile any technical differences before the hearing, so as to be in a position to apply agreed technical basis to the set of facts eventually agreed upon by the lawyers or decided upon by the Court.

The need for impartiality

57. An actuary preparing a report on the value of support lost is an "expert witness", even if ultimately he is not required to give his evidence from the witness box. His function is to put the legal personnel handling the case in possession of objectively assessed figures. He is not there to argue for one side or the other.

58. There are many opportunities for actuaries to influence the technical bases of their calculations in favour of the party whose legal advisers have approached him. The use of an interest rate ½% higher than that normally used, combined with a rate of inflation ½% lower than normally used, implies a net valuation rate that is a full 1% higher than normal, with possibly significant effects on the final result, particularly if the actuary for the other side also amends his bases, but in the opposite direction! One of the purposes of this paper is, of course, to enable a definition of "normal" to be derived.

59. Clearly, the technical bases adopted should be those that the actuary would use if he did not know whether the lawyer approaching him was acting for the plaintiff or for the defendant. Only by adopting this approach can he ensure that he is in every sense an "expert witness".

Some remarks on "expectation of life"

60. Many of the misunderstandings of actuarial techniques result from attempts to apply the concept of "expectation of life", which has no real meaning for an individual life and which is better defined as "the average future lifetime of a very large number of individuals of the same age". Example: "As a result of ill-health, the deceased, a man of 30, had a reduced expectation of life of only 20 years. Why, Mr. Actuary, have you taken pension benefits payable from age 65 into account, when the deceased's life expectancy was only to age 50? " The authors would deal with this type of question by explaining the steps set out in paragraph 12, whereby each year's projected income is taken into account (including, in the above example, benefits payable after age 65) but is combined with the probability, however small, that the person concerned (considered as one of a very large number of lives) would have survived to each future year.

CONCLUSION

61. This paper may transpire to be nothing more than an addition to actuarial writings as related to the profession in South Africa. The authors hope however that it will go further and enable more consistency of approach to be adopted among actuaries, which it is felt will lead to greater recognition of the unique part that actuaries are able to play in matters of this nature.

It must be recorded that the views expressed in this paper are those of the authors alone, and do not necessarily represent the opinions of the organisations with which they are associated.

APPENDIX

In order to avoid disturbing the theme of the paper certain further matters of interest have been set out in this Appendix to the paper.

(a) Brief Notes on the Contents of a Typical Report

The layout is usually along the following lines:–

(i) Terms of reference.
(ii) Details of information on which the assessment is based.
(iii) Technical and other bases.
(iv) Schedule of gross capital values.
(v) Details of adjustments to be applied.
(vi) How net losses would be calculated at any subsequent date.

Typical wording of the terms of reference might be: "I have been asked to report on the capital value of the loss of financial support sustained by Mrs. Jones and her minor children as the result of the death of her husband on (date)."

It will be noted that no opinion on the merits of the case is expressed. Expressions such as "determining the amount of compensation that may be claimed" take the actuary out of his sphere into that of the lawyer and are best avoided. The wording set out above states that a calculation of the *value* of support or income lost is to be undertaken, which is all that the actuary is required and qualified to do; whether *compensation* of this amount can be claimed or should be paid is not his province but that of the lawyer.

A detailed listing of the information on which the assessment is based is essential for two reasons. Firstly, if the actuary has been misinformed on any point or has misunderstood any item of information this is revealed and can be corrected. Secondly, if the opposing sides have each engaged an actuary it can quickly be established whether any discrepancies between their respective results are due to technical differences (for example, different mortality assumptions) or to

differences in the information (for example, ages, salaries or number of dependants) on which each actuary has based his calculations.

The actual information listed will depend on the circumstances of each case but typically will include items such as names, dates of birth, race and state of health of relevant members of the family; whether the marriage was contracted in or out of community of property; nature of deceased's employment, his earnings history, fringe benefits and pension details, and prospects for the future; earnings other than income from employment, and accruals as a result of the deceased's death.

(b) The Special Treatment of Insurance and Certain Other Benefits in the Determination of "Accelerated values"

The Assessment of Damages Act (No. 9 of 1969, assented to on 7th March, 1969) provides that:–

(1) "When in any action, the cause of which arose after the commencement of this Act, damages are assessed for loss of support as a result of a person's death, no insurance money, pension or benefit which has been or will or may be paid as a result of the death, shall be taken into account.

(2) For the purpose of subsection (1) –

(i) 'benefit' means any payment by a friendly society or trade union for the relief or maintenance of a member's dependants;

(ii) 'insurance money' includes a refund of premiums and any payment of interest on such premiums;

(iii) 'pension' includes a refund of contributions and any payment of interest on such contributions, and also any payment of a gratuity or other lump sum by a pension fund or by an employer in respect of a person's employment."

The purpose of the Act was to amend the position that previously existed, whereby a deduction was made from gross compensation in respect of the above benefits, with the net result that the greater the degree of prudence by the breadwinner, the lower the defendant's net liability.

(c) Allowance for a Widow's Continuing Income

Where the family derived support from the joint income of the husband and wife, and where there is evidence that the wife's income would have continued even if the husband had not been killed, the following must be taken into account:—

(i) The widow's income which was previously shared with her husband as well as her children will now be shared by herself and her children alone. Here the actuary must be guided by the lawyer on the apportionment.

(ii) The expected period over which the wife would normally have received an income (e.g. in the case of income from employment, the wife's retirement age) may differ from that assumed for the husband. Here again the actuary must be guided by the lawyer.

(iii) Tax on the wife's income in isolation would generally differ from tax on that same income when it was assessed jointly with that of her husband.

(iv) The after-tax valuation rate of interest used for capitalising the support lost by the widow should reflect the fact that income earned on any award would be marginal to her continuing income.

Expressed symbolically, the steps analogous to steps (1) to (6) in paragraph 12 reduce to the following expression for the gross capital value, at the date of death of a husband then aged x nearest birthday, of the financial support lost by his widow then aged y nearest birthday:—

$$\sum_{t=1}^{n} v^{t-\frac{1}{2}} \cdot {}_{t-\frac{1}{2}}p_{xy} (S_t + W_t)\,{}_tk_y - \sum_{t=1}^{n} v^{t-\frac{1}{2}} \cdot {}_{t-\frac{1}{2}}p_{xy}\, W'_t \cdot {}_tm_y$$

multiplied by $(1 + f)^{t-\frac{1}{2}}$

Where

S_t = the husband's "take-home" earnings projected for year t, net of tax on those earnings only, i.e. as if he were the sole breadwinner

W_t = the wife's previously expected "take-home" income projected for year t, net of the marginal tax payable on this extra income

W'_t = the widow's post-accident "take-home" income projected for year t, net of the tax payable by her as the sole breadwinner.

${}_tp_{xy}$ = the probability that both lives would normally have survived for t years.

f = the assumed rate of change per unit in the purchasing power of currency.

${}_tk_y$ = the assumed fraction of the net family income (i.e. $S_t + W_t$) that the widow could have expected to have enjoyed in year t, had her husband been alive

${}_tm_y$ = the assumed fraction of her own post-accident net income (W'_t) apportioned to the widow for year t. (For example, if there are no other dependants and the "rule-of-thumb" method of apportionment is thought appropriate, ${}_tk_y = \frac{1}{2}$ and ${}_tm_y = 1$)

and where all the other elements of the formula bear the meanings assigned in paragraph 13.

The gross capital value of the support lost by a child would be determined on a conformable basis.

(d) Disablement Claims

In the case of claims arising from disability as opposed to death, the general principles discussed in the body of the paper are still applicable but in a form that is in many respects simplified; for instance, the question of apportionment of income does not arise. There are, however, several interesting additional factors:—

(i) It is settled law that where a plaintiff's prospects of longevity have been reduced as a result of the accident, he can only recover damages in respect of his future loss of earnings over the period he is likely to remain alive as a disabled person. This means that the actuary must capitalise future income allowing approximately for the *increased* level of mortality to be expected, as opposed to the *pre-accident* mortality level that would have been used had the breadwinner been killed in the accident. This also means that if the plaintiff's death is in fact accelerated by his injuries, the compensation for loss of earnings could be (possibly grossly) inadequate to compensate any dependants for the support lost. The authors understand that in such circumstances it would then be open to the dependants to institute a claim for additional compensation, provided the casual connection between the premature death and the accident can at that stage be proved. On the other hand, should the plaintiff's injuries be so severe that he dies before his claim is settled, the claim becomes one for full prospective loss of support by any surviving dependants.

(ii) Where a plaintiff is still in a position to earn an income, albeit reduced, the usual procedure is to capitalise after-tax "take-home" income that could normally have been expected, and then to deduct the capitalised after-tax "take-home" income expected under post-accident conditions.

(iii) The "Assessment of Damages Act" does not apply in cases of personal injury and the actuary may have to reduce his calculated figure by the capitalised value of any ill-health retirement pension or any income payable in terms of any insurance against disablement on the life of the plaintiff. The

word "may" is used deliberately, as the authors understand certain types of benefit are still not deductible.

(iv) These cases often require the assessment of the future earning capacity of children. Here the actuary must be guided by the lawyer as to the child's pre- and post-accident career and earnings prospects. The interested reader is here referred to the article by J.H. Prevett on "The Thalidomide Case", mentioned in the introduction to this paper.

(v) In addition to the claim for loss of earnings there may be a claim for compensation for the future costs of medicine, surgical appliances, special care or accommodation. The lawyer would normally supply details of the estimated monetary amounts involved and the actuary would proceed as before to calculate the capital values involved.

ABSTRACT OF DISCUSSIONS

The Johannesburg meeting:

Mr. Mitchley, in opening the discussion, said:

On my first reading of the paper I was surprised by the reference in paragraph 5 to a divergence of practice among actuaries. From my experience I felt that the practice, at least among actuaries in Johannesburg, varied little and if anything had converged in recent years. On reading further it appeared to me that the difference may well be between actuaries in Cape Town and in Johannesburg and for this reason I welcome this paper as an opportunity for all to air their views. It is, however, perhaps more a difference of opinion than a divergence of practice and I am sure that the legal profession is quite happy to accept that a difference of opinion can arise among expert witnesses.

In paragraph 26 it is stated that "calculations are usually made as at the date of death" and it is implied that changes in rates of pay and rates of tax since that date should be ignored, yet in paragraph 51 it is stated that "It is settled in law that events material to the claim, occurring between death and settlement, should be taken into account" and it was suggested that calculations should be done as at the date of settlement.

I think that it is probably confusing to the legal profession to have two reports from the same actuary on different bases and I therefore suggest to the authors that they should consider changing their practice so that all calculations are made as at a known settlement date or as at an assumed settlement date (say a month after the date of the report).

It might also have been better if the paper had been written with only this method in mind rather than it being introduced almost as an afterthought in paragraph 51. Some of the statements in that paragraph may be misleading and I think it would be as well if all the changes from the earlier method were set out. They are as follows:

1. Past losses and future losses must be separated.
2. Past losses must be calculated without interest.
3. Future losses must be discounted to the date of settlement.
4. The mortality of surviving dependants up to the date of settlement must be ignored in calculating both past and future losses.
5. All changes in rates of pay and rates of tax since the date of the accident must be taken into account. Since the past losses are usually relatively small, for practical purposes current tax rates can be used for both past and future periods.
6. The allowance for inflation only applies to the future period.
7. The remarriage deduction only applies to the future loss.

I was very interested in the novel approach to the question of allowance for inflation as suggested in paragraph 32. I fully agree that the method suggested recognises the cyclical movement of inflation rates. However, it does also rest on the assumption that either the calculation is being made at the peak or trough of the cycle or the period of the cycle is the same as the period of capitalisation. This assumption may be wide of the mark.

For example, if the increase in the Consumer Price Index is 10% a year for the next two years and reduces steadily to 2% a year over the succeeding eight years – a not unreasonable assumption in the light of current increases – the average rate of increase from 1963 to 1983 will be $5\frac{1}{2}\%$ a year while the average rate of increase from 1973 to 1983 will be $6\frac{1}{2}\%$ a year. In 1984 it would be incongruous to use the latter rate for a period of ten years into the future at a time when the pattern of rates is indicating a return to the lower rates of inflation of about $2\frac{1}{2}\%$ to 3% a year that were experienced from 1963 to 1968.

I therefore suggest that the authors' "suitable allowance" should rather be the long-term rate of inflation that is accepted as necessary to sustain economic growth and full employment, say, $2\frac{1}{2}\%$ a year, with an addition to make allowance for the immediate period during which it is expected that inflation will be greater than the long-term rate. The addition will depend on the trend of the rate of inflation over the immediate past and the economic forecasts for the immediate future.

I strongly support the view of the authors given in parenthesis at the end of paragraph 38 that favourable as well as unfavourable contingencies must be taken into account. Unfortunately, the deduction for contingencies has in some cases been used to make an adjustment for an unreasonably optimistic assumption on some other point. If reasonable assumptions are made, the deduction for contingencies should in most cases be minimal. Whilst the actuary should be very reticent about giving the actual deduction that he considers appropriate since he has no statistics to support him, he should be prepared to state his views on which items must be taken into account in determining the deduction.

I was astounded by the first sentence of paragraph 43 since I have never known the question of a deduction from the children's losses for the mother's possibility of remarriage to be raised. A very close analogy can be drawn between this point and the point that the widow's gain from insurance policies cannot be used to offset the children's losses which was considered by the Appeal Court in the case of Groenewald vs Snyders – this case was before the Assessment of Damages Act came into force. In his judgement on this case Mr. Justice Holmes stated:

"It must be emphasised that the widow is not better off by reason of any payment to her by the defendant. The question is whether the defendant, in answer to a claim against him by the children for their lost right of support, can refer them to their mother and so *pro tanto* abate his liability to them.

"It is true that, if policies on the deceased's life had been ceded to the children, their claim to maintenance damages from the defendant would have had to be somewhat abated,

because they would have received a financial benefit in consequence of their father's death. In the present case, however, what financial benefit have they received as the result of his death? The right to look to their mother for some maintenance? They always had that right. What they have now is a potentially more fruitful right against her, even though that is not the result of any moneys paid to her by the defendant. But it does not seem to me that they are obliged to exercise such right against her, or that the defendant can dictate to them as to the debtor to whom they must look. What they have lost is the right of support from their father and it is that loss for which they must be compensated. The defendant has caused their damage and they can look to him for full reparation. This view does not give the children more maintenance than formerly, at the defendant's expense. It gives them the same amount of maintenance as formerly, at his expense. He cannot cavil at that. There is thus no question of the trial court having poured out largesse from the horn of plenty at the defendant's expense, as Counsel contended."

It is ~~therefore clear to me that the~~ children's losses are unaffected by the widow's remarriage prospects.

It is interesting to note that the deduction made for the widow's chance of remarriage in the case referred to in paragraph 41 was the figure obtained from statistics and given in evidence by an actuary. I wish to support the use of average remarriage prospects for making a deduction since this gives a reasonable starting point for settlement negotiations. If the actuary makes no deduction he will invariably be asked in Court to state what deduction he would make based on the available statistics.

In a case where the wife was working at the time of the accident it was the practice of the partnership with which I am connected to make the calculation of the losses in a similar manner to that set out in paragraph (b) of the Appendix until we were criticised by a Senior Counsel who held the same views as those expressed by Mr. Justice Holmes in his judgement in case of Groenewald vs Snyders, that is, that the children's losses are unaffected by the fact that the mother may be able to give them more financial support. The wife's earnings should therefore be treated as a separate item and any gain from her saving in tax because her earnings are no longer aggregated with her husband's earnings for tax purposes and the fact that her husband no longer receives a share of her earnings should be offset against her loss only.

I think a note should have been given in paragraph (b) of the Appendix that section (8) of the Workmen's Compensation Act is in conflict with the Assessment of Damages Act. In the absence of a legal ruling on this point, I hold the view that the Assessment of Damages Act does not apply to Workmen's Compensation benefits and that the value of such benefits must still be deducted from the gross losses.

The root of the problem that the one author had in proving that the approximate equality of an annuity certain for a period equal to the expectation of life and a life annuity is not exact can be laid at the door of the actuaries, since in the days before computers could, at the push of a button, produce annuities on population mortality at varying rates of interest, the actuarial profession and the legal profession had, for practical purposes, accepted that the approximation was reasonable.

I cannot stress strongly enough the statement in paragraph 53(iii) that "The actuary should keep to his home ground." For this reason the actuary should always ensure that the assumptions he makes, or is asked to make, for his calculations are reasonable and capable of being supported by other evidence if necessary. I had the experience in the case of Nochomowitz vs Santam of initially making what I considered reasonable assumptions which were not far different from those finally decided upon by the Court. Subsequently I was instructed by Counsel to make different assumptions and, although I warned him that the assumptions would have to be supported by other evidence, I think he was disappointed that I was not able to help him in substantiating the assumptions when I appeared in the witness box.

In connection with keeping on home ground I think it was out of place and distracting to introduce non-actuarial matters such as general damages and the merits of the case as

was done in passing in paragraphs 9 and 52 – in fact the statement in paragraph 9(d) is wrong since there can be no compensation for pain and suffering in a claim for loss of support.

In conclusion, whilst my comments may have been more critical than complimentary, because I consider that points of difference are more important than points of agreement in the present circumstances, I trust that the authors will treat them as constructive criticism for the purposes of a review of their practice in assessing compensation for loss of support.

Mr. H.N. Murfin commented on the following notes, copies of which had been circulated to the meeting:

1. The authors' formula in paragraph 13 can be expressed as $t|\bar{a}mf\,\overline{n}|$ applied to the widow's share in the income in the period n. For simplicity we will use $\bar{a}'mf$ to represent $t|\bar{a}mf\,\overline{n}|$ which involves a rate of interest adjusted to take account of inflation.

   If the widow was not working:

   Let $w^{(H)}b$ = Widow's share of husband's income in period n while both are alive.

   Let $c(H)b$ = Child's share of husband's income while both alive.

   Let $c^{(H)}h$ = Child's share of husband's income while husband only alive.

   (a) Widow's compensation is given by:

   $w^{(H)}b\ \bar{a}'mf$ – This is what we in fact use.

   (b) Child's compensation is given by (ignoring the child's mortality).

   $$c^{(H)}b\ \bar{a}'mf + c^{(H)}h\ \bar{a}'_{f|}m$$

   which reduces to:

   $$c^{(H)}b\ \bar{a}'m + [c^{(H)}h - c^{(H)}b]\ \bar{a}'_{f|}m$$

In practice we use only $c^{(H)}b \; \bar{a}'_{m}$

This implies either that $c^{(H)}h = c^{(H)}b$ or that $\bar{a}'_{f|m}$ is negligible or that the product of $c^{(H)}h - c^{(H)}b$ and $\bar{a}'_{f|m}$ is negligible.

(i) That $c^{(H)}h = c^{(H)}b$ can only be justified on the assumption that on the wife's death the husband employs a housekeeper as expensive as a wife, or that the husband gets remarried. Suppose, however, he remarries a woman who can produce herself a significant income then $c^{(H)}h$ will probably be greater than $c^{(H)}b$.

(ii) What is the value of $\bar{a}'_{f|m}$?

At the time of death of the husband, for a constant amount of support for the child, $\bar{a}'_{f|m}$ has the following approximate values at 7% interest:

m	f	n	$\bar{a}'_{f\|m}$
50	45	17	.27
50	45	5	.04
30	30	21	.17
35	45	17	.41

Do these values applied to $c^{(H)}h - c^{(H)}b$ give negligible results?

On the whole probably they do, but in a high income case should we not examine this aspect a little more carefully?

2. **If the Widow is working:**

Let $w^{(H+W)}b$ = the widow's share of the joint net income while both alive.

(a) The widow's compensation is given by:

$w^{(H+W)}b \; \bar{a}'_{mf} + w^{(W)}w \times \bar{a}'_{m|f} - w^{(W)}w \; \bar{a}'_{f}$

which reduces to:

$[w^{(H+W)}b - w^{(W)}w] \; \bar{a}'_{mf}$

(b) A problem arises in the case of a widow who was working at the time of the husband's death, but after her husband's death she moved to another area (say to live with her mother). In the new area she now earns an amount significantly different from the amount she earned before her husband's death.

If we assume that whenever her husband had died that similar circumstances would apply, the widow's compensation becomes:

$[w^{(H+W)}b - w^{(W')}w] \; \bar{a}'_{mf}$ where (W') is the widow's new income, which can be greater or less than (W).

(c) The child's compensation is given by: (ignoring the child's mortality)

$c^{(H+W)}b \; \bar{a}'_{mf} + c^{(W)}w \times \bar{a}'_{m/f} + c^{(H)}h \times \bar{a}'_{f/m} - c^{(W)}w \; \bar{a}'_{f}$

which reduces to $[c^{(H+W)}b - c^{(W)}w] \; \bar{a}'_{mf} + c^{(H)}h \; \bar{a}'_{f/m}$

or $[c^{(H+W)}b - c^{(W)}w] \; \bar{a}'_{m} + [c^{(W)}w + c^{(H)}h - c^{(H+W)}b] \; \bar{a}'_{f/m}$

Again we can say we are not giving quite enough to the child, which can be significant if we are dealing with high incomes and a wife older than the husband.

(d) If we now say $c^{(H)}h = c^{(H)}b$ (more doubtful due to the tax implication on a joint income and a widower's income).

Then we have the child's compensation reducing to:

$$c^{(H)}b\ \bar{a}'_m - [c^{(W)}w - c^{(W)}b]\ \bar{a}'_{mf}$$

$$\text{or } [c^{(H+W)}b - c^{(W)}w]\bar{a}'_m + [c^{(W)}w - c^{(W)}b]\bar{a}_{f/m}.$$

$c^{(H)}b$ and $c^{(W)}b$ represents the child's share of the husband's net income and the child's share of the wife's net income, while both husband and wife are alive.

Tax is levied on the joint income $^{(H + W)}b$ while both are alive according to a certain formula. Do we arrive at $c^{(H)}b$ and $c^{(W)}b$ by deducting from the husband's net income before tax and the wife's net income before tax, the tax on the joint income split in proportion to the separate net income before tax?

3. **Remarriage of Widow:**

We have statistics from which we can say that $\bar{a}'_f$ (an annuity on the life of a female) becomes $\bar{a}'_f \times r_f$ (an annuity on the life of a *widow* ceasing on death or remarriage). We admit that these statistics apply to all widows of a given age irrespective of the length of widowhood, number of children, opportunity to meet marriageable men, appearance and intelligence of widow etc. The court decides on the value of r_f representing the factor which should be applied to reduce it to an annuity for a *now widow* aged f, to cease on death or remarriage.

Let us accept the factor r_f as decided. Then we have,

Annuity for life of a widow $= \bar{a}'_f$

Annuity for life ceasing on remarriage $= \bar{a}'_f \times r_f$

Annuity for life commencing on remarriage $= \bar{a}'_f\,(1-r_f)$

Before husbands' death the widows' expectancy (on the assumption a new husband after her now husband's death can provide the same support) is

$$\bar{a}'_{mf} + \int v^t\,{}_tp_m\,\mu_{m+t}\,{}_tp_f\,\bar{a}'_{f+t}\,(1-r_{f+t})\,dt$$
$$= \bar{a}'_f - \int v^t\,{}_t\,{}_m\mu_{m+t}\,{}_tp_f\,\bar{a}'_{f+t}\,r_{f+t}\,dt.$$

After the husband's death the expectancy is:

$$\bar{a}'_f\,(1-r_f)$$

The compensation is therefore

$$\bar{a}'_f \times r_f - \int v^t\,{}_tp_m\,\mu_{m+t}\,{}_tp_f\,\bar{a}'_{f+t}\,r_{f+t}\,dt$$

which can be written

$$\bar{a}'_{mf} \times r_f + [\bar{a}'_{m/t} \times r_f - \int v^t\,{}_tp_m\,\mu_{m+t}\,{}_tp_f\,\bar{a}'_{f+t}\,r_{f+t}\,dt]$$

now the $\int$ is greater than $\bar{a}'_{m/f} \times r_t$ unless $r_f = 1$ (i.e. chance of widow's remarriage is zero).

In practice we apply r_f to $\bar{a}'_{mf}$ which is to say we deduct too little.

The following can be shown at 7% interest.

H	W	Assumed deduction accepted for a widow	Deduction to be made from a mf
40	35	40%	44%
50	30	55%	68%

Theoretical arguments perhaps, but we should bear this aspect in mind when quoting statistical deductions to be applied to $\bar{a}'_{mf}$.

4. **Interest Rates:**

Life annuities can be bought from an Assurance Company and to reproduce the annuities quoted, related to S.A. census mortality, interest at $8\frac{1}{2}\%$ has to be used at present.

Annuities from R20 per month or more can be bought for temporary periods, or for whole of life. These annuities can be for a fixed amount or increasing at any given rate decided, e.g. escalating at 2%, 3% etc. Under present conditions these annuities are only partially taxed. In a large number of cases the tax to be paid is negligible. The argument that, for a widow, an annuity ceasing on remarriage cannot be purchased is quite irrelevant. Any compensation awarded implies that at the end of the average period of support the capital is exhausted. In the case of a widow it is implied that after say 10 years of unmarried life the capital is exhausted and the compensation is calculated on this assumption. The widow has to decide for what period she has to invest her reward. An annuity for a limited period is an appropriate investment. Under these circumstances, at the present time a basic rate of capitalisation of $7\frac{1}{2}\%$ to 8% can be justified. We can well have a differential rate of interest when considering children's compensation. If we have a child with an assumed period of support of 1 year then a rate of interest for this child could be at $3\frac{1}{2}\%$ as the only suitable investment will be a Building Society's savings account.

Investment in Debentures is problematical, are they readily available at the time of award?

If the award is in Bantu case will the award be paid to the Bantu Affairs Commissioner, if so then we will not get such a high rate of interest that we might get otherwise.

Can we expect that the plaintiff is expert in investments? If the plaintiff employs an investment advisor, how much will be charged for the advice?

When we are dealing with a child who has been injured and will in the future lose income, or in the case of some medical expenses which will occur in 10 – 15 years time, then during the period of deferment of the loss of income or expense, we are well justified in using an interest rate higher than that used when *capital and income* has to be drawn. During the period of deferment we might use $8\frac{1}{2}\%$ but only $6\frac{1}{2}\%$ after the period of deferment.

5. **Hazards and Contingencies:**

Deductions under this heading are entirely at the discretion of the Court, but should we not give some thought to the subject.

What are the hazards?

(i) Periods of sickness or other accidents that might have reduced the income.

This depends upon what progression of income we have assumed in the future and who we are considering e.g. A bank clerk assumed to progress to General Manager – high hazard; if assumed a moderate progression – low hazard.

(ii) Divorce – wife would lose certain amount of support. Under South African conditions, is this negligible?

NB? (iii) War or major riots – is this negligible over a long period? It is not the extra death risk but the very possible reduction of income.

(iv) Chances of further children – During the dependancy of further children the shares of the now survivors are lessened. Should we not calculate that if there had been 1, 2, 3 further children, what percentage deduction should be made — as a guide to the court.

(v) Deductions for hazards from children's compensation can be differential due to the shorter period of support.

? (vi) In injury cases the deduction from earnings before the accident could well be less than the deduction from earnings after the accident.

6. **Arithmetic of Deductions:**

Let us suppose that in the case of a childless widow aged 25 the court decides that the following deductions are appropriate:

(i)	Remarriage	70%
(ii)	Hazards	10%
(iii)	Chance of further children	15%
(iv)	Accelerated value of estate	R2 000

Then if the gross prospective compensation calculated is R40 000 we have:

Gross	40 000
Less remarriage	28 000
	12 000
Less hazards	1 200
	10 800
Less chance of children	1 620
	9 180
Less accelerated value	2 000
	7 180

It does not matter of course, in what order you make the percentage deductions. I have seen the argument that the sum of the deductions is (.7 + .1 + .15 =.95) and the arithmetic has been:

Gross	40 000
Less accelerated value	2 000
	38 000
Less deduction (95%)	36 100
	1 900

Clearly quite erroneous.

It, therefore, behoves us to set out the correct arithmetic on hypothetical assumptions.

Bear in mind that no deductions can be made from accrued damages for remarriage and in the majority of cases, for the chance of further children. This leads us to make our calculations at the date of assessment when facts are known and not at the date of death. Bear also in mind, that the law does not allow interest on accrued damages before the defendant is "In Mora" i.e. before the defendant is in a position to know what the amount of the damages are.

7. **Income Tax:**

Increases in earnings come about from two factors:

(i) increase for merit and service and
(ii) the effect of inflation and the rise in the cost of living.

I think we must separate these two factors.

Not only in part but what is valid

Very broadly speaking a rise in income brought about by *inflation alone* does not attract a higher marginal rate of tax. The tax structure changes in that if the tax on an income of I is p% then if due to inflation alone this income is now I + K the tax is still approximately p% of the new income. Therefore, we are not being fair to the claimant if we set out an income progression representing increases due to merit, service *and* inflation, and then deduct tax at the current rates applicable to such increasing income.

8. **Deductions for Accelerated receipt of benefits:**

The authors suggest that an asset say of a savings account with a building society should be assumed to "roll up" with the interest added and therefore, the factor $\bar{A}'_m$ f should be at the basic rate of interest less the "roll up" rate. How valid is this assumption?

If the money is on a savings account, it is probable that it is being maintained for the annual family holiday, or savings for some special purchase of household equipment. The account in these circumstances would be cleared virtually each year. Generally we will not have allowed a reduction in the net earnings for such saving and, therefore, the widow's expectancy of inheritance of the savings account would be unity and the deduction for accelerated receipt zero.

It may be that the family spent each year the interest earned but left the capital, then theoretically we would use $\bar{A}'_m$ f at the basic rate of capitalisation, and add interest expected on to the family income for apportionment.

The case where Workmens Compensation is paid needs some thought. The Commissioner can and will join in the action against the defendant. The Commissioner will state the capitalised value of his awards (the award will probably be in the form of an annuity to the widow until remarriage and an annuity to children until age 17). The Commissioner works out his capitalised value on certain interest, mortality and remarriage assumptions. These assumptions will almost without doubt differ from the assumptions made by the Actuary in any report he may make, and again almost without doubt the Commissioner's capitalised value will be greater than the capitalised value of the Commissioners award on the basis of interest mortality and remarriage considered appropriate by the Court.

If the Commissioner claims the amount of his capitalised value the claimant is in an unfortunate position.

The claimant expects a total compensation calculated less the value of the Workmens Compensation award capitalised on the *same basis*. She gets, however, a lesser amount. If the Commissioner insists on being reimbursed on his basis of calculations, should we not advise the Court that the "balance" due to the claimant must be increased by the difference between the two bases of calculation?

In a case of compensation for loss of earning power due to injury, it sometimes appears that an ill health retirement pension has been obtained from the company's pension fund of which the claimant was a member. On first thought, one would be inclined to deduct the value of this ill health pension fund from the gross capitalised loss of earnings calculated. The law, however, will not allow this (see Oberholzen v Santam N.P.D. 20.10.69 Fannin J).

It was held that the only deduction that could be made was on account of the amount of the ill health pension to be received *after age 65* (the normal retirement date) but no deduction should be made for the ill health pension to be received *before* the normal retirement age.

Mr. D.T. Fabian said:

I would like to start by saying how much I enjoyed Mr. Murfin's contribution. I hope it is not out of place for me to congratulate him; he has obviously put a lot of work into it and it has given me much food for thought.

I would first like to say that whilst I agree entirely with the author's statement that the actuary should make his own independent assessment of any case, I also feel that it is important to realise that the lawyers and judges are not going to be impressed by an over-detailed report and that it is right to use assumptions that are readily accepted by the Courts.

This is not to say, however, that one should always be bound by decisions of the Courts. I think that it is right from time to time to take a tilt at the law because some decisions are bad and they are occasionally reversed. It can, however, be a frustrating experience. A former partner of mine appeared in a case before the Assessment of Damages Act was introduced and gave evidence on a particular point, which he had dealt with in the actuarially correct way but which the Courts had always treated in a different and incorrect way. Another actuary also gave evidence to the effect that he had used the actuarially incorrect method, although he agreed that he had only done so because it was accepted by the Courts. The judge listened carefully to the evidence and in his judgment said that although he agreed with the correctness of the actuarial approach he was bound by the decision of some previous judge in the late nineteenth century and he could not decide otherwise.

I mention this point in particular in connection with the question of ill-health pensions in injury cases. These have been referred to by Mr. Murfin and the authors and I believe that the case which deals particularly with this aspect is that of Oberholzer versus Santam Insurance Company. The judgment in this case is extremely difficult to follow and I am not at all sure that it is correct. One must always remember that a judgment in a particular case may not be relevant to any other case and I would therefore suggest that it is not necessary to accept the decision in this case blindly as applying to all ill-health pensions in injury cases.

I have one or two points on what Mr. Murfin said. He mentioned that there is sometimes a difficulty with widows' earnings where her earnings after the accident are either much more or much less than they were before the accident. In our experience cases normally take some time to settle and on the principle that all events subsequent to the accident which are material must be taken into account, I do not think that there is any difficulty in taking the widow's actual earnings at the time the claim is settled into account. I think the only real difficulty with widows' earnings is when she has been working part-time before the accident and then full-time after the accident and in such a case I think it is necessary to obtain clear instructions.

I cannot follow Mr. Murfin's arguments that the remarriage deduction should be greater because it is applied to a single life annuity, whereas it should be applied to a joint life

annuity. In any case, I think that a perfectly correct way of looking at the problem is to say that the compensation awarded to the widow is regarded as the capital value of any annuity on her life, notwithstanding that it is calculated by reference to joint life annuities, and therefore that the deduction based on a single life annuity is appropriate.

On the subject of hazards, I should like simply to say that there is often a lack of understanding on the part of a person dealing with these claims of the magnitude of the deductions which they contemplate. They seldom realise until it is pointed out to them that a 15% deduction for unemployment or sickness is tantamount to saying that the person concerned would receive no income for two months out of every year of his future lifetime. If we are assuming a rate of inflation in our calculations, then a deduction for unemployment is not appropriate because inflation generally goes with full employment. Of course, if the person concerned has had several jobs during the last few years and has been out of work for some weeks between jobs, then a deduction for unemployment is appropriate and that is a special case. Deductions for sickness are not generally necessary because most people receive sick pay. Overtime earnings may be affected, of course, and special circumstances may require a deduction, but it is not likely to be very large.

I think it is important for the actuary writing a report to quantify the possible deductions to give a guide to the lawyers, but only to make a deduction where he is aware of special circumstances.

I think it a pity that nobody has mentioned the report of the Law Commission in the U.K. entitled "Report on Personal Injury Litigation – Assessments of Damages". This was published in 1973 and contains a great deal of interesting material. In particular this report favoured the greater use of actuarial evidence in assessing compensation claims in the U.K.

Mr. A.N.J. Stretton said:

When dealing with disablement claims the actuary is likely to find himself involved with the medical profession, who sometimes tend to describe the degree of disability somewhat vaguely. The authors in section d(1) of the appendix have discussed how they would deal with a straightforward reduction of expectation of life, but the actuary would probably need more definite briefing. If he were dealing with a plaintiff aged, say, 40 who was injured in such a manner that according to the doctors his expectation of life was reduced by 5 years, is he to assume that for purposes of his calculation the plaintiff is aged 46 so that $\mathring{e}_{40} - 5 = \mathring{e}_{46}$. I think the actuary would wish to know, if it were possible, whether the reduction was in effect likely to affect his whole future lifetime in this manner, or whether it would more likely affect his post retirement longevity. In other words the shortening might have little effect on the future working lifetime. Doctors often describe disability as x%, x being derived from a schedule of injuries in the Workmen's Compensation Act. In practice x% does not bear a proper relation to the likely fall in earnings. The actuary must in fact ask questions himself or get his lawyer to do so, as to how much the plaintiff can earn in future and be guided by such factual estimates, rather than by such vague percentage, in deciding on the loss of income.

The authors rather fight shy of the difficult probability of remarriage factor. As always in applying average statistical results to the individual there is much possibility of error in this factor, but so also, even if to lesser degree, there is in all the other assumptions which the actuary has to make. Probabilities of remarriage can be derived from certain available tables and surely the court is entitled to the benefit of the actuary's knowledge of such tables if only as a guide. If the actuary cannot help, who can?

In paragraph 3 the authors refer to the possibility of settling claims in other forms than lump sums, and appear to dismiss further consideration of the alternatives as being outside the scope of their paper. I think this is a pity because in recent years there has been mounting criticism of the inequity of lump sum awards. I remember some years ago we had a visit from an eminent English actuary who dealt with this very point. One of the examples he gave related to a person who was deprived of an annual income of about R4 000 by accident and was awarded R60 000 compensation. He died

after one year. Have not the courts and the legislature applied the principle of averaging to such a degree in these compensation cases that the principles of justice are no longer observed? The court attempts to make an assessment of compensation which is fair to both plaintiff and defendant, yet in the case I have just quoted plaintiff's estate benefited hugely from the misfortune of the accident and the award, whilst the defendant was obliged to pay a sum much in excess of the actual loss suffered. We must always remember that these awards are the results of civil and not criminal actions. The defendant should compensate the plaintiff or his dependants adequately, but not penally. He is not being found guilty and being made to repay society for his guilt like a common criminal. He is being made to make restitution for damages suffered from an accident which neither he nor the plaintiff wanted to happen.

The alternative method of providing compensation is of course the annuity, and in many cases such annuity would be of a variable nature, exactly equalling the loss which the plaintiffs were deemed to have suffered, at various future periods of their lives calculated in the manner described by the authors. The amounts of such annuities would be laid down by the court, or by agreement, together with the periods or contingencies when variations would be made. I cannot believe that the complexities of such awards would present insuperable difficulties, and the majority would in any event be administered by insurance companies. In parenthesis it may be noted that the calculation of the requisite reserves for such companies would carry the actuary's duties into the short term insurance field. This method of settlement could remove one of the great imponderables of claim assessment, viz the allowance to be made for inflation. Inflationary increases in the compensatory annuity could be made from year to year when the degree of inflation was known and no assumptions would be needed. Furthermore the second ranking imponderable would disappear, viz the rate of discount, as no lump sum would need to be assessed.

The award of compensation in the form of an annuity rather than as a lump sum would probably have some unforeseen social consequences. I am convinced that in present circumstances many claims are preferred against insurance companies more in the hope of exacting large lump sums than in claims for justified compensation. Such claims would surely diminish. But of much more importance, the impossibility of placing a finite limit on claims, especially because of the inflationary element, might well make the business of compensatory insurance in its various forms such that no commercial company would be prepared to accept the risks, or perhaps the premiums therefor would be too high to be borne by the current generation. In this event the business of compensation would have to be suffered by the general community, in other words by the state, where it properly belongs.

You may well think that in these remarks I have far exceeded the scope of the paper and have trespassed into the domains of the legal profession. I confess however that I consider that in trying to assess fair awards the courts have erred in applying the average to the individual and in so doing have not awarded equitable sums either from the point of view of the plaintiff or the defendant. Both the courts and the legislature have been obsessed with the lump sum concept and have buried their heads to the obvious annuity alternative. I am not aware of any profession, other than our own, which sets such store by, and strives to achieve, equity as between individuals and I think we have a duty, which in this case should not be considered presumptuous, even to try and instruct the legislature.

Mr. J.C. Gould said:

In his opening remarks, Mr. Mitchley supported the authors' statement in paragraph 53(iii) that the actuary should keep to his own home ground. I, too, agree with this advice but I feel that, from some of the remarks made in the paper and in the discussion this evening, we are not all in agreement as to just how far our home ground extends.

On the question of the interest rate, for example, the authors suggested that a net rate of up to $7\frac{1}{2}\%$ p.a. (depending on the period of investment) should be used at the present time on the basis of yields obtainable on debentures and Mr.

Murfin stated that a net rate of at least $7\frac{1}{2}\%$ p.a., and possibly higher, was justified in view of the immediate annuities currently available from life offices. I agree that a claimant could, by obtaining expert advice, achieve these yields and on actuarial grounds alone the rates of interest suggested would be justified. However, this is an area where non-actuarial considerations are also involved and my impression is that the Courts take the view that not all claimants will invest their awards as prudently as actuaries might assume and, in addition, the Courts might well consider that at least part of the higher yield on mortgages or debentures, for example, should be disregarded as compensating for the fact that these investments are less secure than gilt edged investments. Thus, if the Courts decide, as I think they have done, that the rate to be used should be based on the way in which an average claimant will invest an award rather than on what an exceptionally prudent claimant might do, and that on this basis they favour a more moderate rate (at present 6% p.a. or $6\frac{1}{2}\%$ p.a.), I don't think that we should press for the use of higher rates because the basis for the Courts decision is not within the actuary's field.

I agree with the statement in paragraph 32 that opinions can vary widely on the likely rate of future inflation. The Courts seem to prefer a moderate allowance of 2% or $2\frac{1}{2}\%$ for inflation and here again I think that it would be better for us to accept this practical approach than to suggest something more elaborate and, on the surface, more scientific such as a rate varying according to the future period being considered, which is the method suggested in paragraph 32.

To summarise, I should generally be more hesitant than the authors, and some of the previous speakers, in departing from bases that have proved acceptable to the Courts. The problem of inconsistency of approach which the authors are highly concerned about might well have arisen because we have been too ready to apply our own judgment when this is not really justified. If actuaries generally followed the principles established by the Courts much of the inconsistency would disappear.

Some of the remarks made by a solicitor, Mr. Kimber, in the discussion on Prevett's paper probably apply to the attitude of South African judges as well as to the attitude of English judges and I'd like to quote a few sentences:

> "It would upset the judge if he thought that somebody was trying to tell him what he felt he knew better, and that was where the question of communications was of vital importance. If an actuary tried to be too precise and to take account of the niceties to too great an extent, a judge would be rather put off and say: 'This is sheer hypothesis. The rate of interest might rise by $\frac{1}{4}\%$.'
>
> " 'The money might be invested in equities or it might be in gilt-edged. Those are all fine technical points. But I am a man of common sense and I know very well that the ordinary litigant does not invest in equities or in gilt-edged. He puts his money in a building society where he knows it will be safe.' That was the sort of attitude that judges took, so if actuaries wanted to persuade the judges, as they ought to do, that actuarial science would help them, they should not be too finicky about things, or go into such details — at all events when giving their evidence — as to make the judge feel that the whole thing was an unreal theoretical exercise."

Mr. Murfin has mentioned the question of the allowance for income tax on inflated earnings. In some reports the net income that the deceased would have received is obtained by taking his expected gross income on present day scales, deducting income tax at present rates, and then adding an allowance for inflation. In other reports the same steps are taken, but in a different order. The inflation allowance is added before income tax is deducted. The two methods can produce very different results and I think that this is one area where inconsistency can easily be removed. The authors have used the first approach, that is deducting tax first and then adding the inflation allowance, and I agree with Mr. Murfin that this is the more logical method. It allows for net income to increase by the rate of inflation assumed. The second method where tax is deducted at present rates from inflated earnings is less acceptable, in my opinion, because it assumes that the rates of tax applying today to the different income bands will continue to apply to those same income bands in future, even though inflation is being allowed for. If we look

far enough ahead on this basis, everybody will eventually be paying the same rate of marginal tax.

Mr. J.M. Hutton said:

In 1953 I took out remarriage rates based on the experience for the Workmen's Compensation Fund for white widows. It appeared that the deduction for remarriage for such widows was substantially greater than that derived from British statistics then available. I feel that if a widow has suffered no loss because her husband was properly insured, no compensation should be payable. The Assessment of Damages Act contradicts this and means that the widow could be in a better position than if her husband had been killed or died in different circumstances.

In closing the discussion, Mr. L.B. Clemans said:

First I would like to thank the authors for this paper which brings to light a subject which does not seem to be tackled anywhere else in actuarial literature because the subject is peculiar to this country. One of the authors, Mr. Van der Linde, in his opening, stated very definitely that this paper was the basis for discussion. It is obvious from the discussion it has provoked and from the number of non-consulting Actuaries who have partaken in the discussion, that a fair number of actuaries are doing work at night which is not part of their normal office duties!

It was also pointed out that we are here in an unusual situation in that the actuaries are the background to a bargaining process and are not the main protagonists in the matter. This is an unusual position to be in, but I think that we should remember it. Our Courts work on an adversary system and our first duty is here to our client.

In opening the discussion Mr. Mitchley made some useful points. From the practical point of view the points that he has introduced are important. Past and the future losses must be separated, discounting must be done to the date of settlement and events that have taken effect in the past must be allowed for, (such as the fact that dependants have actually survived, the remarriage deduction must take account of the widow's present age, etc.). He is also right in pointing out that past losses must not have interest added to them.

He has commented on how the authors treat a widow who is still working. The authors make allowance for the continuing income for the widow by spreading this among the widow and her children leaving out the now deceased husband. Mr. Mitchley says that Senior Counsel states that legally the income can be apportioned to herself and her husband and the children as before; the gain would then be her husband's share of the income and the children will receive no extra benefit from this extra amount of the income that has become available. With respect, this seems anomalous to me. A husband has been expected to support his family to a reasonable extent of his income and not to the minimum standard which he can legally be forced to use. This means that the actual amount of his income that has been shared among his family has been used in assessing the damages. In the same way a widow does actually apportion her income reasonably among the family and not only to the minimum legal extent.

The distinction is important because the authors' method of apportionment decreases the total compensation to all parties because no remarriage deduction is made from the income compensation for the children; the children also receive proportionately less of the total compensation.

Compensation cases seem to me to work on the principle on what actually happens and not on what the legal minimum requirement for support is. Besides it would seem to me that the difference between the capital which a widow receives as a result of death and the extra income which she receives as the result of death should be treated differently.

Mr. Mitchley and many other speakers discussed the importance of inflation in the claim and how it should be assessed. At this stage I would like to put in the suggestion that perhaps this is not the expert evidence that an actuary can give but rather the expert evidence of an economist. The

assessment of future inflation is fairly open and I feel that an economist may be able to speak with more authority here.

I would like to turn to Mr. Murfin's part in the discussion. He has asked me to thank Mr. Fabian for his kind words about his contribution but, he does say that when Mr. Fabian had finished complimenting him someone from the back of the room said something and Mr. Murfin was not sure if it was "Hear, Hear", or "Can't hear".

I could not hope to summarise all the algebra in Mr. Murfin's paper, but I think the point should be made that perhaps greater actuarial analysis could go into this paper if it is destined for further actuarial consumption. There are points and principles which I think should be discussed at an actuarial level and I am sure this will be more palatable to other actuaries reading this paper who are used to this type of analysis. Naturally I am not suggesting that Court should be confused with the mathematical niceties but I feel sure that other actuaries will be interested.

Mr. Murfin brought out what to me was a very crucial point with regard to rates of interest. I agree with him that the fact that one can buy an annuity from an insurance company at a guaranteed rate of payment of annuity with no reinvestment problems is a turning point in our assessment of rates of interest. It does imply rates of $7\frac{1}{2}\%$ to 8% are now easily obtainable and the new taxation provisions which allow only the interest portion of annuity to be taxed has made these entirely suitable. I have not heard any argument today to dispute this and I agree with him that this is a new standard by which we must work.

He also set out other interesting and practical points in his written contribution and I would recommend all interested people to study these as I feel it is a very detailed and experienced analysis of certain problems.

Mr. Fulford has recommended that we approach the legal profession on the basis of mutual education. He is of course right and this is to be applauded. However, I feel his approach (which accords with the approach of Lord Diplock in England) may be too simplified for these assessments. The idea of using a rate of interest of about $4\frac{1}{2}\%$ to allow for future interest and inflation and assuming that the differences between interest in rate and inflation are about steady accord more with the pension fund type of approach. However, although this may work out in the long run I feel it could be unsuitable in individual clients and not an overall actuarial assessment. An approach that is not too scientific sounds well from an actuarial point of view. However, in a witness box a clever Counsel can pick up the fact that you have ignored points a, b, & c and he can make great play with these to cast doubt on your actuarial ability. I want to assure you that in these cases pain and suffering does not only accrue to the plaintiffs but very often to the actuary who stands in the witness box!

In passing Mr. Fulford did ask the following question to which I would like to reply:—

When as a result of an accident an income (such as a pension) is paid which would not have been paid if the accident had not occurred can this negative deduction be made? Except in the case of certain legal strictures (such as ill-health pensions which I'll mention later) in general such a deduction can be made even if the income for a certain period is negative; the only overall important point is that the total compensation cannot be less than zero and if it is negative the fact that a plaintiff has actually gained in total can be ignored.

Mr. Fulford did introduce the next question of whether one assumes the rate of income tax according to the present income tax tables and then allows inflation on the net income or whether one increases the income for inflation and then deducts income tax on the present tables. The difference is important as the overall rate of tax increases in the second method. The other speakers seemed to prefer the first approach but there is a point I would like to make which does allow for some justice in Mr. Fulford's approach. It is true that as incomes are affected by inflation the income tax table is usually changed accordingly. However, these changes are not made year by year in the same way that we assume inflation happens year by year and there can well be a period of 5 years before the table is changed to apply to higher and higher incomes. We last saw a major change in 1971 and it is

obvious that the present income tax table is becoming more and more heavy in relation to present incomes. This does mean that some deduction should be allowed in this respect, possibly in the overall contingency deduction.

Mr. Fabian has mentioned how past decisions from possibly the last century are still effective and this seems to him an anomaly. However, I do not feel this is so because this, I think, is the basic structure of our civilisation. The law is the law and everyone knows where they stand and changes are only made when the feeling is that these are definitely wanted, such as the last change in the Assessment of Damages Act in 1969.

He also referred to the ill-health pension anomaly and asked if this could be explained. There may be some of us who are mystified by this and perhaps I could explain it to those who are new to the subject. The decision is that where a person is injured and consequently receives an ill-health pension from his pension fund because he can no longer work, the offsetting income from the ill-health pension should be ignored up to his normal retirement age and only taken into account from there onward.

I feel that the reason for this is not entirely without foundation. If a person is injured and he happens to have a disability policy in force, this policy is ignored because it is felt that the defendant should not be allowed to benefit from the plaintiff's own prudence. In the same way it is felt that contributions to a pension fund which embraces an ill-health retirement benefit are in the same position as premiums towards a disability income policy and should be treated the same way. I would like to mention in passing that I am at present involved in a similar case where not only is an ill-health pension involved but also an ill-health gratuity and I feel there may be interesting new law made on this case because the ignoring of an ill-health gratuity can have a considerable effect.

Mr. Fabian has given us a useful yard-stick for assessing what the deduction for contingencies really means. He has pointed out that a 15% contingency deduction could mean that the deceased (or the injured plaintiff) would be off work approximately two months every year. This does seem very high but one should remember that there are other contingencies that can occur.

Mr. Goodfellow has suggested that he would not like actuaries to be legal assessers because one actuary could sit in judgement on another. I would like to say that I can think of many actuaries who would be only too willing to be in just such a position!

Mr. Gould has also suggested a rather looser overall approach but here again I feel that it is up to the actuary to do his best and let the judge use his discretion as he sees fit. Both Mr. Gould and Mr. Reed have pointed out the dangers of the fact that an actuary's report is used in many cases which are settled out of Court. In many of these reports the assumptions are made by the actuary as fairly as he possibly can; however, he has often been instructed to make assumptions and the various interested parties could be misled into thinking that this is an actuary's assumption. The actuary should be very careful to state particularly where his assumptions are in accordance with his instructions and are not necessarily what he thinks is reasonable.

I feel that Mr. Stretton's contribution is particularly valuable because he has thought of the deeper aspects on these assessments. He has suggested a new approach (such as the payment of annuities) which could be implemented. I feel that I must point out that in these assessments we are talking about law and not justice. He has pointed out the case of a man who received a R40 000 award for his loss of earning capacity of about R4 000 p.a. and who died a year later. If I may, I could quote the even more surprising example of a plaintiff in England who was injured and whose case went to the Appeal Court. You probably know that an Appeal Court only considers the evidence. While the case was in the Appeal Court the man died. The Court was in a dilemma because the fact of the man's death was obviously new evidence which was not part of the original trial. However, the Courts ruled that it would be a perversion of justice to give a dead man compensation for loss of future earning capacity and the claim was considerably reduced. The surprising corollary to this was that the wife could not claim for the loss of support

from her husband who died as a result of the accident because his claim had legally been satisfied!

I feel that I must point out that in spite of his plea there may be too many special interests involved to have a basic system of compensation changed. In fact this system is well entrenched and I feel it would be difficult because a particular system of law would have to be considerably bent to fall in with this. However, the same sort of system does apply in Workmen's Compensation cases and it might not be impossible to apply this system here.

Mr. Clay feels that he can defend a 5% rate of inflation. Again I put the question that I wonder if he could defend it as an expert witness if he were not qualified as an economist. I also agree with him that investment in Stewart & Lloyds debentures is probably uncalled for in these sort of cases. We all understand his point that Rolls Royce was also a very strong firm!

Before concluding I would like to put forward some concluding remarks of my own.

It was very interesting to see the paper discussing the attitude of an actuary in a witness box. I would again like to emphasize that we are not the main protagonists in this process. As I have said we work under the adversary system of law which asks each side to make the best of his case and it is for the judge to decide how much merit there is on each side of the case. This is an established system and it is not our function to put our ideas of the effect of such cases on society into practice. We must take care of our first duty to our clients; the law will take care of its duty to Society.

Once again I would like to thank you, Mr. Chairman, for giving me the opportunity to close this discussion and also to thank the authors of this paper for their valuable contribution on a very sparsely discussed subject in actuarial literature.

The Cape Town meeting:

Mr. John Williams, in opening the discussion, said:

Those actuaries in South Africa who have had little experience of compensation cases will be indebted to the authors for their industry in setting out the basic principles of assessing compensation for loss of support. It will also serve a useful purpose in promoting an exchange of views between those actuaries engaged in these cases.

The exercise is in essence discounting a variable annuity. As the authors point out, divergence of opinion arises in the choice of the bases. I am doubtful if the paper will succeed, or could be expected to succeed, in the authors' purpose in evolving a consistent approach, if by this they mean using similar assumptions regarding the rates of interest, inflation and so on. There will be as many different honest opinions as there are actuaries, economists or other "experts". Moreover, these opinions will be varied from time to time by the same person.

I would like to comment on a few aspects which seem to me to be worthy of a little deeper consideration.

FUTURE EARNINGS

This is a relatively simple matter where the deceased was employed by a large organisation or in an industry with a fairly predictable earnings pattern, although varying overtime can be a problem, as can the likelihood and dates of possible promotion.

Another difficulty arises where, for example, the deceased ran his own business – perhaps a shop or a farm – with the family helping. I have seen cases where the profit appeared to be unaffected by the owner's death. Was this because his contribution was negligible, was it due to a subsequent economic upsurge, or perhaps simply to inflation? Would the profit have been changed had the deceased lived?

In this context it should be borne in mind that in law there is

no obligation on the widow to seek employment – or presumably to work longer hours – to mitigate the loss sustained by her husband's death.

Another interesting practical problem in an own business situation is that the income reported for tax purposes is sometimes significantly different from actuality. Plaintiff is then clearly in a dilemma.

Since damages for loss of earnings are not taxable, I wonder why in a large case the Receiver of Revenue does not join the action to recover loss of tax.

APPORTIONMENT OF EARNINGS

The 2 : 2 : 1 principle is conveniently generally accepted in this country. But it should not be applied blindly. Consider a man earning R50 000 a year gross. Do you compensate his widow for the loss of one-half of his net income? The deceased could perhaps have been saving part of his net income to provide an estate in which the widow was only a minor beneficiary. The widow's loss may then be significantly less than the usual proportion of his net income.

At the other extreme, what about the peasant who is on a bare subsistence level, with probably a minimal cash income? A marriage by native custom is recognised to enable his widow and children to claim. But the estimation of the support lost by his dependants will not be susceptible to the conventional treatment.

As regards children, surely a child's support is less costly before he goes to school than when he is at school or university?

INFLATION AND INTEREST

The authors make reference to the effect of inflation on earnings – as evidenced by the C.P.I. However, they make no mention of the possibility of a continued improvement in the general standard of living. This is particularly important with our non-white population; the narrowing of the wage gap is likely to continue, quite apart from increased earnings due to improved productivity and inflation.

NB standard of living

I think that the authors' suggestion that the assumed rate of inflation should be that experienced over a past period of equal length is too simplistic. An examination of rates of inflation over the last 50 years will soon show that this method is not generally tenable.

It would indeed be a bold man, whether he be an economist or not, who would forecast with any confidence the average rate of increase in the general level of salaries and wages over the next five or ten years, let alone the longer periods with which we often have to deal. In Prevett's excellent paper read to the Institute in 1968, a rate of between 2% and 4% a year, was suggested as reasonable. Only six years later, this seems almost Utopian.

We must remember that normally we are dealing with a long period and must avoid being over-influenced by the immediate position.

In the same way that as in the valuation of a pension fund based on final average salary, the actuary relies on the sympathetic movement of interest rates with inflation, so we can reasonably utilise the same correlation here. In fact, in these compensation cases the actuary usually conveniently discounts at a net rate, being the excess of the rate of interest over the rate of annual earnings increases due to inflation, productively and so on.

If it is believed that a portfolio of first class equities, currently yielding between 4 and 5%, will in the long term protect income from a fall in purchasing power, this is a useful starting point. It can safely be assumed that in the long run, investors will obtain a reasonable net reward so that in the long term net rates much below this cannot, in my opinion, be accepted. Now that annuities linked to equity performance can be purchased and tax is only paid on the interest element, these can also provide a guide.

It is interesting to consider that while in theory the compensation awarded should be invested so that by recourse to interest and capital, the plaintiff can replace his lost income, once the sum has been received, different considerations arise. For example, an individual should prudently

allow for the possibility that he may live longer than the average life span on which the compensation was based. Further, whatever the period of lost support, his new capital must provide support over his whole future lifetime. In fact, the prudent recipient of substantial compensation will obtain expert investment advice and live on income only for many years. Undoubtedly the expert adviser will invest a substantial proportion of the capital in first-class equities to assist in maintaining its purchasing power. The recipient of a lesser sum of compensation is also unlikely to have recourse to income and capital in accordance with the assumptions on which his award was based. The niceties of approach in the calculation of the compensation have gone overboard. Should not some recognition of this be made in arriving at the compensation, rather than the theoretical approach now in vogue?

FORMULAE

I am doubtful if the formulae in the paper assist in making the issue any clearer. To me they appear to complicate a basically simple exercise. A specific point that worries me is in the formula in paragraph (c) of the Appendix; after the accident the widow may work longer than she would have done had her husband been alive e.g. she might have intended to stop working when all the children were self-supporting, but as a result of the accident this is not possible. Therefore the upper limit (n) of the second summation should not go beyond the year in which W_t in the first summation equals nil. Also I think the postscript "multiplied by $(1 + f)^{t-\frac{1}{2}}$" is misplaced; it should be in both summations.

GENERAL

A solicitor in the U.K. has stated that actuaries "are insatiable in their demands for facts and figures, but when this hunger has been appeased as far as possible the report which is produced is generally incomprehensible". The same purveyor of home truths also expressed the opinion that the expense of an actuary may only be justified in exceptionally large cases.

I don't think that the profession in South Africa can generally be criticised on these grounds, but we must take care. Since most assessments of compensation are merely the basis for horse trading between the rival parties, I do not think that an in-depth investigation reinforced by detailed reasoning is necessary, or even desirable, in the initial stages. The first report can be regarded as a first approximation, closer approximations can be made as the portals of the Court loom closer and more reasonable assumptions as to future earnings and so on are made by both sides. Which reminds me of Dr. Johnson's words to the effect that "the knowledge that you are shortly to be hanged concentrates the mind wonderfully."

IMPARTIALITY

Finally I would like to support the authors' plea for impartiality. The actuary must not use bases which unduly favour the side he is advising. While he personally may reap some immediate financial benefit, he is doing the profession a disservice. The actuary in giving his own opinion must only use bases which he feels can be justified under cross-examination. In practice each side's legal advisers will normally wish to argue in support of assumptions which favour their side. Where these touch upon the actuary's sphere of influence i.e. the rates of interest, inflation, mortality and so on, and where he disagrees, he should make it quite clear that the assumptions made are not his professional opinion but that he is merely carrying out some arithmetic under instructions as to bases.

Mr. H.K.U. Voigt said:

The point has been made at the Johannesburg meeting and it has also been mentioned here that it might be easier and more equitable to pay compensation in instalments "as and when" instead of in a lump sum. Such instalments would be made by the insurance company as long as dependency is deemed to have continued.

However, although this method seems much easier than the present method, there are a few pitfalls which have to be considered.

of payment by instalments.

1. We have to consider mortality. The dependant's mortality does not present a problem, but allowance must be made for the expected mortality of the deceased. The obvious answer to the actuary is to multiply each payment by the probability that the deceased would have survived had it not been for the accident. But is this practical?

2. There is also the question of expected loss of income because of unemployment, illness or disablement. The allowance should be an increasing percentage so that increases because of expected higher earnings may even be reduced to net decreases resulting from allowance for mortality, unemployment or illness.

3. Another problem is the acceleration of benefits. A reasonably correct deduction can be calculated as a lump sum and therefore no problem is encountered in the case of lump sum benefits. If instalments are being paid will the acceleration benefit be spread over the expected period of instalments or will instalments be deferred until the value of the acceleration has been absorbed by instalments that should have been made?

4. What allowance, if any, can and must be made for the possibility of further children being born who would then be entitled to a share of the earnings?

5. At the normal retirement date a deceased who was a member of a pension fund would have become entitled to pension benefits. The pension should then be calculated in accordance with the rules as at the date of retirement. But the possibility that the deceased might have withdrawn from the pension fund cannot be ignored. Another awkward problem arises if the widow is entitled to a widow's pension.

The above points were not made because I feel that there is no merit in the payment of claims in instalments. On the contrary, I regard this as a promising approach. However, I tried to point out some problems that will arise requiring some deep thought and providing a challenge to actuaries. It should be obvious that actuarial advice on compensation claims will be required whether the claim is paid in a lump sum or by instalments.

The authors subsequently wrote:

The Authors wish to record their appreciation of the many constructive comments that were made during the course of the two discussions. Apart from assisting the authors in preparing a paper on the same subject for presentation to the Faculty of Actuaries, it seemed clear that all those present welcomed the opportunity for a full discussion of the subject.

At an early stage in each of the discussions the question was raised as to the extent to which this work justified detailed treatment, or whether a broad approach was all that was required, particularly in relation to the rate of interest at which the capitalising was undertaken and the rate of currency depreciation that was allowed for. The authors have stated in the paper that they consider it essential for each element to be dealt with in detail, in order that at any point of time one's bases and methods might be fully in accord with current and expected future conditions. Mr. Murfin and Mr. Clemans in Johannesburg supported this view, as did Mr. Jacobs, Mr. J. Milburn-Pyle, Mr. Baillie and Mr. Jochelson in Cape Town. The protagonists of the broad approach considered, in respect of the interest rate and the rate of currency depreciation, that there would in the long term tend to be a fairly constant difference (the "stable money rate" of paragraph 33 of the paper) between the rate of investment yield and the rate of currency depreciation, and that all that was necessary was to choose appropriate interest and inflation assumptions such that the "real" discount rate amounted to some $3\frac{1}{2}\%$ to 4%, depending on the tax situation in each case. Against this Mr. Jacobs pointed out that the difference between the two did not follow a consistent trend, and Mr. Jochelson emphasised the point made in the paper, that the cash sum awarded has to be invested immediately, and that the yield on that investment is thus to all intents and purposes secured; in the future therefore one will have an investment yield of reasonably fixed level combined with a rate of currency depreciation that will almost certainly vary.

Mr. Richardson, in Cape Town, commented that the eventual results of the actuary's report were subjected to a considerable amount of adjustment by the lawyers, advocates, and sometimes the Court, in the light of apportionment of damages and other aspects of the negotiations; he appeared to feel that in the light of this, actuarial refinements were out of place. This view was opposed by Messrs. Baillie and Jochelson, who felt that, whatever took place subsequent to the actuary reaching his conclusions, the actuary's report and recommendations should be technically accurate.

Mr. Jochelson made the further point that it was inappropriate to offset one factor against another, and as one of the authors said in replying to the Cape Town discussion, this was of particular importance when it was borne in mind that every report held the possibility, however slight, of the actuary having to appear in the witness box and be cross-examined on his report. The authors would certainly not like to appear in the witness box without having considered each and every item in full detail.

On this latter point Mr. Williams suggested that the first report made could be of a broad nature, to be developed into more detail if and when it appeared that the matter was likely to become the subject of a trial. Mr. Jochelson, however, considered that this principle could only be applied to the wording of the report, and not to the underlying bases.

It would appear from the two discussions that the majority view is that all elements in the calculation should, on each occasion, be considered in detail.

A second general point that occurred in each discussion was the extent, if any, to which the actuary should be bound by previous Court decisions or by the likely attitude of the Judge. There was fair unanimity among those who spoke on this point that the actuary should at all times use bases that he considers to be correct, and which, naturally, he can defend with sound reasoning under cross-examination. Mr. Fabian, in Johannesburg, pointed out that in many instances Court decisions were influenced by the particular circumstances of the case in question, or else could well become overtaken by events and thus rendered inappropriate for use at some future stage.

On a related point the suggestion was made that the actuary should present his results on various alternative technical bases (for example, as to interest rate or mortality) and leave the Judge to select the one he considered correct. The authors do not feel that this approach would do the reputation of the actuaries, as expert witnesses, any good, and regard it preferable for the actuary to make up his mind as to the correct technical bases and to use and to defend them. Naturally this does not prevent him, where requested, from performing the calculations on other bases as well for illustrative purposes, but, in such circumstances, most actuaries would indicate clearly those assumptions that had been made under instruction.

There seemed general agreement that higher rates of interest than those used hitherto are justified, and Mr. Murfin drew attention to the favourable interest bases underlying immediate annuities currently available from Life Offices. The authors take the view that the important fact is to recognise the realities; to take the view that "the Court will not consider more than $6\frac{1}{2}\%$ per annum" does not, the authors submit, recognise such realities. The legal reality might admittedly be that the Court will for a while still object to anything above $6\frac{1}{2}\%$, but as already commented, the authors see no justifiable grounds for this preventing the actuary from using the rate that he considers to be technically correct.

In regard to inflation, the only consistent expression of opinion from the two meetings was that the approach recommended by the authors in paragraph 32 was unlikely to lead to satisfactory results, and, after considering the various comments made, the authors must agree that this is so. What the authors were looking for was a method of arriving at an inflation assumption, that was equitable to both plaintiff and dependant and which took the guess-work out of the exercise as far as possible. Mr. Mitchley agreed with the principle of "making a suitable allowance for inflation", as opposed to endeavouring to forecast the future rate of inflation, but suggested that the allowance in question should be the long-term rate of inflation accepted as necessary to sustain economic growth and full employment, with an addition to make allowance for the immediate period during which it was

expected that inflation would be greater than the long-term rate. The matter is still rather nebulous but the authors trust that the profession will in the near future evolve a suitable approach on this point.

Mr. Williams referred to the fact that in many cases wage increases were being granted not only on account of merit, length of service or inflation, but also in a specific endeavour to enable employees to improve their standard of living; if this could be illustrated to apply in a particular case, there was every reason for incorporating such increases as well.

The allowance for income tax on earnings expected to have been received was fully discussed at both meetings, in particular whether the rate of tax should be calculated on income including future increases designed to offset the effect of depreciation in currency values or on the "real" value of income (i.e. excluding increases on account of depreciation). The general view was that the rate of income tax should be calculated on future earnings excluding any increases on account of inflation.

Another point discussed was the tax basis to be used in calculating net earnings. From certain comments made it would appear that the authors may not have expressed their views sufficiently clearly in the paper; their view is that if a particular salary or wage is to be used as the starting point for the assessment of the future trend of earnings, the net amount of those earnings after tax must be determined having regard to the income tax basis in force at the time that those earnings were being received. This seems the only logical way of arriving at the net earnings at that time. A problem admittedly arises when determining the income tax to be deducted from future increases, if any, granted for reasons other than inflation; but the authors see no greater justification for adopting, for this purpose, say, the tax basis in force at the time that the assessment was made, than there is for continuing to use the tax basis upon which the salary forming the starting point was translated from a gross to a net form.

The next topic was the allowance to be made for the remarriage of a widow plaintiff. Mr. Stretton contended that

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The next topic was the allowance to be made for the remarriage of a widow plaintiff. Mr. Stretton contended that actuaries should not fight shy of quoting a statistical remarriage deduction; Mr. Clemans and Mr. Mitchley said that even if a deduction was not quoted in the actuary's report he would sooner or later be asked for his comments. Mr. Murfin felt that the actuary should, in order to illustrate the correct sequence of deductions, set out in his report the arithmetic of arriving at the net result from the initial gross figures, and for this purpose it was necessary to place a figure upon each of the various allowances that were to be made. Mr. Hart made the same point in regard to quoting practical examples of the application of the results given in the report. Mr. Baillie also contended that a percentage deduction should be quoted.

As the law currently stands in South Africa, someone has to form an idea of the allowance to be made for the possible remarriage of the widow. The question then is, who is the most competent person to take this decision? Is it the actuary, who has available statistics from which average probabilities of remarriage can be derived? Or is it the duty of the Judge or, if the matter does not become the subject of a trial, the legal practitioners involved, persons who are far more closely associated with the widow and who have a greater degree of experience in the course of their daily work of the vagaries of human nature? Or can the decision only be taken by all of the aforementioned persons putting their heads together, in which event, who is likely to have the greatest say in the matter? Provided the actuary makes it perfectly clear that any statistical deduction he quotes is one that refers entirely to the "average" widow (whatever that might mean), and the lawyers adjust this figure in a responsible manner in the light of the circumstances of the widow concerned, it would appear that the third alternative quoted above is the most practical and the least of the three evils.

The authors still prefer to avoid quoting a statistical percentage unless and until they are asked for one, i.e. they avoid the possible disadvantages under subsequent cross-examination of having volunteered the information. It seems clear that this is a topic upon which liaison between the actuarial and the legal professions is of paramount importance, a matter that is referred to again later.

Mention was made of the "select" element in probabilities of remarriage. This is undoubtedly true, but in view of the paucity of data in this regard it would appear that any adjustment on this account must be made along with the other adjustments referred to above.

While on the question of marriage, one speaker raised the question of a single female claiming compensation for loss of income as a result of disablement, in particular the allowance to be made for the possibility that she may have married had the accident not occurred. This would imply that her claim related only to the period during which she would have earned her own income, but one of the authors who has encountered this problem understands that the claim can equally cover loss of support through now being either unable to marry or able only to marry below the financial level that would otherwise have been the case. In such event it is theoretically necessary to estimate when the plaintiff would have married and the likely level of income of her husband; in practice it is usually acceptable to assume that her financial expectation after her marriage would have been at least equal to her earnings had she not married, and thus to base her originally expected overall income on the assumption that she would not have married.

Another subject on which several speakers commented was the adjustment for contingencies. The authors fully support Mr. Mitchley's contention that if the bases over which the actuary and the lawyer have reasonable control are determined with suitable enterprise and precision, the need for further adjustment for "contingencies" becomes minimal. Far too many occasions have been encountered by the authors where a cavalier deduction of "the usual" or "the customary" contingency allowance has been made, and it is clear that a factor that in some instances may have justification has frequently been abused. Mr. Jochelson referred to instances where deductions for contingencies were made on the argument that there would be a loss of income if the person concerned were to be absent from work on account of illness, while in actual fact the nature of the person's employment was such that substantial ill-health benefits would have come into play and no interruption in earnings would in fact have been encountered. It is of interest to note from Prevett's writings that in the U.K. the deduction seldom exceeds two percent – compare that with the 10% to 20% we so often encounter in South Africa.

Mr. Stretton spoke strongly in favour of awards being made in the form of an income, rather than a lump sum, and discussed the many problems that would thereby be avoided, the remarriage allowance being an obvious example. It seemed clear from various comments made on this subject that the "income" approach would be highly welcomed if it were possible, but Mr. Voigt pointed out certain practical problems that would first have to be ironed out. He cited, for example, that a deduction has to be made from the gross value of income lost to allow for the fact that, as a result of the death of the deceased concerned, certain assets in the estate have accelerated in value in the hands of the dependants, and this is most appropriately allowed for by means of a deduction from the *capital* value of gross income lost. A second problem was the fact that the income for which compensation was being granted was dependent for its payment each year not only on the probability of survival of the recipient to each future year but also the probability of survival of the deceased breadwinner to each future year; how was this to be allowed for should awards be made in the form of an income?

The formula in paragraph 13 of the paper was intended to be of general application, applicable equally to the widow and each child or other dependant of the deceased. Mr. Murfin, in a most comprehensive and valuable contribution to the discussion, pointed out that the value of ${}_tk_y$ should theoretically incorporate the probability, when considering one particular dependant, that other dependants might have died in the interim, thereby enabling the value of ${}_tk_y$ to be increased. In practice, this point is dealt with by the assumptions usually made that (a) the mortality of the children during their period of dependency could be ignored, and (b) that if a wife dies the husband would tend either to remarry or to engage the services of a housekeeper, either of which would result in the children's share of the earnings being unaffected, or even to retain the "saving" for himself; the first and second possibilities are of course the most likely.

A number of speakers referred to claims arising through disablement, as opposed to death, and it is clear that the authors could well have spent more time on this particular aspect. Several members pointed out that, as the law currently stands, the capitalising of the future income that the disabled person would have received must be made taking into account his current survival prospects, which may be lower than those which would have been applicable had the accident not occurred. It was clear that this principle could lead to considerable inequity if the disabled person was alive, but only just, at the time that the matter was finally decided upon. It was pointed out that the dependants of the disabled person could institute a separate claim for compensation in respect of the shortening of the disabled person's longevity, but that this was a process fraught with many problems. Mr. Jochelson in particular argued very strongly that the assessment of loss in the case of a disabled person should show the loss in respect of each of the two periods concerned, i.e. the actual expected future life time and the period thereafter by which the original expectancy had been reduced, and that the legal profession should investigate the inconsistencies of the present legal approach.

On the question of disablement claims, many speakers referred to problems in deciding to what extent, if any, a deduction should be made from the value of earnings lost to cater for benefits that may have arisen, for example, under the Workmen's Compensation legislation, ill-health retirement pensions from pension funds to which the disabled person previously belonged, or from permanent health insurance policies, etc. Once again legal practice and precedent enters this matter and as was indicated in Johannesburg there is at least one Court decision on the matter that could well be inappropriate as a statement of the general situation that should apply. This is an aspect that clearly needs review by the legal, assisted by the actuarial, profession.

Mr. Goodfellow spoke on the subject of a Judge sitting with an actuarial assessor, and his feeling was that while the principle was good he considered that the actuary in question sitting as an assessor could find himself in an invidious position. The authors feel, nevertheless, that this would be preferable to leaving a Judge to arbitrate between two actuaries, in which event his action can only be that of taking a mid-point between the two, which could produce inappropriate results. Mr. Jochelson felt that the use of an actuarial assessor could be well worthwhile.

There was agreement with the principle that actuaries involved in these matters should adhere to their own home grounds, although Mr. Jochelson correctly pointed out that sometimes actuaries do have sufficient experience in other fields to be able to speak with authority on those aspects. What the authors are concerned about is the tendency of cross-examining advocates to try to draw the actuary into unfamiliar fields, and this should clearly be opposed.

There seemed general agreement with a principle of impartiality, but it is perhaps necessary here to distinguish between the actuary's participation in respect of the facts to be allowed for and in respect of the technical bases to be applied. Inevitably the actuary finds himself drawn into discussions of the former and it is to be expected that in that respect he will tend to work "for" his client; the point is that the final responsibility for justifying those facts rests with the lawyer. It is in respect of the second area, the technical bases, that the authors consider that there is no question of the actuary working for one side or the other; his bases should be the same in a particular case whether he was engaged on behalf of the plaintiff or of the defendant. It is this that the authors have in mind in referring to impartiality.

Finally the authors would ask, where do we go from here? Views have been expressed on the matter, probably for the first time in full meetings of the profession in South Africa, and it seems that while there is a large measure of agreement there are also significant areas which merit further discussion. Remarriage allowances and rates of inflation are two points in question. The authors thus repeat their verbal request at the Johannesburg meeting for a liaison with the legal profession in discussing matters of common interest, with a view to arriving at solutions to the problems involved in making sound and equitable assessments of damages.