PUBLIC SERVICE SUPERANNUATION ACCOUNT

ACTUARIAL EXAMINATION

AS AT DECEMBER 31, 1972

Department of Insurance,
Ottawa, Canada.
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Public Service Superannuation Act - Part I

Report on Actuarial Examination of the Superannuation Account in the Consolidated Revenue Fund as at December 31, 1972

In accordance with instructions and pursuant to section 35 of the Public Service Superannuation Act, we have conducted an actuarial examination of the Superannuation Account in the Consolidated Revenue Fund and have the honour to report thereon.

The report is divided into the following sections.

I. Terms of the Superannuation Plan as at December 31, 1972

Amendments

The previous actuarial examination was made as at December 31, 1967. Between that date and December 31, 1972, a number of changes have been made in the Public Service Superannuation Act the most significant of which are summarized in the following.

(1) Prior to the amendments in 1971, section 12 of the Act provided that after completing five years of service a contributor retiring at age 60 or over would be entitled to an immediate annuity and a contributor retiring before age 60 would be entitled at his option to a return of contributions*,

* For any contributor who has reached age 45 and has to his credit 10 or more years of pensionable service, the return of contributions option is not available with respect to any period of pensionable service after September 30, 1967.

to a deferred annuity commencing at age 60 or to an annual allowance commencing immediately or on attainment of age 50, if later. The amount of the allowance was the actuarial equivalent of the amount of the deferred annuity. The Act now provides that in addition to contributors who retire at age 60 or over, those who retire voluntarily after attaining age 55 with 30 or more years of pensionable service to their credit will also be entitled to an immediate annuity. Other contributors retiring voluntarily before age 60 continue to have options similar to those in effect before the amendment, except that the amount of the annual allowance will be equal to the amount of the deferred annuity reduced by 5% multiplied by a factor depending on age and length of pensionable service. For a contributor retiring after attaining age 50 with not less than 25 years of pensionable service, the factor is equal to 30 minus the number of years of pensionable service, or 55 minus his age if greater, where age and service are calculated to the nearest one-tenth of a year. For others, the factor is equal to 60 minus the attained age to the nearest one-tenth of a year.

A contributor retired involuntarily for reasons other than misconduct, who has attained age 55 and completed at least 10 years of service in the Public Service is entitled to options similar to those listed above for contributors below age 60, but in determining the amount of allowance the factor used may be taken as equal to 30 minus his years of pensionable service; moreover, any part of such reduction may be waived by the Treasury Board.

(2) Subsection 10(3) was amended to provide that the reduction to the basic annuity as a result of co-ordination with the Canada and Quebec Pension Plans will be based on the Year's Maximum Pensionable Earnings (Y.M.P.E.) as defined in the Canada Pension Plan for the year in which the contributor ceased to be employed and the two immediately preceding years. Prior to this amendment the reduction was based on the Y.M.P.E.'s for the year in which the reduction took effect and the two immediately preceding years. As the Canada Pension Plan provides for annual increases in the Y.M.P.E. related directly or indirectly to increases in certain indices, this change will prevent the reduction from being based on salary quite unrelated to the average salary on which the basic annuity is calculated.

(3) The provision that any allowance to a widow suspended by reason of her remarriage would be reinstated in the event of the death of her husband by that marriage, provided she had not requested and received a lump sum settlement, was extended to permit reinstatement of her allowance also in the event of dissolution or annulment of that marriage if no lump sum settlement had been made.

(4) The definition of a child eligible for allowances on the death of a contributor was amended to include in addition to any child under age 18, any child under age 25 who is unmarried and who has been in full-time attendance at a school or university substantially without interruption since reaching age 18 or the death of the contributor, whichever occurred later.

(5) Section 34 of the Act has been amended to provide that there will be credited to the Account in each fiscal year an amount representing interest on the balance to the credit of the Account calculated at the rate of interest stated in the most recent actuarial report laid before Parliament pursuant to section 35 of the Act to be the interest rate on which the valuation referred to in that report was based. In addition there will be credited to the Account supplementary interest equal to the excess of (a) an amount representing interest at such rates and calculated in such manner as may be prescribed by regulation over (b) the above described amount representing interest at the valuation rate of interest, less (c) any amounts applied by the Minister of Finance in that year toward reducing the amount of any instalments required to be charged to the Consolidated Revenue Fund in respect of increases in the cost of benefits to contributors arising from salary increases applicable to groups of Public Service contributors or in respect of any actuarial deficit in the Account as shown in the latest actuarial report.

(Certain additional amendments contained in Bill C-52, presented to the House of Commons while this report was being written, are referred to in sections IV and VI.)

Coverage

The Public Service Superannuation Act requires contributions from and grants benefits to every full-time employee in the Public Service who has attained age 18 and is in receipt of an annual salary of at least $900, subject to a few exceptions.

The term Public Service as used in the Act includes all positions in any department or portion of the executive government of Canada, of the Senate and House of Commons, the Library of Parliament and any board, commission or corporation listed in a Schedule to the Act.

Persons engaged as sessional employees, postmasters or assistant postmasters in revenue post offices and some others, may be designated as contributors by the President of the Treasury Board either individually or as members of a class.

The main groups of persons employed in the Public Service to which the Act does not apply are part-time employees, persons engaged locally outside Canada and employees covered by pension plans established by their employers as is the case with some Crown corporations.

Two main groups of persons are entitled to receive benefits under the Act, namely:

(a) former contributors who become entitled to lump sum payments, immediate or deferred annuities or immediate or deferred annual allowances payable out of the Account; and

(b) widows and children who are entitled to annual allowances payable out of the Account by reason of death of a husband or parent while an active contributor to the Account or while entitled to an annuity or allowance payable from the Account.

Amounts may also be payable to the estates of deceased contributors or former contributors in certain cases where there are no eligible widows or children entitled to receive annual allowances.

Pensionable Service

The amount of any annuity or allowance to which a contributor or his widow or children may become entitled under the Act and in some cases the reduction factor used in determining the amount of an annual allowance payable to a contributor depend on the number of years of pensionable service to the credit of the contributor at the date he ceases to be employed in the Public Service.

"Pensionable Service" of a contributor is defined in the Act and includes in general terms any period of service in the Public Service for which he has been required to contribute or has elected to contribute, if eligible to do so, and such other types of service for which he has elected to make special contributions as required by the terms of the Act. The periods of service in the Public Service or in other employment for which he may be eligible to elect to contribute include the following:

(a) a period of service before becoming a contributor under the Act during which he was employed in the Public Service and was receiving a salary,

(b) a period of service in respect of which he has received any amount by way of a return of contributions or other lump sum payment under the Act,

(c) a period of active service in the forces during World War II or with the Korean Special Force prior to becoming a member of the Public Service,

(d) a period of pensionable full-time service with the Canadian Forces, the Royal Canadian Mounted Police, or an employer with whom a reciprocal transfer agreement has been entered,

(e) a period of service in civilian war service of a kind specified by regulation,

(f) a period of service in pensionable employment, immediately prior to becoming employed in the Public Service, subject to a pension plan approved by the President of the Treasury Board for this purpose.

Summary of Benefits

Further explanatory notes regarding benefits, as indicated in the following summary, are given in Appendix 1 of this report. (Supplementary benefits to offset loss of purchasing power are provided under another Act and are described in Appendix 2.)

(a) Contributors with less than five years of pensionable service

With a few exceptions, the only benefit to which a contributor in this category is entitled upon termination of service is a "return of contributions" (Note 1).

(b) Contributors with five or more years of pensionable service

(i) Contributors employed in Public Service at date contingency occurs

Contingency	Benefit
Retirement because of age or age and service (Note 2)	Immediate annuity (Note 3)
Retirement because of disability (Note 2)	At option of contributor (Note 9): A. immediate annuity (Note 4), or B. cash termination allowance (Note 5) or return of contributions, whichever is greater
Termination for reasons other than age, age and service, disability, misconduct or death (Note 2)	At option of contributor (Note 9): A. return of contributions, B. deferred annuity (Note 7), C. annual allowance payable immediately, if he is age 50 or over, and otherwise upon attaining age 50
Dismissal because of misconduct	A. Return of contributions, or B. with the consent of the Treasury Board, the whole or any part specified by the Treasury Board of any benefit to which the contributor would have been entitled had he ceased to be employed for a reason other than misconduct (Note 8)
Death leaving no widow, or eligible children	Return of contributions to estate
Death leaving widow and/or eligible children	Annual allowance (Notes 10 and 11)

(ii) Contributors who have ceased to be employed in the Public Service and are entitled to annuities or annual allowances

Contingency	Benefit
Disability before age 60 while entitled to a deferred annuity or an annual allowance	Immediate annuity (Note 4)
Death leaving no widow or eligible children	Return of residual amount of contributions to estate (Note 11)
Death leaving widow and/or eligible children	Annual allowance (Notes 10 and 11)

Contributions

By Contributor

(a) Current Service

The rates of contributions for contributors are

6.5% of salary for males

5.0% of salary for females

reduced in each case by the amount that the contributor would be required to contribute under the Canada Pension Plan (C.P.P.) or the Quebec Pension Plan (Q.P.P.) in respect of that salary if that salary, expressed in terms of annual rate, were the total amount of his income for the year from pensionable employment as defined in that Act and that Act applied to his employment. (For example, in 1974, the C.P.P./Q.P.P. required contributions of 1.8% of that portion of annual salary between $700 and $6,600 as earned.)

Contributions cease after a contributor has to his credit 35 years of pensionable service.

(b) Prior Service

As stated earlier in this report, a contributor may count as pensionable service certain types of prior service for which he elects to contribute. In general, if an election for a period of pensionable service is made by an employee within one year after he last became a contributor under the Act, the amount that he is required to contribute is equal to the total annual contributions that would have been made during that period of service at the rate of contribution in force for current service at that time applied to the salary authorized to be paid to the contributor at the most recent date of becoming a contributor, together with interest. The amount of the interest is equal to simple interest at 4% per annum from the middle of each fiscal year in which contributions would have been made, if the contributor had been making such contributions during the period for which he elected to pay, until the date of the election.

For some major types of prior pensionable service for which a contributor elects to pay, the amount of contribution required is double that determined by this general rule. Included in this category are

(i) any period of service in pensionable employment, prior to becoming employed in the Public Service, to the credit of the contributor in a superannuation or pension plan, approved by the President of the Treasury Board for purposes of the Act, which had been established for the benefit of persons engaged in that employment, and

(ii) any period of active service in the forces in World War II, where the contributor was not employed in the Public Service immediately prior to enlistment in the forces.

If a contributor makes an election for a period of pensionable prior service more than one year after becoming a contributor the amount of contribution that he is required to contribute is based on his salary at date of election.

Any contributor electing to contribute for pensionable prior service must be medically examined as prescribed by regulation, unless he was employed in the Public Service, or was a member of the Canadian Forces or R.C.M.P. for a period of at least five years immediately prior to last becoming a contributor. If a contributor makes his election more than one year after last becoming a contributor he must pass the medical examination for the election to be valid. For other elections, if the contributor fails to pass the medical examination when required, benefits related to such pensionable prior service are limited to a return of contributions, unless the contributor continues to be employed in the Public Service for a further period of not less than five years after the date of the examination or is again medically examined and passes the examination.

The total amount of contributions for prior service determined in accordance with the above rules may be paid in a lump sum at date of election or by monthly instalments. If a contributor, at date of election for a period of prior service, is under age 45, the monthly instalment period may not extend beyond his 65th birthday; if the contributor is age 45 or over, the monthly instalment period may not be longer than 20 years. Monthly instalments are computed in accordance with regulations on the basis of the Canadian Life Tables No. 2 (1941) Males or Females, as the case may be, and interest at 4% per annum.

By Employer

The Government and the Public Service Corporations, as employers credit the Account with amounts matching the contributions of their respective employees to the Account. In addition, the Government credits the Account with such amounts as, in the opinion of the Minister of Finance, may be required to meet increased liabilities resulting from salary increases applicable to groups of its employees or may be required to meet the cost of benefits payable under the Act as shown by the most recent actuarial report on the Account.

The "matching credits" by the Government are made in the fiscal year following the year in which the contributions were made by its employees. The technique for financing the other two types of employer contributions is to credit to the Account the full amount estimated to be required in the fiscal year that the salary increase is authorized or the actuarial report is laid before Parliament and to charge such amounts to the Consolidated Revenue Fund in five equal annual instalments beginning in such fiscal year.

In its role as custodian of the Account, the Government credits the Account with amounts representing interest on the balance in the Account from time to time calculated at the interest rate assumed in the preceding actuarial valuation and at such supplementary rate as may be provided by regulation. However, the Minister may apply such supplementary interest to reduce the instalments being charged to the Consolidated Revenue Fund in respect of increases in liabilities due to salary increases and in respect of actuarial deficiencies.

In accordance with regulations the combined rate of the basic and supplementary interest rates is linked to the investment yield of the Canada Pension Plan; in effect it is calculated each three months as if the net income to the Account had been invested, since the Account started in 1924, in 20-year Government of Canada Bonds with a coupon interest rate equal to the average yield at date of investment on such bonds outstanding with 20 or more years to maturity and as if these amounts were re-invested at current rates every 20 years. The rate used for the Account as a whole is the weighted average for the amounts so invested in respect of each quarter.

The basic interest credits have been made at the rate of 1% of the balance to the credit of the Account at the end of the preceding quarter. The actual supplementary interest rate for the quarter ending December 31, 1972, was 0.4778%, yielding a combined quarterly rate of 1.4778% which is equivalent to a combined annual rate of approximately 6.0%.

II. Description of Data and Membership Statistics

The basic data required for the statutory actuarial examinations of the Account in respect of contributors or their dependants entitled to annuities or annual allowances are maintained on punch cards by the Superannuation Division of the Department of Supply and Services; data in respect of active contributors are maintained on magnetic tape by the Personnel Data Systems Division of the same department.

Data concerning salaries of contributors as at December 31, 1972, and their total contributions paid to the same date were prepared by the various pay offices and merged with the basic records by matching Social Insurance Numbers.

The computer programming and processing of all the basic data was under the control of the Personnel Data Systems Division of the Department of Supply and Services. The same was true of most of the massive volume of calculations relating to contributors who were employed in the Public Service on December 31, 1972, or terminated employment in the preceding five years, for which statistics in summary form are shown in the following table.

Contributors Employed in the Public Service

	Contributors on Jan. 1, 1968	Entrants during the 1968-72 period	Terminations during the 1968-72 period: Less than 5 years of pensionable service	Five or more years of pensionable service: Age(1)	Death	Disability(2)	Other(3)	Contributors on Dec. 31, 1972
Males	160,970	88,750	41,780	12,811	2,942	2,523	7,668	181,996
Females	57,459	66,245	36,924	4,230	437	958	6,193	74,962
Total	218,429	154,995	78,704	17,041	3,379	3,481	13,861	256,958

Pertinent statistics derived from tabulations relating to persons entitled to annuities or annual allowances some time during the 1968-72 period are shown in the following tables.

(1) Contributors who retired with entitlement to an immediate annuity at age 60 or over, or at ages 55 to 59 with 30 or more years of pensionable service.

(2) Contributors who ceased to be employed at ages under 60 because of disability. (The benefit received was either an immediate annuity, a cash termination allowance, or a return of contributions, with annuities accounting for about 92% of the cases.)

(3) Contributors who ceased to be employed at ages under 55, or ages 55 to 59 with less than 30 years of service for reasons other than death or disability. (Subject to the restriction described in Note 9 in Appendix 1, the benefit was either a return of contributions, a deferred annuity or an annual allowance. Approximately 78% of all such contributors elected to take the return of contributions benefit, the proportion ranging from over 80% for both males and females in the younger age groups to 40% for males and 37% for females in the age group 55 to 59.)

Persons Entitled to an Annuity or Annual Allowance

Contributors

	Entitled Jan. 1, 1968	Who became entitled during the 1968-72 period	Who ceased to be entitled during the 1968-72 period: Died	Re-employed or recovered	Other*	Entitled Dec. 31, 1972: In Pay't	Deferred	Total
Males								
Entitlements for reasons other than disability	25,115	15,696	7,609	32	156	30,152	2,862	33,014
Entitlements because of disability	2,513	2,584	1,123	11	-	3,963	-	3,963
Total	27,628	18,280	8,732	43	156	34,115	2,862	36,977
Females								
Entitlements for reasons other than disability	6,907	5,728	1,004	17	90	9,983	1,541	11,524
Entitlements because of disability	1,101	920	224	2	-	1,795	-	1,795
Total	8,008	6,648	1,228	19	90	11,778	1,541	13,319
Grand Total	35,636	24,928	9,960	62	246	45,893	4,403	50,296

Widows

Entitled Jan. 1, 1968	Who became entitled during the 1968-72 period	Who ceased to be entitled during the 1968-72 period: Died	Remarried	Entitled Dec. 31, 1972
16,372	8,653	3,027	545	21,453

Children and Students

	Entitled Jan. 1, 1968	Who became entitled during the 1968-72 period	Who ceased to be entitled during the 1968-72 period: Attained age 18 or age 25	Ceased to be eligible as a student	Entitled Dec. 31, 1972
Children	3,658	3,326	3,076	-	3,908**
Students	-***	2,334	97	1,648	589

* Includes contributors who ceased to be entitled to deferred annuities upon becoming entitled to disability annuities and who are included in number of new entitlements because of disability, and contributors who elected the capitalized value of small annuities.

** This figure includes 55 children of female contributors of whom eight were full orphans; of the remaining 3,853 children of male contributors 101 were full orphans.

*** Act amended in 1969 to provide for benefits to students over age 18. There were 32 children of deceased female contributors who became entitled to benefits as students, of which two were still eligible at December 31, 1972.

III. Valuation Bases and Assumptions

1. General

With some important exceptions, the bases and assumptions used for the actuarial examination as at December 31, 1967, were deemed to be satisfactory for purposes of the examination as at December 31, 1972. New bases were adopted for the following:

(a) select rates of termination for all reasons (less than five years of pensionable service),

(b) rates of termination for reasons other than age, age and service, disability or death (five or more years of pensionable service),

(c) proportions of terminating contributors electing to take a deferred annuity,

(d) rates of retirement because of age or age and service,

(e) rates of retirement because of disability, and

(f) rates of mortality for employed female contributors.

In addition, new factors had to be developed in connection with benefits to eligible students to show the proportion of those entitled to children's allowances at ages 17 to 24 who as students remain eligible for allowances in the succeeding year of age, as well as the annuity values based thereon.

In reference to rates of termination, death and remarriage in this report, the terms "select" and "ultimate" are used from time to time. In this connection,

(a) "select" means rates classified by age at beginning of pensionable service for contributors employed in the Public Service, or by age at becoming entitled to an annuity or annual allowance for persons so entitled, and by number of complete years elapsed since that age, and

(b) "ultimate" means rates classified by age only, derived from all the experience of the group being studied except that covering the years for which select rates have been determined.

2. Salary Scales

Where used in this report, the term "salary scale" means the assumed pattern of future salary increases for a contributor as his age increases year by year. It is essential to use such a scale for valuation purposes, because both benefits and contributions that become payable in the future depend on the rates of salary that will be earned by the contributors in the future.

There are two main forces that tend to generate salary increases for an individual during his period of service. One, which we shall call the promotional force results from the experience that he gains through service and the new and improved skills that he acquires through training both of which normally earn him increased remuneration. The other, which might be called the economic force is related to factors such as increased productivity and inflation which through bargaining or otherwise result in periodic revisions in the salaries of groups of employees. Increases in pay resulting from this second force are hereinafter referred to as "general" increases.

While the pattern of average promotional increases is fairly predictable on the basis of past experience, relatively little confidence can be placed in predictions of future increases in salaries that depend on varying economic and social pressures.

If salary scales were constructed to include provision for general salary increases at the level that has been experienced in recent years, this would have the undesirable effect of reinforcing inflationary expectations. Moreover, since the long-term level of general salary increases might then be expected to turn out less than assumed (possibly as the result of controls or other forces), liabilities and contribution rates might then be over-estimated. However, since the inclusion of inflationary elements in assumed salary scales would normally be counterbalanced by the inclusion of similar elements in the assumed rate of interest, there is a danger that an over-estimate of future inflation in the salary scale might be more than offset by an over-estimate of investment earnings, and thus the value of pension liabilities and rates of contribution might be under-estimated.

Even if there were general agreement on what might be considered a reasonable long-term level of general salary increases and provision for it were reflected in the salary scales, prolonged cyclical variation would tend to strain the credibility of the assumptions. There would likely be extended periods, such as in the recent past, when general salary levels would rise at rates substantially greater than assumed. During such periods, actuarial deficits arising out of general salary increases would continue to appear (although at lower levels than if no provision at all for such increases is made), and this would likely engender concern that costs were being under-estimated. On the other hand, during periods when salaries rose at rates lower than assumed, unwarranted pressure for changes in the plan would build up on the mistaken premise that the long term level of government credits was generating surpluses which ought to be available for the benefit of the plan members.

Finally it might be reasoned that, as a minimum, the salary scale ought to make provision for annual increases in the general level of salaries of, say, $2\frac{1}{2}\%$ which on the basis of recent experience might be regarded as the non-inflationary or productivity-related element of general salary increases. However, under such circumstances, the objections discussed in the preceding paragraph would still apply. Moreover, it was felt that in the rapidly evolving contemporary socio-economic environment it may be premature to assume that the non-inflationary element of general salary increases would continue at this level for the indefinite future.

The above considerations have led us to conclude that it is not unreasonable to continue the practice of providing for increases in liabilities arising out of general salary increases as and when they materialize rather than attempting to provide for them as a normal contingency in the basic contribution rates. This, of course, is contemplated in the terms of the Public Service Superannuation Act which, as stated earlier, provide that the Account shall be credited with an amount estimated to be equal to the additional net liability created by any salary increase applicable to at least 1% of the Public Service. Accordingly, in the current and preceding examination of the Superannuation Account, the salary scales used for purposes of valuing the net liabilities in respect of current contributors and the required contribution rates in respect of new contributors have provided for promotional increases only.

The valuation data included the rate of salary authorized to be paid to each contributor employed in the Public Service on December 31, 1972. These data were tabulated in such manner that the average increase in salary from age to age could be studied for all persons of the same age-group at beginning of pensionable service. Examination of these average increases indicated that the salary scales used in the preceding three valuations could reasonably be retained for use in the current valuation.

In Appendix 3 are shown the salary scales used for this valuation, and, for specimen ages, the manner in which an initial salary of $1,000 would increase in the future on the basis of these salary scales.

3. Interest Rates

Until July 1, 1969, interest was credited to the Superannuation Account on the last day of each quarter in the fiscal year at the rate of 1% of the balance to the credit of the Account on the last day of the preceding quarter. This is a rate equivalent to approximately 4% per annum which is the rate that has been assumed in preceding actuarial valuations and has been retained for the current valuation.

As noted earlier, the Act now provides for crediting supplementary amounts representing interest in excess of the rate used in the preceding actuarial valuation. The total rate at which interest is now credited changes every three months and is calculated as if the amounts not required for payment of benefits in each quarter had been invested on a basis similar to that applied under the Canada Pension Plan, i.e., in 20-year bonds having a yield equivalent to the average yield on long term Government of Canada bonds outstanding at that time.

For the quarter ending December 31, 1972, the combined rate of the basic and supplementary interest credits was 1.4778%, which is equivalent to approximately 6% per annum. The combined annual rate has remained above 5% since the 1969 amendments and, given the current climate of relatively high interest rates, is likely to continue for some time at a level such as to raise questions regarding the continued use of an assumed valuation rate of 4%. The following comments seem, therefore, in order.

Although it is generally desirable to select each of the actuarial assumptions on its own merits, it is also necessary in order to judge the reasonableness of the results to consider all the assumptions together. In judging the reasonableness of the interest assumption in the valuation of pension plans such as the Public Service Superannuation Plan, where benefits are based on final average salaries, it is particularly relevant to have regard to the assumptions used for purposes of estimating future salaries.

For reasons noted in the discussion of salary scales, it was decided to continue the practice of including no provision for increases in general levels of salaries. This means that in the valuation of benefits and contributions no allowance is made for any future increases in salaries attributable to general inflation, increased productivity or other factors unrelated to the relative progress of individual contributors. It is no more than consistent with the foregoing to eliminate from the assumed rate of future interest earnings the portion that may be considered as attributable to inflation and to use what may be regarded as an approximation to a "natural" rate of interest.

It might be added that one of the primary purposes of an actuarial valuation of a pension plan such as the Public Service Superannuation Plan is to establish the level of contributions required to provide all benefits for successive cohorts of new contributors. It is desirable that such contribution rates be applicable regardless of whether current interest rates are high or low, because it is not customary to set different rates for different generations of contributors. While in the long period of low interest rates from the 1930's to the 1950's, there was a natural tendency not to anticipate a return to high interest rates, there is a similar natural tendency at the present time not to anticipate a return to low interest rates. In our estimation, the use of an assumed rate at the level of four per cent constitutes an attempt to make reasonable allowance for the long-term effect of interest earnings in the calculation of required rates of contributions.

4. Rates of termination for all reasons (less than
five years of pensionable service

A return of contributions is the only benefit applicable in respect of a contributor who dies or otherwise ceases to be employed in the Public Service before he has to his credit five years of pensionable service. Thus, for valuation purposes, the rates of termination required for each of the first five years of pensionable service are the rates at which contributors cease to be employed for any reason. These are referred to hereinafter as "select rates of termination for all reasons".

Experience during the 1968-72 period indicated that termination rates for both male and female contributors were generally higher during the first year of service than those assumed for the preceding valuation, and generally lower during the later years. It was considered desirable therefore to use a revised set of termination rates for this valuation based on this more recent experience.

The rates used in this valuation are shown in Appendix 4.

5. Rates of termination for reasons other than age, age and service,
disability or death with five or more years of pensionable service

and

Proportions of terminating contributors electing
to take a deferred annuity or annual allowance

These rates and proportions pertain only to contributors under age 60.

On the basis of the experience during the period 1968-72, the termination rates were found to be lower for male contributors at most ages and female contributors up to age 40, and higher for female contributors at older ages than those assumed for the preceding valuation.

The revised rates based on this experience and used in this valuation are shown in Appendix 5.

As described in the "Summary of Benefits" contributors who terminate service for reasons other than age, age and service, disability or death and have five or more years of pensionable service have the option of electing a return of contributions, a deferred annuity to commence at age 60, or an annual allowance to commence immediately if the contributor's age is 50 or over, or at age 50 if the contributor's age is under 50. Reference may be made to notes in Appendix 1 for further details.

The value of a deferred annuity or annual allowance benefit is considerably greater than the value of a return of contributions benefit. For valuation purposes, therefore, it is necessary to determine the proportion of contributors who, on terminating service, elect to take a deferred annuity or annual allowance.

As noted in previous actuarial reports, there does not appear to be a general trend toward an increase in the proportion of contributors electing to take a deferred annuity or annual allowance, except for the male contributors over age 49 and the female contributors over age 54. The increase in the proportions at the older ages may reflect the effect of the provisions of the Act requiring that contributors terminating after age 45 with at least 10 years of pensionable service must elect a deferred annuity or an annual allowance in respect to service after September 30, 1967, though the increased publicity given to the desirability of preserving pension entitlement is also more likely to produce results at the relatively older ages.

On the basis of the 1968-72 experience, a single table of proportions for both male and female contributors was adopted and is shown in Appendix 5.

Recent amendments to the Act, as noted earlier, provided that the amount of an annual allowance be determined by the application of factors based on the age and length of service of the terminating contributor to the amount of the deferred annuity to which such contributor is entitled. Thus, the value of the annual allowance is no longer equal to the value of the deferred annuity, in accordance with prescribed mortality and interest assumptions. However, for the purposes of this valuation, annual allowances and deferred annuities were assumed to be actuarially equivalent.

6. Rates of retirement because of age or age and service

The provision of income maintenance after completion of an employee's working lifetime is the primary purpose of pension plans. Under the Public Service Superannuation Plan, a contributor becomes entitled to an immediate annuity upon retirement at age 60 or over, provided that such contributor has at least five years of pensionable service. In this report, such retirements are termed "retirements because of age".

An amendment to the Act referred to earlier in this report, provides that a contributor with 30 or more years of pensionable service may now retire at ages 55 to 59 with entitlement to an unreduced immediate annuity. In this report, such retirements are termed "retirements because of age and service".

As stated in previous reports there has been a marked trend toward higher rates of retirement at ages 60 to 65 which continued during the period 1968-72. Also there are, of course, now retirements at ages 55 to 59, although the experience is quite limited. New rates were therefore established on the basis of this most recent experience for this valuation. They are shown in Appendix 6.

As might be expected, the age-retirement rates do not progress smoothly from age to age. There is a distinct heaping at age 60 (the earliest age at which an unreduced immediate annuity is available for "retirements because of age" and again at age 65 which may be regarded as the "normal retirement age" since employment in the Public Service after age 65 is contingent on special authorization from year to year.

As the number of contributors over age 70 is negligible, it was assumed as in preceding valuations that all active contributors who attain age 70 cease to be employed during the following year.

7. Rates of retirement because of disability

In the event of disability, a contributor with at least five years of pensionable service becomes entitled to an immediate annuity or other optional benefits (see page 7).

The experience during 1968-72 showed a definite trend toward an increase in the rates of retirement because of disability at all ages for female contributors, and at ages 40 to 55 for male contributors. New rates based on this most recent experience were adopted for this valuation and are shown in Appendix 7.

8. Mortality of contributors employed in the Public Service
with five or more years of pensionable service

The mortality rates used for purposes of the three preceding valuations were selected so as to provide a small margin beyond the rates experienced to provide for expected improvement in mortality. In the case of the males, the rates were those of the α-1949 Table* projected 10 years in accordance with Projection Scale B**. The number of actual deaths of male contributors during 1968-72 was slightly less than that expected on this table but the basis was considered to remain appropriate for use in this valuation.

In the case of the female contributors, the number of actual deaths during 1968-72 was substantially higher than that expected based on the rates derived from 1948-57 experience of female contributors. It was, therefore, deemed appropriate to use a table which more closely reflects current experience for this valuation. The rates chosen are those from the α-1949 Table* projected using Projection Scale C** assuming year of birth 1910.

Both sets of rates are shown in Appendix 8.

9. Mortality of contributors entitled to an annuity or
annual allowance for reasons other than disability

For the purposes of the two preceding valuations, the mortality rates deemed suitable to provide a margin for improvement in mortality over a considerable future period were, for males the α-1949 Table and for females the α-1949 Table projected in accordance with Projection Scale C assuming a year of birth 1910.

The experience of the 1968-72 period indicated that these rates continue to provide a satisfactory margin and, accordingly, they were retained for the current valuation.

The rates used for both males and females and the relevant annuity values are shown in Appendix 9.

10. Mortality of contributors entitled
to an annuity because of disability

The rates used in the three preceding valuations were select and ultimate rates of mortality developed from the experience of this class of former contributors during the 1948-57 period. The 1968-72 experience indicated that these rates continue to provide a reasonable margin for any improvements in mortality which may also be expected to affect disabled lives. Accordingly, these rates were retained for use in the current valuation.

The ultimate rates of mortality, applicable after the first three years following retirement, are shown in Appendices 10 and 11 for males and females, respectively. Rates of mortality for the first, second and third years following retirement are assumed to be the following multiples of the ultimate rates;

(a) for males, 250%, 175% and 125%, respectively

(b) for females, 190%, 145% and 115%, respectively

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* Transactions of the Society of Actuaries, Vol. I pp 386-9
** Transactions of the Society of Actuaries, Vol. IV p 272

The above multiples which were determined on the basis of the 1948-57 experience, were considered to be appropriate for the current valuation although the more recent experience indicates a somewhat higher mortality in these early years.

Annuity values based on these rates are also shown in Appendix 10 for males, and in Appendix 11 for females.

11. Widows

The rates of mortality used for valuing widows' allowances in the three preceding valuations were derived from the 1948-57 experience of widows under the Superannuation plan, and were designed to provide some margin for future improvement in mortality. On the basis of the 1968-72 experience, there still appears to be some margin in these rates at the older ages. It was therefore considered satisfactory to retain the same rates for this valuation.

The rates of remarriage, varying by age and duration from widowhood, that were used for the three preceding valuations were developed from the experience during the period from January 1, 1940 to December 31, 1957, of widows awarded pensions from August 4, 1914 to December 31, 1957, under the Pension Act and previous Government administrative orders.

Experience among widows of contributors under the Superannuation plan in more recent years indicates that the number of remarriages of such widows is higher than expected on the basis of the above rates. However, it was considered that a moderate margin in the remarriage rates constituted a desirable offset to the vanishing margin in the mortality rates and, accordingly, the same remarriage rates were retained for use in the current valuation.

In Appendix 12 are shown

(a) select remarriage rates for quinquennial ages at widowhood 25 to 55 and specimen durations from widowhood,

(b) ultimate remarriage rates and aggregate mortality rates for quinquennial ages commencing at age 39, and

(c) annuity values based on the probabilities of payments ceasing as a result of death or remarriage for the ages and durations noted in (a) and (b).

12. Children and Students

In the current as well as preceding valuations, mortality was ignored in determining the value of allowances payable to children and students, because such allowances are not payable after the 25th birthday and the effect of mortality at the relevant ages would have been negligible.

As noted previously, the 1969 amendments extended allowances past age 17 to children who are under age 25 and unmarried, and who have been in full-time attendance, substantially without interruption since attaining age 18 or the death of the contributor, whichever occurred later. In connection with this valuation, we were supplied with data for each student who was in receipt of an allowance at December 31, 1972, or who had received an allowance at any time from the date of the amendment to the Act to December 31, 1972. From this data, we determined that 51% of children receiving allowances at age 17 were qualified at their 18th birthday to continue to receive allowances as students. Similar proportions at higher ages and the values of an allowance of $1.00 per annum to a child or student at specimen ages from 0 to 24 at the death of a contributor are shown in Appendix 13.

For each age at death of contributors there is needed the average value of children's and students' benefits per $1.00 of the annuity payable to a contributor or that would have been payable to a contributor if he had retired with an immediate annuity at the date of his death. Such values were derived from the 1948-57 experience data for purposes of the 1957 valuation. More recent experience would indicate that the average number of children at death of a contributor has decreased. Offsetting this decrease in the average value of children's benefit has been the extension of the benefit to students. It has therefore been considered appropriate to retain the same average values for purposes of the current valuation. Specimen values are shown in Appendix 13.

13. Proportion of male contributors married at death

and

Average ages of widows corresponding to ages of contributors at death

These proportions and average ages are needed to value prospective benefits of future widows of contributors who at the time of their death are either employed in the Public Service or are entitled to an annuity or annual allowance.

Proportions of male contributors married at death were derived for the 1957 valuation from the 1948-57 experience for employed and retired contributors, separately. More recent experience indicates the proportion married at death was somewhat higher than that expected in accordance with the 1957 bases.

Average ages of widows corresponding to ages of contributors at death were derived for the 1957 valuation from the 1948-57 experience for employed and retired contributors combined. According to the more recent experience the differentials between the ages of widows and the ages of deceased contributors at date of death have decreased slightly.

Because of the offsetting effects of indicated trends in the two factors under consideration, it was considered appropriate to continue the use of the 1957 bases for the current valuation. Values are shown in Appendix 13 for quinquennial ages of contributors at death.

14. Capitalized values of immediate annuity or deferred annuity benefits

In Appendix 14 are shown for quinquennial ages the values of immediate annuities or deferred annuities emerging in the event of certain contingencies. For retirements below age 60 for reasons other than disability, or age and service, the values shown are in respect of a deferred annuity to commence at age 60. For male retirements, the values include provisions for prospective allowances to widows and children. All values include provision for payment of an aggregate amount of all benefits at least equal to the contributor's total contributions without interest as referred to in Note 11 in Appendix 1.

15. Proportion of contributors with salaries below "Year's Maximum Pensionable Earnings" (as defined in Canada Pension Plan)

and

Ratios of average salary to "Year's Maximum Pensionable Earnings" for contributors with salaries below that maximum

As described in Appendix 1, the basic annuity of a retired contributor reaching age 65 or becoming entitled to a disability pension under the Canada or Quebec Pension Plan is reduced by reason of the co-ordination of the Public Service Superannuation Plan with the Canada and Quebec Pension

Plans. The amount of the reduction is related to the number of years of pensionable service since 1965 or since becoming a contributor, if later, and the lesser of the contributor's average salary used in determining his basic annuity or the "Average Maximum Pensionable Earnings" (see Note 3 in Appendix 1). Similarly, a contributor's contributions to the Superannuation plan are reduced by the amount of his contributions to the Canada or Quebec Pension Plans. The contributions to these latter plans are subject to an annual maximum based on the "Year's Maximum Pensionable Earnings" (Y.M.P.E.) for these plans.

In valuing the liability for future benefits and the present value of future contributions to the Superannuation Account, we require the proportions of contributors by age with salaries below the Y.M.P.E. and the ratios of the average salary of such contributors to the Y.M.P.E. As at December 31, 1972, the Y.M.P.E. was $5,500. However, pursuant to recent amendments to the Canada and Quebec Pension Plans the Y.M.P.E. was increased substantially, reaching $7,400 in 1975, and is scheduled to be increased by 12½% per annum until it reaches the industrial composite annual average of wages and salaries. In view of this it was deemed more appropriate to develop the required proportions as if the Y.M.P.E. at the date of valuation had been $8,000.

The actual proportions and ratios used in the valuation based on this data are shown in Appendix 15.

IV. Required Rates of Contribution

Using the assumptions described in the preceding section of this report, and the distribution of active contributors as at December 31, 1972, the total rates required from contributors and the Government combined to provide all benefits were calculated to be as follows:

Males: 14.2% of salary, less Canada/Quebec Pension Plan contributions

Females: 11.4% of salary, less Canada/Quebec Pension Plan contributions

As noted earlier, contributions paid by contributors to the Account are 6.5% for males and 5.0% for females, less amounts approximately equal to contributions required by the Canada or Quebec Pension Plans. It is apparent that these contributions together with matching Government credits to the Account leave a deficiency of 1.2% of salary in respect of males and 1.4% of salary in respect of females. If no changes are made in the present rates of contributions and Government credits, a deficit of the order of 200 million dollars may be expected to accumulate by December 31, 1977.

If it were desired to raise Government credits to the Account to a level which would avoid the accumulation of deficits in respect of future service, it is estimated that such credits should be made at the rate of 1.25 times the amount of employee contributions rather than on the present one to one matching basis.

The rates of contribution required, as stated above, are higher by 0.7% for males and lower by 0.2% for females than the corresponding rates quoted in the preceding report. These differences are accounted for partly by the various changes in actuarial bases described in section III of this report and partly by the method of calculation. In previous examinations of the Account calculations were performed on what is generally known as the "entry age normal cost" method, while for purposes of this report the method known as "unit credit cost" or "recurring single premium cost" was employed.

For a mature, stable distribution of members, such as the contributors to the Superannuation Account, the contribution rates should remain fairly stable regardless of the method used. The new method adopted relates contribution rates to units of benefits currently accruing to active contributors rather than to total benefits for cohorts of new entrants. The resulting funding progress is somewhat less stringent and will be discussed further in section V of this report.

As mentioned earlier, Bill C-52, currently before Parliament proposes certain amendments. The most significant of these from an actuarial point of view are equality of status for male and female contributors, the payment of interest on returns of contributions and the provision of a minimum benefit in cases of death or retirement with entitlement to annuity equal to five times the amount of the basic annuity. If these amendments are passed into law, the deficiencies in contributions for females and males and females combined and the rate of Government credits required to prevent the accumulation of the deficiencies will be somewhat lower than indicated above.

As noted earlier, in addition to the regular "matching credits" referred to above, the Government is required to credit to the Account following authorization of any salary increase applicable to at least one per cent of the contributors employed in the Public Service, an amount representing the net increase in liabilities for benefits resulting from that salary increase. The factor to be applied to the total annual increase in salary authorized to determine the amount of credit required has been calculated as 1.4.

V. Valuation Balance Sheet and Observations

The results of the valuation are summarized and the financial status of the Account as at December 31, 1972, is shown in the following Balance Sheet. The salary scales used in the valuation make no provision for future general salary increases. Thus, the balance sheet reflects the provision in the Act under which, in the event of general salary increases, credits equal to the additional liabilities created thereby are made to the Account on behalf of the Government at the time such increases are authorized.

Valuation Balance Sheet as at December 31, 1972

Assets

Balance of Account			$4,729,558,000
Government matching credits due in respect of past contributions by contributors			94,675,000
Government credits due in respect to past general increases in salaries			60,238,000
Present value of future instalments of prior service contributions and matching credits by the Government			
Employed Males	34,662,000		
Employed Females	4,654,000	39,316,000	
Retired Males	5,068,000		
Retired Females	1,256,000	6,324,000	45,640,000
Total Assets			$4,930,111,000
Deficit			214,153,000
			$5,144,264,000

Liabilities

Present value of prospective benefits to employed contributors:			
Males	$3,164,459,000		
Females	567,756,000		$3,732,215,000
Present value of benefits to persons entitled to an annuity or annual allowance:			
Retired contributors			
Entitled for reasons other than disability - Males	854,236,000		
- Females	200,740,000		
Entitled because of disability - Males	104,393,000		
- Females	35,617,000	$1,194,986,000	
Widows		213,364,000	
Children and Students		3,699,000	1,412,049,000
Total Liabilities			$5,144,264,000

The foregoing balance sheet shows an estimated actuarial deficit of about $214 million. The more noteworthy elements having a bearing on the development of this deficit are discussed in the following numbered paragraphs.

1. An estimated $335 million is due to apparent increases in salaries in excess of (i) normal promotional salary increases provided for in the regular contribution rates and (ii) general increases in salary provided for by special Government credits.

2. An estimated $188 million is due to miscellaneous differences between actual and expected experience during the five years ending December 31, 1972.

3. Deficiencies in rates of contribution and Government credits in respect of new contributors (who entered after December 31, 1967, and thus were not included in the preceding valuation) resulted in an estimated increase in liabilities of $58 million.

4. The change in the actuarial cost method, discussed in section IV, produced a reduction of $535 million in the deficit. However, it is worth noting that of this amount $164 million is attributable to estimated deficiencies in future contributions and Government credits, which were prefunded under the old method.

5. The use of new rates of retirement (see section III) which was necessitated partly because of amendments to the Act resulted in an increase in liabilities of $172 million.

6. Changes in various other actuarial bases described in section III produced an increase in liabilities of $64 million.

7. Finally, allowance for the effect of raising the "Year's Maximum Pensionable Earnings", as defined in the Canada Pension Plan, to the level of the industrial composite average of annual wages and salaries, had the effect of reducing liabilities by about $68 million.

VI. Conclusions

1. The average rates of contribution estimated to be required to provide for benefits in respect of new contributors, for contributors and Government combined, are 14.2% and 11.4% of salaries less Canada or Quebec Pension Plan contributions in respect of males and females, respectively. These rates make no provision for possible future increases in the general level of salaries; it is estimated that the additional liabilities arising from such increases may be provided for by means of special Government credits to the Account equal to 1.4 times the estimated increase in total annual salaries.

2. The estimated deficit in the Account as at December 31, 1972, was $214 million.

3. If the combined contribution rates remain unchanged, a deficit of the order of $200 million may be expected to accumulate between December 31, 1972 and December 31, 1977. On the other hand, if it were desired to raise Government credits to the Account to a level which would avoid the recurring accumulation of such deficits, it is estimated that this might be accomplished by making Government credits at the rate of 1.25 times the amount of contributions received from contributors.

4. If Bill C-52 currently before Parliament were enacted, the estimated deficiencies in the total required rates of contributions and Government credits would be slightly less than indicated in this report.

We wish to take this opportunity of acknowledging the co-operation and able assistance of the Superannuation Division and the Personnel Data Systems Division of the Department of Supply and Services.

Respectfully submitted,

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March 10, 1975.

Appendices

APPENDIX 1

Explanatory Notes to Summary of Benefits on pages 6 and 7 of this Report

Note 1

"Return of contributions" means return of the contributor's total current service and prior service contributions without interest.

Note 2

Employment of contributors may normally be terminated by reason of age at about age 65. In this summary, however, "retirement because of age or age and service" means ceasing to be employed in the Public Service, for any reason other than misconduct or death, at age 60 or over, or at ages 55 to 59 with pensionable service of 30 years or more. It follows that "retirement because of disability" refers only to those retirements for that reason where the contributor would not be entitled to the same benefits by reason of age or age and service and that "termination for reasons other than age, age and service, disability, misconduct or death" also refers only to terminations before age 55 or at ages 55 to 59 with less than 30 years of pensionable service.

Note 3

"Immediate annuity" means an annuity that becomes payable to a contributor immediately upon his becoming entitled thereto. The annual amount of "basic annuity" is equal to 2% of average annual salary in respect of any selected six-year period of pensionable service multiplied by the number of years of pensionable service up to a maximum of 35. The six-year period may consist of consecutive periods of pensionable service totalling six years. If a contributor has less than six years of pensionable service, the average annual salary is based on salary in respect of his total pensionable service. Any annuity or annual allowance is ordinarily payable in equal monthly instalments in arrears until the end of the month in which the person receiving it dies or ceases to be entitled thereto.

When a contributor entitled to an annuity or annual allowance has reached age 65 or has become entitled to a disability pension under the terms of the Canada Pension Plan or Quebec Pension Plan, the annuity or annual allowance is reduced by an amount equal to 0.7% of the average salary multiplied by the number of years of pensionable service after 1965 that are counted in the calculation of the basic annuity, provided that the average salary used in this calculation will have a maximum value of the "Average Maximum Pensionable Earnings". The latter amount is the average of the "Year's Maximum Pensionable Earnings" as defined in the Canada Pension Plan for the year in which the contributor ceased to be employed in the Public Service and for each of the two preceding years.

Note 4

When a contributor under age 60 and entitled to an annuity in respect of a disability is certified in accordance with regulations to have regained his health or to be capable of performing the duties of his former position in the Public Service or any other position in the Public Service commensurate with his qualifications he ceases to be entitled to that annuity and becomes entitled to a deferred annuity.

When a contributor entitled to a deferred annuity or annual allowance becomes disabled before age 60, he ceases to be entitled to that deferred annuity or annual allowance and becomes entitled to an immediate annuity adjusted in accordance with regulations to take into account the amount of any annual allowance which he may have received prior to becoming disabled.

Note 5

"Cash termination allowance" means one month's salary for each year of pensionable service (in the usual case at the rate of salary authorized to be paid to the contributor at the time that he ceases to be employed in the Public Service) less an amount equal to the reduction in contributions paid to the Account because of co-ordination with the Canada Pension Plan and the Quebec Pension Plan.

Note 6

"Deferred annuity" means an annuity that becomes payable to a former contributor when he reaches age 60. The annual amount of the annuity is computed as described in Note 3.

Note 7

The amount of the annual allowance is equal to the amount of the deferred annuity to which the contributor would have been entitled, if he had elected to receive a deferred annuity, reduced by the product obtained by multiplying 5% of that amount by a factor varying with age and length of pensionable service at retirement.

For a contributor age 50 or more with not less than 25 years of pensionable service to his credit, the factor is the greater of fifty-five minus his age and thirty minus his number of years of pensionable service.

For a contributor age 55 or more who has been employed in the Public Service on a full-time basis for a period or periods totalling at least ten years and who does not retire voluntarily the factor is thirty minus the number of years of pensionable service. In any such case the whole or part of the reduction calculated using this factor may be waived by the Treasury Board.

For all other cases the factor is sixty minus the contributor's age.

In all cases, the factor is determined by expressing age or length of service to the nearest one-tenth of a year.

Note 8

In the case of dismissal because of misconduct, the capitalized value of any annuity or annual allowance granted by the Treasury Board computed in accordance with regulations on the basis of the a(f) and a(m) Ultimate Tables of mortality and interest at 4% per annum may not be less than the "return of contributions" as defined in Note 1.

Note 9

If on termination of employment a contributor has attained age 45 and has to his credit 10 or more years of pensionable service, his right to select a "return of contributions" or a "cash termination allowance" benefit is limited to the period of pensionable service prior to October 1, 1967. With respect to the service on and after that date, it is mandatory that he receive an annuity or annual allowance.

Note 10

"Annual allowance" to the widow of an active contributor or a former contributor entitled to receive an annuity or annual allowance means one-half of the annual amount of "basic annuity" computed as described in Note 3. This is termed the "basic allowance".

If the age of the contributor exceeds that of his widow by 20 or more years, the widow's allowance is reduced. If a contributor dies within one year after his marriage, no allowance is payable to the widow if the Treasury Board is not satisfied that the contributor was at the time of his marriage in such a condition of health as to justify him in having an expectation of surviving for at least one year thereafter. Also if a contributor marries after having become entitled to an annuity or annual allowance his widow is not entitled to any annual allowance unless, after his marriage, he became or continued to be a contributor.

If a widow remarries, her allowance is either suspended during the period of remarriage or forfeited, if she requests and receives a return of contributions less all payments made to the contributor, widow and children. Such request can only be made during the period of remarriage if there is no child of the contributor entitled to an annual allowance under the Act.

The allowance to a widow which has been suspended upon her remarriage will be resumed in the event of the dissolution or annulment of that marriage, or the death of her husband by that marriage.

"Annual allowance" to each child of a deceased contributor means one-fifth of the widow's "basic allowance" described above, or if there is no living widow, two-fifths of the basic allowance. The allowance is payable to any child under age 18 until he reaches his 18th birthday, and to any child 18 years or older until he reaches his 25th birthday provided he remains unmarried and has been in full-time attendance at school or university substantially without interruption since his 18th birthday or the death of the contributor, whichever occurred later. The total amount of allowance payable to the eligible children of a deceased contributor when there are more than four may not exceed that which would be payable if there were only four.

A child born to the widow of a contributor is not entitled to an annual allowance unless the child was conceived before the death of the contributor. Also a child who was born or adopted by a contributor or who became the stepchild of a contributor after the contributor ceased to be employed in the Public Service is not entitled to an annual allowance unless, in the case of a child born to a contributor, the child was conceived before the contributor ceased to be employed.

Note 11

When a contributor dies leaving no widow or children entitled to an allowance, or the last of a contributor's widow and children to whom an allowance is payable dies or otherwise ceases to be entitled to such benefit, any amount by which the "return of contributions" computed as described in Note 1 exceeds the aggregate of all amounts that have been paid to the contributor, his widow and his children, is paid to the contributor's estate, or, if less than $500, as authorized by the President of the Treasury Board.

APPENDIX 2

Supplementary Retirement Benefits

The Supplementary Retirement Benefits Act was enacted in 1970 (and amended in 1973) to provide supplementary benefits for persons in receipt of pensions payable out of the Consolidated Revenue Fund. This Act applies to former contributors to the Public Service Superannuation Account and their dependants who are entitled to annuities or annual allowances.

The supplementary benefit is calculated by multiplying the amount of the annuity or annual allowance to which the person is entitled from the Public Service Superannuation Account by the ratio of the Benefit Index for the year of payment to the Benefit Index for the year in which the person to whom or the person in respect of whose service the pension is payable ceased to hold office and subtracting the amount of the annuity or annual allowance. The Benefit Index for the years prior to 1975 are shown in a Schedule in the Act. The Benefit Index for any year after 1974 is equal to the Benefit Index for the preceding year multiplied by the average of the Consumer Price Index for the twelve months ending with September of that preceding year and divided by the average for a similar period one year earlier.

Pursuant to Part III of the Public Service Superannuation Act (enacted in 1970 and amended in 1973) contributors to the Superannuation Account are required to pay in addition 0.5% of their salaries until 1976 and one per cent thereafter to the Supplementary Retirement Benefits Account.

Neither the contributions to nor the benefits payable from the Supplementary Retirement Benefits Account affect the liabilities of the Superannuation Account.

APPENDIX 3

Salary Scales

Age	Males	Females
18	0.385	0.396
19	0.401	0.412
20	0.418	0.429
21	0.436	0.447
22	0.455	0.466
23	0.475	0.486
24	0.496	0.507
25	0.517	0.529
26	0.539	0.551
27	0.561	0.573
28	0.583	0.596
29	0.605	0.619
30	0.627	0.642
31	0.649	0.664
32	0.670	0.686
33	0.691	0.707
34	0.711	0.728
35	0.731	0.748
36	0.750	0.767
37	0.769	0.785
38	0.787	0.802
39	0.804	0.819
40	0.820	0.834
41	0.836	0.849
42	0.850	0.863
43	0.863	0.876
44	0.876	0.888
45	0.887	0.899
46	0.898	0.910
47	0.908	0.919
48	0.917	0.928
49	0.926	0.936
50	0.934	0.943
51	0.941	0.950
52	0.948	0.956
53	0.954	0.962
54	0.960	0.967
55	0.965	0.971
56	0.969	0.975
57	0.973	0.979
58	0.977	0.982
59	0.980	0.985
60	0.983	0.988
61	0.986	0.990
62	0.988	0.992
63	0.990	0.994
64	0.992	0.995
65	0.994	0.996
66	0.995	0.997
67	0.997	0.998
68	0.998	0.998
69	0.999	0.999
70	1.000	1.000

Illustration of increases in salary in accordance with salary scales

Age		Males	
20	$1,000		
25	1,237		
30	1,500	$1,000	
35	1,749	1,166	
40	1,962	1,308	$1,000
45	2,122	1,415	1,082
50	2,234	1,490	1,139
55	2,309	1,539	1,177
60	2,352	1,568	1,199
65	2,378	1,585	1,212
		Females	
20	1,000		
25	1,233		
30	1,497	1,000	
35	1,744	1,165	
40	1,944	1,299	1,000
45	2,096	1,400	1,078
50	2,198	1,469	1,131
55	2,263	1,512	1,164
60	2,303	1,539	1,185
65	2,322	1,551	1,194

APPENDIX 4

Select Rates of Termination for all reasons

Age at beg. of Pens. Svc.	Males: Completed Years of Pensionable Service 0	1	2	3	4	Females: Completed Years of Pensionable Service 0	1	2	3	4
18	.385	.181	.123	.094	.072	.310	.180	.135	.135	.135
19	.365	.176	.117	.091	.070	.310	.200	.155	.145	.145
20	.345	.171	.112	.088	.068	.310	.220	.185	.155	.155
21	.325	.166	.108	.085	.066	.310	.240	.215	.165	.165
22	.305	.161	.105	.082	.064	.315	.260	.245	.185	.165
23	.285	.156	.102	.079	.062	.316	.280	.245	.200	.165
24	.265	.151	.099	.076	.060	.318	.280	.240	.190	.160
25	.245	.146	.097	.073	.058	.315	.280	.235	.180	.150
26	.230	.141	.095	.070	.056	.311	.270	.220	.170	.140
27	.215	.137	.093	.068	.054	.302	.265	.205	.160	.130
28	.215	.133	.091	.066	.052	.296	.260	.190	.150	.120
29	.215	.129	.089	.064	.050	.288	.240	.180	.140	.110
30	.215	.125	.087	.062	.049	.280	.220	.170	.135	.105
31	.215	.122	.085	.060	.048	.272	.200	.160	.130	.102
32	.215	.120	.083	.059	.047	.265	.190	.150	.125	.097
33	.215	.119	.081	.058	.046	.259	.180	.145	.120	.094
34	.215	.118	.079	.057	.045	.254	.180	.140	.115	.091
35	.215	.117	.077	.056	.045	.250	.180	.135	.110	.088
36	.215	.116	.075	.056	.045	.247	.180	.130	.105	.085
37	.215	.115	.073	.056	.045	.245	.170	.125	.100	.082
38	.215	.114	.071	.056	.045	.244	.160	.120	.095	.079
39	.215	.113	.069	.056	.045	.243	.150	.115	.090	.077
40	.215	.112	.068	.055	.045	.242	.145	.110	.087	.076
41	.215	.111	.067	.055	.045	.241	.142	.105	.085	.075
42	.215	.110	.066	.055	.045	.240	.140	.100	.083	.074
43	.215	.109	.065	.055	.045	.239	.138	.097	.081	.073
44	.215	.108	.064	.055	.045	.238	.136	.095	.079	.072
45	.215	.107	.064	.054	.045	.237	.134	.094	.077	.071
46	.215	.106	.063	.054	.045	.236	.132	.093	.075	.070
47	.216	.105	.063	.054	.045	.234	.131	.093	.073	.069
48	.217	.104	.062	.054	.045	.231	.131	.093	.071	.068
49	.219	.103	.062	.054	.045	.227	.131	.093	.069	.067
50	.222	.102	.061	.053	.045	.222	.130	.092	.067	.067
51	.226	.101	.061	.053	.045	.220	.130	.092	.065	.065
52	.231	.100	.060	.053	.045	.219	.130	.092	.064	.064
53	.237	.100	.060	.053	.046	.220	.130	.092	.065	.065
54	.244	.101	.061	.054	.047	.222	.131	.092	.067	.067
55	.252	.102	.063	.056	.049	.225	.133	.093	.071	.071
56	.261	.104	.067	.060	.053	.229	.136	.094	.076	.076
57	.271	.107	.073	.066	.059	.234	.140	.095	.082	.082
58	.282	.111	.081	.074	.067	.240	.145	.096	.090	.090
59	.294	.116	.091	.084	.077	.247	.151	.097	.100	.100

APPENDIX 5

Rates of Termination for Other Reasons
than age, age and service, disability or death
(five or more years of pensionable service)*
and
Proportions of Terminating Contributors Electing to take
a Deferred Annuity or Annual Allowance**

Age	Rates of Termination* Males	Rates of Termination* Females	Proportion Electing Deferred Annuity or Annual Allowance Males and Females
20	.044	.100	.071
21	.042	.110	.071
22	.041	.120	.071
23	.040	.130	.071
24	.038	.140	.071
25	.037	.140	.071
26	.035	.132	.071
27	.034	.123	.073
28	.033	.114	.076
29	.031	.105	.079
30	.030	.096	.082
31	.028	.087	.085
32	.027	.078	.088
33	.025	.071	.091
34	.024	.064	.094
35	.023	.057	.097
36	.022	.052	.100
37	.020	.047	.104
38	.019	.043	.109
39	.019	.040	.115
40	.018	.037	.122
41	.017	.034	.130
42	.016	.032	.140
43	.015	.031	.151
44	.014	.029	.164
45	.012	.028	.180
46	.011	.027	.197
47	.010	.026	.217
48	.009	.025	.239
49	.009	.024	.264
50	.008	.023	.292
51	.008	.023	.323
52	.009	.022	.358
53	.009	.021	.398
54	.009	.020	.442
55	.010	.020	.490
56	.010	.019	.543
57	.010	.019	.600
58	.010	.018	.662
59	.010	.018	.728

* See Note 2 in Appendix 1.

** Contributors who have attained age forty-five and completed ten years of pensionable service, must take a deferred annuity or annual allowance in respect of service after September 30, 1967.

A P P E N D I X 6

Rates of Retirement because of Age or Age and Service*

Age	Males	Females
55	.010	.009
56	.010	.009
57	.010	.010
58	.015	.010
59	.020	.017
60	.150	.170
61	.090	.105
62	.095	.100
63	.115	.140
64	.160	.175
65	.800	.750
66	.200	.110
67	.200	.110
68	.200	.160
69	.200	.160
70	1.000	1.000

* See Note 2 in Appendix 1.

APPENDIX 7

Rates of Retirement because of Disability*

Age	Males	Females
20	.0002	.0011
21	.0002	.0012
22	.0002	.0013
23	.0002	.0014
24	.0002	.0015
25	.0003	.0016
26	.0003	.0017
27	.0003	.0018
28	.0004	.0019
29	.0004	.0020
30	.0004	.0020
31	.0005	.0020
32	.0005	.0020
33	.0005	.0021
34	.0005	.0021
35	.0005	.0021
36	.0006	.0022
37	.0006	.0023
38	.0006	.0024
39	.0007	.0025
40	.0010	.0026
41	.0013	.0027
42	.0016	.0028
43	.0020	.0030
44	.0024	.0032
45	.0028	.0035
46	.0032	.0039
47	.0036	.0044
48	.0040	.0051
49	.0045	.0060
50	.0051	.0069
51	.0057	.0080
52	.0065	.0093
53	.0074	.0106
54	.0083	.0121
55	.0094	.0136
56	.0109	.0151
57	.0127	.0166
58	.0149	.0181
59	.0173	.0196

* See Note 2 in Appendix 1.

APPENDIX 8

Rates of Mortality for employed contributors

Age	Males	Females
20	.0006	.0004
21	.0006	.0004
22	.0006	.0004
23	.0006	.0004
24	.0006	.0005
25	.0007	.0005
26	.0007	.0005
27	.0007	.0006
28	.0008	.0006
29	.0008	.0006
30	.0009	.0007
31	.0009	.0007
32	.0010	.0008
33	.0011	.0008
34	.0011	.0009
35	.0012	.0009
36	.0013	.0010
37	.0014	.0011
38	.0015	.0012
39	.0017	.0013
40	.0018	.0014
41	.0020	.0014
42	.0022	.0015
43	.0025	.0017
44	.0028	.0018
45	.0032	.0019
46	.0036	.0020
47	.0041	.0022
48	.0046	.0024
49	.0052	.0025
50	.0058	.0027
51	.0064	.0029
52	.0071	.0031
53	.0078	.0034
54	.0085	.0036
55	.0093	.0039
56	.0101	.0042
57	.0110	.0046
58	.0119	.0049
59	.0128	.0054
60	.0138	.0058
61	.0149	.0064
62	.0161	.0069
63	.0175	.0076
64	.0190	.0083
65	.0206	.0091
66	.0225	.0099
67	.0245	.0109
68	.0268	.0119
69	.0292	.0131
70	.0320	.0144

APPENDIX 9

Rates of Mortality for contributors retired for reasons other than disability and Annuity Values based thereon

Age	Rate of Mortality		Value of Annuity of $1.00 per annum to commence at age 60 or immediately if age is 60 or over (interest at 4% per annum)	
	Males	Females	Males	Females
50	.0066	.0027	$ 6.923	$ 9.668
51	.0073	.0029	7.272	10.082
52	.0080	.0031	7.650	10.516
53	.0088	.0034	8.061	10.971
54	.0097	.0036	8.509	11.448
55	.0106	.0039	8.999	11.949
56	.0115	.0042	9.537	12.476
57	.0125	.0046	10.129	13.030
58	.0135	.0049	10.785	13.613
59	.0145	.0054	11.515	14.228
60	.0157	.0058	12.331	14.877
61	.0169	.0064	11.999	14.540
62	.0182	.0069	11.665	14.195
63	.0197	.0076	11.326	13.842
64	.0213	.0083	10.985	13.481
65	.0231	.0091	10.642	13.113
66	.0250	.0099	10.297	12.738
67	.0272	.0109	9.950	12.355
68	.0296	.0119	9.603	11.965
69	.0322	.0131	9.256	11.567
70	.0351	.0144	8.909	11.162
71	.0383	.0160	8.563	10.751
72	.0418	.0179	8.219	10.334
73	.0456	.0201	7.878	9.915
74	.0499	.0225	7.540	9.492
75	.0545	.0252	7.206	9.066
76	.0596	.0285	6.876	8.639
77	.0652	.0322	6.551	8.213
78	.0714	.0365	6.232	7.788
79	.0781	.0414	5.920	7.367
80	.0855	.0470	5.614	6.950
81	.0936	.0534	5.316	6.539
82	.1024	.0608	5.026	6.135
83	.1121	.0693	4.744	5.740
84	.1227	.0790	4.471	5.355
85	.1342	.0901	4.208	4.982
86	.1467	.1030	3.954	4.623
87	.1603	.1177	3.709	4.280
88	.1751	.1345	3.475	3.955
89	.1912	.1539	3.251	3.652
90	.2085	.1762	3.037	3.375

APPENDIX 10

Rates of Mortality for male contributors retired
because of disability
and
Annuity Values based thereon

Age	Ultimate Rate (applicable after at least 3 yrs. have elapsed from date of retirement)	Value of Annuity of $1.00 per annum (interest at 4% per annum): At date of retirement	Value of Annuity of $1.00 per annum (interest at 4% per annum): Applicable after at least 3 yrs. have elapsed from date of retirement
25	.0072	$18.232	$18.550
26	.0073	18.093	18.408
27	.0074	17.945	18.261
28	.0075	17.791	18.110
29	.0076	17.630	17.952
30	.0077	17.462	17.789
31	.0078	17.291	17.621
32	.0080	17.113	17.445
33	.0082	16.929	17.265
34	.0084	16.740	17.080
35	.0086	16.543	16.889
36	.0088	16.340	16.693
37	.0090	16.132	16.490
38	.0093	15.918	16.281
39	.0096	15.700	16.066
40	.0100	15.467	15.845
41	.0103	15.232	15.620
42	.0107	14.990	15.389
43	.0111	14.743	15.152
44	.0116	14.494	14.909
45	.0122	14.232	14.661
46	.0128	13.976	14.410
47	.0135	13.712	14.154
48	.0142	13.441	13.894
49	.0150	13.160	13.630
50	.0158	12.858	13.364
51	.0167	12.530	13.093
52	.0177	12.184	12.819
53	.0188	11.868	12.543
54	.0200	11.600	12.264
55	.0212	11.379	11.985
56	.0225	11.190	11.703
57	.0240	11.028	11.419
58	.0256	10.883	11.135
59	.0273	10.750	10.851
60	.0292		10.567
65	.0400		9.167
70	.0549		7.798
75	.0751		6.479
80	.1044		5.234
85	.1464		4.092
90	.2085		3.037

APPENDIX 11

Rates of Mortality for female contributors retired because of disability and Annuity Values based thereon

Age	Ultimate Rate (applicable after at least 3 yrs. have elapsed from date of retirement)	Value of Annuity of $1.00 per annum (interest at 4% per annum): At date of retirement	Value of Annuity of $1.00 per annum (interest at 4% per annum): Applicable after at least 3 yrs. have elapsed from date of retirement
25	.0069	$19.275	$19.469
26	.0070	19.171	19.365
27	.0071	19.062	19.257
28	.0072	18.950	19.147
29	.0073	18.834	19.034
30	.0074	18.716	18.917
31	.0075	18.595	18.796
32	.0076	18.469	18.672
33	.0077	18.340	18.544
34	.0078	18.209	18.411
35	.0079	18.067	18.274
36	.0080	17.920	18.132
37	.0081	17.770	17.985
38	.0082	17.619	17.833
39	.0084	17.461	17.675
40	.0086	17.297	17.514
41	.0088	17.133	17.348
42	.0090	16.960	17.177
43	.0092	16.782	17.002
44	.0094	16.597	16.821
45	.0096	16.405	16.635
46	.0098	16.214	16.443
47	.0100	16.013	16.245
48	.0103	15.808	16.040
49	.0106	15.593	15.830
50	.0109	15.369	15.614
51	.0112	15.132	15.392
52	.0116	14.892	15.163
53	.0120	14.645	14.928
54	.0124	14.408	14.688
55	.0128	14.175	14.441
56	.0133	13.952	14.186
57	.0138	13.736	13.926
58	.0144	13.532	13.658
59	.0150	13.333	13.384
60	.0157		13.104
65	.0203		11.610
70	.0277		9.978
75	.0401		8.242
80	.0620		6.468
85	.1048		4.789
90	.1762		3.375

APPENDIX 12

Rates of Remarriage and Mortality for Widows

Rate of Remarriage

Age at Widowhood	Year of Widowhood: 1st yr.	3rd yr.	5th yr.	10th yr.	Ultimate	Attained Age	Rate of Mortality
25	.050	.148	.132	.060	.028	39	.0022
30	.029	.086	.076	.035	.016	44	.0026
35	.018	.048	.042	.019	.009	49	.0033
40	.011	.027	.023	.010	.004	54	.0050
45	.006	.015	.012	.005	.002	59	.0083
50	.004	.008	.006	.002	.001	64	.0141
55	.002	.004	.003	.001	0	69	.0232
						74	.0367
						79	.0559
						84	.0822
						89	.1180

Value of Annuity of $1.00 per annum payable to death or remarriage of widow (interest at 4% per annum)

Age at Widowhood	Year of Widowhood: 1st yr.	3rd yr.	5th yr.	10th yr.	Ultimate	Attained Age
25	$ 8.393	$ 8.687	$10.453	$14.731	$16.465	39
30	11.992	12.306	13.644	16.232	16.854	44
35	14.821	14.954	15.692	16.759	16.423	49
40	16.326	16.249	16.494	16.407	15.429	54
45	16.717	16.421	16.279	15.414	14.013	59
50	16.209	15.757	15.349	14.013	12.386	64
55	15.142	14.553	13.977	12.386	10.681	69
					9.008	74
					7.447	79
					6.040	84
					4.789	89

APPENDIX 13

Proportions of Male Contributors Married at Death;
Average Ages of Widows corresponding to ages of contributors at death;
and
Values of Children's Benefits per $1.00 "earned" annuity per contributor at death

Age of Contributor at Death	Proportion of Male Contributors Married at Death		Average Age of Widows	Value of Children's Benefits	
	Employed Contributors	Retired Contributors		Employed Contributors	Retired Contributors
25	.811	.315	24.36	$1.624	$0.576
30	.826	.455	29.01	1.679	.832
35	.844	.575	33.61	1.628	.991
40	.864	.673	38.16	1.417	.977
45	.885	.749	42.68	1.025	.763
50	.901	.802	47.20	.618	.476
55	.909	.828	51.68	.316	.243
60	.898	.826	56.14	.139	.106
65	.867	.797	60.57	.051	.039
70	.832	.737	64.94	.016	.011
75		.646	69.19		.003
80		.526	73.20		
85		.392	76.57		
90		.263	78.58		

Age	Proportion of students entitled to children's allowances remaining eligible for allowance at the end of the year of age
18	0.74
19	0.68
20	0.67
21	0.60
22	0.54
23	0.53
24	0.31

Age	Value of Children's Allowance of $1.00 per annum
0	$13.487
5	10.885
10	7.719
15	3.867
17	2.102
18	2.287
20	1.817
22	1.319
24	0.646

A P P E N D I X 14

Capitalized Values of Annuity or Annual Allowance Benefits per $1.00 "earned" annuity of contributors at retirement or death (interest at 4% per annum)

Age of Contributor at Retirement	Deferred Annuity on Retirement for reasons other than disability		Immediate Annuity on Retirement because of age or age and service	
	Males	Females	Males	Females
50	$ 9.452	$ 9.959		
55	11.433	12.075	$15.683	$16.457
60			14.138	14.895
65			12.437	13.141
70			10.621	11.207

On Retirement because of Disability

Age of Contributor at Retirement	Males	Females
25	$19.648	$19.311
30	19.146	18.755
35	18.492	18.108
40	17.658	17.342
45	16.642	16.455
50	15.392	15.426
55	14.068	14.242
59	13.482	13.441

On Death leaving dependants entitled to annual allowance

Age of Contributor at Death	Employed Male Contributors	Retired Male Contributors
25	$6.562	$5.804
30	8.039	7.489
35	9.224	8.811
40	9.726	9.406
45	9.585	9.352
50	9.042	8.878
55	8.362	8.243
60	7.646	7.547
65	6.916	6.809
70	6.198	6.052
75		5.312
80		4.635
85		4.095
90		3.787

APPENDIX 15

Age	Proportion of contributors with salaries below Y.M.P.E.* — Males	Females	Ratio of average salary to Y.M.P.E.* for contributors below that maximum — Males	Females
18	.985	.990	.680	.625
19	.970	.990	.710	.650
20	.950	.990	.740	.685
21	.920	.985	.770	.725
22	.860	.960	.800	.755
23	.780	.915	.830	.780
24	.670	.865	.845	.800
25	.570	.830	.860	.805
26	.500	.785	.870	.810
27	.440	.745	.875	.810
28	.390	.720	.880	.810
29	.360	.720	.885	.810
30	.340	.720	.890	.805
31	.330	.720	.890	.805
32	.320	.720	.890	.805
33	.310	.720	.885	.795
34	.310	.720	.885	.795
35	.310	.720	.885	.790
36	.315	.720	.885	.785
37	.315	.720	.885	.785
38	.320	.720	.885	.785
39	.325	.720	.885	.780
40	.330	.720	.885	.780
41	.335	.720	.885	.780
42	.340	.720	.880	.780
43	.340	.720	.875	.780
44	.340	.720	.875	.780
45	.340	.720	.875	.780
46	.340	.720	.875	.780
47	.340	.720	.875	.780
48	.345	.720	.875	.780
49	.350	.720	.875	.780
50	.360	.715	.875	.780
51	.365	.715	.870	.780
52	.370	.710	.870	.780
53	.380	.710	.865	.780
54	.390	.700	.865	.780
55	.395	.700	.865	.780
56	.400	.700	.860	.780
57	.405	.700	.855	.780
58	.410	.700	.855	.780
59	.415	.700	.850	.775
60	.420	.705	.845	.770
61	.430	.710	.845	.765
62	.440	.715	.840	.760
63	.450	.720	.835	.755
64	.460	.725	.830	.750
65	.460	.730	.825	.740
66	.460	.735	.820	.730
67	.460	.740	.815	.720
68	.460	.745	.810	.710
69	.460	.750	.805	.700
70	.460	.755	.800	.700

* Y.M.P.E. = "Year's Maximum Pensionable Earnings" (Canada Pension Plan) which for this purpose was assumed to be at the level of the industrial composite average of annual wages and salaries.

A P P E N D I X 16

Age Distribution of employees who became contributors during the period from January 1, 1968 to December 31, 1972

	Males		Females	
Age at Entry	Number	Cumulative Proportion	Number	Cumulative Proportion
18	1,991	2.2%	5,159	7.8%
19	4,193	6.9	6,143	17.1
20	5,430	13.0	5,589	25.5
21	5,834	19.6	5,101	33.2
22	6,136	26.5	4,917	40.6
23	5,879	33.1	4,137	46.8
24	5,154	38.9	3,468	52.0
25	4,527	44.0	2,708	56.1
26	3,802	48.3	2,183	59.4
27	3,121	51.8	1,791	62.1
28	2,798	55.0	1,513	64.4
29	2,452	57.8	1,357	66.4
30	2,086	60.2	1,215	68.2
31	1,883	62.3	1,093	69.8
32	1,690	64.2	958	71.2
33	1,559	66.0	976	72.7
34	1,382	67.6	930	74.1
35	1,341	69.1	951	75.5
36	1,309	70.6	923	76.9
37	1,177	71.9	897	78.3
38	1,287	73.4	931	79.7
39	1,211	74.8	802	80.9
40	1,202	76.2	859	82.2
41	1,174	77.5	858	83.5
42	1,166	78.8	860	84.8
43	1,209	80.2	859	86.1
44	1,270	81.6	829	87.4
45	1,308	83.1	891	88.7
46	1,277	84.5	833	90.0
47	1,345	86.0	780	91.2
48	1,315	87.5	751	92.3
49	1,268	88.9	742	93.4
50	1,433	90.5	666	94.4
51	1,351	92.0	566	95.3
52	1,091	93.2	474	96.0
53	869	94.2	444	96.7
54	781	95.1	388	97.3
55	735	95.9	336	97.8
56	724	96.7	311	98.3
57	560	97.3	254	98.7
58	505	97.9	219	99.0
59	467	98.4	170	99.3
60	393	98.8	120	99.5
61	306	99.1	87	99.6
62	263	99.4	73	99.7
63	226	99.7	51	99.8
64	152	99.9	28	99.9
65 & over	118	100.0	54	100.0
All Ages	88,750		66,245	

Average Age: Males: 31.53 years; Females: 28.64 years

APPENDIX 17

Age Distribution of contributors employed in the Public Service on December 31, 1972

Age	Males Number	Males Cumulative Proportion	Females Number	Females Cumulative Proportion
18	143	0.1%	473	0.6%
19	754	0.5	1,829	3.1
20	1,478	1.3	2,730	6.7
21	2,089	2.5	3,176	10.9
22	2,963	4.1	3,411	15.5
23	3,557	6.0	3,464	20.1
24	4,194	8.3	3,418	24.7
25	4,871	11.0	3,231	29.0
26	5,245	13.9	2,912	32.9
27	4,440	16.3	2,099	35.7
28	4,169	18.6	1,723	38.0
29	4,146	20.9	1,529	40.0
30	4,216	23.2	1,388	41.9
31	4,044	25.4	1,343	43.7
32	3,891	27.6	1,230	45.3
33	3,458	29.5	1,130	46.8
34	3,491	31.4	1,060	48.2
35	3,513	33.3	1,109	49.7
36	3,442	35.2	1,040	51.1
37	3,576	37.2	1,153	52.6
38	3,504	39.1	1,144	54.2
39	3,480	41.0	1,128	55.7
40	3,730	43.1	1,219	57.3
41	3,754	45.1	1,153	58.8
42	3,933	47.3	1,217	60.4
43	3,706	49.3	1,264	62.1
44	3,740	51.4	1,298	63.9
45	3,688	53.4	1,348	65.7
46	3,898	55.6	1,441	67.6
47	4,516	58.0	1,588	69.7
48	5,141	60.9	1,710	72.0
49	5,507	63.9	1,750	74.3
50	5,818	67.2	1,748	76.6
51	6,198	70.5	1,790	79.0
52	6,253	73.9	1,750	81.4
53	6,200	77.3	1,815	83.8
54	5,297	80.2	1,406	85.7
55	4,940	83.0	1,440	87.6
56	4,737	85.6	1,384	89.4
57	4,609	88.1	1,390	91.3
58	4,360	90.5	1,346	93.1
59	4,062	92.7	1,183	94.7
60	3,453	94.6	1,013	96.0
61	2,717	96.1	838	97.1
62	2,297	97.4	729	98.1
63	1,992	98.5	599	98.9
64	1,750	99.4	514	99.6
65 +	1,036	100.0	309	100.0
All Ages	181,996		74,962	

Average Age: Males 42.50 years; Females: 37.50 years