



Department of Insurance
Canada

Département des assurances
Canada

Ottawa, Canada
K1A 0H2

PUBLIC SERVICE SUPERANNUATION ACT - PART I

ACTUARIAL REPORT
ON THE
SUPERANNUATION ACCOUNT
AS AT
DECEMBER 31, 1980

	<u>Table of Contents</u>	<u>Page</u>
I.	Introduction and Summary	1
II.	Data and Membership Statistics	2
III.	Valuation Assumptions	7
IV.	Actuarial Cost Method	15
V.	Required Contributions and Credits to the Account	15
VI.	Valuation Balance Sheet and Gain and Loss Analysis	16
VII.	Conclusion	19
Appendix 1:	Supplementary Retirement Benefits	20
2:	Summary of Basic Superannuation Act	29
3-13:	Various Actuarial Assumptions	38
14:	Active Contributor Display	51
15:	Pensioner Display	53

Public Service Superannuation Act - Part 1

Report on the Actuarial Examination of the
Superannuation Account in the Consolidated Revenue
Fund as at December 31, 1980

I. Introduction and Summary

Pursuant to section 35 of the Act we have made an actuarial examination of the Account as at December 31, 1980, and have the honour to report thereon.

The last examination of this Account was made as at December 31, 1977. No significant changes of general applicability were made in the Public Service Superannuation Act during the intervalation period. However, amendments made in 1981 introduced special retirement provisions for air traffic controllers, retroactive to April 1, 1976. Pursuant to these amendments an air traffic controller may, among other things, retire to an immediate annuity after attainment of age 50 and completion of twenty-five years of operational service in case of voluntary retirement or after twenty years of operational service in case of non-voluntary retirement, for reasons other than misconduct. In certain other cases, reduced benefits may be payable. Air traffic controllers are required to contribute a special additional contribution equal to two percent of salary.

The normal actuarial cost, that is, the total contribution required from contributors and Government combined to provide all benefits in respect of current service, is estimated to be 11.45% of pay. Allowing for coordination with the Canada/Quebec Pension Plan, the effective rate of contribution to the Account from contributors is equivalent to 5.37% of pay. As a result, it is estimated that Government credits are required at a rate equal to 1.13 times the contributions from contributors.

The above normal actuarial cost makes allowance for general salary increases at the rate of 5.0% of pay per annum. Pursuant to subsection 34(2) of the Act, additional liabilities arising out of general increases in pay in excess of this rate are estimated to require Special Credits to the Account equal to 1.3 times the increase in the effective annual payroll in excess of 5.0%. Under the existing provisions of the Act, such credits would be set up as a deferred charge to be amortized in five equal annual instalments. These instalments, together with those in respect of existing deferred charges, may be offset by interest earnings in excess of 6.5% per annum, pursuant to subsection 34(4) of the Act.

The estimated unfunded actuarial liability related to the Account as at December 31, 1980 was 431.5 million. This is about 3.3% of total actuarial liabilities or equivalent to 7.2% of the effective annual payroll at the date of valuation.

With the combined employer-employee contribution rate having remained unchanged at an estimated 10.8% of salary, a deficit of the order of \$200 million may be expected to have accumulated by December 31, 1983, the date of the next triennial* actuarial examination of the Account.

This report and the above figures make no provision for benefits and increases in benefits related to increases in the cost of living. Such benefits, payable to persons in receipt of annuities or annual allowances under various government superannuation and other acts, including the Public Service Superannuation Act, are provided under the Supplementary Retirement Benefits Act and, pursuant to Part III of the Public Service Superannuation Act, contributors are required to pay special contributions to the Supplementary Retirement Benefits Account. Although these provisions do not affect the operation of the Superannuation Account, it was considered appropriate to continue the practice of including a description of those provisions and commenting briefly on the related financing and actuarial implications, in order to present a complete picture of the total employer-sponsored pension provisions for contributors to the Superannuation Account. This is done in Appendix 1.

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 computer files by the Superannuation Division of the Department of Supply and Services; data in respect of active contributors are maintained in a similar manner by the Personnel Data Systems Division of the same department. Data concerning salaries of contributors as at December 31, 1980, 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 data were considered to be reasonably satisfactory for the purpose.

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, 1980, or terminated employment in the preceding three years, for which statistics in summary form are shown in the following table.

* The minimum statutory requirement is for an actuarial report every five years. However, it was considered desirable to adopt the practice generally required of employer-sponsored pension plans in Canada.

Contributors Employed in the Public Service

	Contri- butors on Jan. 1, 1978	Entrants during the 1978-80 period	Less than 5 years of pension- able service	<u>Terminations during the 1978-80 period</u>				Contri- butors on Dec. 31 1980
				Age(1)	Death	Disabi- lity(2)	Other(3)	
Males	205,317	49,334	32,243	15,411	1,400	1,486	9,734	194,377
Females	<u>100,716</u>	<u>53,007</u>	<u>37,008</u>	<u>3,854</u>	<u>176</u>	<u>543</u>	<u>8,427</u>	<u>103,715</u>
Total	306,033	102,341	69,251	19,265	1,576	2,029	18,161	298,092

-
- (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 96% 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 10 in Appendix 2, the benefit was either a return of contributions, a deferred annuity or an annual allowance.) Proportions electing deferred annuities or annual allowances are shown in Appendix 5.

Pertinent statistics derived from tabulations relating to persons entitled to annuities or annual allowances some time during the 1978-80 period are shown in the following tables.

Persons Entitled to an Annuity or Annual Allowance

Former contributors

	Became entitled during the 1978-80 period	Ceased to be entitled during the 1978-80 period			Entitled Dec. 31, 1980			
		Re-entitled Jan. 1 1978-80 period	Re-employed or recovered	Other*	In Payment	Deferred	Total	
<u>Males</u>								
Entitlements for reasons Other than Disability	47,276	17,980	6,557	40	71	55,262	3,326	58,588
Entitlements because of Disability	<u>5,823</u>	<u>1,604</u>	<u>1,005</u>	<u>10</u>	<u>--</u>	<u>6,412</u>	<u>--</u>	<u>6,412</u>
Total	<u>53,099</u>	<u>19,584</u>	<u>7,562</u>	<u>50</u>	<u>71</u>	<u>61,674</u>	<u>3,326</u>	<u>65,000</u>
<u>Females</u>								
Entitlements for reasons Other than Disability	17,838	5,404	1,251	12	27	20,161	1,791	21,952
Entitlements because of Disability	<u>2,422</u>	<u>552</u>	<u>210</u>	<u>4</u>	<u>--</u>	<u>2,760</u>	<u>--</u>	<u>2,760</u>
Total	<u>20,260</u>	<u>5,956</u>	<u>1,461</u>	<u>16</u>	<u>27</u>	<u>22,921</u>	<u>1,791</u>	<u>24,712</u>
Grand Total	73,359	25,540	9,023	66	98	84,595	5,117	89,712

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

Surviving Spouses

	Entitled Jan. 1, 1978	Became entitled during the 1978-80 period	Ceased to be enti- tled during the <u>1978-80 period</u>		Entitled Dec. 31, 1980
			Died	Remarried	
Widows	27,600	6,659	2,912	446	30,901
Widowers	83	219	16	18	268

Children and Students

	Entitled Jan. 1, 1978	Became entitled during the 1978-80 period	Ceased to be enti- tled during the <u>1978-80 period</u>		Entitled Dec. 31, 1980
			Attained age 18 or age 25	Ceased to be elig- ible as a student	
Children	3,474	1,489	2,168	-	2,795
Students	1,480	1,707	215	1,514	1,458

III. Valuation Assumptions

A. General Comments

For this valuation we continued the approach adopted for the preceding valuation of selecting assumptions that might be regarded as appropriate and reasonably "realistic" each on its own merits as well as when considered together in the long term. In comparison with the preceding valuation, slight changes were made in some of the explicit and implicit economic assumptions. The changes were discussed with and supported by officers in the Department of Finance and the Treasury Board Secretariate. Supportive advice was also obtained from the Economic Council of Canada.

Our primary purpose in continuing to treat this plan in a manner consistent with the practice for industrial pension plans is not to provide security through funding, but to report pension costs in an appropriate and reasonably comparable fashion. Before discussing the various assumptions under individual headings the following general comments relating to economic assumptions may be in order.

- (1) Some considerations involved in selecting explicit or implicit levels of inflation and in determining the general level of economic assumptions

There are two aspects to the discussion under this heading:

- (a) The extent to which the normal actuarial cost (current service contribution rate) is affected by the level of economic assumptions depends on the type of pension plan under consideration. For a pension plan of the career-average type, where the rate of interest is normally the sole economic assumption, a relatively higher level of interest produces a very substantially lower cost. For a final-average-pay plan such as the Public Service Superannuation Act, where the effect of a relatively higher assumed rate of interest tends to be partly offset by the effect of an accompanying relatively higher level of assumed salary increases, the effect is considerably smaller. Finally, for a fully indexed final-average salary plan, such as the Public Service Superannuation Act if it were combined with the Supplementary Retirement Benefits Act, the level of assumed inflation tends to have a relatively slight effect on costs, if its relationship to assumed interest rates and increases in salaries remains approximately the same. Clearly, the level of economic assumptions and the differentials between them must be kept in mind when attempts are made to compare different types of pension plans or when modifications in a particular plan are being considered, and mere consistency will not necessarily ensure acceptable conclusions regarding costs.
- (b) It seems unavoidable that actuaries, individually and collectively, influence expectations regarding future inflation by their very act of attempting to use "realistic" assumptions. And it may well be that the realism, desirable as it may appear to economists, accountants and actuaries, needs to be moderated if there is to be any hope of reducing the long-term level of inflation. While this appears to apply quite generally, it seems crucial in relation to actuarial reports dealing with pension plans operated by governments or major financial or industrial enterprises.

(2) Effect of benefits beyond the terms of pension plans

As suggested above, when costs of different plans are being compared or amendments are being considered, it is important to bear in mind the level of the economic assumptions as well as the differentials between individual assumptions. However, there are considerations beyond these.

In recent years, for a growing number of plans, in some cases as a result of collective bargaining, employers have adopted the practice of (a) making periodic ad hoc adjustments to pensions in payment to compensate for some or all of the purchasing power lost through inflation, and (b) increasing the benefits accrued to active members of flat-benefit or career-average type pension plans in order to keep earned pensions in a reasonable relationship to current rates of pay. When there is no explicit commitment under the terms of the plan for similar adjustments in the future, they will not be included in the calculations of normal actuarial cost and actuarial liabilities.

It might be argued, especially when adjustments occur with regularity, that there is a strong moral commitment and that from an accounting point of view the costs are understated. It would be possible, of course, for the employer to make advance provision for such adjustments without contributing additional funds to the plan by setting up a special contingent liability in his balance sheet and by including the additions to such contingent liability account with the normal actuarial cost (current service contributions) of the pension fund for purposes of assessing the total normal actuarial cost. Such practice might make for more valid comparison of the value of expected pensions under different plans. However, setting up a contingent liability in the employer's balance sheet might well be interpreted as converting a moral commitment into a promise, in which case the additional benefits should be considered part of the formal plan and funded in the same manner as basic benefits. For practical purposes, of course, this would eliminate the employer's option of updating benefits from time to time without commitment regarding future adjustments.

H. Rate of Interest

Until the quarter ending June 30, 1969, interest was credited to the 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, i.e. approximately 4% per annum.

The 1969 amendments to the Act made provision for crediting interest to the Account at the rate used in the preceding actuarial valuation and for the possibility of crediting interest in excess of that rate. However, interest credits in excess of the valuation rate may be applied against budgetary expenditure related to the amortization of actuarial deficiencies. 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 pursuant to this Act and the Canadian Forces and R.C.M.P. Superannuation Acts had been invested on a basis similar to the one used for the Canada Pension Plan, i.e., in twenty-year bonds having a yield equivalent to the average yield on Government of Canada bonds with 20 or more years to maturity outstanding at that time.

For the quarter ending December 31, 1980, the total rate of interest credit was 2.1033% which is equivalent to 8.68% per annum. The total annual rate of interest credit has remained above 6.5% after June 1974 and seems likely to continue above that rate for some considerable period of time, given that rates of return on new notional investments reached an average of about 15% during 1981 and 1982 and have declined only to between 11% and 12% during 1983, even if allowance is made for a continued decline in anticipated inflation and interest rates to substantially lower levels.

For purposes of this valuation it was decided to continue the use of an assumed rate of interest of 6.5% which, as noted above, is expected to be exceeded by actual interest credits for a considerable period of time. In the long term the rate is assumed to be composed of an inflation factor of 3.5% and a real rate of return of about 3.0%*.

A real rate of return of 3.0% is considered to be reasonably consistent with an average long term inflation rate of 3.5%, particularly, if that rate is assumed to be somewhat unstable. As well, 3.0% appears to be a real rate explicitly or implicitly assumed in many actuarial valuations of private pension plans, so that its use would tend to minimize the nevertheless formidable difficulties in comparing normal actuarial costs (contribution rates) with those of other plans.

C. Salary Increases

There are two main forces that tend to generate increases in salaries: firstly, a promotional force resulting from experience and training and increase in responsibility due to promotion; secondly, an economic force related, directly or indirectly, to such factors as inflation, general increases in productivity, collective bargaining and labour market conditions. Increases in salaries resulting from this second force are herein referred to as "general" increases.

Analysis of the data indicated that except at relatively younger ages average promotional increases were somewhat higher than they had appeared in the preceding study. Accordingly, new promotional salary scales were constructed for purposes of this report.

With regard to general increases, the wide variations that have occurred in recent years as a result of varying economic and social forces are indicative of the difficulty in predicting the level of future increases of this type. For purposes of this valuation, we have assumed a level rate of general increases in salaries of 5.0%. In the long term this rate

*More precisely $(\frac{1.065}{1.035} - 1)$ or 2.899%.

is assumed to be composed of a 3.5% inflation factor and a 1.5% factor* for real general increases related to productivity, labour market conditions and collective bargaining.

The reduction in the assumption for real general salary increases from 2.5% to 1.5%, coupled with the reduction in the assumed real rate of return from 3.5% to 3.0%, is thought to result in a better representation of expected long-term economic conditions. The relationship between the assumptions for interest and salary increases would meet the current requirements of the Department of National Revenue applicable to employer-sponsored pension plans.

Appendix 3 shows the promotional salary scales and salary scales incorporating both promotional and general increases.

D. Rates of termination for all reasons with less than five years of pensionable service

Subject to certain minor exceptions, 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".

With some exceptions, mainly among males at the very young and relatively old ages, experience during the 1978-80 period indicated that termination rates for both male and female contributors were generally somewhat higher than those assumed for the preceding valuation. 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.

F. Rates of termination for reasons other than age, age and service, disability or death after five or more years of pensionable service and Proportions of terminating contributors electing to take a deferred annuity or annual allowance

On the basis of the experience during the period 1978-80, the termination rates were found to be higher for both male and female contributors than those assumed for the preceding valuation. Revised rates based on this experience were used and are shown in Appendix 5.

* More precisely $(\frac{1.050}{1.035} - 1)$ or 1.449%

As described in the "Summary of Benefits" in Appendix 2, 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. Contributors terminating after age 45 with at least 10 years of pensionable service must elect a deferred annuity or an annual allowance in respect of service after September 30, 1967.

The 1978-80 experience showed generally substantial increases in the proportions electing to take a deferred annuity or annual allowance, except for females aged 41 to 53. Revised proportions based on this experience were used and are shown in Appendix 5.

The amount of an annual allowance is determined by the application of arbitrary* factors based on the age and length of service to the amount of the deferred annuity to which a terminating contributor is entitled. As in the preceding valuation, annual allowances were assumed to be actuarially equivalent to deferred annuities.

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

In this report, the expression "retirement because of age" applies to contributors entitled to an immediate annuity because of attainment of age 60 and completion of at least five years of pensionable service. Retirements with entitlement to an immediate annuity at ages 55 to 59 with at least 30 years of pensionable service are termed "retirement because of age and service".

Previous reports have noted a marked trend toward higher rates of retirement at ages below 65. This trend continued, during the period 1978-80, except at age 60 for males and ages 59 to 61 for females. The rates used were established on the basis of this most recent experience. 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 concentration at age 60 (the earliest age at which an unreduced immediate annuity is available for "retirements because of age") and more than ninety-six percent of contributors attaining age 65 retire at that age (employment in the Public Service after age 65 is contingent on special authorization). It was assumed as in preceding valuations that all active contributors who attain age 70 cease to be employed during the following year.

G. Rates of retirement because of disability

The experience during 1978-80 showed a marked reversal of the earlier trend toward higher rates of retirement because of disability. New rates based on this most recent experience but containing a safety margin were adopted for this valuation and are shown in Appendix 7.

* See Note 8 in Appendix 2

In the preceding valuation it was assumed that 50% of contributors retiring in the future on account of disability will have their basic annuities reduced as a result of their eligibility for CPP/QPP disability benefits and that the other 50% of such annuitants would have their basic annuities reduced at age 65 when the normal CPP/QPP retirement pensions become payable. This assumption was retained, since the data indicated that it provided a reasonable safety margin.

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

The number of actual deaths of contributors during 1978-80 was generally less than that expected on the basis used for purposes of the preceding valuation. It was, therefore, deemed appropriate to use mortality rates giving substantial recognition to the most recent experience for this valuation.

The rates used are shown in Appendix 8.

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

For the purposes of the four preceding valuations, the mortality rates deemed suitable to provide a margin for improvement in mortality over a considerable future period were, for males the a-1949 Table and for females the a-1949 Table projected in accordance with Projection Scale C assuming a year of birth 1910. The experience of the 1978-80 period indicated that in the case of females these rates continue to provide a satisfactory margin and, accordingly, they were retained for the current valuation. However, in the case of males the margin for expected improvement appeared to have become too small. Accordingly, the 1971 GAM Table was adopted for purposes of valuing annuities payable to males. The rates used and the relevant annuity values are shown in Appendix 9.

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

The rates used in the five 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 1978-80 experience indicated that these rates could be retained in the case of females because they continue to provide a reasonable margin for any improvements in mortality which may also be expected to affect disabled lives. In the case of males, the rates used appeared to contain an excessively large margin for expected improvement above age 50. Accordingly, a new set of rates was adopted for purposes of the current valuation.

The ultimate rates of mortality, applicable after the first two years following retirement, are shown in Appendices 10A and 10B for males and females, respectively. Rates of mortality for the first and second years following retirement are assumed to be 250% and 150%, respectively, of the ultimate rates.

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

K. Widows

The rates of mortality used for valuing widows' allowances in the five 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. The 1978-80 experience, as well as the preceding study, showed that these rates had gradually become quite inadequate. Accordingly, a new table providing for some expected improvement in mortality was constructed for this valuation.

The rates of remarriage, varying by age and duration from widowhood, that were used for the five 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 has been somewhat higher than expected on the basis of the above rates. Accordingly, a new table based on the 1978-80 experience was constructed for use in the current valuation. The rates are based on the following percentages of the 1962 Railroad Retirement Board (U.S.) rates: 50% in the first and second years of widowhood, 75% in the third, fourth and fifth year and thereafter, except at the very young ages, 85%.

Sample remarriage and mortality rates, as well as annuity values based on the probabilities of payments ceasing as a result of death or remarriage are shown in Appendix 11A.

L. Widowers

Widowers of deceased contributors who were employed in the Public Service on and after December 20, 1975, are entitled to annual allowances.

As at December 31, 1980, there were relatively few widowers entitled to benefits and therefore no usable experience under the Public Service Superannuation Act on which to base remarriage and mortality rates for widowers of deceased contributors. The remarriage rates assumed for this valuation were the same as those used for purposes of the Canada Pension Plan. The mortality rates are those for male lives in the Life Tables 1970-72, Canada, as published by Statistics Canada.

Sample remarriage and mortality rates, as well as annuity values based on the probabilities of payments ceasing as a result of remarriage or death are shown in Appendix 11B.

M. Proportions of contributors married at death and Average ages of spouses corresponding to ages of contributors at death

Proportions of male contributors married at death used in the five preceding valuations were derived from the 1948-57 experience for employed and retired contributors, separately. More recent experience indicates that, except for pensioners at ages below 60, the proportion married at death was somewhat higher than that expected in accordance with the 1957 basis.

Average ages of widows corresponding to ages of contributors at death used in the five preceding valuations were derived 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 generally increased slightly below age 45 and decreased slightly above that age.

For purposes of the current valuation new factors were constructed on the basis of the 1978-80 experience for both male and female contributors. Values for quinquennial ages of contributors at death are shown in Appendix 12.

N. 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 payment of allowances to a child between ages 18 and 25 is conditional on the child being in full-time attendance at school, probabilities of a child at any age continuing to be eligible during the next year of age are needed. The factors used in the two preceding valuations were calculated using data on the children who have received allowances at any time after their 18th birthday during the 1968-72 period. These probabilities which were used in the two preceding valuations were retained; they are shown in Appendix 12.

- O. 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 2, 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.

In valuing the liability for future benefits and employer costs in respect of current service, 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. are required. As at December 31, 1980, the Y.M.P.E. was \$13,100. However, the Y.M.P.E. is scheduled to be increased by 12.5% per annum until it reaches the estimated 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 \$16,800 (the hypothetical value of the Y.M.P.E. at the point of valuation assuming the ultimate formula) and to use this value for the Y.M.P.E. (increasing at the assumed rate of general increase in salaries of 5.0% p.a.) when determining the effect of the reduction in P.S.S.A. benefits (resulting from integration with CPP/QPP benefits) on the liabilities and the employer's current service contributions.

The proportions and ratios used in this valuation are shown in Appendix 13. They appear somewhat different from those developed for the preceding valuation, but the effect of the difference is relatively small.

IV. Actuarial Cost Method

The actuarial cost method used for purposes of the preceding report was retained. It is known as the Accrued Benefit or Unit Credit Actuarial Cost method and contemplates contributions in any year sufficient to fund all future benefits in respect of service during that year. The actuarial liability is the actuarial present value of projected benefits in respect of service to the effective date of the valuation.

V. Rates of Contribution and Required Credits to Account

Using the assumptions and actuarial cost method described in Sections III and IV, respectively, and the distribution of active contributors as at December 31, 1980 summarized in Appendix 14, the normal actuarial cost, i.e. the total rate required from contributors and the Government combined to fund future benefits in respect of current service was calculated to be 11.45% of salary.

After making allowance for integration with contributions payable to the Canada/Quebec Pension Plan, contributions from contributors to the Account were calculated to be equal to approximately 5.37% of salary. It is apparent that these contributions together with matching Government credits to the Account leave a deficiency of 0.71% of salary. If the Act is not amended to allow for credits to the Account to be made at the appropriate level, estimated at approximately 1.13 times the amount of employee contributions, a deficit of the order of 200 million dollars may be expected to accumulate by December 31, 1983, the date of the next planned triennial* actuarial examination of the Account.

The rates of government credits required, as stated above, are lower by about 0.48% than determined for purposes of the preceding report. The difference is largely accounted for by a decrease of 0.69% of salary attributable to changes in economic assumptions and a net increase of 0.21% of salary attributable to other factors and assumptions.

The valuation assumptions include provision for 5.0% annual increases in the general level of pay. Under normal pension funding practices, increases in actuarial liabilities arising out of increases in salaries in excess of the assumed rate would be taken care of, along with other actuarial losses after allowing for any gains, following receipt of periodic actuarial reports. The Public Service Superannuation Act, however, provides for a special 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 actuarial liability resulting from that salary increase. The amount of this special credit is estimated as 1.3 times the excess, if any, of the total amount of an authorized increase in salaries over 5.0% p.a. of total salaries of contributors receiving such increase.

*See footnote on page 2.

VI. Valuation Balance Sheet and Gain and Loss Analysis

The results of the valuation based on the assumptions and actuarial cost method described in Sections III and IV, respectively, are summarized and the financial status of the Account as at December 31, 1980, is shown in the following balance sheet.

<u>Assets</u>		(millions)
Balance of Account (Par Value)*		\$11,976.7
Government matching credits outstanding December 31, 1980, in respect of past contributions by contributors		238.9
Government credits outstanding December 31, 1980, in respect of past general increases in salaries		537.0
Actuarial present value of future instalments of past service contributions and matching credits by the Government		
Employed contributors	\$201.8	
Retired contributors	73.0	<u>274.8</u>
Total Actuarial Value of Assets		\$13,027.4
Unfunded Actuarial Liability**		<u>431.5</u>
		<u>\$13,458.9</u>

*The value of the Account as at December 31, 1980, determined by discounting the notional investments at the assumed valuation interest rate of 6.5% was \$14,862.1 million. The difference between this value and the par value used in the balance sheet may be considered a reserve for increases in actuarial liabilities relating to future general salary increases in excess of 5% and for part of the unfunded actuarial liability related to indexing of superannuation benefits pursuant to the Supplementary Retirement Benefits Act (see Appendix 1).

**Deferred charges totalling \$699.3 million that were in the process of amortization but are included in the balance of the Account would normally be shown as part of the unfunded actuarial liability.

Liabilities

Actuarial present value of prospective benefits to and in respect of employed contributors \$ 9,083.4

Actuarial present value of benefits to persons entitled to an annuity or annual allowance

Retired contributors on pension	\$3,863.7	
Deferred annuities	87.1	
Spouses	417.4	
Children and Students	7.3	<u>4,375.5</u>
Total Actuarial Liability		<u>\$13,458.9</u>

The foregoing balance sheet indicates an unfunded actuarial liability of about \$432 million. The major actuarial gain and loss items combining to produce this deficit were calculated to be as follows:

Actuarial Gains and Losses
(in millions of dollars)

	<u>Gain</u>	<u>Loss</u>
Normal Actuarial gains and losses		
- Terminations	75	
- Retirements, disabilities and survivor benefits		29
- Promotional salary increases	<u>75</u>	<u>17</u>
		46
Changes in actuarial assumptions and methods		
- Economic assumptions	381	
- Retirement rates		145
- Termination rates	207	
- Promotional salary scale		119
- Pensioner mortality		145
- Other assumptions and methods	<u>588</u>	<u>92</u>
		501
Extraordinary actuarial gains and losses		
- Special credits related to salary increases	889*	
- Interest credits		755*
- Normal actuarial cost (contribution rate)		210
- 1977 unfunded actuarial liability accumulated with interest to 1980	<u>889</u>	<u>74</u>
		1039
Other largely unidentifiable net actuarial losses		398
Total net loss		<u>432</u>

* These items are attributable in large part to the time lapse between the effective date of the preceding valuation and the date when the 1977 valuation assumptions were reflected in the accounting procedures. An accumulated loss of \$755 million is attributable to interest credits between December 31, 1977 and October 1, 1980, at the old rate of 4% p.a. instead of 6.5% p.a. as assumed in the 1977 valuation. Similarly, an accumulated gain of \$1201 million is attributable to credits in respect of 1978, 1979 and 1980 salary increases being based on total general salary increases instead of the excess over 5.5% expected in accordance with the 1977 assumptions; but this is partially offset by an apparent accumulated loss of \$312 million representing a shortage of credits calculated on the new basis as compared to credits required on the basis of the 1980 valuation data.

VII. Conclusion

In conclusion we wish to acknowledge the co-operation and able assistance of the Superannuation Division and the Personnel Data Systems Division of the Department of Supply and Services.

In my opinion

- (a) the data on which this report is based are sufficient for the purpose of the valuation,
- (b) the assumptions used are adequate and appropriate for the purpose of the valuation,
- (c) the methods employed are consistent with sound actuarial principles, and
- (d) this report conforms with the recommendations adopted by the Canadian Institute of Actuaries for the valuation of pension plans, but for an actuarial assessment of the complete pension plan for contributors to the Public Service Superannuation Account, including provisions of the Supplementary Retirement Benefits Act, reference must be made to Appendix 1 of this report.

Respectfully submitted,



Walter Riese, F.C.I.A.,
Chief Actuary.

Department of Insurance,
Ottawa, Canada.
K1A 0H2
April 3, 1984.

Appendix 1

Supplementary Retirement Benefits

In 1970, the Supplementary Retirement Benefits Act (SRBA) was passed to provide supplementary benefits related to increases in the cost of living for persons in receipt of pensions payable out of the Consolidated Revenue Fund. This Act applies to former contributors to the Superannuation Account and their surviving spouses and children 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 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 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 1971 is shown in a Schedule in the Act. The Benefit Index for any year after 1970 is equal to the Benefit Index for the preceding year multiplied by the average of the Consumer Price Index for Canada for the twelve-month period ending on September 30 of that preceding year and divided by the average for a corresponding period one year earlier. Prior to 1973, the increase in the Benefit Index was limited to a maximum of 2% in any year. An amendment to the Supplementary Retirement Benefits Act in 1973 removed that limit and provided that the increase payable in January 1974 would take into account increases in the cost of living above the 2% ceiling since 1970. In January 1983, an amendment made as part of a general economic restraints program limited the increase for 1983 and 1984 to 6.5% and 5.5% respectively.

Under the terms of the original Act of 1970, the supplementary benefits were payable to all former contributors in receipt of annuities or annual allowances who had attained age 60 or, if less than that age, were disabled, and to all spouses and children in receipt of annual allowances. The amendments effective January 1, 1973 provided for the payment of benefits to all former contributors in receipt of annuities or annual allowances except in cases of dismissal for misconduct.

The Public Service Superannuation Act was amended in 1970, by the addition of Part III, to require that contributors pay 0.5% of their salary to the Supplementary Retirement Benefits Account in addition to their contributions to the Superannuation Account. By a further amendment in 1973, provision was made for an increase in this contribution rate from 0.5% to 1.0%, commencing January 1, 1977. Such contributions are payable until the contributor retires. The government makes credits to the Account equal to the contributions of the employees.

Interest is also credited to the Supplementary Retirement Benefits Account at the end of each quarter. The amount of the interest is calculated monthly on the minimum balance at a rate of interest representative of the yield on outstanding Government of Canada bonds having a term to maturity of 5 years, less 1/8 of 1%.

Prior to January 1, 1974, the Supplementary Retirement Benefits Act provided that all supplementary benefits would be charged to the Account. Since that date, supplementary retirement benefits paid in respect of a former contributor are charged to the Account only until their accumulated total

equals the aggregate of all amounts credited to that Account in respect of that person, including interest. Supplementary benefits paid in excess of that aggregate are then charged directly to the Consolidated Revenue Fund. The Act also provides for a return of contributions paid by a contributor to the Supplementary Retirement Benefits Account, to the extent that such contributions exceed any benefit that has been or may be paid to him or his spouse or children from that Account.

Contributions and other credits to the Account, and supplementary benefits paid to former contributors and their surviving spouses and children receiving basic benefits under the Public Service Superannuation Act, and other charges to the Account during the fiscal years, 1981-82 and 1982-83 are shown below.

Public Service Supplementary Retirement Benefits
(in thousands of dollars)

<u>Credits to the S.R.B. Account</u>	<u>1981-82</u>	<u>1982-83</u>
Contributions from employees	\$ 71,850	\$ 83,233
Government credits	78,748	77,478
Interest	117,665	131,904
Transfers in	<u>83</u>	<u>156</u>
	\$268,346	\$ 292,771
 <u>Charges to the S.R.B. Account</u>		
Supplementary Benefits	\$ 23,237	\$ 28,068
Refunds on withdrawal	8,585	5,956
Transfers out	1,168	1,330
Others	<u>164</u>	<u>224</u>
	\$ 33,154	\$ 35,578
 <u>Balance in Account (end of year)</u>	 \$899,564	 \$1,156,757
 <u>Charges to Consolidated Revenue Fund</u>		
Supplementary Benefits	\$263,863	\$ 332,442

Under the partially funded system of financing supplementary retirement benefits as it existed on December 31, 1980, a substantial balance will be accumulated in the Supplementary Retirement Benefits Account. However, on the basis of the assumptions used for purposes of Section V of this report on the Superannuation Account and (for consistency with other assumptions) an assumed rate of increase in the Consumer Price Index of 3.5% per annum, it has been estimated that the supplementary benefits will likely always remain a direct charge on the Consolidated Revenue Fund, unless the total of normal contributions and credits to the Supplementary Retirement Benefits Account were increased from 2.0% to about 4.8% of payroll and provision were made to handle deviations of actual from expected experience. Even if normal contributions and credits were raised to this level, a substantial unfunded actuarial liability would remain, suggesting that the Consolidated Revenue Fund would have to be charged for a long time to come either with amortization payments or with a substantial portion of the supplementary retirement benefits payable.

In any event, cost estimates relating only to Supplementary Retirement Benefits are extremely sensitive to economic assumptions. If principles of actuarial funding were to be applied to the Supplementary Retirement Benefits, it would be desirable to finance all pension benefits in respect of Superannuation Account contributors through one account; this could be expected to result in greater stability and avoid the situation where one account would have a surplus while the other had a deficit.

In the remaining part of this Appendix the effects of more conventional methods of financing the existing level of supplementary retirement benefits are presented.

(a) Required Contributions and Credits to the Superannuation Account, if benefits pursuant to the Supplementary Retirement Benefits Act as it existed in 1980* were considered superannuation benefits

Using the assumptions and actuarial cost method described in Sections III and IV of this report and an annual Consumer Price Index increase of 3.5%, the total required from the contributors and the Government combined to fund superannuation benefits in respect of current service, increasing in accordance with the Benefit Index, was calculated to be 16.23% of payroll. After making allowance for co-ordination with contributions payable to the Canada/Quebec Pension Plan, contributions from employees, including 1% contributions to the Supplementary Retirement Benefits Account, are calculated to be equivalent to 6.39% of salary. It follows that credits on behalf of the Government in respect of the combined benefits would have to be equivalent to about 9.84% of salary, or 1.54 times the contributions received from employees.

In addition, a procedure analogous to the existing procedure could be adopted under which special credits would be made in respect of liabilities arising out of (i) general salary increases in excess of the assumed 5.0% per annum, and (ii) increases to annuities and allowances to and in respect of former contributors in excess of the assumed 3.5%,

*The pro-rating of the increase in the Benefit Index applicable to the first year following the year of retirement became effective January 1, 1983, but was assumed to be in force for purposes of this calculation.

either or both of which could be offset by interest earnings on the Account in excess of the assumed 6.5% of total actuarial liabilities. With such a procedure, the only gains and losses attributable to variation of experience from the basic economic assumptions that would emerge at periodic actuarial examinations are (i) gains from general salary increases and increases to annuities and allowances below the assumed rates, and (ii) losses and unused gains from interest earnings below and above the assumed rate, respectively. Alternatively, the more common practice of letting all actuarial gains and losses accumulate until the following actuarial examination could be adopted.

The following table shows the individual as well as combined effect of sample variations of experience from the economic assumptions in any one year in terms of equivalent additional required percent of payroll in that year.

		Required Additional % of Payroll to Offset Deficiency in the Year it Occurs				
		Combinations				
	Actual General Salary Increase	Indiv. Var'n	(1)(2)(4)	(1)(3)(4)	(1)(2)(5)	(1)(3)(5)
(1)	7%	+3.7	+3.7	+3.7	+3.7	+3.7
<u>Actual C.P.I. Increase</u>						
(2)	5%	+2.2	+2.2		+2.2	
(3)	7%	+5.0		+5.0		+5.0
<u>Actual Interest Earned, if fully funded</u>						
(4)	9%	-8.9	-8.9	-8.9		
(5)	8%	-5.4			<u>-5.4</u>	<u>-5.4</u>
Net effect, if fully funded			-3.0	-0.2	+0.5	+3.3
Net effect, if 2/3 funded			0.0	+2.8	+2.3	+5.1

(b) Valuation Balance Sheet combining Public Service Superannuation and Supplementary Retirement Benefits including future adjustments to pensions in payment in accordance with assumed rate of inflation

This balance sheet is based on the same assumptions as were used for purposes of calculating the required contributions and credits in (a) above. It differs from the balance sheet in Section VI of this report to the extent that (i) the assets include a share of the Supplementary Retirement Benefits Account and future Government credits related to instalment payments based on a factor of 1.5 times the amount from contributors, (ii) the value of prospective benefits to and in respect of active contributors includes provision for increases to annuities and allowances in accordance with assumed increases of 3.5% p.a. in the Consumer Price Index, and (iii) the value of prospective benefits to persons entitled to an annuity or annual allowance includes the value of all supplementary benefits based on the Benefit Index for 1980 and makes provision for continued increases in accordance with assumed increases of 3.5% p.a. in the Consumer Price Index.

(\$ millions)

Assets

Balance of Superannuation Account and share of Superannuation contributors in Supplementary Retirement Benefits Account	12,571.4
Credits from Government outstanding at December 31, 1980 and made in 1981	775.9
Actuarial present value of future instalments from contributors and related Government Credits in respect of prior service	<u>289.2</u>
Total Assets	13,622.1
Unfunded Actuarial Liability	<u>7,863.9</u>
	<u>21,500.4</u>

Liabilities

Actuarial present value of prospective benefits to and in respect of active contributors	12,854.8
Actuarial present value of future benefits to persons entitled to an annuity or annual allowance	<u>8,645.6</u>
Total Actuarial Liability	<u>21,500.4</u>

The foregoing balance sheet indicates an unfunded actuarial liability of about \$7,864 million as at December 31, 1980. If this amount were to be amortized, the following table gives an indication of the possible impact.

Option	Amortization Plan (beginning in year following valuation date)		Initial Payment*	
	No. of Years	Type of Payment	in millions	as % of pay
(1)	25	level	\$ 625	10.1%
(2)	60	level	507	8.2
(3)	25	constant % of pay	374	6.1

* For options (1) and (2) the payment is the same each year, while for option (3) the payment is assumed to increase by 5% (compounded) each year. For options (1) and (2) payments expressed as a percentage of pay are assumed to decrease by 5% (compounded) each year, while for option (3) the percentage stays constant.

It must be noted that for option (3) in the above table, the initial payment is lower than the interest assumed to be earned. As a result, the unfunded actuarial liability would be expected to increase in the first year by about 1.6% in absolute terms (\$7864 to \$7989 million) but would decrease by 3.3% in terms of payroll (from 1.309 to 1.266 times payroll).

It will also be noted that, as in the balance sheet in Section VI of this report, the value of the notional investment was taken at par. Discounted at the assumed interest rate, the value would have been higher by about \$3030 million. To put this actuarial present value into perspective, it is interesting to note that the actuarial present value (on December 31, 1980) of liabilities attributable to "excess salary increases" and "excess indexing" during the three years following the valuation date was of the order of \$3380 million.

(c) Valuation Balance Sheet combining Public Service Superannuation and Supplementary Retirement Benefits including future adjustments to pensions in payment in accordance with assumed rates of inflation, using dynamic economic assumptions

This balance sheet is constructed using the assumptions and methods employed for purposes of (b) above, except that dynamic economic assumptions were used. The purpose of these assumptions is to recognize specifically that existing notional investments will produce higher earnings than the level long term interest assumption used for purposes of this report and in parts (a) and (b) of this Appendix above. The dynamic assumptions also make provision in the early years for general salary increases and inflation (i.e. indexing) at rates somewhat higher than the level long term assumptions. There is a danger in this approach in that it may eliminate any expected actuarial gain from investment earnings

that could cushion the effect of actuarial losses from salary increases and indexing in excess of the assumed rates. Accordingly, an explicit margin was introduced into the assumed rates of interest.

Dynamic Economic Assumptions

<u>Year</u>	<u>Rates of Interest</u>			<u>Assumed Increases in CPI</u>	<u>General Salary Increases</u>	<u>Rate of Indexing</u>
	<u>New Money</u>	<u>Projected Fund Yield</u>	<u>Assumed Fund Yield</u>			
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
81*	Var'd	9.1	8.1	12.5	12.0	9.7
2*	"	9.6	8.6	10.8	11.5	12.2
3*	"	9.9	8.9	5.8	5.3	6.5
4	10.5	10.0	9.0	5.2	5.0	5.5
85	9.6	10.1	9.1	5.3	5.0	5.4
6	8.7	10.1	9.1	4.8	5.0	5.3
7	8.0	10.1	9.1	4.5	5.1	4.9
8	7.4	10.0	9.0	4.6	5.5	4.6
9	6.9	9.8	8.8	4.5	5.5	4.6
90	6.7	9.6	8.6	4.2	5.3	4.5
1	6.6	9.5	8.5	4.0	5.2	4.3
2	6.5	9.3	8.3	3.8	5.1	4.1
3		9.1	8.1	3.5	5.0	3.9
4		9.0	8.0			3.6
95		8.8	7.8			3.5
6		8.6	7.6			
7		8.4	7.4			
8		8.2	7.2			
9		8.0	7.0			
2000		7.7	6.7			
1		7.4	6.5			
2		7.1	6.5			
3		6.9	6.5			
4		6.8	6.5			
2005		6.7	6.5			
6		6.6	6.5			
7		6.6	6.5			
8		6.5				

* Factors for 1981, 1982 and 1983 and the rate of indexing for 1984 are based on actual experience. The interest rate on new money varied between 12.7 and 17.5% in 1981, between 12.0 and 16.1% in 1982 and between 10.9 and 12.1% in 1983; for later years it was designed so that the average real rate for the ensuing ten years in the case of each year of investment would decline gradually to 3% by 1990. The factors for increases in prices and salaries for 1984 to 1988 were determined having regard to the budget of February 15, 1984; the series were extended to reach the ultimate values by 1993. The projected fund yield assumes no new entrants, no service and no contributions after the date of the valuation.

Balance Sheet based on Dynamic Economic Assumptions

<u>ASSETS</u>	(\$ millions)
Balance of Superannuation Account and share of Superannuation contributors in Supplementary Retirement Benefits Account	\$ 12,571.4
Credits from Government outstanding at December 31, 1980, and made in 1981	775.9
Actuarial present value of future instalments from contributors and related Government Credits in respect of prior service	<u>271.0</u>
Total Assets	\$ 13,618.3
Unfunded actuarial liability	<u>6,452.9</u>
	<u>\$ 20,071.2</u>

LIABILITIES

Actuarial present value of prospective benefits to and in respect of active contributors	\$ 11,057.3
Actuarial present value of future benefits to persons entitled to an annuity or annual allowance	9,013.9
Total actuarial liability	<u>\$ 20,071.2</u>

It should be noted that, as in the case of the balance sheet in the report and the others in this Appendix, the unfunded actuarial liability does not include the unamortized portion of past deferred charges amounting to \$699.3 million as at December 31, 1980. This is particularly significant in the case of the foregoing balance sheet, since there would not be much by way of interest credit in excess of the assumed rate available for purposes of amortizing these outstanding deferred charges.

The balance sheet suggests that through the use of dynamic assumptions, the total actuarial liabilities and, therefore, the notional unfunded actuarial liability as at December 31, 1980 might be reduced by about 1.4 billion dollars. However, although this is a reduction in the unfunded actuarial liability of about 18%, when the same assumptions are used to translate it into amortization payments, a comparison of the table below with the corresponding one appearing under (b) above shows that in terms of annual requirements the effect can be substantially less. Sample amortization payments corresponding to the above unfunded actuarial liability of \$6,453 million would be as follows:

<u>Option</u>	<u>Amortization Plan</u> (beginning in year following valuation date)		<u>Initial Payment*</u>	
	<u>No. of Years</u>	<u>Type of Payment</u>	<u>in millions</u>	<u>as % of pay</u>
(1)	25	level	\$ 606	9.5%
(2)	60	level	506	8.0
(3)	25	constant % of pay	330	5.2

* For options (1) and (2) the payment is the same each year, while for option (3) the payment is assumed to increase by 5% (compounded) each year. For options (1) and (2) payments expressed as a percentage of pay are assumed to decrease by 5% (compounded) each year, while for option (3) the percentage stays constant.

Option (3) of course is affected by interest as well as salary increase assumptions and while it exhibits the greatest effect of dynamic assumptions, this would not necessarily always be the case.

APPENDIX 2

Summary of Public Service Superannuation Plan

A. 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 of some Crown Corporations covered by separate pension plans.

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

(i) 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

(ii) surviving spouses and children who are entitled to annual allowances payable out of the Account by reason of the death of a contributor while employed in the Public Service or while entitled to an annuity or allowance payable from the Account.

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

B. Contributions and Credits to the Account

1. By Contributor

(a) Current Service

The rate of contributions for contributors is 6.5% of salary reduced in each case by the amount that the contributor would be required to contribute under the Canada Pension Plan (CPP) in respect of that salary if that salary, expressed in terms of an

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 1983, the CPP required contributions of 1.8% of that portion of annual salary between \$1,800 and \$18,500 as earned).

Contributions cease after a contributor has to his credit 35 years of pensionable service (less the number of years of service upon which any pension benefit is based that is payable to the contributor out of the Consolidated Revenue Fund, or out of any account or fund in the Consolidated Revenue Fund other than the Superannuation Account, or out of a pension fund pursuant to which contributions have been paid out of the Consolidated Revenue Fund in respect of employees engaged locally outside Canada).

(b) Prior Service

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 is 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.

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.

* Residents of Quebec contribute to the Quebec Pension Plan which, except in 1973, has maintained required contributions at an identical level.

** See Note 1 in Section D of this Appendix.

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.

2. 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, are necessary to provide for the increase in cost of the benefits payable under the Act as a result of any salary increase applicable to at least one percent of the contributors or are 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. (See Section III B of this report for further details). However, the Minister may apply such supplementary interest to reduce the instalments being charged to the Consolidated Revenue Fund in respect of increases in costs due to salary increases and in respect of unfunded actuarial liabilities indicated in statutory actuarial reports.

C. Summary of Benefits*

(1) Contributors with less than five years of pensionable service (Note 1)

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 2).

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

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

<u>Contingency</u>	<u>Benefit</u>
Retirement because of age or age and service (Note 3)	Immediate annuity (Note 4)
Retirement because of disability (Note 3)	At option of contributor (Note 10): A. immediate annuity (Note 5), or B. cash termination allowance (Note 6) or return of contributions, whichever is greater
Termination for reasons other than age, age and service, disability, misconduct or death (Note 3)	At option of contributor (Note 10): A. return of contributions, B. deferred annuity (Note 7) C. annual allowance payable immediately, if age 50 or over, and otherwise upon attaining age 50 (Note 8)
Dismissal because of misconduct	A. return of contributions, or B. with the consent of the Treasury Board, the whole or 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 9)
Death leaving no surviving spouse or eligible children	Return of contributions or five times the annuity to which the contributor would have been entitled at the time of his death, whichever is greater
Death leaving surviving spouse and/or eligible children	Annual allowance (Notes 11 and 12)

* The explanatory notes referred to in this summary are given in Section D of this Appendix. Supplementary benefits to offset the loss of purchasing power are provided under another Act and are described in Appendix 1.

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

<u>Contingency</u>	<u>Benefit</u>
Disability before age 60 while entitled to a deferred annuity or an annual allowance	Immediate annuity (Note 5)
Death leaving no surviving spouse or eligible children	Minimum benefit (Note 12)
Death leaving surviving spouse and/or eligible children	Annual allowance (Notes 11 and 12)

D. Explanatory Notes

Note 1

The amount of any annuity or allowance to which a contributor or his surviving spouse 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 completed,

- (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.

Note 2

"Return of Contributions" means the payment of an amount equal to the total current and prior service contributions paid by the contributor into the Account or paid into any other superannuation account or pension fund and transferred to the Account plus interest credited to December 31st of the year immediately preceding the year the contributor ceased to be employed in the Public Service. Interest at the rate of 4% per annum is credited each December 31st (beginning in 1974) on the accumulated contributions with interest as at the prior December 31st.

Note 3

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. In the case of Air Traffic Controllers it also means ceasing to be employed after completion of 20 years of operational service in case of "involuntary retirement" or after attainment of age 50 and completion of 25 years of operational service in case of "voluntary retirement". 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" refers only to terminations before age 55 or at ages 55 to 59 with less than 30 years of pensionable service.

Note 4

"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 5

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 6

"Cash termination allowance" means an amount equal to 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 7

"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 4.

Note 8

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 9

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 2.

Note 10

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 11

"Annual allowance" to the surviving spouse 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 4. This is termed the "basic allowance".

No allowance is payable to the widower of a female contributor unless the contributor was employed in the Public Service and had 35 years of pensionable service or was required to contribute to the Superannuation Account on or after December 20, 1975.

If the age of the contributor exceeds that of his surviving spouse by 20 or more years, the spouse allowance is reduced. If a contributor dies within one year after his marriage, no allowance is payable to the surviving spouse 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 surviving spouse is not entitled to any annual allowance unless, after his marriage, he became or continued to be a contributor.

If a surviving spouse remarries, the allowance is either suspended during the period of remarriage or forfeited, if the spouse requests and receives a return of contributions less all payments made to the contributor, surviving spouse 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 surviving spouse which has been suspended upon remarriage will be resumed in the event of the dissolution or annulment of that marriage, or the death of the new spouse.

"Annual allowance" to each child of a deceased contributor means one-fifth of the "basic allowance" described above, or if there is no living spouse, two-fifths of the basic allowance. The allowance is payable to any children under age 18 until they reach their 18th birthday, and to any children 18 years or older until they reach their 25th birthday provided they remain unmarried and have been in full-time attendance at school or university substantially without interruption since their 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 12

If upon the death of a contributor there is no person to whom an allowance provided under the terms of the Act may be paid, or if the persons to whom such allowances may be paid die or cease to be entitled thereto and no other amount may be paid to them, there is paid to the estate of the contributor:

- (1) if the contributor was not employed in the Public Service on or after December 20, 1975, any amount by which the amount of return of contributions exceeds the aggregate of all amounts paid to those persons and to the contributor,
- (2) if the contributor was employed in the Public Service on or after December 20, 1975, any amount by which the greater of the amount of the return of contributions, and an amount equal to five times the immediate annuity to which the contributor was or would have been entitled at the time of his death exceeds the aggregate of all amounts paid to those persons and to the contributor.

A P P E N D I X 3

<u>Promotional Salary Scales</u>			<u>Salary Scales Including Promotional and 5.0% p.a. General Increases</u>	
<u>Age</u>	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
18	.434	.407	.034	.032
19	.443	.426	.037	.035
20	.454	.446	.040	.039
21	.468	.466	.043	.043
22	.487	.487	.047	.047
23	.513	.507	.052	.051
24	.550	.528	.058	.056
25	.594	.548	.066	.061
26	.626	.569	.073	.067
27	.655	.589	.080	.072
28	.682	.610	.088	.079
29	.704	.631	.095	.085
30	.723	.652	.103	.093
31	.740	.670	.110	.100
32	.755	.688	.118	.108
33	.769	.704	.126	.116
34	.783	.719	.135	.124
35	.795	.735	.144	.133
36	.807	.748	.154	.142
37	.819	.761	.164	.152
38	.830	.774	.174	.162
39	.841	.786	.185	.173
40	.851	.798	.197	.185
41	.861	.810	.209	.197
42	.871	.822	.222	.210
43	.880	.834	.236	.223
44	.889	.846	.250	.238
45	.898	.857	.265	.253
50	.939	.913	.354	.344
55	.969	.956	.466	.460
60	.987	.985	.606	.605
65	.995	.998	.780	.782
70	1.000	1.000	1.000	1.000

A P P E N D I X 4

Select Rates of Termination for all Reasons

<u>Age at start of pensionable Service</u>	<u>Males</u>					<u>Females</u>				
	Completed Years of Pensionable Service					Completed Years of Pensionable Service				
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
18	.356	.223	.148	.112	.092	.319	.183	.123	.111	.112
19	.344	.213	.141	.105	.086	.322	.204	.150	.126	.119
20	.333	.203	.135	.100	.080	.325	.223	.173	.139	.125
21	.324	.196	.131	.095	.075	.327	.236	.188	.149	.129
22	.315	.189	.127	.092	.072	.328	.244	.198	.156	.132
23	.307	.184	.124	.090	.069	.329	.248	.204	.161	.133
24	.299	.179	.122	.089	.068	.329	.248	.207	.161	.132
25	.293	.175	.120	.088	.067	.329	.246	.208	.160	.130
26	.287	.172	.118	.088	.066	.328	.241	.207	.156	.126
27	.282	.168	.117	.088	.066	.326	.235	.202	.152	.122
28	.277	.165	.116	.088	.066	.324	.227	.196	.147	.116
29	.273	.162	.115	.088	.067	.322	.219	.188	.140	.111
30	.270	.160	.114	.089	.067	.318	.209	.179	.133	.105
31	.267	.157	.112	.089	.068	.314	.200	.169	.126	.100
32	.266	.155	.111	.089	.068	.310	.191	.158	.119	.095
33	.264	.154	.110	.089	.068	.305	.183	.148	.113	.090
34	.264	.152	.108	.088	.068	.300	.176	.139	.107	.086
35	.264	.151	.107	.088	.068	.295	.171	.131	.102	.082
36	.265	.149	.106	.087	.067	.289	.166	.124	.098	.079
37	.266	.148	.104	.086	.066	.285	.162	.119	.094	.076
38	.268	.147	.103	.084	.065	.281	.159	.114	.091	.074
39	.271	.146	.102	.083	.063	.277	.156	.110	.089	.072
40	.275	.145	.101	.081	.062	.275	.154	.107	.087	.071
41	.279	.145	.100	.079	.060	.274	.153	.105	.085	.070
42	.283	.145	.100	.077	.059	.273	.151	.103	.084	.069
43	.288	.145	.099	.076	.058	.273	.150	.102	.084	.069
44	.294	.145	.099	.074	.058	.273	.149	.102	.084	.069
45	.300	.145	.099	.074	.058	.275	.149	.103	.085	.070
50	.331	.149	.103	.077	.064	.296	.152	.114	.095	.078
55	.362	.162	.119	.098	.083	.333	.165	.136	.117	.098

A P P E N D I X 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	<u>Rates of Termination*</u>		<u>Proportions Electing Deferred Annuity or Annual Allowance</u>	
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
20	.059	.107	.0270	.0200
21	.057	.107	.0270	.0200
22	.055	.105	.0270	.0210
23	.053	.103	.0270	.0230
24	.051	.101	.0285	.0240
25	.049	.099	.0300	.0245
26	.048	.097	.0305	.0255
27	.046	.094	.0315	.0275
28	.044	.091	.0335	.0305
29	.042	.087	.0360	.0330
30	.040	.083	.0380	.0360
31	.038	.078	.0405	.0400
32	.036	.072	.0440	.0440
33	.035	.067	.0485	.0490
34	.033	.062	.0540	.0550
35	.031	.058	.0605	.0620
36	.029	.054	.0680	.0700
37	.028	.051	.0770	.0790
38	.026	.048	.0870	.0895
39	.023	.045	.0985	.1015
40	.022	.043	.1125	.1145
45	.016	.035	.2550	.2100
50	.014	.033	.4970	.3790
55	.019	.039	.7480	.6790

* See Note 3 in Appendix 2.

** 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*

<u>Age</u>	<u>Males</u>	<u>Females</u>
48	.001	.000
49	.000	.000
50	.001	.000
51	.000	.000
52	.001	.000
53	.000	.000
54	.001	.000
55	.080	.055
56	.050	.035
57	.050	.030
58	.050	.035
59	.090	.075
60	.165	.170
61	.145	.130
62	.155	.150
63	.185	.185
64	.580	.565
65	.965	.965
66	.400	.425
67	.320	.420
68	.405	.405
69	.450	.450
70	1.000	1.000

* See Note 3 in Appendix 2.

A P P E N D I X 7

Rates of Retirement because of Disability*

<u>Age</u>	<u>Males</u>	<u>Females</u>
20	.0002	.0005
21	.0002	.0006
22	.0002	.0006
23	.0002	.0007
24	.0002	.0007
25	.0002	.0007
26	.0002	.0007
27	.0002	.0007
28	.0002	.0008
29	.0002	.0008
30	.0002	.0009
31	.0003	.0009
32	.0003	.0010
33	.0003	.0010
34	.0004	.0011
35	.0005	.0012
36	.0005	.0013
37	.0006	.0014
38	.0008	.0016
39	.0009	.0018
40	.0011	.0021
41	.0013	.0025
42	.0016	.0029
43	.0019	.0034
44	.0023	.0039
45	.0027	.0045
46	.0031	.0052
47	.0036	.0060
48	.0044	.0069
49	.0053	.0080
50	.0063	.0093
51	.0075	.0110
52	.0087	.0117
53	.0099	.0127
54	.0111	.0136
55	.0123	.0144
56	.0135	.0153
57	.0147	.0161
58	.0159	.0170
59	.0172	.0178

* See Note 3 in Appendix 2.

A P P E N D I X 8

Rates of Mortality for employed contributors

<u>Age</u>	<u>Males</u>	<u>Females</u>
20	.0004	.0002
25	.0005	.0003
30	.0006	.0004
35	.0007	.0005
40	.0012	.0007
41	.0014	.0008
42	.0016	.0009
43	.0018	.0009
44	.0020	.0010
45	.0022	.0011
46	.0025	.0012
47	.0028	.0013
48	.0031	.0014
49	.0034	.0015
50	.0037	.0016
51	.0041	.0017
52	.0045	.0019
53	.0049	.0020
54	.0054	.0022
55	.0058	.0024
56	.0063	.0026
57	.0068	.0028
58	.0074	.0031
59	.0079	.0034
60	.0085	.0037
61	.0090	.0040
62	.0096	.0043
63	.0102	.0047
64	.0108	.0051
65	.0115	.0055
66	.0121	.0060
67	.0128	.0064
68	.0134	.0069
69	.0141	.0075
70	.0147	.0081

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 (continuous)			
	Males	Females	Interest at 6.5% per annum		Interest at real rate*	
			Males	Females	Males	Females
50	.0053	.0027	12.169	13.321	17.959	20.665
51	.0059	.0029	11.993	13.192	17.560	20.306
52	.0065	.0031	11.813	13.056	17.158	19.940
53	.0071	.0034	11.626	12.914	16.753	19.566
54	.0078	.0036	11.435	12.766	16.344	19.185
55	.0085	.0039	11.237	12.611	15.932	18.797
56	.0093	.0042	11.033	12.448	15.515	18.401
57	.0100	.0046	10.823	12.279	15.095	17.997
58	.0109	.0049	10.605	12.102	14.670	17.587
59	.0119	.0054	10.381	11.917	14.241	17.169
60	.0131	.0058	10.150	11.725	13.810	16.745
61	.0144	.0064	9.914	11.525	13.378	16.314
62	.0159	.0069	9.672	11.316	12.946	15.876
63	.0174	.0076	9.426	11.100	12.513	15.433
64	.0192	.0083	9.175	10.875	12.080	14.983
65	.0213	.0091	8.919	10.641	11.649	14.527
66	.0236	.0099	9.661	10.399	11.221	14.065
67	.0263	.0109	8.402	10.148	10.799	13.598
68	.0292	.0119	8.143	9.889	10.384	13.126
69	.0324	.0131	7.885	9.619	9.976	12.649
70	.0361	.0144	7.629	9.341	9.578	12.167
71	.0400	.0160	7.376	9.053	9.191	11.680
72	.0438	.0179	7.128	8.757	8.816	11.192
73	.0475	.0201	6.883	8.455	8.449	10.703
74	.0512	.0225	6.637	8.145	8.087	10.213
75	.0553	.0252	6.388	7.829	7.728	9.724
76	.0601	.0285	6.138	7.508	7.373	9.237
77	.0659	.0322	5.888	7.182	7.024	8.754
78	.0726	.0365	5.644	6.853	6.687	8.276
79	.0797	.0414	5.407	6.522	6.365	7.804
80	.0874	.0470	5.178	6.190	6.058	7.341
85	.1301	.0901	4.177	4.567	4.749	5.189
90	.1795	.1762	3.359	3.170	3.724	3.474

* values used for parts (a) and (b) of Appendix 1; exact interest rate is
 $\left(\frac{1.065}{1.035} - 1\right)$ or 2.899%.

A P P E N D I X 10A

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

Age	Ultimate Rate applicable after at least 2 years have elapsed from date of retirement	Value of Annuity of \$1.00 per annum (continuous)			
		At date of retirement		Applicable 2 years after retirement or later	
		at 6.5%	at real rate*	at 6.5%	at real rate*
25	.0072	13.098	21.117	13.280	21.417
26	.0073	13.025	20.879	13.209	21.179
27	.0074	12.950	20.634	13.135	20.935
28	.0075	12.870	20.383	13.056	20.684
29	.0076	12.786	20.125	12.973	20.426
30	.0077	12.697	19.859	12.886	20.161
31	.0078	12.603	19.586	12.793	19.888
32	.0080	12.502	19.301	12.695	19.607
33	.0082	12.396	19.011	12.593	19.319
34	.0084	12.286	18.714	12.485	19.024
35	.0086	12.170	18.410	12.372	18.723
36	.0088	12.049	18.099	12.254	18.414
37	.0090	11.921	17.780	12.129	18.097
38	.0093	11.785	17.450	11.997	17.771
39	.0096	11.643	17.113	11.860	17.439
40	.0100	11.493	16.767	11.715	17.099
41	.0103	11.338	16.417	11.565	16.752
42	.0107	11.175	16.057	11.407	16.397
43	.0111	11.004	15.689	11.241	16.035
44	.0116	10.823	15.312	11.068	15.665
45	.0122	10.634	14.925	10.887	15.287
50	.0158	9.567	12.895	9.864	13.304
55	.0240	8.251	10.675	8.646	11.198
60	.0414			7.381	9.193
65	.0601			6.200	7.436
70	.0887			4.983	5.761
75	.1388			3.799	4.248
80	.2169			2.785	3.024
85	.3271			1.984	2.103
90	.4733			1.380	1.434

* values used for parts (a) and (b) of Appendix 1; exact interest rate is $(\frac{1.065}{1.035} - 1)$ or 2.899%.

A P P E N D I X 10B

Rates of Mortality for female contributors retired
because of disability
and

Annuity Values based thereon

Age	Ultimate Rate applicable after at least 2 years have elapsed from date of retirement	Value of Annuity of \$1.00 per annum (continuous)			
		At date of retirement		Applicable 2 years after retirement or later	
		at 6.5%	at real rate*	at 6.5%	at real rate*
25	.0069	13.572	23.212	13.753	23.529
26	.0070	13.530	23.042	13.713	23.361
27	.0071	13.486	22.868	13.671	23.189
28	.0072	13.440	22.691	13.627	23.014
29	.0073	13.393	22.509	13.582	22.834
30	.0074	13.344	22.324	13.534	22.651
31	.0075	13.292	22.134	13.485	22.463
32	.0076	13.239	21.940	13.434	22.270
33	.0077	13.184	21.741	13.380	22.073
34	.0078	13.126	21.538	13.324	21.870
35	.0079	13.065	21.329	13.264	21.662
36	.0080	13.001	21.115	13.202	21.449
37	.0081	12.935	20.896	13.137	21.230
38	.0082	12.864	20.669	13.068	21.005
39	.0084	12.788	20.434	12.996	20.774
40	.0086	12.709	20.194	12.921	20.539
41	.0088	12.628	19.950	12.843	20.298
42	.0090	12.543	19.702	12.762	20.053
43	.0092	12.456	19.448	12.678	19.803
44	.0094	12.364	19.189	12.590	19.546
45	.0096	12.269	18.924	12.498	19.285
50	.0109	11.721	17.501	11.970	17.880
55	.0128	11.042	15.917	11.318	16.323
60	.0157			10.519	14.613
65	.0203			9.563	12.767
70	.0277			8.443	10.817
75	.0401			7.171	8.809
80	.0620			5.785	6.819
85	.1048			4.396	4.985
90	.1762			3.170	3.474

* values used for parts (a) and (b) of Appendix 1; exact interest rate is
 $(\frac{1.065}{1.035} - 1)$ or 2.899%

A P P E N D I X 11A

Rates of Remarriage and Mortality assumed for Widows

Age at becoming widow	Remarriage Rates			Attained Age	Ultimate Remarriage Rate**	Mortality Rate	Attained Age	Mortality Rate
	Year of Widowhood							
	1st yr.	3rd yr.	5th yr.					
25	.045	.121	.061	30	.056	.0007	65	.0114
30	.028	.090	.047	35	.039	.0010	70	.0174
35	.017	.058	.030	40	.024	.0013	75	.0274
40	.010	.031	.020	45	.015	.0020	80	.0426
45	.005	.016	.012	50	.009	.0033	85	.0608
50	.003	.010	.008	55	.006	.0051	90	.0880
55	.002	.007	.005	60	.004	.0074	95	.1300

Value of Annuity of \$1.00 per annum payable (continuously)
to remarriage or death of widow

Age at becoming widow	Year of Widowhood			Attained Age	Ultimate**	Attained Age	Ultimate**
	1st yr.	3rd yr.	5th yr.				
<u>Interest: 6.5%</u>							
25	8.586	8.773	9.996	30	10.278	65	10.622
30	10.042	10.199	11.280	35	11.528	70	9.618
35	11.356	11.418	12.151	40	12.311	75	8.498
40	12.266	12.213	12.534	45	12.606	80	7.358
45	12.659	12.488	12.515	50	12.495	85	6.228
50	12.533	12.303	12.181	55	12.100	90	5.082
55	12.112	11.825	11.597	60	11.467	95	3.885

Interest: real rate*

25	13.531	14.072	16.232	30	16.751	65	14.843
30	16.285	16.676	18.513	35	18.919	70	12.935
35	18.572	18.672	19.811	40	20.016	75	11.000
40	19.909	19.702	20.065	45	20.088	80	9.174
45	20.161	19.691	19.523	50	19.379	85	7.484
50	19.433	18.845	18.423	55	18.180	90	5.887
55	18.193	17.521	16.944	60	16.632	95	4.338

* values used for parts (a) and (b) of Appendix 1; exact interest rate is $(\frac{1.065}{1.035} - 1)$ or 2.899%.

** remarriage rates are duration-specific for 5 years

A P P E N D I X 11B

Rates of Remarriage and Mortality assumed for Widowers

Age at becoming widower	Remarriage Rates			Attained Age	Ultimate Remarriage Rate**	Mortality Rate	Attained Age	Mortality Rate
	Year of being a widower 1st yr.	3rd yr.	5th yr.					
25	.071	.258	.258	30	.198	.0015	65	.0296
30	.065	.215	.198	35	.139	.0019	70	.0444
35	.047	.130	.116	40	.094	.0029	75	.0655
40	.031	.078	.069	45	.059	.0046	80	.0970
45	.019	.048	.040	50	.027	.0076	85	.1436
50	.013	.028	.022	55	.014	.0121	90	.2098
55	.008	.014	.011	60	.009	.0192	95	.3003

Value of Annuity of \$1.00 per annum payable (continuously)
to remarriage or death of widower

Age at becoming widower	Year of being a widower			Attained Age	Ultimate**	Attained Age	Ultimate**
	1st yr.	3rd yr.	5th yr.				
<u>Interest: 6.5%</u>							
25	3.824	3.308	3.961	30	4.475	65	8.349
30	4.722	4.526	5.537	35	6.201	70	7.171
35	6.724	6.706	7.560	40	8.027	75	5.996
40	8.634	8.632	9.250	45	9.551	80	4.858
45	9.913	9.832	10.159	50	10.290	85	3.814
50	10.273	10.093	10.104	55	10.076	90	2.911
55	10.083	9.785	9.553	60	9.422	95	2.167

Interest: real rate*

25	4.524	4.024	5.028	30	5.789	65	10.745
30	6.035	5.990	7.599	35	8.625	70	8.888
35	9.344	9.493	10.874	40	11.607	75	7.168
40	12.501	12.549	13.468	45	13.893	80	5.615
45	14.415	14.220	14.584	50	14.701	85	4.276
50	14.656	14.248	14.098	55	13.968	90	3.177
55	13.972	13.375	12.872	60	12.602	95	2.311

* values used for parts (a) and (b) of Appendix 1; exact interest rate is
 $(\frac{1.065}{1.035} - 1)$ or 2.899%.

** remarriage rates are duration-specific for 5 years.

A P P E N D I X 12

Proportions of Contributors Married at Death and
Average Ages of Spouses Corresponding to Ages
of Contributors at Death

Age of Contributor At Death (last birthday)	<u>Males</u>			<u>Females</u>		
	<u>Proportions Married</u>		<u>Average Age of Widow</u>	<u>Proportions Married</u>		<u>Average Age of Widower</u>
	<u>Employed Contributor</u>	<u>Retired Contributor</u>		<u>Employed Contributor</u>	<u>Retired Contributor</u>	
25	.826	.3320	23.535	.506	.2545	29.000
30	.861	.4670	28.475	.609	.3140	34.000
35	.895	.5725	33.345	.691	.3830	39.000
40	.923	.6520	38.200	.750	.4480	44.000
45	.944	.7180	43.020	.787	.4820	48.945
50	.957	.7710	47.800	.800	.4725	53.820
55	.957	.8090	52.530	.795	.4090	58.610
60	.948	.8285	57.190	.770	.2960	63.260
65	.939	.8205	61.770	.714	.1960	67.730
70	.926	.7770	66.245	.625	.1310	71.895

Proportions of Students Entitled to Allowances
Remaining Eligible for Allowances
at the end of the year of age

<u>Age</u>	<u>Proportion</u>
18	0.74
19	0.68
20	0.67
21	0.60
22	0.54
23	0.53
24	0.31

A P P E N D I X 13

Proportion of Contributors with salaries below Y.M.P.E.* Ratio of average salary to Y.M.P.E.* for contributors below that maximum

<u>Age</u>	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
18	.970	.985	.705	.665
19	.880	.955	.735	.700
20	.800	.927	.763	.728
21	.726	.895	.784	.751
22	.654	.860	.802	.771
23	.566	.816	.816	.787
24	.486	.768	.826	.802
25	.412	.709	.836	.814
26	.332	.644	.842	.826
27	.304	.572	.848	.836
28	.262	.520	.850	.836
29	.226	.482	.850	.836
30	.196	.453	.850	.835
31	.169	.433	.850	.835
32	.147	.422	.851	.834
33	.133	.421	.851	.830
34	.123	.423	.851	.828
35	.117	.428	.851	.824
36	.114	.436	.852	.820
37	.112	.446	.852	.816
38	.116	.452	.852	.816
39	.120	.457	.852	.816
40	.124	.461	.852	.816
41	.128	.464	.852	.815
42	.132	.467	.852	.814
43	.136	.470	.852	.814
44	.140	.470	.852	.814
45	.145	.470	.852	.814
50	.172	.462	.848	.812
55	.206	.440	.844	.816
60	.251	.434	.836	.815
65	.300	.430	.806	.792
70	.338	.436	.742	.730

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

A P P E N D I X 14A

Number of Active Male Contributors and Average Salary on Dec. 31, 1980

Attained Age	Completed Years of Service									All Years of Service	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 +		
to 24	9024 \$15472	911 \$16885									9935 \$15602
25-29	13549 \$17802	12132 \$19135	481 \$19670								26162 \$18454
30-34	9200 \$19841	16216 \$22169	7598 \$22437	665 \$21230							33679 \$21575
35-39	4394 \$21169	7854 \$24293	7708 \$25295	4661 \$23084	589 \$22965						25206 \$23800
40-44	2666 \$21146	4433 \$24050	4421 \$26306	4395 \$25474	3720 \$23794	690 \$23363					20325 \$24398
45-49	2196 \$20363	3286 \$22966	3187 \$25133	3094 \$25301	4097 \$25109	4368 \$23692	504 \$23413				20732 \$23959
50-54	1937 \$20239	3147 \$22107	2796 \$23981	2717 \$24047	3327 \$24052	4680 \$24579	2177 \$25038	372 \$24250	1 \$21577		21154 \$23625
55-59	1415 \$19286	2911 \$21071	2678 \$22122	2839 \$22652	3460 \$21861	4024 \$22901	3330 \$25020	1586 \$24492	166 \$26721		22409 \$22606
60-64	717 \$18388	1814 \$19759	2145 \$21716	1998 \$20925	2142 \$20771	2158 \$20904	1664 \$23430	1049 \$24925	328 \$27260		14015 \$21484
65 +	42 \$19481	147 \$21577	157 \$21531	137 \$21364	105 \$22314	98 \$21519	37 \$28564	26 \$30672	11 \$27492		760 \$22245
All Ages	45140 \$18564	52851 \$21756	31171 \$23983	20506 \$23717	17440 \$23360	16018 \$23349	7712 \$24594	3033 \$24665	506 \$27077		194377 \$22026

Average Age = 41.5 Years Average Service = 12.2 Years Average Age of New Entrants = 31.0 Years

A P P E N D I X 14B

Number of Active Female Contributors and Average Salary on Dec. 31, 1980

Attained Age	Completed Years of Service									All Years of Service	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 +		
to 24	13800 \$13611	1888 \$15001									15688 \$13778
25-29	11657 \$15722	10225 \$16910	686 \$17069								22568 \$16301
30-34	6889 \$16024	6804 \$19281	3342 \$18703	535 \$18369							17570 \$17866
35-39	4404 \$15575	3476 \$18922	1662 \$20774	1001 \$18991	278 \$19219						10821 \$17858
40-44	3348 \$15160	2882 \$17827	1189 \$19600	604 \$20088	752 \$19075	189 \$19017					8964 \$17348
45-49	2505 \$14933	2706 \$17113	1239 \$18559	667 \$19120	577 \$19418	619 \$19024	65 \$19112				8378 \$17150
50-54	1699 \$14778	2275 \$16550	1381 \$17903	817 \$18708	622 \$18653	599 \$19247	315 \$19432	107 \$18798			7815 \$17150
55-59	1050 \$14794	1870 \$16478	1391 \$17267	1026 \$18033	981 \$18216	632 \$18714	320 \$19318	222 \$19305	35 \$19826		7527 \$17235
60-64	361 \$14715	890 \$16024	797 \$16767	648 \$17447	656 \$17705	410 \$17709	173 \$17900	147 \$19025	64 \$20125		4146 \$16956
65 +	19 \$16568	51 \$16073	48 \$16612	49 \$17760	33 \$16893	29 \$18006	7 \$21169		2 \$15931		238 \$17066
All Ages	45732 \$14968	33067 \$17523	11735 \$18572	5347 \$18643	3899 \$18604	2478 \$18769	880 \$19080	476 \$19105	101 \$19938		103715 \$16666

Average Age = 36.6 Years Average Service = 7.1 Years Average Age of New Entrants = 29.1 Years

A P P E N D I X 15A

Retired Contributors as at December 31, 1980

Other Than Disability Pensions

Immediate Pensions

Age Group	Number of Pensioners			Annual Pension	
	Male	Female	Total	PSSA	SRBA
50 - 54	407	306	713	3,549,702	405,464
55 - 59	4,855	1,527	6,382	60,618,601	8,123,475
60 - 64	12,079	3,826	15,905	113,178,930	27,102,626
65 - 69	17,435	5,937	23,372	112,407,041	42,687,972
70 - 74	10,142	4,152	14,294	45,604,570	37,835,388
75 - 79	5,180	2,389	7,569	17,689,839	19,480,704
80 - 84	3,187	1,354	4,541	8,968,909	11,840,364
85 - 89	1,554	526	2,080	3,612,626	6,098,988
90 - 94	360	129	489	793,820	1,741,116
95 - 99	59	15	74	121,223	255,960
100 -104	4	0	4	6,942	14,196
TOTAL	55,262	20,161	75,423	366,552,203	155,586,253

Deferred Pensions

Age Group	Number of Pensioners			Annual Pension	
	Male	Female	Total	PSSA	SRBA
25 - 29	9	15	24	34,479	18,619
30 - 34	114	110	224	446,337	241,022
35 - 39	223	110	333	1,001,798	540,971
40 - 44	291	150	441	1,507,150	813,861
45 - 49	623	267	890	3,273,057	1,767,451
50 - 54	782	438	1,220	3,433,905	1,854,307
55 - 59	1,260	688	1,948	4,003,916	2,162,116
60 - 64	24	13	37	69,628	37,599
TOTAL	3,326	1,791	5,117	13,770,270	7,435,946

A P P E N D I X 15B

Retired Contributors as at December 31, 1980

Disability Pensions

Age Group	<u>Number of Pensioners</u>			<u>Annual Pension</u>	
	Male	Female	Total	PSSA	SRBA
25 - 29	1	8	9	9,552	1,128
30 - 34	12	10	22	32,310	3,432
35 - 39	40	19	59	119,390	26,496
40 - 44	81	58	139	362,343	88,740
45 - 49	212	111	323	1,063,283	267,120
50 - 54	574	250	824	3,167,310	827,040
55 - 59	1,972	637	2,609	9,976,949	3,464,760
60 - 64	2,033	693	2,726	8,162,686	4,525,968
65 - 69	924	507	1,431	3,080,995	2,974,620
70 - 74	286	234	520	1,020,782	1,258,188
75 - 79	104	106	210	319,020	519,576
80 - 84	96	86	182	235,576	508,068
85 - 89	59	27	86	111,405	223,392
90 - 94	16	11	27	37,575	65,988
95 - 99	2	3	5	6,943	12,900
TOTAL	6,412	2,760	9,172	27,706,119	14,767,416

A P P E N D I X 15C

Surviving Spouses Eligible for Allowances as at December 31, 1980

Age Group	WIDOWS			WIDOWERS		
	Number	Annual Allowance		Number	Annual Allowance	
		PSSA	SRBA		PSSA	SRBA
20 - 24	3	3,878	0	0	0	0
25 - 29	25	33,059	3,432	1	484	132
30 - 34	73	95,908	22,524	5	6,822	1,256
35 - 39	150	266,841	65,304	4	4,193	440
40 - 44	315	529,789	164,112	6	7,308	357
45 - 49	636	1,159,070	435,600	19	38,437	5,126
50 - 54	1,627	3,087,469	1,331,148	33	54,347	7,339
55 - 59	3,418	6,402,831	3,371,136	48	86,606	11,360
60 - 64	4,249	7,443,056	4,998,372	70	124,869	12,728
65 - 69	4,671	6,774,918	5,951,784	41	65,596	9,478
70 - 74	4,669	5,737,133	6,373,980	33	46,658	7,904
75 - 79	4,373	4,415,139	6,070,980	5	4,434	518
80 - 84	3,769	3,505,979	5,824,512	1	1,353	120
85 - 89	2,113	1,860,398	3,479,232	2	3,184	599
90 - 94	657	525,332	1,066,548	0	0	0
95 - 99	141	110,857	214,584	0	0	0
100 -104	11	10,141	18,396	0	0	0
110 -114	1	240	264	0	0	0
TOTAL	30,901	41,962,038	39,391,908	268	444,291	57,357