

REPORT ON THE ACTUARIAL EXAMINATION

OF THE

ROYAL CANADIAN MOUNTED POLICE SUPERANNUATION ACCOUNT

IN THE

CONSOLIDATED REVENUE FUND

AS AT

DECEMBER 31, 1974

ROYAL CANADIAN MOUNTED POLICE SUPERANNUATION ACT - PART I

Report on the Actuarial Examination of the  
Royal Canadian Mounted Police Superannuation Account  
in the Consolidated Revenue Fund as at December 31, 1974\*

I. Introduction

Pursuant to Section 25 of the Royal Canadian Mounted Police Superannuation Act, we have made an actuarial examination of the Account as at December 31, 1974\* and have the honour to report thereon.

The report is divided into the following sections:

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The last examination of this Account was made as of December 31, 1969 and included the amendments to the Royal Canadian Mounted Police Superannuation Act in 1970. Since that time, a number of significant developments have taken place which have a direct or indirect bearing on this report.

A. Recent Amendments to the R.C.M.P. Superannuation Act

In 1975 significant changes were made in the R.C.M.P. Superannuation Act, the most important of which are as follows:

1. The Act was amended to provide for equality of status for male and female contributors. One amendment resulted in an increase in the basic rate being paid by female contributors. Another amendment entitled the widower of a deceased female contributor who was a member of the Force upon or after the coming into force of this amendment to the same benefits as the widow of a deceased male contributor.
2. Any contributor or beneficiary entitled to a return of contributions following the amendments became entitled, in addition, to receive interest on the accumulation of such contributions at the rate of four per cent per annum after December 31, 1973.

\* Allowance was made in this valuation for the 1975 amendments to the Act, the main object of which was to provide equality of status for male and female contributors and beneficiaries.

3. Prior to amendment, the Act provided for the payment upon the death of a contributor without eligible beneficiaries, or the termination of all surviving beneficiaries or allowances, of the excess, if any, of the return of contributions benefit over the aggregate of all other payments made to the contributor and/or his beneficiaries. By virtue of the amendment, the greater of the return of contributions benefit (including interest as described in (2) above) and five times the annuity to which the contributor was or would have been entitled at the time of his death was substituted for the return of contributions benefit in the calculation of the excess to be paid.
4. Before the amendments, the amount of the annual allowance payable to an officer who, on retirement after serving in the Force for less than thirty-five years, elected to receive an immediate allowance, was the actuarial equivalent of the amount of a deferred annuity to which he was entitled. The amount of such immediate allowance is now calculated as the amount of the deferred annuity reduced by an amount equal to five per cent of the annuity multiplied by (a) sixty minus his age in years, if he has less than twenty-five years of pensionable service, and otherwise multiplied by (b) the greater of fifty-five minus his age in years, or thirty minus his years of pensionable service. As a result of the latter formula, an officer who, on retirement, has reached the age of fifty-five years and has thirty years of pensionable service will be entitled to a full immediate annuity. The new provision is identical to the one applicable to contributors to the Public Service Superannuation Act.
5. A further amendment provides new pension benefits for members of the Force not holding a rank in the Force similar to the benefits provided for contributors under the Public Service Superannuation Act.
6. The period of service necessary to render the surviving spouse and children of a contributor eligible to receive allowances upon his or her death has been reduced from ten years to five years.

B. Supplementary Retirement Benefits Act

The Supplementary Retirement Benefits Act, enacted in 1970 and amended in 1973, provides supplementary benefits related to increases in the cost of living to persons in receipt of annuities or annual allowances under various government superannuation and other acts, including the Royal Canadian Mounted Police Superannuation Act. Although the provisions of the Supplementary Retirement Benefits Act do not affect the operation of the R.C.M.P. Superannuation Account, it was considered desirable to include a description of them and to

comment briefly on the related financing of the benefits in Appendix 2 to this report, in order to present a more complete picture of the total pension provisions for contributors to the R.C.M.P. Superannuation Account.

C. Interest Earnings and Valuation Assumptions

Pursuant to a 1969 amendment, interest credits in respect of the balance in the Account reflect a level of earnings that would be applicable if net increases in the balance were invested in long-term government bonds. In recognition of this change as well as the preferred actuarial approach of choosing each assumption on its own merits and on as "realistic" a basis as may appear appropriate, some substantial changes in assumptions were made. The various assumptions and their rationale are described in detail in Section III.

II. Membership Statistics

In the following tables are shown pertinent statistics concerning contributors to the Account during the five-year period from the date of the last valuation December 31, 1969, to the date of the current valuation December 31, 1974. These figures were obtained from computer tabulations of active and former contributors and their dependents, supplied by the R.C.M.P.

A. Active Contributors

Contributors on Jan. 1/70	New Contributors Jan. 1/70 to Dec. 31/74	Type of Benefit Paid	Terminations during period Jan. 1, 1970 to Dec. 31, 1974				Contributors on Dec. 31/74
			Deaths in Service	Disability Retirements	Other Immediate Annuities and Annual Allowances	Other Lump Sums and Deferred Annuities	
<u>Males</u>							
9,481*	5,945	Annuity	35	31	425	-	
		Lump Sum	-	41	-	1,203	
			35	72	425	1,203	13,691
<u>Females</u>							
210*	371	Annuity	-	1	-	-	
		Lump Sum	2	-	-	116	
			2	1	-	116	462

\* The number of persons listed as being contributors at Dec. 31, 1969 in the data supplied for the previous valuation was 9,156 males and 207 females.

B. Persons Entitled to Annuities or Annual Allowances

Retired Contributors\*

<u>Entitled on Jan. 1/70</u>	<u>New Entitlements Jan. 1/70 to Dec. 31/74</u>	<u>Terminated by Death or Recovery from Disability Jan. 1/70 to Dec. 31/74</u>	<u>Entitled on Dec. 31/74</u>
323	471	42	752

Surviving Spouses

<u>Entitled on Jan. 1/70</u>	<u>New Entitlements Jan. 1/70 to Dec. 31/74</u>	<u>Terminated by Death or Remarriage Jan. 1/70 to Dec. 31/74</u>	<u>Entitled on Dec. 31/74</u>
73	61	16	118

Children

<u>Entitled on Jan. 1/70</u>	<u>Entitled on Dec. 31/74</u>
44	115

\* includes former contributors entitled to deferred annuities

### III. Valuation Assumptions

#### A. General Comments

It is generally recognized that actuarial estimates of the cost of funding pensions are heavily dependent on the assumptions underlying the calculations, and that the choice of the economic assumptions is critical and often among the most difficult. For this valuation it was decided to abandon the 4% interest assumption used in preceding valuations as well as the assumption of no future general increases in salaries, in order to bring our approach more in line with the generally more favoured actuarial approach of selecting assumptions that might be regarded as appropriate and reasonably "realistic" each on its own merits as well as when considered together.

The primary purpose of treating this plan in a manner consistent with the practice for industrial pension plans is not to provide security through funding, but to account for 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 help in deciding whether the primary objective is being achieved.

#### (1) Effect of explicit or implicit level of inflation determining the general level of economic assumptions

There are three aspects to the discussion under this heading.

- (a) The extent to which the required current service or normal 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 R.C.M.P. Superannuation Plan, where the effect of a relatively higher assumed rate of interest tends to be 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 R.C.M.P. Superannuation Plan if it were combined with the Supplementary Retirement Benefits Plan, the level of assumed inflation tends to have a very 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 is critical 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 actuaries and accountants, 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.
- (c) Some recent studies appear to have shown that the real rate of return (see below) decreases as the rate of inflation increases. However, it is not clear and seems difficult to accept that in the long run the "normal" level of the real rate of return will vary depending on the level of inflation.

(2) Effect of differentials between economic assumptions

The three relevant economic assumptions are:

p = rate of inflation

s = rate of increase in level of salaries

i = rate of return on investments

Although, strictly speaking, pension funding costs are affected by ratios of the type  $\frac{1+s}{1+i}$  and  $\frac{1+p}{1+i}$ , for practical purposes the effect may be measured by the differentials (i - s) and (i - p).

The differential (i - p) is commonly referred to as the real rate of return and may be thought of as reflecting the share of production allocated to capital. The real rate of return affects directly the funding cost of indexed pensions, and indirectly, as shown below, the funding cost of pensions based on final-average salary.

The cost of final-average salary plans is affected by the differential (i - s) which may be thought of as (i - p) - (s - p). The differential (s - p) is generally regarded as reflecting the rate of increase in productivity and may be referred to as the real rate of salary increases. Thus the cost of final-average salary plans is affected by the difference between the real rate of return and the real rate of salary increases.

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

As suggested by (1) and (2) 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 contribution rates and accrued pension 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 including the additions to such contingent liability account with the current service contributions to the pension fund for purposes of assessing the total current service cost. Such practice might make for more valid comparison of the potential value of 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 and that the additional benefits should, for practical purposes, be considered part of the formal plan and funded in the same manner as basic benefits. For practical purposes, of course, this would remove the employer's option of updating benefits from time to time without commitment regarding future adjustments.

B. Salary Increases

Where used in this report, the term "salary scale" means the assumed pattern of future increases in pay from year to year as a member advances in age. Such a scale is needed for valuation purposes, because benefits that become payable in the future depend on the rates of pay that will be received in the future.

There are two main forces that tend to generate increases in rates of pay: First, a promotional force resulting from experience



and training; second, an economic force related, directly or indirectly, to such factors as collective bargaining, labour market conditions, inflation and general increases in productivity. Increases in pay resulting from this second force are herein referred to as "general" increases.

The pattern of average promotional increases in pay is fairly predictable on the basis of past experience, and provision for such increases was made in the 1964 and 1969 valuations on the basis of a promotional salary scale constructed from data relating to the rates of pay of members of the Force in 1964. This scale was considered to remain appropriate and was used for the current valuation.

With regard to general increases, on the other hand, the wide variations that have occurred in recent years as a result of varying economic and social pressures are indicative of the difficulty in predicting the level of future increases of this type, and in preceding valuations no explicit provision for such increases was made in determining the required contribution rate. (As mentioned in Section V, credits are made to the Superannuation Account to cover the increases in liabilities arising from general increases in pay as they occur.) For purposes of this valuation, in combination with the assumption of an interest rate of 6.5%, we have assumed a level rate of general increases in pay of 5.5%.

The assumed rate of general increases of 5.5% may be thought of as being composed of a 3% inflation factor and a 2.5% factor for increases in productivity (excess of increases in wages over increases in prices). Further comments are made in the discussion of interest rates which follows, and in Sections V and VI.

The promotional salary scale and a salary scale incorporating both promotional and general increases, as well as illustrations of how the salary of an average member might increase as his age increases, if he joins the Force at age 20, 25 or 30 with an initial salary of \$1,000 per year, are shown in Appendix 3.

#### C. Interest Rates

Until the quarter ending June 30, 1969, interest was credited to the Superannuation Account on the last day of each quarter in the fiscal year at the rate of 1% of the balance to the credit of the Account on the last day of the preceding quarter. This is a rate equivalent to approximately 4% per annum which is the rate that has been assumed in preceding actuarial valuations.

The 1969 amendments to the Act made provision for crediting interest to the Account in excess of the rate used in the preceding actuarial valuation. The total rate at which interest is now credited

changes every three months and is calculated as if the amounts not required for payment of benefits in each quarter pursuant to this Act and the Public Service and Canadian Forces Superannuation Acts had been invested on a basis similar to that applied under the Canada Pension Plan, i.e., in 20-year bonds having a yield equivalent to the average yield on Government of Canada bonds with 20 or more years to maturity outstanding at that time.

For the quarter ending December 31, 1974, the total rate of interest credit was 1.6259%, which is equivalent to 6.66% per annum. The total annual rate of interest credit has remained above 6.5% since that time and seems likely to continue above that level for a long time, given that rates of return on current notional investments have been around 9%, even if allowance is made for a drop in anticipated inflation to substantially lower levels.

As stated earlier, in previous valuations an assumed interest rate of 4% was used, but the effect of using an assumed rate of return substantially lower than might be expected was largely offset by including no explicit provision for general increases in salaries. Moreover, specific provision is made in the Act for the application of interest earnings in excess of the valuation rate to the liquidation of various actuarial deficiencies, of which increases in liabilities arising out of general salary revisions were by far the most important.

For purposes of this valuation it was decided to use an assumed rate of interest of 6.5% which, as noted above, is expected to be exceeded by actual interest credits for a long time. In the long term, the rate may be thought of as being composed of an inflation factor of 3% and a real rate of return of 3.5%.

A real rate of return of 3.5% appears to be a typical rate explicitly or implicitly assumed in actuarial valuations of private pension plans, and its use would tend to minimize the nevertheless formidable difficulties in comparing contribution rates with those of other plans.

If the method of crediting interest described above is retained and past experience can serve as a guide, it appears likely that the experienced real rate of return will fall short of the assumed real rate by about one percentage point in the long term. The effect of this, however, might be at least partially offset if the productivity factor implicit in the salary scale turned out to be overstated by a similar margin, which is not at all improbable. It might be added that, also for consistency with practice in the private sector, the assumed real rate of return should not be taken as less than 3.5%, once the assumption for productivity increases implicit in the salary scale was fixed at

2.5%, because of the administrative rules adopted pursuant to the Income Tax Act; these rules specify that normally the assumed rate of return on assets should exceed the assumed rate of salary increases by at least one percentage point.

The effect of changes in the assumptions and variations of experience from the assumptions is discussed further in Sections V and VI.

D. Rates of Retirement or Termination (for reasons other than death)

Substantially increased use of electronic computers allowed more refined analysis than had been possible in preceding examinations. As a result, slightly different bases and valuation techniques were used in the current examination.

1. Rates of Disability

The rates used were developed from the 1969-74 experience and are shown in Appendix 4.

2. Rates of Retirement

The rates used were developed from the 1969-74 experience and are shown in Appendix 4. As in the past, it was assumed that contributors retiring with at least 20 years of pensionable service would receive immediate annuities. For those with 10 to 20 years of pensionable service, it was assumed that a proportion would receive a return of contributions and the remainder a deferred annuity commencing at age 60; factors to determine the split between these two types of benefit were developed from the 1969-74 experience and are shown in Appendix 4.

3. Rates of Termination other than in (1) and (2) above

The rates used were developed from the 1969-74 experience and are shown in Appendix 4. For contributors terminating with 10 or more years of pensionable service, it was assumed that a proportion would receive a return of contributions and the remainder a deferred annuity commencing at age 60; factors to determine the split between these two types of benefit were developed from the 1969-74 experience and are shown in Appendix 4.

E. Rates of Mortality and Remarriage

1. Active Contributors

During the five-year period January 1, 1969 to December 31, 1974, there were 37 deaths of active members of the Force who were contributors. The small numbers of deaths and of members do not provide sufficient data to determine a mortality table based solely on this experience. The mortality table used in the last four valuations, namely, the Canadian Institute of Actuaries 1949-52 Ultimate Table of Mortality, was used again. The rates are shown in Appendix 5.

2. Former Contributors entitled to annuities or annual allowances

Different mortality rates generally apply to persons entitled to pensions because of disability as compared to persons entitled for other reasons. However, for this valuation, as the group of disability pensioners is small both in number and as a percentage of the total, being 8.4% of the 752 entitled to pensions at December 31, 1974, we have continued to assume the same rates of mortality for both groups. The assumed rates are the same as those used in the three previous valuations, namely, those according to the a-1949 Table of Mortality. These rates, and annuity values based on them, are shown in Appendix 6.

3. Surviving Spouses

The bases chosen for the valuation of both present and prospective spouses' allowances were the same as for the three preceding valuations, namely,

- (i) for mortality - aggregate rates derived from the 1948-57 experience of widows entitled to annual allowances under the Public Service Superannuation Act, and
- (ii) for remarriage - select and ultimate rates derived from the 1940-57 experience of widows awarded pensions under the Pension Act and previous Government administrative orders from August 4, 1914 to December 31, 1957.

Samples of the above rates and of annuity values based on those rates are shown in Appendix 7.

F. Proportions of deceased contributors leaving spouses, and Average ages of spouses corresponding to ages of contributors at death

The assumptions used for the three preceding valuations were deemed to remain appropriate and, accordingly, were retained for the 1974 valuation. These were as follows:

- (a) for active contributors, the proportions of members of the Force at December 31, 1959, who were married and the average ages of their spouses corresponding to the ages of the members of the Force, and
- (b) for retired contributors, the proportions of male pensioners under the Public Service Superannuation Act who died during the period from January 1, 1948 to December 31, 1957, leaving widows, and the average ages of the widows corresponding to the ages of the pensioners at death.

These factors are shown for quinquennial ages at death in Appendix 8.

G. Integration with Canada Pension Plan

Reductions in benefits and contributions to provide for integration with the Canada Pension Plan apply only in respect of salary up to the Year's Maximum Pensionable Earnings as defined in the

Canada Pension Plan. For purposes of this valuation, it was assumed that the Year's Maximum Pensionable Earnings would increase from \$6600 in 1974 at the rate of 12.5% per annum, as provided by statute, until it reached the level of the average industrial composite earnings and to stay equal with it thereafter. Average industrial composite earnings were assumed to be \$10,500 for 1974 and to increase at the rate of 5.5% per annum, i.e., at the rate assumed for general pay increases.

The proportion of members whose pay is below the Year's Maximum Pensionable Earnings was assumed to be zero, as in the preceding examinations.

As the conditions to be satisfied for a person to be considered as disabled and entitled to a disability annuity are more stringent under the Canada Pension Plan than under the R.C.M.P. Superannuation Act, we have assumed for purposes of valuing the reduction in annuities as a result of integration with the Canada Pension Plan that only 10% of the contributors being retired for disability will also be entitled to a disability pension under the Canada Pension Plan. However, the remaining 90% of the disability annuities were assumed to be subject to reduction on account of integration upon attainment of age 65. The probability of contributors retired for reasons other than disability becoming disabled before age 65 and entitled to a disability pension under the Canada Pension Plan was assumed to be zero.

#### H. Civilian Members

It is reasonable to expect that rates of retirement, withdrawal and disability, as well as salary scales applicable to the male civilian members and to the female members, would be different from those applicable to the regular male members of the Force. However, since the civilian and female members of the Force constitute only about 10% of the total number of contributors, it was considered appropriate to make no distinction between these groups in the valuation.

IV. Funding Method

The method used in preceding valuations is known as the "Entry Age Normal" cost method and contemplated a current service contribution rate expressed as a constant percentage of pay equal to a rate applicable to a representative cohort of new entrants during their contributory membership in the plan.

The method used for the present valuation is known as the "Unit Credit" (alias "Unit Benefit" or "Accrued Benefit") cost method. It contemplates contributions in any year sufficient to cover all future benefits in respect of service during that year. The fund resulting from the use of this method will be equal to the liability for accrued benefits; it will be somewhat smaller than the fund that would have resulted from the continued use of the old method.

In contrast to preceding valuations, as noted earlier, the salary scale used for purposes of the present valuation includes an explicit provision for general salary increases. This change might be considered tantamount to a modification in funding method. However, its effect is relatively small because of a concurrent change in the assumed rate of interest.

V. Required Contributions and Credits to the Account

Using the assumptions described in Section III and the distribution of active contributors as at December 31, 1974, shown in Appendix 10, the total required from contributors and the Government combined to fund future benefits in respect of current service was calculated to be 16.8% of pay.

After making allowance for coordination with contributions payable to the Canada Pension Plan, contributions from contributors to the R.C.M.P. Superannuation Account were calculated to be equivalent to 5.6% of pay.

It follows that credits to the Account on behalf of the Government should be equivalent to 11.2% of pay or approximately 2.0 times the contributions received from contributors.

The above multiple of 2.0 for Government credits is somewhat higher than the multiple of 1.8 which has been in effect, as recommended in the 1969 actuarial report. The total of 16.8% of pay indicated above as being required corresponds to a figure of 15.1% which is the equivalent of the requirements indicated in the preceding report. The difference of 1.7% of pay is the net result of an increase of 2.4% of pay attributable to the change in valuation assumptions, a decrease of 1.8% of pay attributable to the change in valuation method, an increase of 0.8% due to a change in distribution of members by age, salary and service, and an increase of 0.3% attributable to the amendments described in Section I.

The new valuation assumptions include provision for 5.5% annual increases in the general level of pay. Under normal pension funding practices, liabilities arising out of increases in pay in excess of the assumed rate would be taken care of, along with other deficiencies after allowing for any gains, following receipt of periodic actuarial reports. The R.C.M.P. Superannuation Act, however, provides for special credits to the Account following authorization of general pay increases. Accordingly, it has been estimated that special credits to the Account in respect of such pay increases should be made equal to 1.6 times the amount of increase in the effective annual payroll in excess of 5.5% per annum. Under the existing provisions of the Act, such credits would be set up as a deferred charge to be amortized in five equal instalments. These instalments, together with instalments in respect of any actuarial deficiency reported as a result of quinquennial actuarial examinations, could be offset by interest earnings in the excess of 6.5% per annum.

VI. Valuation Balance Sheet and Observations

Using the assumptions and the valuation method described in Sections III and IV respectively, the results of the valuation are summarized and the status of the Account is shown in the following balance sheet.

Valuation Balance Sheet as at December 31, 1974

Assets

Balance of Account (Par value)*		\$ 382,885,000
Credits from Government outstanding at December 31, 1974 and made in 1975		9,403,000
Present value of future contributions from the Government of Newfoundland		70,000
Present value of future instalments from contributors in respect of prior service:		
Members of the Force	\$ 659,000	
Retired Contributors	<u>165,000</u>	824,000
Present value of future credits from the Government in respect of prior service (assuming 2.0 times the amount from contributors)		<u>1,648,000</u>
	Total Assets	\$ 394,830,000
	Deficit	<u>\$ 21,724,000</u>
		<u><u>\$ 416,554,000</u></u>

Liabilities

Present value of prospective benefits to active contributors and their dependants		\$ 376,151,000
Present value of benefits to former contributors and their dependants entitled to an annuity or annual allowance:		
Retired Contributors	\$ 38,177,000	
Widows	1,908,000	
Children	<u>309,000</u>	40,394,000
Benefits to former contributors due in 1974 and paid in 1975		<u>9,000</u>
	Total Liabilities	<u><u>\$ 416,554,000</u></u>

\*The value of the Account as at December 31, 1974, determined by discounting the notional investments at the assumed valuation interest rate of 6.5%, was \$417,430,000. It was decided not to use such a value so as not to capitalize interest earnings in excess of the assumed valuation rate without any compensating provision for salary increases in excess of the assumed rate. A deferred charge of \$46,200,000 was in the process of liquidation and would be considered an unfunded liability, if it were not included in the balance of the Account.



The foregoing balance sheet indicates an estimated actuarial deficit of about \$22 million. The major factors having a bearing on the development of this deficit are discussed in the following numbered paragraphs.

1. An estimated \$24 million is due to various differences between actual and expected experience.
2. Estimates of special credits required in respect of general increases in pay during the intervaluation period which amounted to about \$84 million appeared to have been short by amounts which, with accumulated interest, come to about \$14 million.
3. An additional estimated \$19 million is attributable to miscellaneous items, notably an apparent understatement in liabilities in the preceding report due to apparently incomplete data.
4. The use of new assumptions discussed in Section III resulted in an increase in actuarial liabilities of \$15 million.
5. The change in the funding method discussed in Section IV produced a reduction in actuarial liabilities of \$50 million.

VII. Summary and Conclusion

1. The total contribution required from contributors and Government combined to provide all benefits in respect of current service is estimated to be 16.8% of pay. Allowing for coordination with the Canada Pension Plan, the effective rate of contribution to the Account from contributors is estimated to be 5.6% of pay. As a result, it is estimated that Government credits are required at 2.0 times the contributions from contributors.
2. The above rates of contribution make allowance for general salary increases at the rate of 5.5% of pay per annum. Pursuant to subsection 24(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 1.6 times the increase in the effective annual payroll in excess of 5.5%. Under the existing provisions of the Act, such credits would be set up as a deferred charge to be amortized in five equal instalments. These instalments, together with those in respect of existing deferred charges, could be offset by interest earnings in excess of 6.5% per annum.
3. The estimated actuarial deficit in the Account as at December 31, 1974 was \$21.7 million.
4. This report on the R.C.M.P. Superannuation Account makes no allowance for contributions or benefits related to the Supplementary Retirement Benefits Act. These are discussed in Appendix 2.

In conclusion, we wish to acknowledge the cooperation of the Departmental Services Office of the R.C.M.P. which provided the basic records, and the Canadian Police Information Centre Directorate which provided valuable assistance in the programming and data processing related to contributors who were members of the Force on the valuation date.

Respectfully submitted,



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March 9, 1978

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APPENDIX 1

Summary of the R.C.M.P. Superannuation Plan

A. Coverage

Persons covered by this Plan include:

- (a) all members of the Royal Canadian Mounted Police, referred to in this report as the "Force", except a small number who have been members of the Force since March 1, 1949 but did not elect to become contributors under this Act,
- (b) former members of the Force who are entitled to annuities or annual allowances payable out of the Account, and
- (c) widows and children who are entitled to annual allowances or other benefits payable out of the Account as dependants of contributors who died either in service or while entitled to an annuity or annual allowance.

B. Contributions and Credits to the Account

1. By Contributor

(a) Current Service

The rates of contribution for members of the Force covered by the Act are 6.5%\* of pay reduced by the amount that the contributor would be required to contribute under the Canada Pension Plan in respect of pay received by him as a member of the Force. (For example, in 1975 the reduction was 1.8% of the pay between \$700 and \$7,400 per annum.)

Contributions for current service cease when a contributor has to his credit 35 years of pensionable service.

(b) Prior Service

A contributor may elect to contribute in respect of any period of prior pensionable service as described on page 23 of this report. Subject to some minor exceptions, if the election to contribute for a period of prior pensionable service is made within one year of the member becoming a contributor, the amount that the member is required to contribute is equal to the total contributions that he would have had to make during that period of prior pensionable service if the contributions had been computed according to the rate of pay applicable to the contributor on the most recent occasion on which he became a contributor under the Act and at rates of contributions in effect for the period of service elected to be paid for, adjusted for integration with the Canada Pension Plan for any prior pensionable service after 1965

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\* The rates were 6% for males before April 1, 1969 and 5% for females before Feb. 1, 1976.

included in the election. All contributions are increased by simple interest at the rate of 4% per annum from the middle of each fiscal year of prior service to the date of election.

If a contributor fails to make an election in respect of a period of prior pensionable service within the prescribed time, he may do so at any later time while still a member of the Force provided that he is in good health at the date of election. However, the rate of pay used in determining the contributions for such prior service will be the rate of pay authorized to be paid to the contributor at the time he makes his election.

Contributions in respect of prior service may be paid in a lump sum, or by monthly instalments, payable for life, or for a period ceasing upon death or completion of a fixed number of years, whichever is earlier. Monthly instalments are computed on the basis of the Canadian Life Table No. 2 (1941), Males or Females, as the case may be, and interest at 4% per annum.

2. By Government

The Government makes credits to the Account as follows:

- (a) In each quarter such multiple of the total amount paid into the said Account during the preceding quarter by way of contributions in respect of current services and past services rendered by contributors as is specified by the Minister of Finance. During the period under review, a multiple of 1.8, as recommended in the report on the 1969 actuarial valuation was specified.
- (b) In each fiscal year, an amount 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 might be provided by regulations. Further details are given in Section III C of this report.
- (c) Following authorization of any pay increase applicable to at least one per cent of the members of the Force, an amount representing the increase in the net liability for benefits resulting from that pay increase. The amount so credited is charged to the Consolidated Revenue Fund in five equal annual instalments commencing in the fiscal year in which the pay increase was authorized. In accordance with the recommendation in the report on the 1969 actuarial valuation, the amount credited was 1.6 times the amount of increase in the effective annual payroll at the date of increase.
- (d) Following the laying before Parliament of any actuarial report, an amount which in the opinion of the Minister of Finance is required, in addition to the amount then to the credit of the said Account, to meet the cost of the benefits payable from the Account. The amount so credited is charged to the Consolidated Revenue Fund in five equal annual instalments commencing in the fiscal year in which the report is laid before Parliament.

The Minister may apply the "supplementary" interest mentioned in (b) above to reduce the instalments described in (c) and (d) above.

C. Summary of Benefits

(The explanatory Notes referred to in the following summary are given in Section D of this Appendix.)

1. Contributors who hold a rank in the Force

<u>Type of Termination</u>	<u>Period of Service (Note 1)</u>	
	<u>Under 10 years of service in the Force*</u>	<u>10 or more years of service in the Force*</u>
Retirement because of age (Note 2)	Return of contributions (Note 3), or Cash termination allowance (Note 4), whichever is the greater	Immediate annuity (Note 5)
Compulsory retirement to promote economy or efficiency in the Force	Return of contributions	1) With 10 to 20 years at option of contributor: return of contributions, deferred annuity (Note 6), or reduced annuity (Note 7) 2) With 20 or more years: immediate annuity
Compulsory retirement because of misconduct	Return of contributions, or in the discretion of the Treasury Board (Note 8) cash termination allowance if the contributor has reached retirement age	Return of contributions, or in the discretion of Treasury Board (Note 8) (i) if the contributor has reached retirement age: immediate annuity (ii) if the contributor has not reached retirement age: deferred annuity, reduced annuity (immediate), or immediate annuity
Voluntary retirement - contributors other than officers	Return of contributions	1) With 10 to 20 years, at option of contributor: return of contributions, or deferred annuity 2) With 20 to 25 years: annual allowance (Note 9) 3) With 25 or more years: immediate annuity
Voluntary retirement - officer contributors	Return of contributions	1) With 10 to 20 years: Return of contributions 2) With 20 to 35 years, unless qualified in (3) below, at option of contributor: return of contributions, deferred annuity, or annual allowance (Note 10) 3) With 30 or more years of pensionable service at age 55 or older: immediate annuity 4) With 35 or more years: immediate annuity
	<u>Under 10 years of pensionable service</u>	<u>10 or more years of pensionable service</u>
Compulsory retirement because of disability	Return of contributions, or Cash termination allowance, whichever is greater	Immediate annuity

\* A contributor must have 10 or more years of pensionable service to qualify for a benefit other than a return of contributions.

2. Contributors who do not hold a rank in the Force

	<u>Under 5 years of pensionable service</u>	<u>5 or more years of pensionable service (Note 1)</u>
Retirement because of age (Note 2)	Return of contributions	Immediate annuity
Compulsory retirement because of disability	Return of contributions or Cash termination allowance, whichever is greater	Immediate annuity
Compulsory retirement because of misconduct	Return of contributions	Return of contributions or in the discretion of the Treasury Board (Note 8) (i) if the contributor has reached retirement age: immediate annuity (ii) if the contributor has not reached retirement age: deferred annuity, annual allowance (Note 10) or immediate annuity
Retirement for any other reason	Return of contributions	1) With less than 5 years of service in the Force - return of contributions 2) With more than 5 years of service in the Force (a) with 35 years or more service in the Force: immediate annuity (b) with 30 or more years of pensionable service at age 55 or older: immediate annuity (c) in all other cases, at the option of the contributor, a deferred annuity or one of the following benefits: (i) with 25 or more years of pensionable service at age 50 or older: immediate annual allowance, or (ii) if compulsorily retired at age 55 or older with 10 or more years of service in the Force: immediate annual allowance (iii) in all other cases if age 50 or over: immediate annual allowance, or if under age 50: deferred annual allowance

3. All Active Contributors

	<u>Under 5 years of pensionable service</u>	<u>5 or more years of pensionable service</u>
Death leaving no spouse or eligible children under age 25 (Note 11)	Return of contributions to nominated beneficiary, otherwise to estate	Return of contributions or five times the annuity to which contributor would have been entitled, whichever is greater (Note 13)
Death leaving spouse and/or eligible children under age 25 (Note 11)	Return of contributions, or an amount equal to one month's pay for each year of pensionable service, whichever is greater	Annual allowance to surviving spouse and/or children (Notes 12 and 13)

4. Former contributors entitled to immediate annuities, annual allowances or deferred annuities

<u>Type of Termination</u>	<u>Benefit</u>
Death leaving no spouse or eligible children under age 25 (Note 11)	Residual benefit (Note 13)
Death leaving spouse and/or eligible children under age 25 (Note 11)	Annual allowance to surviving spouse and/or children (Notes 13 and 14)

D. Explanatory Notes to Summary of Benefits in Section C of this Appendix (above)

Note 1

1. Service in the Force

For purposes of the plan, "service in the Force" includes any period of service as a special constable of the Force before the date on which the Act came into force and any period of service as a member of a provincial or municipal police force that has been taken over by the Force.

2. Pensionable Service

Pensionable service is described in detail in the Act. In general, the pensionable service of a contributor includes any period of "service in the Force" (see above) for which he has contributed or has elected to contribute. It may also include other periods of prior service not in the Force for which he has elected to contribute in accordance with the provisions of the Act, namely:

- (a) a period of service
  - (i) on active service in the armed forces during World War I or World War II,
  - (ii) in the Canadian Army Special Force established in 1950,
  - (iii) in the regular forces,
  - (iv) in forces raised by Canada other than the regular forces, provided that such service was full-time service lasting for six months or more, and



- (b) a period of full-time paid employment in the Public Service,
- (c) a period of service as a former member of the House of Commons or as a former Senator in respect of which he made contributions under the Members of Parliament Retiring Allowances Act.

Note 2

In this summary, "retirement because of age" means ceasing to be a member of the Force on or after reaching the prescribed retirement age applicable to the member's rank, or at age 60 or above in the case of a civilian member, provided the contributor is not being retired because of disability or misconduct. The retirement ages prescribed in the regulations are shown below:

<u>Rank</u>	<u>Retirement Age</u>
(a) Commissioner	62
(b) Deputy Commissioner	61
(c) All other officers and all members of the Force not holding a rank in the Force	60
(d) Corps Sergeant Major Staff Sergeant Major Sergeant Major Staff Sergeant	58
(e) Sergeant	57
(f) Corporal, Constable, Special Constable, Marine Constable	56

Note 3

"Return of contributions" means payment of an amount equal to the total current and prior service contributions paid by a contributor plus interest at the rate of 4% per annum to December 31st of the year immediately preceding the year the contributor ceased to be a member of the Force. Interest is credited each December 31st (beginning in 1974) on the accumulated contributions with interest as at the prior December 31st.

Note 4

"Cash termination allowance" means an amount equal to one month's pay at the rate of pay authorized to be paid to the contributor at date of termination, multiplied by the number of years of pensionable service to the credit of the contributor, minus in all cases (except termination due to death) the total reduction in his contributions as a result of integration of the Plan with the Canada Pension Plan.

Note 5

"Immediate annuity" means an annuity that becomes payable immediately upon termination. The annual amount of the annuity is equal to 2% of the contributor's average annual pay in respect of any selected six-year period of

pensionable service multiplied by his number of years of pensionable service, not exceeding 35. If a contributor has reached age 65, or if he is entitled to a disability pension under the Canada Pension Plan, the amount of the annuity to which he is entitled under the Act is reduced by 0.7% of his average annual pay used in determining the amount of the annuity, not exceeding the "Average Maximum Pensionable Earnings" multiplied by the number of years of pensionable service after 1965 or after he attained age 18, whichever is later, but not exceeding 35 years. "Average Maximum Pensionable Earnings" is the average of the Year's Maximum Pensionable Earnings, as defined in the Canada Pension Plan, during the contributor's last 3 years of service. All annuities are normally payable in equal monthly instalments in arrears until the end of the month in which the contributor dies.

Note 6

"Deferred annuity" means an annuity that becomes payable upon attainment of age 60. The annual payment is determined on the same basis as for an immediate annuity.

If a former member entitled to a deferred annuity becomes disabled before his deferred annuity commences, his entitlement changes from a deferred annuity to an immediate annuity for the same amount.

Note 7

"Reduced immediate annuity" means an immediate annuity, determined as in Note 5, reduced during the period prior to age 65 but not thereafter by 5% for each full year not exceeding six by which the period of the member's service in the Force is less than 20 years.

This type of annuity may be chosen by a contributor who holds a rank in the Force with 10 but less than 20 years of service in the Force:

- a) if he is compulsorily retired prior to his normal retirement age due to a reduction in the Force, or
- b) at the discretion of the Treasury Board, if he is compulsorily retired to promote economy or efficiency (Note 8).

Note 8

In the case of compulsory retirement because of misconduct, the contributor is entitled to a return of contributions or, in the discretion of the Treasury Board, the whole or any part specified by the Treasury Board of the benefits to which he would have been entitled by reason of his age and length of service if he had been retired because of age, compulsorily retired to promote economy or efficiency or, in the case of a civilian member, retired for any other reason. In no case, however, shall the capitalized value of any reduced benefit (based by Regulation on the a(f) and a(m) ultimate mortality table and an interest rate of 4%) be less than the return of contributions.

Note 9

"Annual allowance" in the case of a contributor other than an officer or a civilian member, means an immediate annuity, reduced by 5% for each full year by which (a) the period of his service in the Force is less than 25 years, or (b) his age at time of retirement is less than the retirement age applicable to his rank, whichever is the lesser.

Note 10

"Annual allowance" in the case of an officer or a civilian member means an optional annuity payable immediately or when the contributor attains age 50, if later. The amount of the allowance is equal to the amount of the deferred annuity to which he is entitled reduced by 5% of such annuity multiplied by (a) the greater of 55 minus his age and 30 minus the number of years of pensionable service, if the contributor had more than 25 years of pensionable service and attained age 50, (b) 30 minus the number of years of pensionable service, in the case of a civilian contributor compulsorily retired for any reason at age 55 or older with 10 years of service in the Force, or (c) 60 minus his age, in every other case. However, the reduction in (b) may be waived by the Treasury Board. Age and service are expressed in the nearest one-tenth of a year.

If a former contributor entitled to an annual allowance commencing at age 50 becomes disabled before reaching age 50, his entitlement changes from an annual allowance deferred to age 50 to an immediate annuity.

This type of annuity may be chosen by

- a) an officer who retires voluntarily and has 20 or more years of service in the Force and is not entitled to a full immediate annuity by reason of having 35 years of service in the Force or having attained age 55 with 30 or more years of pensionable service;
- b) a civilian member who retires for any reason other than disability or misconduct with 5 years of service in the Force and 5 years of pensionable service and is not entitled to a full immediate annuity.

Note 11

"Eligible children under age 25" includes all children of the contributor under age 18, and any child of the contributor over age 18 and under age 25, unmarried and in full-time attendance at a school or university, having been in such attendance substantially without interruption since he or she reached age 18 or the contributor died, whichever occurred later.

Note 12

"Annual allowances" to surviving spouses and children are determined with reference to a basic allowance. The "basic allowance" is equal to 1% of the average annual pay of the deceased contributor in respect of any selected

six-year period of pensionable service multiplied by the number of years of pensionable service, not exceeding 35.

A surviving spouse is entitled to an "annual allowance" equal to the basic allowance except under the following circumstances:

- a) If the age of the contributor exceeded that of the surviving spouse by 20 or more years, the allowance is reduced as prescribed by regulation.
- b) If the contributor dies within one year after marriage, no allowance is payable to the surviving spouse if the Treasury Board is not satisfied that the contributor was at the time of marriage in such a condition of health as to justify his or her having an expectation of surviving for at least one year thereafter.
- c) If a surviving spouse remarries, payment of the allowance is suspended but is resumed in the event of the dissolution or annulment of that marriage or the death of the new spouse by that marriage. In lieu of any further claim to the payment of the allowance, an amount equal to the return of contributions less the total amount of benefit payments made to the contributor and to the surviving spouse and children may be paid to the surviving spouse any time before the dissolution or annulment of that marriage or the death of his or her spouse by that marriage, if there is no child of the contributor entitled to an allowance.

The "annual allowance" to an eligible child is equal to 20% of the basic allowance or, if the contributor died leaving no spouse or the spouse is dead, 40% of the basic allowance, provided that the total amount of allowances to children shall not exceed four times the allowance to an eligible child as applicable in each case, and such maximum allowance is apportioned among the eligible children. Allowances are not payable to children of a surviving spouse who is not entitled to an allowance under the circumstances indicated in (b) above.

An allowance to the widower of a female contributor is payable only if the contributor was a member of the Force on or after February 1, 1976.

Note 13

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, a residual death benefit may be payable. In the case of any contributor who was not a member of the Force on or after February 1, 1976, such benefit is payable to the estate and is equal to the excess, if any, of the "return of contributions" over the aggregate of all amounts paid to the contributor, the surviving spouse and eligible children. In the case of a contributor who was a member of the Force on or after that date, the benefit is payable to the beneficiary if one has been nominated by

the contributor or otherwise to the estate and is equal to the greater of the benefit stated above and the amount obtained by substituting "five times the annuity to which the contributor was or would have been entitled at his death" for the "return of contributions". Under most circumstances, five times the annuity will exceed the "return of contributions".

Note 14

The annual allowances payable to a surviving spouse and/or children on the death of a former contributor who has become entitled to an immediate annuity, an annual allowance, or a deferred annuity, are determined in the same manner and are subject to the same conditions as described in Note 12.

However, the surviving spouse of a person who was over 60 years of age at the time of such person's marriage and, except as provided in the regulations, a child who was born to or adopted by a former contributor or who became a stepchild of such person at a time when that person was over 60 years of age, are not entitled to annual allowances unless that person was or became a contributor after that time.

APPENDIX 2

Supplementary Retirement Benefits

In 1970, the Supplementary Retirement Benefits Act 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 R.C.M.P. Superannuation Account and their dependants who are entitled to annuities or annual allowances.

The supplementary benefit is calculated by multiplying the amount of the annuity or annual allowance to which the person is entitled from the R.C.M.P. 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 are 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 corresponding average for a 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.

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 the age of 60, or, if less than that age, were disabled, and to all widows and children in receipt of annual allowances. The amendments effective January 1, 1973 provided for the payment of benefits to former contributors aged 55 to 59 and in receipt of annuities or annual allowances in cases where the total of service and age equals or exceeds 85.

The R.C.M.P. Superannuation Act was amended in 1970, by the addition of Part III, to require that contributors pay 0.5% of their salaries 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 member retires. The government makes credits to the Account equal to the contributions of the members. The liabilities of the Superannuation Account are not affected by these contributions to or the benefits payable from the Supplementary Retirement Benefits Account.

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, those 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 to the Consolidated Revenue Fund. The Act also provides for a return of contributions paid by a member to the Supplementary Retirement Benefits Account, to the extent that such contributions exceed any benefit that has been or may be paid in respect of him.

The Supplementary Retirement Benefits Act applies to active members and former members of the Force who are entitled to benefits under the R.C.M.P. Pension Continuation Act as well as to those entitled to benefits under the R.C.M.P. Superannuation Act. Contributions paid by both groups of members and other credits to the Account, and supplementary benefits paid to former members and their widows and children receiving basic benefits under either Act, and other charges to the Account during the fiscal years 1974-75 and 1975-76 are shown below.

R.C.M.P. Supplementary Retirement Benefits

<u>Credits to Account</u>	<u>1974-75</u>	<u>1975-76</u>
Contributions from members	\$ 973,017	\$ 1,176,320
Government credits	973,017	1,176,320
Interest	128,406	250,746
Transfers in	4,005	13,617
	<u>\$ 2,078,445</u>	<u>\$ 2,617,003</u>
 <u>Charges to Account</u>		
Supplementary Benefits	\$ 34,578	\$ 43,992
Refunds on withdrawal	51,710	60,871
Transfers out	1,796	2,404
	<u>\$ 88,084</u>	<u>\$ 107,267</u>
 <u>Balance in Account (end of year)</u>	 \$ 2,628,325	 \$ 5,138,059
 <u>Charges to Consolidated Revenue Fund</u>		
Supplementary Benefits	\$ 1,935,136	\$ 3,363,000

Under the partially funded system of financing supplementary retirement benefits as it existed on December 31, 1974, 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 R.C.M.P. Superannuation Account and, for consistency with other assumptions, an assumed rate of increase in the Consumer Price Index of 3% 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 contributions and credits to the Supplementary Retirement Benefits Account were increased from 2.0% to about 6.0% of payroll.

In the following sections of this Appendix the effects of some other methods of financing supplementary retirement benefits are presented.

(a) Required Contributions and Credits to the R.C.M.P. Superannuation Account if benefits pursuant to the Supplementary Retirement Benefits Act as it existed in 1974 were considered superannuation benefits.

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Using the above-noted assumptions, and methods analogous to those used for purposes of Section V of this report, the total required from the contributors and the Government combined to fund future superannuation benefits, increasing in accordance with the Consumer Price Index, in respect of current service was calculated to be 22.8% of payroll.

After making allowance for coordination with contributions payable to the Canada Pension Plan, contributions from contributors, including 1% contributions to the Supplementary Retirement Benefits Account, are calculated to be equivalent to 6.6% of pay.

It follows that credits on behalf of the Government in respect of the combined benefits would have to be equivalent to about 16.2% of pay, or 2.5 times the contributions received from contributors.

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 pay increases in excess of the assumed 5.5% per annum, and (ii) increases to annuities and allowances to former contributors and their dependants in excess of the assumed 3%, which could be offset by interest earnings on the Account in excess of the assumed 6.5%. 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 pay increases and increases to annuities and allowances below the assumed rates, and (ii) losses from interest earnings below the assumed rate. Alternatively, the more common practice of letting all actuarial gains and losses accumulate until the following actuarial examination could be adopted..



(b) Valuation Balance Sheet combining R.C.M.P. Superannuation and Supplementary Retirement Benefits including future adjustments to pensions in payment in accordance with assumed rate of inflation.

This balance sheet 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, (ii) the value of prospective benefits to former contributors and their dependants includes the value of supplementary benefits payable at the rate in effect on December 31, 1974, and makes provision for continued increases at the rate of 3% per annum, and (iii) the value of prospective benefits to active contributors and their dependants includes provision for increases to annuities and allowances in payment at the rate of 3% per annum. In other words, all the assumptions are consistent with those used for purposes of calculating the required contributions and credits in (a) above.

Assets

Balance of R.C.M.P. Superannuation Account and share of Superannuation contributors in Supplementary Retirement Benefits Account	\$ 384,885,000
Credits from Government outstanding at December 31, 1974 and made in 1975	9,403,000
Present value of future contributions from the Government of Newfoundland	70,000
Present value of future instalments from contributors in respect of prior service	824,000
Present value of future credits from the Government in respect of prior service (assuming 2.0 times the amount from contributors)	<u>1,648,000</u>
Total Assets	\$ 396,830,000
Deficit	<u>178,815,000</u>
	<u>\$ 575,645,000</u>

Liabilities

Present value of prospective benefits to active contributors and their dependants	\$ 511,371,000
Present value of benefits to former contributors and their dependants entitled to an annuity or annual allowance:	
Retired Contributors	\$ 59,956,000
Widows	3,829,000
Children	<u>480,000</u>
	\$ 64,265,000
Benefits to former contributors due in 1974 and paid in 1975	<u>9,000</u>
Total Liabilities	<u>\$ 575,645,000</u>

(c) Valuation Balance Sheet for R.C.M.P. Superannuation Account on assumption that interest in excess of 3.5% on the pensioner equity be used for financing Supplementary Retirement Benefits on a pay-as-you-go basis.

It has been suggested from time to time that adjustments to pensions in payment might be financed at least partially by using interest earnings in excess of what might be considered "real" interest or interest under non-inflationary conditions. If such a method of operation were implemented, then consistent with the implicit assumption of a 3% inflation component, the 6.5% interest rate assumed for purposes of the R.C.M.P. Superannuation Account would have to be reduced to 3.5% in respect of periods after benefits become payable. In respect of active contributors, this would be equivalent to assuming indexed benefits as in (b) above. Thus the present balance sheet differs from the preceding one only to the extent that the value of prospective benefits to former contributors and their dependants does not include the value of supplementary benefits payable at the rate in effect on December 31, 1974, since they would continue to be paid out of the Supplementary Retirement Benefits Account, and the assets do not include a share of that account.

Assets

Balance of R.C.M.P. Superannuation Account	\$ 382,885,000
Credits from Government outstanding at December 31, 1974 and made in 1975	9,403,000
Present value of future contributions from the Government of Newfoundland	70,000
Present value of future instalments from contributors in respect of prior service	824,000
Present value of future credits from the Government in respect of prior service (assuming 2.0 times the amount from contributors)	<u>1,648,000</u>
Total Assets	\$ 394,830,000
Deficit	<u>170,637,000</u>
	<u>\$ 565,467,000</u>

Liabilities

Present value of prospective benefits to active contributors and their dependants	\$ 511,371,000
Present value of benefits to former contributors and their dependants entitled to an annuity or annual allowance:	
Retired Contributors	\$ 51,128,000
Widows	2,592,000
Children	<u>367,000</u>
	\$ 54,087,000
Benefits to former contributors due in 1974 and paid in 1975	<u>9,000</u>
Total Liabilities	<u>\$ 565,467,000</u>

(d) Valuation Balance Sheet combining R.C.M.P. Superannuation and Supplementary Retirement Benefits to the extent that the latter were payable as at Dec. 31, 1974

This balance sheet presents the situation on a fully funded basis, if adjustments to pensions in payment were assumed to be granted annually or, in other words, if future increases were not considered to be guaranteed. It differs from the balance sheet in Section VI only to the extent that the assets include a share of the Supplementary Retirement Benefits Account, and the liabilities in respect of former contributors and their dependants include the value of supplementary benefits payable at the rate in effect on December 31, 1974.

Assets

Balance of R.C.M.P. Superannuation Account and share of Superannuation contributors in Supplementary Retirement Benefits Account	\$ 384,885,000
Credits from Government outstanding at December 31, 1974 and made in 1975	9,403,000
Present value of future contributions from the Government of Newfoundland	70,000
Present value of future instalments from contributors in respect of prior service	824,000
Present value of future credits from the Government in respect of prior service (assuming 2.0 times the amount from contributors)	<u>1,648,000</u>
Total Assets	\$ 396,830,000
Deficit	<u>27,323,000</u>
	<u>\$ 424,153,000</u>

Liabilities

Present value of prospective benefits to active contributors and their dependants	\$ 376,151,000
Present value of benefits to former contributors and their dependants entitled to an annuity or annual allowance:	
Retired Contributors	\$ 44,769,000
Widows	2,819,000
Children	<u>405,000</u>
	\$ 47,993,000
Benefits to former contributors due in 1974 and paid in 1975	<u>9,000</u>
Total Liabilities	<u>\$ 424,153,000</u>

With this method of funding, the additional liability incurred annually by an increase to pensions in payment at the implicitly assumed annual rate of increase in the Consumer Price Index of 3% would be equivalent, currently, to .72% of pay.

APPENDIX 3

<u>Age</u>	<u>Promotional Salary Scale</u>	<u>Salary Scale including 5.5% per annum General Increase added to Promotional</u>	<u>Age</u>	<u>Promotional Salary Scale</u>	<u>Salary Scale including 5.5% per annum General Increase added to Promotional</u>
17	.387	.039	40	.768	.263
18	.412	.043	41	.777	.281
19	.437	.049	42	.785	.299
20	.461	.054	43	.794	.320
21	.484	.060	44	.802	.341
22	.506	.066	45	.810	.363
23	.527	.073	46	.819	.387
24	.547	.080	47	.827	.412
25	.568	.087	48	.835	.439
26	.587	.095	49	.843	.468
27	.605	.103	50	.852	.499
28	.622	.112	51	.862	.532
29	.639	.122	52	.873	.569
30	.655	.131	53	.885	.608
31	.670	.142	54	.898	.651
32	.684	.153	55	.912	.698
33	.697	.164	56	.928	.749
34	.709	.176	57	.945	.805
35	.720	.189	58	.963	.865
36	.731	.202	59	.981	.930
37	.741	.216	60	1.000	1.000
38	.750	.231			
39	.759	.247			

Illustration of Increases in Pay for age of entry 20, 25 and 30

<u>Attained age</u>	<u>Entry age</u> -	<u>Based on Promotional Salary Scale only</u>			<u>Based on General Pay Increases of 5.5% per annum in addition to Promotional Salary Scale</u>		
		<u>Pay</u>	<u>Pay</u>	<u>Pay</u>	<u>Pay</u>	<u>Pay</u>	<u>Pay</u>
		<u>20</u>	<u>25</u>	<u>30</u>	<u>20</u>	<u>25</u>	<u>30</u>
20		1,000			1,000		
25		1,232	1,000		1,610	1,000	
30		1,421	1,153	1,000	2,427	1,507	1,000
35		1,562	1,268	1,099	3,487	2,166	1,436
40		1,666	1,352	1,173	4,861	3,018	2,004
45		1,757	1,426	1,237	6,700	4,161	2,762
50		1,848	1,500	1,301	9,210	5,720	3,796
55		1,978	1,606	1,392	12,884	8,004	5,308
60		2,169	1,761	1,527	18,465	11,471	7,610

APPENDIX 4

Rates of Retirement or Termination (for reasons other than death)

<u>Age</u>	<u>Rates of Disability</u>	<u>Rates of Retirement</u>	<u>Rates of Termination other than (A) and (B)</u>	<u>Proportion Assumed to receive Deferred Annuities*</u>
	(A)	(B)	(C)	(D)
17	.0072		.0502	
18	.0061		.0401	
19	.0051		.0401	
20	.0041		.0401	
21	.0031		.0401	
22	.0020		.0401	
23	.0015		.0360	
24	.0010		.0340	
25	.0005		.0340	
26	.0003		.0300	
27	.0002		.0280	
28	.0002		.0270	
29	.0002		.0260	
30	.0003		.0180	.00
31	.0003		.0160	.00
32	.0004		.0140	.08
33	.0004		.0120	.22
34	.0005		.0090	.35
35	.0005	.0100	.0030	.39
36	.0006	.0100	.0030	.44
37	.0007	.0100	.0030	.48
38	.0008	.0100	.0030	.53
39	.0009	.0100	.0030	.60
40	.0011	.0101	.0201	.90
41	.0013	.0102	.0262	1.00
42	.0016	.0122	.0323	1.00
43	.0018	.0152	.0212	1.00
44	.0020	.0182	.0192	1.00
45	.0023	.0523	.0041	1.00
46	.0025	.0552	.0021	1.00
47	.0027	.0553	.0021	1.00
48	.0029	.0553	.0010	1.00
49	.0032	.0553	.0010	1.00
50	.0036	.0633		1.00
51	.0042	.0744		1.00
52	.0048	.0845		1.00
53	.0057	.0957		1.00
54	.0068	.1058		1.00
55	.0082	.1513		1.00
56	.0103	.2423		1.00
57	.0132	.3236		1.00
58	.0167	.4353		1.00
59	.0212	.5778		1.00
60		1.0000		1.00

\*Used to obtain the numbers assumed to receive deferred annuities or equivalent benefits (rather than returns of contributions) by applying to  
 (1) number retiring in accordance with rates in (B) above who have between 10 and 20 years of pensionable service,  
 (2) number terminating in accordance with rates in (C) above who have 10 or more years of pensionable service.

APPENDIX 5

Rates of Mortality  
assumed for Active Contributors

<u>Age</u>	<u>Mortality Rate</u>
17	.0009
18	.0010
19	.0010
20	.0011
21	.0011
22	.0011
23	.0011
24	.0011
25	.0011
26	.0010
27	.0010
28	.0010
29	.0010
30	.0010
31	.0010
32	.0010
33	.0011
34	.0012
35	.0013
36	.0014
37	.0016
38	.0018
39	.0020
40	.0023
41	.0026
42	.0030
43	.0034
44	.0038
45	.0042
46	.0046
47	.0051
48	.0056
49	.0061
50	.0067
51	.0074
52	.0081
53	.0088
54	.0096
55	.0106
56	.0117
57	.0130
58	.0145
59	.0162

APPENDIX 6

Rates of Mortality assumed for former contributors  
entitled to annuities or annual allowances

and

Annuity Values based on this Table with interest at 6.5% per annum

<u>Age</u>	<u>Mortality Rates</u>	<u>Value of Annuity of \$1.00 per annum</u>	<u>Value of Annuity of \$1.00 in first year, increasing 3% annually thereafter</u>
40	.0020	\$13.477	\$19.824
41	.0022	13.348	19.521
42	.0025	13.214	19.211
43	.0028	13.074	18.895
44	.0032	12.929	18.574
45	.0036	12.779	18.248
46	.0041	12.625	17.918
47	.0047	12.467	17.584
48	.0053	12.304	17.247
49	.0059	12.138	16.907
50	.0066	11.967	16.565
51	.0073	11.793	16.221
52	.0080	11.615	15.873
53	.0088	11.433	15.525
54	.0097	11.248	15.174
55	.0106	11.058	14.821
56	.0115	10.865	14.465
57	.0125	10.667	14.108
58	.0135	10.464	13.748
59	.0145	10.257	13.385
60	.0157	10.044	13.019
61	.0169	9.827	12.651
62	.0182	9.603	12.279
63	.0197	9.375	11.905
64	.0213	9.141	11.529
65	.0231	8.903	11.152
66	.0250	8.660	10.774
67	.0272	8.414	10.396
68	.0296	8.164	10.018
69	.0322	7.911	9.642
70	.0351	7.655	9.267
71	.0383	7.397	8.894
72	.0418	7.138	8.525
73	.0456	6.878	8.160
74	.0499	6.617	7.798
75	.0545	6.356	7.442
76	.0596	6.096	7.092
77	.0652	5.838	6.748
78	.0714	5.581	6.411
79	.0781	5.328	6.082
80	.0855	5.077	5.760
81	.0936	4.830	5.448
82	.1024	4.588	5.144
83	.1121	4.350	4.850
84	.1227	4.119	4.566
85	.1342	3.893	4.292
86	.1467	3.673	4.028
87	.1603	3.460	3.775
88	.1751	3.255	3.533
89	.1912	3.057	3.302
90	.2085	2.866	3.082

\* Used for calculations reported in Appendix 2(a), (b) & (c).

APPENDIX 7

Assumed Rates of Remarriage for Widows

Age at Becoming a Widow	Years of Widowhood				Ultimate Rates	
	1st yr.	3rd yr.	5th yr.	10th yr.	Attained Age	Rate
25	.050	.148	.132	.060	39	.028
30	.029	.086	.076	.035	44	.016
35	.018	.048	.042	.019	49	.009
40	.011	.027	.023	.010	54	.004
45	.006	.015	.012	.005	59	.002
50	.004	.008	.006	.002	64	.001
55	.002	.004	.003	.001	69	∅

Assumed Rates of Mortality for Widows

Attained Age	Rate	Attained Age	Rate	Attained Age	Rate	Attained Age	Rate
39	.0022	54	.0050	69	.0232	84	.0822
44	.0026	59	.0083	74	.0367	89	.1180
49	.0033	64	.0141	79	.0559		

Value of Annuity payable to death or remarriage of widow of \$1.00 per annum (interest at 6.5% per annum)

Age at Widowhood	Year of Widowhood				Ultimate	
	1st yr.	3rd yr.	5th yr.	10th yr.	Attained Age	Annuity Value
25	\$ 6.563	\$ 6.638	\$ 7.823	\$ 10.781	39	\$ 12.077
30	8.974	9.118	10.034	11.911	44	12.515
35	10.906	10.991	11.537	12.445	49	12.420
40	12.030	12.018	12.258	12.408	54	11.930
45	12.468	12.330	12.316	11.919	59	11.104
50	12.316	12.077	11.870	11.104	64	10.068
55	11.768	11.420	11.076	10.068	69	8.908
					74	7.702
					79	6.521
					84	5.408
					89	4.378

Value of Annuity payable to death or remarriage of widow of \$1.00 in first year increasing 3% annually thereafter (interest at 6.5% per annum)\*

Age at Widowhood	Year of Widowhood				Ultimate	
	1st yr.	3rd yr.	5th yr.	10th yr.	Attained Age	Annuity Value
25	\$ 9.034	\$ 9.408	\$11.380	\$ 16.108	39	\$ 17.967
30	13.052	13.422	14.902	17.711	44	18.308
35	16.179	16.321	17.115	18.203	49	17.732
40	17.791	17.679	17.913	17.714	54	16.545
45	18.133	17.771	17.575	16.528	59	14.917
50	17.475	16.942	16.457	14.917	64	13.088
55	16.212	15.537	14.878	13.088	69	11.205
					74	9.384
					79	7.708
					84	6.214
					89	4.899

\* Used for calculations reported in Appendix 2(a), (b) & (c).



APPENDIX 8

<u>Age of Contributor at Death</u>	<u>Retired Members of the Force</u>		<u>Active Members of the Force</u>	
	<u>Proportion Leaving Spouses</u>	<u>Average Age of Spouses</u>	<u>Proportion Leaving Spouses</u>	<u>Average Age of Spouses</u>
25	.32	24	.50	24
30	.46	29	.87	28
35	.58	34	.93	32
40	.67	38	.94	37
45	.75	43	.98	42
50	.80	47	.98	47
55	.83	52	.98	51
60	.83	56	.98	56
65	.80	61		
70	.74	65		
75	.65	69		
80	.53	73		
85	.39	77		
90	.26	79		

APPENDIX 9

Distribution by Age of Members of the Force who became Contributors during the period from January 1, 1970 to December 31, 1974

<u>Age at becoming a Contributor</u>	<u>Number</u>	
	<u>Males</u>	<u>Females</u>
18	4	-
19	885	11
20	1,326	33
21	1,030	37
22	680	50
23	450	53
24	288	30
25	224	16
26	151	12
27	145	11
28	109	12
29	76	4
30	62	2
31	53	3
32	31	5
33	43	6
34	30	10
35	33	4
36	27	4
37	9	7
38	24	5
39	23	11
40	35	8
41	22	3
42	21	2
43	21	4
44	33	5
45	24	5
46	16	2
47	14	5
48	16	1
49	15	1
50	14	3
51	3	1
52	3	1
53	1	2
54	2	-
55	-	-
56	1	-
57	1	1
58	-	1
TOTALS	5,945	371

APPENDIX 10

Distribution by Age of Members of the Force who were Contributors to the R.C.M.P. Superannuation Account at December 31, 1974

<u>Age</u>	<u>Number</u>	
	<u>Males</u>	<u>Females</u>
19	69	-
20	371	13
21	529	17
22	627	26
23	704	32
24	750	41
25	808	32
26	860	21
27	847	21
28	896	23
29	599	13
30	493	9
31	448	4
32	513	6
33	429	2
34	449	9
35	387	8
36	412	8
37	324	13
38	354	11
39	290	7
40	294	7
41	289	13
42	357	7
43	289	3
44	264	11
45	218	6
46	158	9
47	101	6
48	78	6
49	66	8
50	47	10
51	54	10
52	47	7
53	40	11
54	40	4
55	33	4
56	25	6
57	21	2
58	20	1
59	21	4
60	17	3
61	17	1
62	8	4
63	6	2
64	5	-
65	7	1
66	1	-
67	5	-
68	2	-
69	1	-
70	1	-
TOTALS	13,691	462