

Royal Canadian Mounted Police Superannuation Act, Part I

Actuarial Report on the State of the
Royal Canadian Mounted Police Superannuation Account
in the Consolidated Revenue Fund as at December 31, 1964

The Royal Canadian Mounted Police Superannuation Act was assented to on July 8, 1959, and proclaimed in force on April 1, 1960. In most respects, Part I of the Royal Canadian Mounted Police Superannuation Act, hereinafter referred to as the "Act", continues the provisions of Part V of the Royal Canadian Mounted Police Act, Chapter 241 of the Revised Statutes of Canada, hereinafter referred to as the "former Act".

In accordance with instructions and pursuant to section 24 of the Act, we have prepared an actuarial report on the state of the Royal Canadian Mounted Police Superannuation Account in the Consolidated Revenue Fund, hereinafter referred to as the "Account", as at December 31, 1964.

The report has been divided into seven sections, as follows:

- I. Terms of the Superannuation Plan as at December 31, 1964
- II. Description of Data and Membership Statistics
- III. Valuation Bases and Assumptions
- IV. Contribution Rates
- V. Valuation Balance Sheets and Observations
- VI. 1966 Amendments
- VII. Summary
- VIII. Appendices

I. Terms of the Superannuation Plan as at December 31, 1964

Membership:

Persons covered by this plan comprise

- (a) members of the Royal Canadian Mounted Police, hereinafter referred to as the "Force", who
 - (i) were contributors under the former Act immediately before the date on which the Act came into force,
 - (ii) not having been members of the Force at the date on which the Act came into force, became members of the Force after that date,
 - (iii) having been members of the Force at the date on which the Act came into force, thereafter ceased to be members and subsequently were re-appointed to or re-enlisted in the Force, and
 - (iv) having been members of the Force but not contributors under the former Act at the date on which the Act came into force, elected to become contributors under the Act within one year from that date;

- (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 in receipt of annual allowances payable out of the Account as dependants of contributors who died either in service or while entitled to an annuity or annual allowance.

Service in the Force:

Except in the case of compulsory retirement because of disability, a contributor cannot become entitled to an annuity or annual allowance when he ceases to be a member of the Force unless he has to his credit at least ten years of "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.

Pensionable Service:

The amount of any annuity, annual allowance or cash termination allowance to which a contributor or his dependants may become entitled under the Act depends upon the number of years of "pensionable service" to the credit of the contributor at the date he ceases to be a member of the Force.

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 for which he has contributed or has elected to contribute. It may also include

- (a) a period of service as a member of a provincial or municipal police force that has been taken over by the Force,
- (b) a period of service
 - (i) on active service in the 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
- (c) a period of full-time, paid employment in the Public Service.

Benefits:

The benefit provisions of the Act (as they were on December 31, 1964) are summarized below:

Summary of Benefits

A. Contributors who are members of the Force:

<u>Type of Termination</u>	<u>Period of Service (Note 1)</u>	
	<u>Under 10 years</u>	<u>10 years or over</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 because of disability	Return of contributions, or cash termination allowance, whichever is the greater	Immediate annuity
Compulsory retirement to promote economy or efficiency in the Force	Return of contributions	1. With 10 to 20 years, at option of contributor - (a) return of contributions, (b) deferred annuity (Note 6), or (c) reduced immediate annuity (Note 7) 2. With 20 or more years - immediate annuity
Compulsory retirement because of misconduct (Note 8)	Return of contributions, or cash termination allowance	(a) Return of contributions, or (b) in the discretion of the Treasury Board, (i) if the contributor has reached retirement age - immediate annuity, (ii) if the contributor has not reached retirement age - deferred annuity, reduced immediate annuity, or immediate annuity
Voluntary retirement - contributors other than officers	Return of contributions	1. With 10 to 20 years, at option of contributor - (a) return of contributions, or (b) deferred annuity 2. With 20 to 25 years - annual allowance (Note 9) 3. With 25 or more years - immediate annuity

<u>Type of Termination</u>	<u>Period of Service (Note 1)</u>	
	<u>Under 10 years</u>	<u>10 years or over</u>
Voluntary retirement - officer contributors	Return of contributions	1. With 10 to 20 years - return of contributions 2. With 20 to 35 years, at option of contributor - (a) return of contributions, (b) deferred annuity, or (c) annual allowance (Note 10) 3. With 35 or more years - immediate annuity
Death leaving no widow or children under age 18	Return of contributions	Return of contributions
Death leaving widow and/or children under age 18	Return of contributions, or cash termination allowance, whichever is the greater	Annual allowance to widow and/or children (Notes 11 and 12)

B. Contributors entitled to annuities or annual allowances:

<u>Type of Termination</u>	<u>Benefit</u>
Death leaving no widow or children under age 18	Return of excess contributions to estate (Note 12)
Death leaving widow and/or children under age 18	Annual allowance to widow and/or children (Notes 12 and 13)

Note 1: "Service" for the purpose of determining the type of benefit available to a contributor or his dependants means

- (a) in the case either of compulsory retirement because of disability or of death leaving dependants, the "pensionable service" to the credit of the contributor at the date of his retirement or death, and
- (b) in all other cases, the "service in the Force" of the contributor at the date of his retirement, except that a contributor must have to his credit at least ten years of pensionable service to receive any benefit other than a return of contributions.

Note 2: "Retirement because of age" in this summary means ceasing to be a member of the Force for any reason other than compulsory retirement because of disability or misconduct either

- (a) at or after the prescribed retirement age, which depends upon rank and ranges from age 56 for constables to age 62 for the Commissioner, or
- (b) in the case of an officer or civilian contributor, on or after completion of 35 years of service in the Force and, in the case of any other contributor, on or after completion of the greater of 25 years of service in the Force or the number of years of such service required to bring total contributory service up to 35 years.

- Note 3: "Return of contributions" means return of a contributor's total current service and prior service contributions without interest.
- Note 4: "Cash termination allowance" means an amount equal to one month's pay for each year of pensionable service at the rate of pay authorized to be paid to the contributor at the time he ceases to be a member of the Force.
- Note 5: "Immediate annuity" means an annuity that becomes payable to a contributor immediately upon his becoming entitled thereto. The annual amount of annuity is equal to 2% of average annual pay 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. The annuity is ordinarily 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 to a contributor at age 60. The annual amount of annuity is computed as described in Note 5. If a contributor who has become entitled to a deferred annuity becomes disabled before attaining age 60, he ceases to be entitled to that deferred annuity and becomes entitled to an immediate annuity.
- Note 7: A "reduced immediate annuity" may be paid to a contributor with 10 but less than 20 years of service in the Force, at his option, if his retirement is due to a reduction in the establishment of the Force, or, in any other case of compulsory retirement to promote economy or efficiency, if the Treasury Board so authorizes. Under these circumstances, "reduced immediate annuity" means an immediate annuity, reduced, until such time as the contributor reaches age 65, by 5% for each full year not exceeding six by which the period of his service in the Force is less than 20 years.
- Note 8: In the case of compulsory retirement because of misconduct, the Treasury Board has the power to specify that the contributor become entitled to the whole or any part of the cash termination allowance or annuity to which he would have become entitled on retirement because of age as respects a contributor who has reached retirement age or on compulsory retirement to promote economy or efficiency due to a reduction in the establishment of the Force as respects any other contributor. However, any reduction specified by the Treasury Board is limited to the extent that the reduced cash termination allowance or the capitalized value of the reduced annuity cannot be less than the amount of a return of contributions. For this purpose, the capitalized value of an annuity is calculated in accordance with the $a(f)$ and $a(m)$ Ultimate tables of mortality and interest at 4% per annum.
- Note 9: "Annual allowance" to a contributor, other than an officer, means an allowance, payable immediately, equal to three-quarters of the annuity to which he would have been entitled upon compulsory retirement because of disability increased by 5% of such annuity for each full year of service in the Force over 20.
- Note 10: "Annual allowance" to an officer contributor means an allowance, payable immediately in the case of a contributor of age 50 or over, or payable at age 50 in the case of a contributor of age less than 50, computed as the actuarial equivalent of the deferred annuity described in Note 6 in accordance with the $a(f)$ and $a(m)$ Ultimate tables of mortality and interest at 4% per annum. If

a contributor who has become entitled to an annual allowance payable at age 50 becomes disabled before attaining age 50, he ceases to be entitled to that annual allowance and becomes entitled to an immediate annuity.

Note 11: "Annual allowance" to the widow of a contributor means one-half of the annual amount of annuity computed as described in Note 5. This is termed the "basic allowance". If the age of the contributor exceeds that of the widow by more than 20 years, the widow's allowance is reduced. If a contributor dies within five years after his marriage, the widow's allowance may be reduced unless the Treasury Board is satisfied that anticipation of impending death was not a consideration affecting the agreement to marry. If a widow remarries, her allowance is

- (a) suspended during the lifetime of her new husband, or
- (b) forfeited, if she receives, upon her request, a return of contributions less all payments made to the contributor, widow and children; such request can only be made while her new husband remains alive and after the youngest child of the contributor has attained age 18.

"Annual allowance" to each child of a deceased contributor means one-fifth of the basic allowance, or, if there is no living widow of the contributor, two-fifths of the basic allowance. The allowance is payable until the child attains age 18. The total amount of annual allowances payable to the children of a deceased contributor may not exceed four-fifths of the basic allowance, or, if there is no living widow, eight-fifths of the basis allowance.

Note 12: At the time that

- (a) a contributor dies leaving no widow or children entitled to an annual allowance, or
- (b) a contributor's last dependant to whom an annual allowance is payable dies or otherwise ceases to be entitled thereto,

any amount by which the amount of a return of contributions exceeds the aggregate of all amounts that have been paid to the contributor, his widow and his children, is paid to the contributor's estate.

Note 13: The annual allowances payable are computed in the manner and subject to the conditions described in Note 11. However, a widow who married a person of age 60 or over after he became entitled to an annuity or annual allowance payable out of the Account is not entitled to an annual allowance unless such person subsequently became a member of the Force. Also, a child who was born to, adopted by, or became the step-child of a person of age 60 or over after he became entitled to an annuity or annual allowance payable out of the Account is not entitled to an annual allowance unless

- (a) such person subsequently became a member of the Force, or
- (b) in the case of a child born to such person, the child was conceived before that person attained age 60 or ceased to be a member of the Force.

Contributions:

By contributor -

(a) Current Service

The rates of contribution (as they were on December 31, 1964) for members of the Force who come under the Act are - for males, 6% of pay
females, 5% of pay.

Contributions cease after 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 pensionable service served prior to becoming a contributor.

In general, if a contributor makes an election in respect of a period of pensionable prior service within one year after he becomes a contributor, the amount of contributions required is equal to the total contributions that would have been made during that period of service at the rate of contribution specified above for current service together with simple interest at 4% per annum to the date of election. (There are a few exceptions to this general rule.)

If a contributor fails to make an election in respect of a period of pensionable prior service within the time prescribed therefor, he may make an election at any time before he ceases to be a member of the Force provided that he is in good health at date of election. However, the amount of contributions required in respect of such period of service is computed on the basis of pay at the rate 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 for life, or for a period of years or life whichever is the shorter. 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.

By Government

At the end of each calendar quarter, the Government credits to the Account

- (a) an amount, representing interest, equal to 1% of the balance to the credit of the Account at the end of the preceding quarter, and
- (b) an amount related to the current service and prior service contributions paid by contributors during the preceding quarter as is specified by the Minister of Finance; since the Account was established in 1949, credits have been made at the rate of one and two-thirds of total contributions paid by contributors.

After any pay increase of general application to the Force, the Government credits to the Account the amount estimated to be necessary to provide for the excess of the value of the increase in benefits over the value of the increase in contributions resulting from the pay increase.

II. Description of Data and Membership Statistics

The Pay and Pensions Division of the Treasury Office of the Royal Canadian Mounted Police Headquarters supplied files of manual record cards which contained all details necessary for the valuation of the plan. These files included a card for each member of the Force who was a contributor under the plan and each person who was entitled to an annuity or annual allowance payable out of the Account at any time between January 1, 1960, and December 31, 1964.

In the following table are shown pertinent membership and termination statistics for the period from January 1, 1960, to December 31, 1964.

A. Members of the Force

Contributors on Jan. 1/60	New Contributors Jan. 1/60 to Dec. 31/64	<u>Terminations during period Jan. 1, 1960 - Dec. 31, 1964</u>					Contributors on Dec. 31/64
		Type of Benefit	<u>Non-disability Retirements</u>		Disability Retirements	Deaths in Service	
			Immediate Annuities and Annual Allowances	Deferred Annuities and Lump Sums			
		Annuity	81	4	11	17	
		Lump Sum	-	916	56	31	
4,010	3,439		81	920	67	48	6,333

B. Persons entitled to Annuities or Annual Allowances

Retired Contributors

Entitled on Jan. 1/60	New Entitlements Jan. 1/60 to Dec. 31/64	Terminated by Death Jan. 1/60 to Dec. 31/64	Entitled on Dec. 31/64
90	91	18	163

Widows

Entitled on Jan. 1/60	New Entitlements Jan. 1/60 to Dec. 31/64	<u>Terminations during period Jan. 1/60 - Dec. 31/64</u>		Entitled on Dec. 31/64
		Death	Remarriage	
18	33	1	5	45

Children

Entitled on Jan. 1/60	Entitled on Dec. 31/64
20	40

III. Valuation Bases and Assumptions

1. Civilian Members

Of the 6,333 current service contributors at the date of valuation, 289 were civilians and 92 of these were women. It can be expected that the experience among civilians, and particularly that among women, will differ from that of regular members in respect to retirement, withdrawal, disability, salary increases, and so on. However, due to the small size of the civilian membership, any such differences would not materially affect the valuation results. Hence, the same valuation bases and assumptions were used for civilian members as for regular members, except that cognizance was taken of the fact that the contribution rate for female contributors is only 5%.

2. Interest

The Royal Canadian Mounted Police Superannuation Regulations provide that interest shall be credited to the Account at the rate of 1% quarterly, that is, at the rate of 4% per annum, approximately. The interest basis for the valuation was therefore taken as 4% per annum.

It may also be mentioned that, where an interest basis is necessary for calculations under the Act, the Regulations prescribe the interest basis to be 4% per annum.

3. Salary Scales

The term "salary scale" as used in this report, denotes the predicted pattern of increase in pay from age to age over future years.

The manner in which pay will increase from age to age in the future must be predicted for valuation purposes because

- (a) annuity and annual allowance benefits depend on the average pay received during a selected six year period of pensionable service (ordinarily, the period selected is the last six years of service),
- (b) the cash termination allowance benefit depends on the rate of pay authorized at termination of service, and
- (c) future current service contributions depend on pay received during future years of service.

There are two main forces that tend to generate increases in the pay of an individual during his working lifetime. One may be thought of as a "promotional" force, stemming from experience gained and new or higher skills attained by an individual and resulting in periodic increases in the pay of that individual. The other may be thought of as an "economic" force, stemming from such factors as increased productivity and inflation in the economy and resulting in general pay increases to groups of employees.

The Act provides that an amount estimated to be equal to the additional net liability created by a general pay increase shall be credited to the Account as soon as possible after the increase. The implication in this provision is that the Government, as employer, has assumed responsibility for the additional net liabilities created under the plan as a result of such pay increases. Hence, in the development of the salary scale for this valuation, only promotional increases in pay were taken into account.

The data supplied by the Pay and Pensions Division included the rate of pay authorized to be paid to each contributor on December 31, 1964. In the case of contributors other than officers, the data also included the rate of pay applicable to each contributor at the valuation date pursuant to the

general pay increase declared after December 31, 1964, but made retroactively effective to April 1, 1964. (The corresponding general pay increase for officers was declared prior to the valuation date.) For valuation purposes, the rate of pay assumed to be paid to each member at the valuation date was taken as the rate authorized to be paid to the members at that time. However, the revised rates of pay were used in the development of the salary scale used for this valuation, which is shown in Appendix 1.

In Appendix 2 is shown, for specimen ages, the manner in which an initial amount of pay of \$1,000 per annum would increase in accordance with the salary scale.

4. Rates of mortality and remarriage

For valuation purposes, mortality rates expected to be experienced in the future were required for each of the following groups:

- (a) contributors who are members of the Force;
- (b) contributors entitled to annuities or annual allowances;
- (c) widows of deceased contributors;
- (d) children of deceased contributors.

Widows' allowances are suspended on remarriage. Thus, rates of remarriage were needed for their valuation.

The bases used in the valuation are described in the following paragraphs:

(a) Contributors who are members of the Force

Only 48 deaths occurred among this group during the period from January 1, 1960, to December 31, 1964. In view of this small number of deaths, investigation of mortality was limited to comparing the number and incidence of actual deaths with the number and incidence of deaths that would have occurred in accordance with the rates of

- (i) tables of mortality developed from the mortality experience of other Government employee groups, and
- (ii) recent standard mortality tables.

As a result of these tests, the mortality table used for the 1954 and 1959 valuations, namely, the Canadian Association of Actuaries 1949-52 Ultimate Table of Mortality, was considered to be suitably representative of the experience to be expected, and was used again. The rates are shown in Appendix 3.

(b) Contributors entitled to annuities or annual allowances

For pension plans that include provision for retirement to pension because of disability, different mortality assumptions are frequently made in respect of persons entitled to pension because of disability and persons entitled for other reasons. For this plan, the group of disability pensioners is small, both in number and as a proportion of the total; about 10% of the 163 retired contributors entitled to pension at December 31, 1964, had become so entitled because of disability. In fact, even the total pensioner group is so small that past mortality experience has been too limited to do more than indicate that mortality has not been unfavourable. Hence, for this valuation as for the 1959 valuation, it was arbitrarily assumed that all contributors entitled to a pension at the date of valuation and all those who will become so entitled in the future will be subject to mortality in accordance with the rates of the a-1949 Table. These rates and relevant annuity values are shown for ages 40 to 90 in Appendix 4.

(c) Widows

The bases chosen for the valuation of both present and prospective widows' allowances were the same as for the 1959 valuation, namely,

- (i) for mortality - aggregate rates derived from the 1948-57 experience of widows entitled to annual allowances under the Public Service Superannuation plan, 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.

In Appendix 5 are shown

- (i) select remarriage rates for quinquennial ages at widowhood 25 to 55 and specimen durations from widowhood,
- (ii) ultimate remarriage rates and aggregate mortality rates for quinquennial ages commencing at age 39, and
- (iii) annuity values based on the probabilities of payments ceasing as a result of remarriage or death for the ages and durations noted in (i) and (ii) above.

(d) Children

Payments of annual allowances to children cease at age 18. Since the mortality of children under age 18 is very low, it was deemed suitable to value children's allowances without taking account of mortality.

5. Rates of retirement for reasons other than disability

- (a) Rates of retirement with entitlement to an immediate annuity, a reduced annuity, or an annual allowance

Rates of retirement were calculated from the 1960-64 experience data and smoothed to obtain graduated rates for use in the valuation. For valuation purposes, it was assumed that contributors retiring in accordance with these rates with at least twenty years of service would receive immediate annuities and those retiring with less than twenty years of service would receive deferred annuities commencing at age 60. The graduated rates are shown in Appendix 6.

- (b) Rates of retirement with entitlement to a lump sum or a deferred annuity

During the period January 1, 1960, to December 31, 1964, there were 920 retirements of this type. Of these retirements, approximately 60 had ten or more years of service in the Force, most of whom could have elected a deferred annuity; only 4 did so, the remainder electing to take a return of contributions. However, since the deferred annuity benefit is normally more advantageous to the contributor than a return of contributions, it would seem reasonable that a greater proportion will elect to take the deferred annuity benefit in the future. Therefore, for this valuation it was assumed that 25% of contributors retiring in the future with more than ten years of service will receive a deferred annuity and that all others, including all those with less than ten years of service, will receive a return of contributions.

Rates of retirement were calculated from the 1960-64 experience data and smoothed to obtain graduated rates for use in the valuation. The graduated rates are shown in Appendix 7.

6. Rates of retirement because of disability

Rates based upon the 1960-64 experience were smoothed to obtain graduated valuation rates. For the valuation, contributors retiring in accordance with these rates with less than ten years of service were assumed to receive cash termination allowances and those retiring with more than ten years of service were assumed to receive immediate annuities. The graduated rates are shown in Appendix 8.

7. Proportions of male contributors married at death, and average ages of widows corresponding to ages of contributors at death

These proportions and average ages were needed to value prospective benefits of future widows, both of contributors who are members of the Force at death, and of contributors entitled to an annuity or annual allowance at death. For valuation purposes, it was decided to retain the assumptions used for the 1959 valuation, namely, that proportions of contributors married at death and the average ages of widows corresponding to ages of contributors at death would be suitably represented by,

- (a) for contributors who are members of the Force at death, the proportions married and the average ages of wives of contributors who were members of the Force on December 31, 1959, and
- (b) for contributors entitled to an annuity or annual allowance at death, the proportions married and the average age of widows derived from the experience of persons who died during the period from January 1, 1948, to December 31, 1957, while entitled to an annuity or annual allowance under the Public Service Superannuation Act or its predecessor Act.

These factors are shown for quinquennial ages of contributors at death in Appendix 9.

8. Children's benefits

For each age at death of contributor, there was needed the value of children's benefits per \$1.00 of the annuity payable to a contributor or that would have been payable to a contributor if he had retired with entitlement to an immediate annuity at the date of his death. The values used for the 1959 valuation, namely, the values determined for the examination of the Public Service Superannuation Account as at December 31, 1957, were considered to be suitable for this valuation also. They are shown in Appendix 9.

9. Capitalized values of benefits

In Appendix 10 are shown, for quinquennial ages, the values of benefits emerging

- (a) on retirement with entitlement to an immediate annuity or annual allowance, and
- (b) on death leaving dependants with entitlement to an annual allowance.

For retirements, the values include provision for prospective annual allowances to widows and children. All values include provision for payment of an aggregate amount of benefit at least equal to the contributor's total contributions without interest.

IV. Contribution Rates (applicable as at December 31, 1964)

Contributions payable by contributors for current service are equal to 6% of pay for males and 5% of pay for females, and contributions for periods of prior service are, in the usual case, based on these same rates. Also, from commencement of the plan in 1949 to the date of the current valuation, credits equal to one and two-thirds of total current service and prior service contributions by contributors were made to the Account on behalf of the Government. Thus, assuming that Government credits continue to be made at the same proportion of contributions by contributors as in the past, total credits to the Account will ordinarily be at a rate of 16% of pay received by male contributors and 13 1/3% of pay received by female contributors for any period of pensionable service.

On the basis of the valuation assumptions, together with the assumption that in the future the distribution of new contributors by sex and age will parallel the distribution for the 1960-64 period (as shown in Appendix 11) it is estimated that the average total contribution rate required in respect of a new contributor to provide for benefits is 16.1% of pay. This is only slightly higher than the contribution rate now applicable in respect of male contributors but is substantially higher than the contribution rate applicable in respect of female contributors. In view of the fact that a high proportion of the members are men, contributions by contributors and credits by the Government at the current rates would be very nearly sufficient to provide for benefits in respect of new contributors under the terms of the Act as they were on December 31, 1964. However, this situation has changed significantly as a result of 1966 amendments to the Act, as explained in detail later in this report. Also, it should be emphasized that the calculated 16.1% contribution rate required for new contributors takes into account only "promotional" increases in pay; it would be much higher indeed if account had also been taken of "economic" increases.

V. Valuation Balance Sheet and Observations

The following balance sheet summarizes the results of the valuation and shows the financial status of the Account as at December 31, 1964. It is assumed that Government credits to the Account will continue to be made at the rate of one and two-thirds of total current service and prior service contributions paid by contributors.

Valuation Balance Sheet as at December 31, 1964

Assets

Balance of Account			\$ 50,746,000
Outstanding credits from Government			1,310,000
Present value of future contributions from Province of Newfoundland			202,000
Present value of future contributions from contributors:			
<u>Members of the Force</u>			
Current service	\$27,740,000		
Prior service	<u>416,000</u>	\$28,156,000	
<u>Retired contributors</u>			
Prior service		<u>86,000</u>	28,242,000
Present value of future credits from Government			<u>47,107,000</u>
		Total Assets	\$127,607,000
Deficit			<u>6,644,000</u>
			<u>\$134,251,000</u>

Liabilities

Present value of prospective benefits to contributors who are members of the Force			\$127,990,000
Present value of benefits to persons entitled to an annuity or annual allowance:			
Retired contributors	\$5,560,000		
Widows	626,000		
Children	<u>26,000</u>		6,212,000
Contributions held pending refund to former members of the Force			<u>49,000</u>
			<u>\$134,251,000</u>

The foregoing balance sheet shows an estimated deficit of \$6,644,000 as at December 31, 1964. There are two main reasons for the emergence of this deficit.

1. During the five years ended December 31, 1964, actual rates of retirement with a return of contributions were much lower than the rates during previous periods and, in particular, were lower than the rates assumed for the 1959 valuation which were based on the experience of the 1955-59 period. Since the net liability reflected in the Account to provide for the benefits of a continuing contributor is substantially greater than the amount paid out to a contributor who retires with a return of contributions, it follows that the net liability as at December 31, 1964, was substantially greater than had been estimated at the time of the preceding actuarial review. Besides this effective loss to the Account, the rates assumed for the current valuation were revised to take account of the experience of the 1960-64 period, so that the estimate of the liability as at December 31, 1964, was considerably higher than it would have been if the 1959 valuation rates had again been used.

2. Experience indicated that the salary scale assumed for the 1959 valuation was not appropriate for the future and a new scale was constructed for use in the current valuation. The resulting increase in the estimated value of future benefits and, hence, in the net liability was only partially offset by the corresponding increase in the estimated value of future contributions. The offset was only partial because

- (a) the estimated value of future contributions is significantly less than the estimated value of future benefits so that, even if the former had increased by the same percentage as the latter, the absolute amount of increase would be less, and
- (b) the percentage increase in the estimated value of future contributions was less than in the estimated value of future benefits because the greater part of future benefits consists of prospective annuity entitlements based on average pay during the last six years of service of current contributors, whereas future contributions will be based on the lower average pay taken over the whole remaining period of service of those contributors.

VI. Effect of the 1966 Amendments

The more important changes resulting from the amendments to the Act effected by the Statute Law (Superannuation) Amendment Act, 1966, are outlined below.

1. Current service contributions to the Account are reduced by the amount that the contributor is required to contribute under the Canada Pension Plan in respect of pay received by him as a member of the Force. In general, annual current service contributions by contributors are less than would have formerly been the case by 1.8% of that portion of pay that falls between the Canada Pension Plan contributory earnings lower and upper limits. (For 1966 and 1967, these limits are \$600 and \$5,000, respectively.)

2. The amount of any annuity to which the contributor may become entitled under the Act is reduced by a portion of any disability or retirement pension concurrently payable to the contributor under the Canada Pension Plan; such portion is to be determined by reference to contributions made under the Canada Pension Plan in respect of the contributor's service as a member of the Force prior to completion of thirty-five years of pensionable service. The expression "any disability or retirement pension concurrently payable" is intended to include any such pension to which the contributor would have become entitled under the Canada Pension Plan if he had applied therefor and, in the case of a retirement pension, the amount of pension were not subject to the earnings test under the Canada Pension Plan.

3. The cash termination allowance payable to a contributor is reduced by any amount by which his contributions may have been reduced on account of integration with the Canada Pension Plan as outlined in 1. above. However, the cash termination allowance payable to the widow and children of a contributor who dies with less than ten years of pensionable service is not so reduced.

4. Prior to the 1966 amendments, civilian members were subject to the same rules as officers as respects their benefit entitlements. This has been changed in one respect, namely, that a civilian member who retires with at least ten but less than twenty years of service in the Force has the choice of a return of contributions or of a deferred annuity, instead of being required to take a return of contributions.

5. The contribution basis for elections in respect of prior military service or service in the Public Service was changed. In the future, contributions will be based on the rate of pay applicable to the contributor on the most recent occasion on which he became a contributor under the Act. Formerly, contributions were based on the rate of pay applicable to the contributor during the period of such service.

6. Formerly, if the Treasury Board was not satisfied that anticipation of impending death was not a consideration affecting the agreement to marry, the annual allowance otherwise payable to the widow and children of a contributor was subject to a reduction if the contributor died within five years of his marriage. The stipulated percentage reduction, set at 100% for deaths within the first year of marriage, gradually decreased with increasing duration of marriage after the first year.

These provisions were considerably liberalized by the 1966 amendments. There can be no reductions in cases of death after the first year of marriage but a reduction of 100% or less may still be made in cases of death within the first year of marriage if the Minister of Justice is not satisfied that the contributor, at the time of his marriage, had a reasonable expectation of surviving for at least one year thereafter.

7. The Act, as it read on December 31, 1964, provided that as soon as possible following any general pay increase, there would be credited to the Account such amount as was deemed necessary to provide for the net increase in liability resulting from the increase.

As the Act is presently constituted, an amount representing the increase in the net liability resulting from a pay increase applicable to at least one per cent of the members of the Force shall forthwith be credited to the Account and the amount so credited shall be charged to the Consolidated Revenue Fund in five equal annual instalments commencing in the fiscal year in which the pay increase was authorized.

8. The 1966 amendments provide that, following the laying before Parliament of an actuarial report, "there shall be credited to the Superannuation Account such amount as, in the opinion of the Minister of Finance, together with the amount then to the credit of the said Account, is required to meet the cost of the benefits payable under this Part and the amount so credited shall be charged to the Consolidated Revenue Fund in five equal annual instalments commencing in the fiscal year in which the report is laid before Parliament." This provision is entirely new.

The effect of these changes are not reflected in the balance sheet as at December 31, 1964, since the amending legislation had not been passed at that date. However, supplementary calculations were made to estimate what the effect would have been if the amending legislation had been in force on the valuation date to take effect on January 1, 1966. The changes taken into account in these supplementary calculations were

- (a) the reduction in employee current service contributions as outlined in 1. above together with the consequential reduction in "matching" Government credits,
- (b) the reduction in the benefit of return of contributions on death or retirement following from the reduction in contributions, and
- (c) the reduction in retirement and disability annuities and in cash termination allowances as outlined in 2. and 3. above.

The calculations to estimate the effect of the changes noted in the above paragraph indicated that the present value of future contributions would have been reduced by a greater amount than the present value of future benefits in respect of younger contributors and by a smaller amount in respect of older contributors. Because a large proportion of contributors at December 31, 1964, were at the younger ages, the effect as at that date in respect of all contributors then current would have been a reduction in the present value of future contributions of about \$16 million and a reduction in the present value of future benefits of about \$10 million. Thus, if the amending legislation had been in force on December 31, 1964, to become effective on January 1, 1966, the deficit as at December 31, 1964, would have been some \$6 million more than that shown in the balance sheet of that date. Besides this increase in the net liability in respect of current contributors, the changes effected by the amendments also result in an increase in the contribution rates required to provide benefits in respect of new contributors because the age distribution of new contributors is considerably younger than the age distribution of all current contributors. The increase in the required contribution rate for new contributors is estimated to be 1.7% of pay.

The statements in the above paragraph as respects the increase in the required contribution rate need some further explanation. In section IV of this report, it was noted that the required contribution rate for new contributors was estimated to be 16.1% of pay. As a result of the 1966 amendments, the contributions and "matching" credits that would formerly have been applicable will be reduced by some 4.8% of pay on annual earnings between the Canada Pension Plan contributory earnings upper and lower limits (initially set at \$600 and \$5,000, respectively). Thus, if the present value of future benefits were reduced by the same amount as the present value of future contributions in respect of new contributors, the required contribution rates for such contributors would become 16.1% of pay on annual earnings below \$600 and above \$5,000 and 11.3% (that is, 16.1% less 4.8%) of pay on annual earnings between \$600 and \$5,000. However, the present value of future benefits is reduced by a lesser amount than the present value of future contributions in respect of new contributors so that the estimated required contribution rates for new contributors are 17.8% of pay on annual earnings below \$600 and above \$5,000 and 13.0% of pay on annual earnings between \$600 and \$5,000. Since, therefore, contributions and "matching" Government credits will be less than those estimated to be required by about 1.8% of pay for new male contributors and about 4.5% for new female contributors, such contributions and credits will not be sufficient to provide for benefits in respect of new contributors; it is estimated that the deficiency resulting from this circumstance will be about \$1 million for each year after 1964.

VII. Summary

The balance sheet as at December 31, 1964, indicates that there was a deficit of \$6,644,000 in the Account at that date.

The total contribution rate required to provide for benefits in respect of new contributors was estimated to be 16.1% of pay under the terms of the Act as they were at December 31, 1964. This rate was slightly greater than the current combined rate of contributions from contributors and credits from the Government.

The Act has been amended by the Statute Law (Superannuation) Amendment Act, 1966. It is estimated that, as a result of changes effected by those amendments, the net liability as at December 31, 1964, would be increased by approximately \$6 million and the required total contribution rate for new contributors after that date would be increased by 1.7% of pay. It follows that contributions from contributors and credits from Government at the current rate of about 16% of pay for males and 13 1/3% of pay for females (reduced by 4.8% of pay on annual earnings between the Canada Pension Plan's contributory earnings lower and upper limits) will not be sufficient to provide for benefits in respect of new contributors. The deficiency arising each year from the insufficiency in contribution rates in respect of new contributors is estimated to be about \$1 million.

We acknowledge with pleasure the cooperation and assistance of the Treasury Office of the Royal Canadian Mounted Police Headquarters throughout this examination.

Respectfully submitted,



Chief Actuary.

Department of Insurance,
March 17, 1967.

VIII. A P P E N D I C E S

1. Salary Scale.
2. Illustration of Increases in Pay in accordance with the salary scale.
3. Rates of Mortality for contributors who are members of the Force.
4. Rates of Mortality for contributors entitled to annuities or annual allowances and Annuity Values based thereon.
5. Rates of Remarriage and Mortality for widows and Annuity Values based thereon.
6. Rates of Retirement with entitlement to an immediate annuity, reduced annuity, or annual allowance for reasons other than disability.
7. Rates of Retirement with entitlement to a lump sum or deferred annuity for reasons other than disability.
8. Rates of Retirement because of disability.
9. Proportions of contributors married at death;
Average ages of widows corresponding to ages of contributors at death; and
Values of children's benefits per \$1.00 "earned" annuity of contributors at death.
10. Capitalized Values of Annuity or Annual Allowance per \$1.00 "earned" annuity of contributors at retirement or death.
11. Age Distribution of members of the Force who became contributors during the period from January 1, 1960, to December 31, 1964.

A P P E N D I X 1

<u>Age</u>	<u>Salary Scale</u>
17	.387
18	.412
19	.437
20	.461
21	.484
22	.506
23	.527
24	.547
25	.568
26	.587
27	.605
28	.622
29	.639
30	.655
31	.670
32	.684
33	.697
34	.709
35	.720
36	.731
37	.741
38	.750
39	.759
40	.768
41	.777
42	.785
43	.794
44	.802
45	.810
46	.819
47	.827
48	.835
49	.843
50	.852
51	.862
52	.873
53	.885
54	.898
55	.912
56	.928
57	.945
58	.963
59	.981
60	1.000

A P P E N D I X 2

Illustration of Increases in Pay
in accordance with the salary scale

<u>Age</u>	<u>Pay</u>		
20	1000		
25	1232	1000	
30	1421	1153	1000
35	1562	1268	1099
40	1666	1352	1173
45	1757	1426	1237
50	1892	1500	1301
55	1978	1606	1392
60	2169	1761	1527

A P P E N D I X 3

Rates of Mortality for contributors who
are members of the Force

<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	.0139
58	.0145
59	.0162

A P P E N D I X 4

Rates of Mortality for contributors entitled
to annuities or annual allowances
and
Annuity Values based thereon

Age at Retirement	Mortality Rate	Value of Annuity of \$1.00 per annum (interest at 4% per annum)
40	.0020	\$18.232
41	.0022	17.979
42	.0025	17.718
43	.0028	17.452
44	.0032	17.179
45	.0036	16.902
46	.0041	16.620
47	.0047	16.334
48	.0053	16.045
49	.0059	15.752
50	.0066	15.456
51	.0073	15.156
52	.0080	14.854
53	.0088	14.550
54	.0097	14.242
55	.0106	13.931
56	.0115	13.618
57	.0125	13.301
58	.0135	12.981
59	.0145	12.658
60	.0157	12.331
61	.0169	11.999
62	.0182	11.665
63	.0197	11.326
64	.0213	10.985
65	.0231	10.642
66	.0250	10.297
67	.0272	9.950
68	.0296	9.603
69	.0322	9.256
70	.0351	8.909
71	.0383	8.563
72	.0418	8.219
73	.0456	7.878
74	.0499	7.540
75	.0545	7.206
76	.0596	6.876
77	.0652	6.551
78	.0714	6.232
79	.0781	5.920
80	.0855	5.614
81	.0936	5.316
82	.1024	5.026
83	.1121	4.744
84	.1227	4.471
85	.1342	4.208
86	.1467	3.954
87	.1603	3.709
88	.1751	3.475
89	.1912	3.251
90	.2085	3.037

A P P E N D I X 5

Rates of Remarriage and Mortality for widows

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

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

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

A P P E N D I X 6

Rates of Retirement with entitlement to an immediate annuity, reduced annuity, or annual allowance, for reasons other than disability

<u>Age at Retirement</u>	<u>Retirement Rate</u>
40	.001
41	.003
42	.005
43	.007
44	.010
45	.013
46	.016
47	.018
48	.020
49	.022
50	.024
51	.026
52	.028
53	.030
54	.060
55	.110
56	.250
57	.300
58	.400
59	.500
60	1.000

A P P E N D I X 7

Rates of Retirement with entitlement to a
lump sum or deferred annuity, for
reasons other than disability

<u>Age at Retirement</u>	<u>Rate of Retirement</u>
17	.0751
18	.0732
19	.0702
20	.0661
21	.0608
22	.0543
23	.0469
24	.0391
25	.0316
26	.0255
27	.0212
28	.0183
29	.0165
30	.0154
31	.0147
32	.0142
33	.0138
34	.0135
35	.0132
36	.0128
37	.0125
38	.0121
39	.0116
40	.0110
41	.0104
42	.0097
43	.0089
44	.0080
45	.0070
46	.0058
47	.0045
48	.0032
49	.0017

A P P E N D I X 8

Rates of Retirement because of disability

<u>Age at Retirement</u>	<u>Retirement Rate</u>
17	.0200
18	.0200
19	.0200
20	.0100
21	.0050
22	.0030
23	.0015
24	.0008
25	.0005
26	.0004
27	.0003
28	.0003
29	.0003
30	.0004
31	.0004
32	.0004
33	.0004
34	.0005
35	.0005
36	.0006
37	.0006
38	.0007
39	.0008
40	.0009
41	.0010
42	.0011
43	.0013
44	.0015
45	.0017
46	.0020
47	.0024
48	.0029
49	.0035
50	.0042
51	.0050
52	.0059
53	.0070
54	.0082
55	.0095
56	.0109
57	.0124
58	.0140
59	.0157

A P P E N D I X 9

Proportions of contributors married at death;
Average ages of widows corresponding to ages
of contributors at death;

and

Values of children's benefits per \$1.00 "earned"
annuity of contributors at death

<u>Age of Contributor at Death</u>	<u>Proportion of Contributors Married at Death</u>		<u>Average Age of Widow</u>		<u>Value of Children's Benefits</u>	
	<u>Members of the Force</u>	<u>Retired Contributors</u>	<u>Members of the Force</u>	<u>Retired Contributors</u>	<u>Members of the Force</u>	<u>Retired Contributors</u>
25	.50	.32	24	24	\$1.62	\$0.58
30	.87	.46	28	29	1.68	.83
35	.93	.58	32	34	1.63	.99
40	.94	.67	37	38	1.42	.98
45	.98	.75	42	43	1.03	.76
50	.98	.80	47	47	.62	.48
55	.98	.83	51	52	.32	.24
60	.98	.83	56	56	.14	.11
65		.80		61		.04
70		.74		65		.01
75		.65		69		
80		.53		73		
85		.39		77		
90		.26		79		

A P P E N D I X 10

Capitalized Values of benefits per \$1.00 "earned"
annuity of contributors at retirement or death
(interest at 4% per annum)

On retirement with entitlement to an immediate annuity

<u>Age at Retirement</u>	<u>Capitalized Value</u>
30	21.273
35	20.461
40	19.494
45	18.362
50	17.088
55	15.683
60	14.137

On death leaving dependents entitled to annual allowances

<u>Age at Death</u>	<u>Capitalized Value</u>	
	<u>Employed Contributors</u>	<u>Retired Contributors</u>
30	7.622	7.488
35	8.743	8.808
40	9.532	9.403
45	9.540	9.350
50	9.056	8.878
55	8.421	8.243
60	7.658	7.546
65		6.809
70		6.052
75		5.312
80		4.636
85		4.096
90		3.788

A P P E N D I X 11

Age Distribution of members of the Force who
became contributors during the period from
January 1, 1960, to December 31, 1964

<u>Age at Becoming Contributor</u>	<u>Number</u>	
	<u>Males</u>	<u>Females</u>
17	3	0
18	12	1
19	609	0
20	994	3
21	575	2
22	256	3
23	165	5
24	100	9
25	88	4
26	54	3
27	46	7
28	33	6
29	45	2
30	31	8
31	33	2
32	22	4
33	16	3
34	19	2
35	20	2
36	19	5
37	17	2
38	20	7
39	18	6
40	15	1
41	11	2
42	10	2
43	17	2
44	12	4
45	5	4
46	9	2
47	6	0
48	8	1
49	8	3
50	7	0
51	4	1
52	3	1
53	3	3
54	5	1
55	1	0
56	3	2
57	0	0
58	0	0
59	1	0
74	1	0
Total	3324	115