

Employees Retirement System of the
State of Rhode Island

REPORT ON AN ACTUARIAL SURVEY AND INVESTIGATION
OF THE OPERATING EXPERIENCE OF THE SYSTEM
AND ANNUAL VALUATION OF ITS ASSETS AND LIABILITIES
AS OF JUNE 30, 1953

In accordance with the provisions of Chapter 18 of the Public Laws of 1936, as amended, governing the operation of the Employees Retirement System of the State of Rhode Island, there is presented herewith a report on an actuarial survey and investigation of the operating experience of the system for the period from July 1, 1946 to June 30, 1953, and a valuation of the assets and liabilities of the system as of June 30, 1953.

The Act as amended in 1947, requires that an actuarial investigation be made in every five-year period beginning with the year 1937. Such a study was due to be made, therefore, as of June 30, 1952. The last such investigation was completed as of June 30, 1946. Because of the delay in this undertaking, the study was brought up to June 30, 1953, in order to provide more recent information on the operations of the system for the use and guidance in the formulation of future administrative policy.

Purpose of Actuarial Investigation

An actuarial survey and investigation is undertaken for the purpose of checking the actuarial functions in use in annual valuations reflecting the factors of mortality, turnover in employment interest and compensation. By means of annual valuations the true financial condition of the system from the actuarial standpoint is established currently by the application of the actuarial functions. Changes in the accrued liabilities for the various benefit obligations covering service prior to the date of valuation are disclosed, and the amount of the unfunded liabilities, constituting a deferred obligation of the State, is determined.

Rates of mortality among active members and retired members are formulated based upon experience data. The operating experience of the system with respect to new entrants into the system and separations from the system due to resignation, dismissal, death or retirement, are analyzed. Trends in rates of compensation are studied for the purpose of verifying the salary scales previously assumed in the determination of liabilities and costs. Trends in interest income are evaluated.

The several factors that are basic in the operation of a retirement system and in an evaluation of its experience are briefly discussed.

Basic factors

The financial condition of a retirement system is established by the valuation of its assets and liabilities. Such a valuation is predicated upon certain basic factors such as conditions for retirement, rates of death, rates of separation from service, rates of disability, rates of retirement and rates of mortality among annuitants. These factors are applied to determine the cost of the retirement allowances and other benefits provided under the plan of operation.

The factor of age has an important bearing upon cost considerations. For example, a young entrant into the service will require larger total contributions than an older entrant because the younger entrant will be able to earn a larger retirement benefit. On the other hand, an employee in service at the date of inception of the system who is of an advanced age may require an immediate outlay of moneys to provide for his retirement, as contrasted with a younger employee in service for whom no contributions may be necessary because of the possibility that this employee may withdraw from service or die while in the service before reaching retirement age.

The age of retirement must also be considered in cost calculations. A low retirement age results in larger costs not only because of longer life expectancy but also because

by early retirement such employees avoid risk of health impairment that usually results from physical exertion at the advanced ages.

The factor of sex is also of importance because of the diverse physiological and economic conditions governing the two different sexes. Thus, marriage is a contributing factor in the rate of withdrawal from service of female employees. That women live longer than men is apparent from a study of mortality rates. Retirement annuities for women, therefore, require a larger outlay of moneys, not only because of their increased longevity but also because, on the average, women retire at earlier ages than men.

All of these factors are basic and interactive in a valuation of a retirement system. For example, a change in the death or withdrawal rates on active members will affect the present value of the retirement benefits unless the change is counterbalanced by the operation of other factors. Costs of retirement and other benefits, therefore, are dependent upon these forces.

Mortality

The rate of mortality experienced among members of a retirement system affects its financial operations in two diverse ways. If the number of deaths is lower than con-

templated by the mortality standard in use, certain gains to the system accrue because a smaller amount of death benefits are payable. On the other hand, if more members survive at the age fixed for retirement than was anticipated, more pensions have to be paid and the result is higher pension cost. The increase in pension cost is greater than the saving in death benefit payments.

With respect to members already retired, if the rates of mortality are less than the expected according to the mortality table used to measure mortality among annuitants, a deficit results which must be met by larger contributions to the system. Conversely, if the rate of death among the annuitants is greater than the expected according to the assumed mortality table, a gain to the system occurs and a surplus is created. This surplus may be used as an additional reserve to meet future contingencies or applied as a credit on future contributions.

The mortality measure used in this survey is the Combined Annuity Mortality Table. This is a standard table which was derived from group insurance experience among clerical employees more than 30 years ago. While this table may be considered adequate for the present, a change to a more conservative standard may be necessary in the future. This can be determined from the experience of the

present system. The basic factors constituting this table of mortality are reproduced in the appendix.

Turnover

Another important factor affecting current pension cost is employee turnover. While one of the objectives of a retirement system is to reduce employee turnover, and this is generally achieved in operations, there is usually a number of employees who leave the service with relatively short periods of employment and forfeit their accrued pension credits by accepting a refund of their contributions. On the other hand, the provision for the vesting of pension credit which has been provided in retirement plans during recent years has made it possible for some employees to leave the service and retain their rights in a future pension experience.

The factor of turnover is basic in the calculation of costs and liabilities of a retirement system. Annual valuations and periodic actuarial investigations are prescribed in order that a continuous check of the factor of turnover may be maintained. Thus, changes in the basic assumptions can be made without too long a delay if it appears that the results of operating experience dictate such changes.

Disability

The operating experience of a retirement system with disability incidents is subject to wide variations depending upon the types of provisions made and the character and degree of administration of disability claims. The policies of the governmental agency have a considerable bearing upon the number of disability claims to be processed by a retirement system and the payments to be made. Members disabled for the particular duties of their previously assigned position are frequently able to perform useful service in another capacity. If they are given other employment, the burden on account of disability claims is reduced. As a general rule, however, this is not done and the members are placed upon disability retirement.

For these and other reasons established disability tables cannot be applied to the operations of a particular system with any degree of dependability as a measure of the number of disability incidents and the amount of claims to be paid. Where such tables are applied they must be carefully reviewed and checked periodically in order that the forecast of costs and obligations that they reflect takes into account all present and prospective factors of both internal and external character influencing the incidence of claims for disability benefits and their continued payment.

Employment

The policies maintained by the employer relative to the employment of personnel must be carefully studied and evaluated as to their effect on the current operations of the system. These policies frequently affect the number of persons entering its service, the age and salary distribution of the new entrants, the rates of separation from service or rates of disability. Any major revisions in employment or fiscal policies of the governmental agency, therefore, may have an immediate or future effect on the course of operations of the retirement system and its financial status.

In an actuarial investigation these possibilities must be considered. If any of these factors are of sufficient scope to warrant adjustments or revisions in the financing provisions of the retirement system or in the qualifying conditions relating to the several benefits comprising the benefit schedule or rates of benefit, the necessary changes must be made. Such changes are imperative if the underlying plan governing the retirement system is to be maintained on a basis that will meet most effectively, in accordance with technical requirements, the peculiar needs of the governmental agency.

Interest

The factor of interest is also basic in the operation of a retirement system. All calculations of costs and liabilities are predicated upon the theory that the reserves of the system will be continuously invested in income-bearing securities at an assumed rate. Mortality tables used in the computation of annuities and reserves reflect an interest factor. Interest income accounts for a substantial part of the revenue of the system. Without this income, contribution rates necessary to meet these costs would be considerably higher.

The effect on cost of the income from invested assets is quite pronounced. Earnings on investments have a direct bearing on the amounts to be contributed to the retirement system. The larger the earnings, the smaller are the contribution requirements from the employees or employer, or both. Earnings on invested reserves result in large savings in cost. The amount of these earnings depends upon two factors, namely: (1) the rate of income on investments, and (2) the length of service rendered by those qualifying for pension benefits. Assuming a fixed return of 3% per year and regular monthly contributions to the system, the interest earnings after a period of 30 years would be equal to 36.1% of the total accumulated sum consisting of

principal and interest, and after 25 years, to 32.7% of such sum.

To illustrate further, an investment made over a period of 25 years at 3% will produce 28% more income than one made at 2½% for the same period. Likewise, an investment made at 3½% for 25 years would produce 25% more income than one made at 3% for the same period of time.

The rate of interest used in calculations for the purposes of this survey is 3% per annum. This rate was adopted by the Board of Trustees at the inception of the system and is to be maintained until the investment earnings under the applicable investment authority are clearly established and defined.

Earnable Compensation

Since the retirement annuities payable by the system are based upon the highest average rate of compensation of a member during any 5 consecutive years of service prior to retirement, it is necessary for the correct calculation of costs and liabilities, that future increases in compensation be taken into account. The accrued liabilities of the system at any given date, representing the present value of future pension expectancies, must reflect increases due to changes in compensation that will occur prior to the time when the annuities become payable.

Generally a salary scale is prepared showing the rates of compensation that will be in effect at various ages until the prescribed minimum ages of retirement, on the assumption that as a member progresses in service towards retirement, his compensation will be continuously increased in accordance with the rates assumed in the salary scale.

In cost determinations, the salary scale is generally applied in terms of an average salary relationship between the present age of the member and the assumed average age of retirement. For example, if the salary scale rate at age 45 for a male member is \$3,747.00 and at age 60, \$4,377.00, it is assumed that the member now 45 years of age will be earning at age 60, $4377/3747$ ths of his rate of salary at age 45.

The relationship between ages may be unaffected in a salary scale by an overall increase in salary for the employees on a fixed percentage basis uniformly applied. However, the total pension cost for the system in terms of a dollar amount would be increased because pension cost generally follows the trend in salaries particularly if the retirement annuities are predicated upon salaries or if employer contributions are made upon the basis of employees' earnings.

But under a fixed percentage rate of increase applicable uniformly to all employees, salary scale relationships between ages may remain at substantial parity and the salary scale may continue to be used effectively even though rates of salary have increased.

STATISTICAL DATA

For the purposes of this actuarial investigation, a large amount of statistical data was compiled on both active members and pensioners. A number of tabulations were made. Some of the tables reflecting the statistics resulting from these tabulations and analyses are presented in the appendix.

The age, service and salary characteristics of the members were classified in the form required for our calculations. Statistics relating to pensioners were prepared to meet the requirements for a study of the operating experience concerning this group of beneficiaries.

Compilations of statistics covered the period of operations from July 1, 1946 to June 30, 1953. Information was gathered on new entrants during the period, separations from service due to the factors of death,

disability, age and service retirement, and resignations and dismissals with refund of contributions. A compilation was also made of the mortality experience among service and disability pensioners. Other pertinent information was obtained for a proper evaluation of the results of operations of the system. With the use of this information, standards were formulated to govern cost estimates and actuarial valuations.

The following is a summary of certain statistical information compiled for this survey:

| | <u>Members</u> | <u>State Employees</u> | <u>Teachers</u> |
|---------------------------|----------------|------------------------|-----------------|
| Number at June 30, 1953 - | | | |
| Male | | 3,942 | 1,195 |
| Female | | 2,596 | 3,486 |
| Aggregate Salaries - | | | |
| Male | | \$12,570,065.00 | \$4,502,027.00 |
| Female | | 6,729,863.00 | 11,817,973.00 |
| Average Annual Salary - | | | |
| Male | | \$3,189.00 | \$3,767.00 |
| Female | | 2,592.00 | 3,390.00 |
| Average Age - | | | |
| Male | | 40.0 | 42.6 |
| Female | | 40.9 | 45.3 |

(Continued)

| <u>Members</u> | <u>State Employees</u> | <u>Teachers</u> |
|---|------------------------|-----------------|
| Number of New Entrants, July 1, 1946 to June 30, 1953 - | 7,233 | 5,561 |
| Number of Separations with Refund, July 1, 1946 to June 30, 1953 (from July 1, 1949 in the case of teacher- members) | 4,079 | 479 |
| Average per year | 583 | 120 |
| Number of Deaths while in service, July 1, 1946 to June 30, 1953 (from July 1, 1949, in the case of teacher- members) | 299 | 59 |
| Average per year | 42.7 | 14.8 |

Annuitants

| | | |
|---|-----|-------------------|
| Number at June 30, 1953 | 213 | 307 |
| Retirements, July 1, 1946 to June 30, 1953 (from July 1, 1949 in the case of teacher- members) | 180 | 342 ^{1/} |
| Terminations among retired members, July 1, 1946 to June 30, 1953 | 89 | 35 |

^{1/} Covering period from July 1, 1949
to June 30, 1953.

MORTALITY AND WITHDRAWAL EXPERIENCE

Life and Service Tables

With the use of the statistics compiled for this study, life and service tables were prepared. A life and service table is required to establish actuarial functions for use in the valuation of the assets and liabilities of the retirement system and in the computation of cost estimates. These functions were applied in the preparation of the actuarial valuation balance sheet as of June 30, 1953, which is presented herewith.

A life and service table records the rates of death, separations from service due to resignations or dismissals with refund, deaths while in service, number of retirements, and the incidence of disability. In the process of arriving at these rates, graphic charts are prepared to which are transcribed the rates of separation caused by the above factors as tabulated from the original statistical data reflecting the experience among the group of participants covered by the survey. With the use of these graphs rates, as established in the original tabulations, were adjusted and graduated for the purpose of eliminating extreme variations from an indicated primary trend. The graduated rates

produced from a reading of these graphs were then applied in the preparation of the life and service tables.

Withdrawals from service

The experience among the members of the system with respect to the termination of membership by the acceptance of refunds was analyzed. In the refinement of these statistics for use in the preparation of actuarial functions, adjustments were made in the data to give effect to factors and conditions governing the present membership. The rates of separation used in this survey and the rates assumed in our previous study are presented for comparison.

Rates of Separation per 1,000 Members

| Age | <u>Rates Derived for This Survey</u> | | | | <u>Rates Applied in Previous Valuations</u> |
|-----|--------------------------------------|---------------|-----------------|---------------|---|
| | <u>State Employees</u> | | <u>Teachers</u> | | <u>Male and Female Combined</u> |
| | <u>Male</u> | <u>Female</u> | <u>Male</u> | <u>Female</u> | |
| 20 | 92.7 | 80.8 | 62.7 | 50.8 | |
| 25 | 91.2 | 77.4 | 61.2 | 47.4 | 67.3 |
| 30 | 86.8 | 74.7 | 56.8 | 41.7 | 65.5 |
| 35 | 79.9 | 62.5 | 49.9 | 33.7 | 61.0 |
| 40 | 68.5 | 52.5 | 39.7 | 25.7 | 54.7 |
| 45 | 53.7 | 42.5 | 24.6 | 16.9 | 44.5 |
| 50 | 38.5 | 32.5 | 11.4 | 0.8 | 28.9 |
| 55 | 16.6 | 19.8 | 0.2 | 0.2 | 13.3 |
| | | | | | 0.5 |

The rates of separation from service as established in this survey are higher for State employees and lower for teachers than the comparable rates used in our previous actuarial valuations. Based upon the experience of the system during the last several years, these revised rates reflect our opinion regarding possible future separations from service with respect to State employees and teachers. These rates represent a more realistic evaluation of the factor of separations in the operation of the retirement system.

Mortality Among Active Members

Our analysis of the mortality incidents among the members in active service reveals that fewer deaths have occurred during recent years than assumed in our previous study or contemplated by recognized life insurance tables. This variation is especially marked for female members.

The following table shows the rates of mortality used in this survey and the comparative rates applied in our previous valuations.

Rates of Death per 1,000 Active Members

| Age | <u>Rates Derived For Survey</u> | | <u>Rates Applied in Previous Valuations</u> | | |
|-----|-------------------------------------|---------------|---|---------------|-------------------------------------|
| | <u>State Employees</u> | | <u>Teachers</u> | | <u>Male and Female Combined</u> |
| | <u>Male</u> | <u>Female</u> | <u>Male</u> | <u>Female</u> | |
| 20 | 2.04 | 1.70 | 1.80 | 1.30 | 3.92 |
| 25 | 2.75 | 2.07 | 2.07 | 1.57 | 4.31 |
| 30 | 3.56 | 2.76 | 2.46 | 1.96 | 4.46 |
| 35 | 4.44 | 3.57 | 3.17 | 2.67 | 4.78 |
| 40 | 5.36 | 4.42 | 3.92 | 3.42 | 5.84 |
| 45 | 6.38 | 5.44 | 4.44 | 3.94 | 7.94 |
| 50 | 7.64 | 6.64 | 4.86 | 4.34 | 11.58 |
| 55 | 10.41 | 8.67 | 6.62 | 5.85 | 17.47 |

The lower rates of mortality among the members reflects the basic underlying trend and may be attributed to the following factors: (1) the general improvement in the health conditions among the State employees and teachers; (2) higher living standards in effect during recent years; (3) increased emphasis on welfare programs for the employees; and (4) the fact that the membership of the system comprises two specific occupational groups of a closely knit character. Standard mortality tables, therefore, are not applicable under such conditions.

Mortality among annuitants

Because of the comparatively small number of annuitants on the roll and the relatively short period of operations of the system especially with respect to teachers, it is difficult to draw any reliable conclusions from their mortality experience in comparison with recognized standards.

Our analysis of the limited experience with respect to the annuitants discloses that the rate of mortality among the State employee retired members seems to approximate closely the rates contemplated by the Combined Annuity Mortality Table. This is a standard which was derived from group insurance experience among clerical employees some 30 years ago. The rates of mortality shown by this table are reproduced below for certain ages:

| <u>Age</u> | | <u>Rates of Mortality Per 1,000</u> |
|-------------|---------------|---|
| <u>Male</u> | <u>Female</u> | |
| 60 | 64 | 23.02 |
| 65 | 69 | 34.25 |
| 70 | 74 | 50.81 |
| 75 | 79 | 75.06 |
| 80 | 84 | 110.18 |
| 85 | 89 | 160.27 |

The paucity of data on teacher retirements due to the short period in which these persons have been members of the system does not allow for the preparation of rates of mortality which could be accepted as reflecting the possible long term trend with respect to this factor. However, exposure tables have been prepared for an analysis of rates, and these tables have disclosed that the rates among female retirants are fairly close to the rates shown by the 1937 Standard Annuity Mortality Table and that the rates among male retirants are slightly above the level of rates disclosed by this table. The rates of mortality for certain ages according to this mortality table are shown below.

| <u>Age</u> | | <u>Rates of Mortality per 1,000</u> |
|-------------|---------------|---|
| <u>Male</u> | <u>Female</u> | |
| 60 | 65 | 19.75 |
| 65 | 70 | 28.75 |
| 70 | 75 | 41.76 |
| 75 | 80 | 60.46 |
| 80 | 85 | 87.16 |
| 85 | 90 | 124.84 |

The lower rates of mortality among the teacher re-tired members and the fewer separations from service prior to retirement due to resignation or death mean higher pension cost for teacher-members and account for the larger contribution rates on the part of the State and the cities and towns for this group of members.

Current service cost

The current service cost represents the accruing pension cost for retirement annuities, disability annuities and death benefits, on account of service being rendered by the members. This is frequently referred to as "normal cost" and represents the current premium for the benefits provided by the system.

Our computations disclose that the accruing current service cost on account of State employees and teachers is as follows:

| | <u>State Employees</u> | <u>Teachers</u> |
|--|----------------------------|-----------------------|
| Male | \$1,759,288.00 | \$ 665,068.00 |
| Female | <u>903,612.00</u> | <u>1,953,260.00</u> |
| Total | \$2,662,900.00 | \$2,618,328.00 |
| Less, Contributions by members at rate of 5% of salary | <u>964,996.00</u> | <u>816,000.00</u> |
| Obligation of the employer | <u>\$1,697,904.00</u> | <u>\$1,802,328.00</u> |
| As percentage of payroll | <u>8.8%</u> | <u>11.04%</u> |

The foregoing rates of contribution would be required from the State of Rhode Island on account of the State employees, and from the State and the cities and towns on account of teachers, each sharing equally, to meet the cost of the system on an actuarially funded basis. While the system operates according to a modified form of funding which meets the requirements of the State satisfactorily, the above data is given for information purposes since this is the only true measure of expressing the actual pension obligation.

Accrued Liabilities

The accrued liabilities consist of the reserve requirements on the annuities and benefits being paid by the system and the proportionate pension credits earned by the members for their service prior to the date of valuation, namely, June 30, 1953.

1. The present value of annuities and benefits entered upon and in force is as follows:

| | <u>Number</u> | <u>Annual Payments</u> | <u>Reserve Liability</u> |
|--|---------------|----------------------------|------------------------------|
| Retired State Employees And Beneficiaries | 213 | \$232,267.00 | \$1,491,386.00 |
| Retired Teacher Members and Beneficiaries | <u>307</u> | <u>597,248.00</u> | <u>4,709,897.00</u> |
| Totals | 520 | \$829,515.00 | \$6,201,283.00 |

2. The liabilities for pension credits earned during service rendered prior to July 1, 1953, including provision for death and disability benefits, are as follows:

| | <u>State Employees</u> | <u>Teachers</u> |
|--------|----------------------------|----------------------|
| Male | \$6,411,658.00 | \$5,044,283.00 |
| Female | <u>4,597,201.00</u> | <u>14,221,362.00</u> |
| Totals | \$11,008,859.00 | \$19,265,645.00 |

Net Present Assets

Net assets of the system at June 30, 1953, amounted to \$14,101,038.61. This consists of the following items:

Members' Accumulated Contribution Credits -

| | |
|-----------------|-----------------|
| State Employees | \$ 4,890,204.42 |
| Teachers | 2,602,478.47 |

Contingency Reserve Account -

| | |
|-----------------|---------------------|
| State Employees | 4,510,345.34 |
| Teachers | <u>2,068,010.38</u> |

| | |
|-------|------------------------|
| Total | <u>\$14,101,038.61</u> |
|-------|------------------------|

Of the total amount of member contributions at June 30, 1953, only a certain proportion will be available to meet the cost of retirement annuities at retirement, representing that part of the present group of members who will attain vested rights and will preserve those rights, or who will be in service at the time of retirement. The remainder of these contributions will have been paid out to members terminating their membership before retirement by resignation or death. Hence, the net present assets available, on a discounted basis, to meet the accrued liabilities of the system at June 30, 1953, are as follows:

| | |
|------------|-----------------|
| Net Assets | \$14,101,038.61 |
|------------|-----------------|

Less, releases of member contributions prior to retirement age -

| | | |
|-----------------|-------------------|---------------------|
| State Employees | \$3,384,022.00 | |
| Teachers | <u>968,122.00</u> | <u>4,352,144.00</u> |

Balance, available to meet accrued liabilities

| | |
|--|-----------------------|
| | <u>\$9,748,894.61</u> |
|--|-----------------------|

Unfunded Accrued Liability

The amount of the unfunded accrued liability at June 30, 1953, was arrived at as follows:

Accrued Liabilities at June 30, 1953 -

| | |
|------------------------------------|-----------------|
| 1. On account of pensions in force | \$ 6,201,283.00 |
| 2. On account of active members | 30,274,504.00 |
| | <hr/> |
| Total | \$36,475,787.00 |
| | <hr/> |

Available assets - \$9,748,894.61

| | |
|--|-----------------|
| 1. To be applied to pensions in force | \$ 6,201,283.00 |
| 2. Remainder available for the liabilities on account of members in service | 3,547,611.61 |
| | <hr/> |
| Total | \$9,748,894.61 |
| | <hr/> |

Difference, Unfunded Accrued Liability \$26,726,892.39

To amortize the unfunded liability over a period of 40 years, assuming interest at the rate of 2 $\frac{1}{2}$ % per annum, will require an annual payment of \$1,064,730.00. This is equal to 3.0% of payroll.

Prospective Liabilities

These liabilities relate to service to be rendered subsequent to July 1, 1953, during the future working lifetime of the present members. The amounts of liability as computed are as follows:

State Employees -

| | | |
|--------|---------------------|----------------|
| Male | \$4,584,335.00 | |
| Female | <u>3,627,191.00</u> | |
| | | \$8,211,526.00 |

Teachers -

| | | |
|--------|---------------------|-----------------|
| Male | \$2,906,046.00 | |
| Female | <u>8,807,462.00</u> | |
| | | \$11,713,508.00 |

These liabilities are to be discharged by future contributions by the members and by the employer under the method of financing prescribed by the Act governing the operation of the system.

VALUATION BALANCE SHEET

The Valuation Balance Sheet reflecting the results of these determinations has been prepared as of June 30, 1953, showing the assets and liabilities of the system from an actuarial standpoint. In the preparation of such statement, a technique has been used which is similar in many respects

to that followed by accountants in the preparation of a financial balance sheet. The form of statement prepared by the actuary, however, differs from the accountant's balance sheet in that it shows, in addition to the results of current financial operations, the actuary's evaluation of the accrued and prospective liabilities, and the present and prospective assets, determined in accordance with actuarial requirements.

The Valuation Balance Sheet presented in the following pages exhibits the results of this determination. This statement includes: (1) the present value of the annuities and benefits entered upon and in force at the date of valuation; (2) the accrued liabilities for the proportionate pension credits earned by the State employees and teachers for the periods of service rendered to the date of valuation; (3) the present value of annuities and benefits to be earned during the remaining working life of the State employees and teacher-members; (4) the present and prospective assets; and (5) the accrued unfunded liability which represents a deferred obligation of the State of Rhode Island and the cities and towns.

A sound financial condition exists from an actuarial

standpoint when assets have been accumulated by the system which are equal to the difference between (1) the total of all liabilities, both accrued and prospective, and (2) the present value of the obligations for future service, i.e. service subsequent to June 30, 1953, which are described as "Deferred Assets".

VALUATION BALANCE SHEET

JUNE 30, 1953

VALUATION BALANCE SHEET - JUNE 30, 1953

A S S E T S

PRESENT ASSETS

Net present assets..... \$14,101,038.61

Less, releases of
member contributions
on account of refunds
and death benefits..... 4,352,144.00

\$ 9,748,894.61

DEFERRED ASSETS

Obligations of the
participants and the
employer for retirement
and disability annuities
covering service of members
for the remainder of their
active working lifetime
subsequent to June 30, 1953..... \$19,925,034.00

DEFERRED OBLIGATION OF
THE STATE OF RHODE ISLAND

Accrued Unfunded Liability -
Present value of annuities
and benefits in force, and
accrued liabilities for
retirement annuities and
disability annuities on
account of service prior to
July 1, 1953..... \$26,726,892.39

Total Assets

\$56,400,821.00

VALUATION BALANCE SHEET - JUNE 30, 1953

LIABILITIES

ACCRUED LIABILITIES

Reserve requirements
for annuities and
benefits in force -

| | | |
|-----------------|---------------------|-----------------|
| State Employees | \$1,491,386.00 | |
| Teachers | <u>4,709,897.00</u> | |
| | | \$ 6,201,283.00 |

Present Value of accrued
requirements for retire-
ment annuities, disability
annuities and death benefits,
at June 30, 1953 -

| | | |
|-------------------|---------------------|---------------|
| State Employees - | | |
| Male | \$6,411,658.00 | |
| Female | <u>4,597,201.00</u> | |
| | | 11,008,859.00 |

| | | |
|------------|----------------------|---------------|
| Teachers - | | |
| Male | \$ 5,044,283.00 | |
| Female | <u>14,221,362.00</u> | |
| | | 19,265,645.00 |

PROSPECTIVE LIABILITIES

Present Value of retirement
annuities and disability
annuities on account of
service to be rendered
after June 30, 1953 -

| | | |
|-----------------|----------------------|------------------------|
| State Employees | \$ 8,211,526.00 | |
| Teachers | <u>11,713,508.00</u> | |
| | | 19,925,034.00 |
| Total | | <u>\$56,400,821.00</u> |

CONCLUSION

Since June 30, 1946, when the last actuarial investigation was completed, a number of changes have occurred affecting the substantive provisions of the retirement Act relating to both the benefit and contribution provisions. These changes brought about increases in obligations. They are fully expressed in the foregoing Valuation Balance Sheet.

A study of the turnover and mortality experience has disclosed certain marked variations from previous assumptions. New life and service tables were prepared from which certain actuarial functions were derived. These functions were used in the valuation of reserves and liabilities. Thus a more realistic appraisal of the financial condition of the system was possible. Separate rates were established for State employees and teachermembers, with variations for the factor of sex.

It is recommended that the Combined Annuity Mortality Table be continued as the standard of mortality measurement for State employees in the calculation of annuities, but that the 1937 Standard Annuity Mortality Table be adopted as the measure of mortality among retired teacher members. The rate of interest assumption for the various purposes of the system, for all members, should be fixed at $2\frac{1}{2}\%$ per annum.

It is further recommended that the rates of separation from service prior to retirement, shown in the tables in the appendix, be adopted by the Retirement Board for use in future valuations of reserves and liabilities.

The system is developing satisfactorily under the plan of benefit and contribution provisions adopted in 1947, which established a more equitable benefit schedule and more adequate benefit payments. The administrative policies and procedures in effect are sound and constructive, and reflect an intelligent and conscientious approach to the various problems arising in administration. These policies give promise of the continued effective operation of the system in accordance with the established law in fulfillment of its stated objectives.

A. A. Weinberg

Actuary.

A P P E N D I X A

Summary of Benefit and
Contribution Provisions