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# FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES

## FISCAL YEAR 1962-63



DOMINION BUREAU OF STATISTICS
Business Finance Division
Planning and Development Section

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# PREFACE

This publication is the third in the series *Federal Government Expenditures on Scientific Activities*. It presents in tabular form estimates of various aspects of the scientific activities undertaken by the Federal Government in 1962-63, and preliminary estimates of the programmes for 1963-64 and 1964-65. The two previous reports covered the years 1958-59, 1959-60 (Catalogue No. 13-515) and 1960-61, 1961-62 (Catalogue No. 13-401).

The present publication covers current and capital expenditures on the different scientific activities, the organizations performing the activities, the scientific fields covered, the types of research-development involved, the areas of investigation and the number of personnel engaged in research and development.

The concepts and definitions were prepared with the aid of officials of the National Research Council, and they are in line with the Proposed Standard Practice for Surveys of Research and Development published by the Organization for Economic Co-operation and Development. The data cover programmes in the physical and life sciences, but do not include those in the social sciences. Scientific activities comprise research and development, grants-in-aid of research, collection of scientific data and the compilation and distribution of scientific information. Scholarships and fellowships for students working in these areas are included in expenditures on scientific activities.

The assistance of the departments and agencies of the Federal Government who have cooperated by submitting reports is gratefully acknowledged.

WALTER E. DUFFETT,
*Dominion Statistician.*

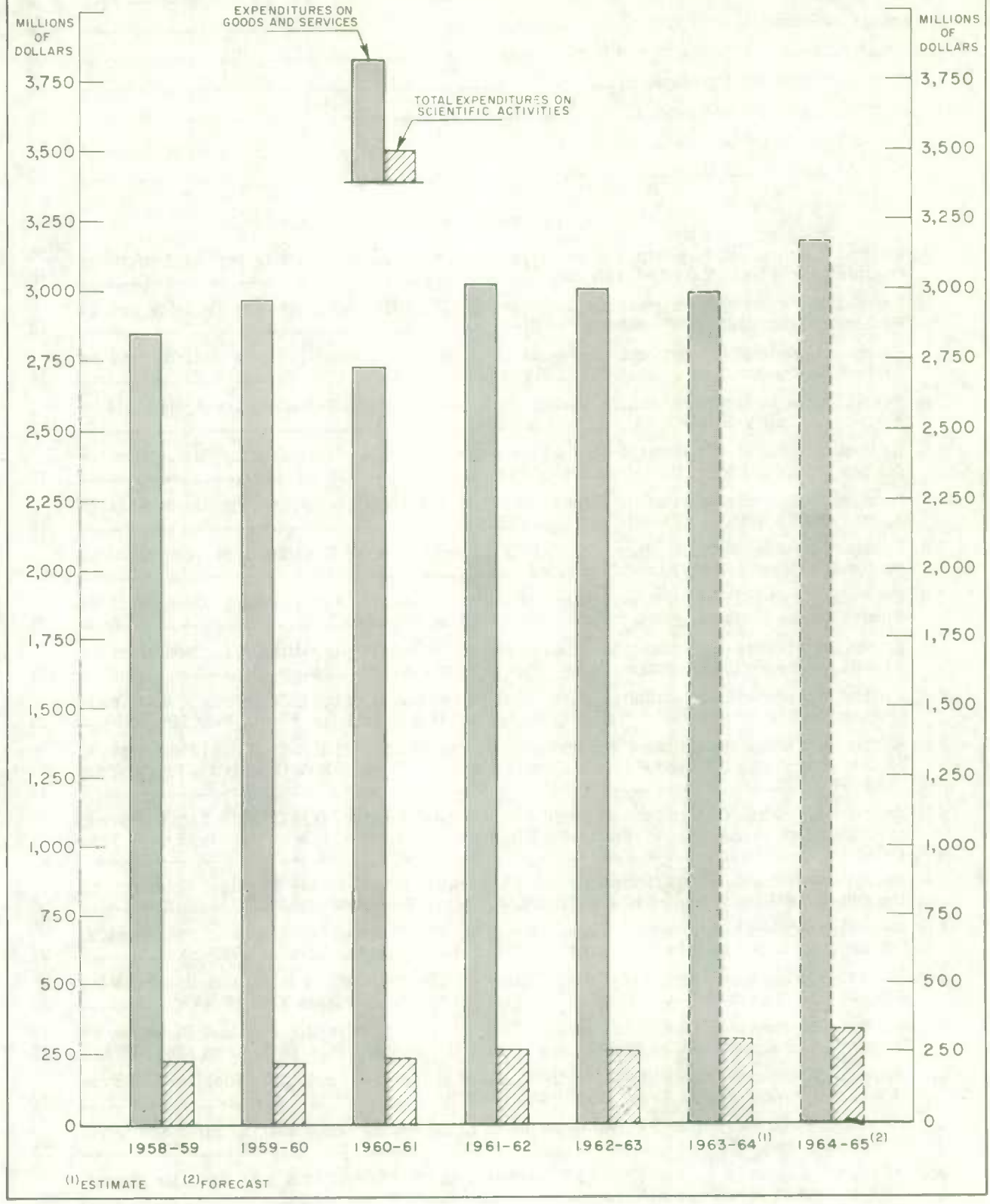
November 1964.

# TABLE OF CONTENTS



## STATISTICAL TABLES

# COMPARISON OF TOTAL FEDERAL GOVERNMENT EXPENDITURES ON GOODS AND SERVICES WITH EXPENDITURES ON SCIENTIFIC ACTIVITIES



# INTRODUCTION

The Federal Government has been involved in scientific activities since the formation of the Geological Survey shortly after Confederation. However, it was not until the National Research Council was established in 1916, that there was tangible government-wide recognition of the need to encourage scientific research and related activities.

Expenditures on scientific activities remained relatively small until the Second World War. During the war and particularly since 1945 there has been an accelerated growth in the scientific activities of the Federal Government; estimated expenditures have increased from $35 million in 1945 to over $333 million in 1964-65.[1]

[1] For a description of the structural organization of scientific activities within the Federal Government, as well as special estimates prepared by the Royal Commission on Government Organization for 1951-52 to 1961-62, see the latter's Volume IV, Report 23: Scientific Research and Development, Queen's Printer, Ottawa, Canada.

More and more government departments and agencies are involved in activities of a scientific nature. Some, such as the National Research Council, are mainly research organizations, whereas others, such as Veterans Affairs, scientific programmes are a relatively minor part of their operations.

**Total Expenditures**

In 1964-65, expenditures on scientific activities are expected to reach $333.6 million, or about 10% of the expenditures on goods and services of the Federal Government. The table below shows that in recent years expenditures on scientific activities have been increasing at a greater rate than expenditures on goods and services.

As mentioned in the Introduction, government financial support of scientific activities has shown a great increase since the Second World War. However, this trend has not been constant, but has tended to fluctuate, due largely to the initiation and cessation of some large costly programmes.

**Comparison of Total Federal Government Expenditures on Goods and Services with Expenditures on Scientific Activities**

| | 1958-59 | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 Estimate | 1964-65 Forecast |
|---|---|---|---|---|---|---|---|
| | millions of dollars | | | | | | |
| Expenditures on goods and services[1] | 2,849 | 2,970 | 2,728 | 3,023 | 3,005 | 2,993 | 3,175 |
| Total expenditures on scientific activities | 225 | 214 | 231 | 261 | 256 | 297 | 334 |
| Percentage of expenditures in scientific activities to total expenditures on goods and services | 7.9 | 7.2 | 8.5 | 8.6 | 8.5 | 9.9 | 10.5 |

[1] Sources of figures: Budget Speeches of March 16, 1964, p. 31; of April 10, 1963, p. 62; of April 9, 1959, p. 75.

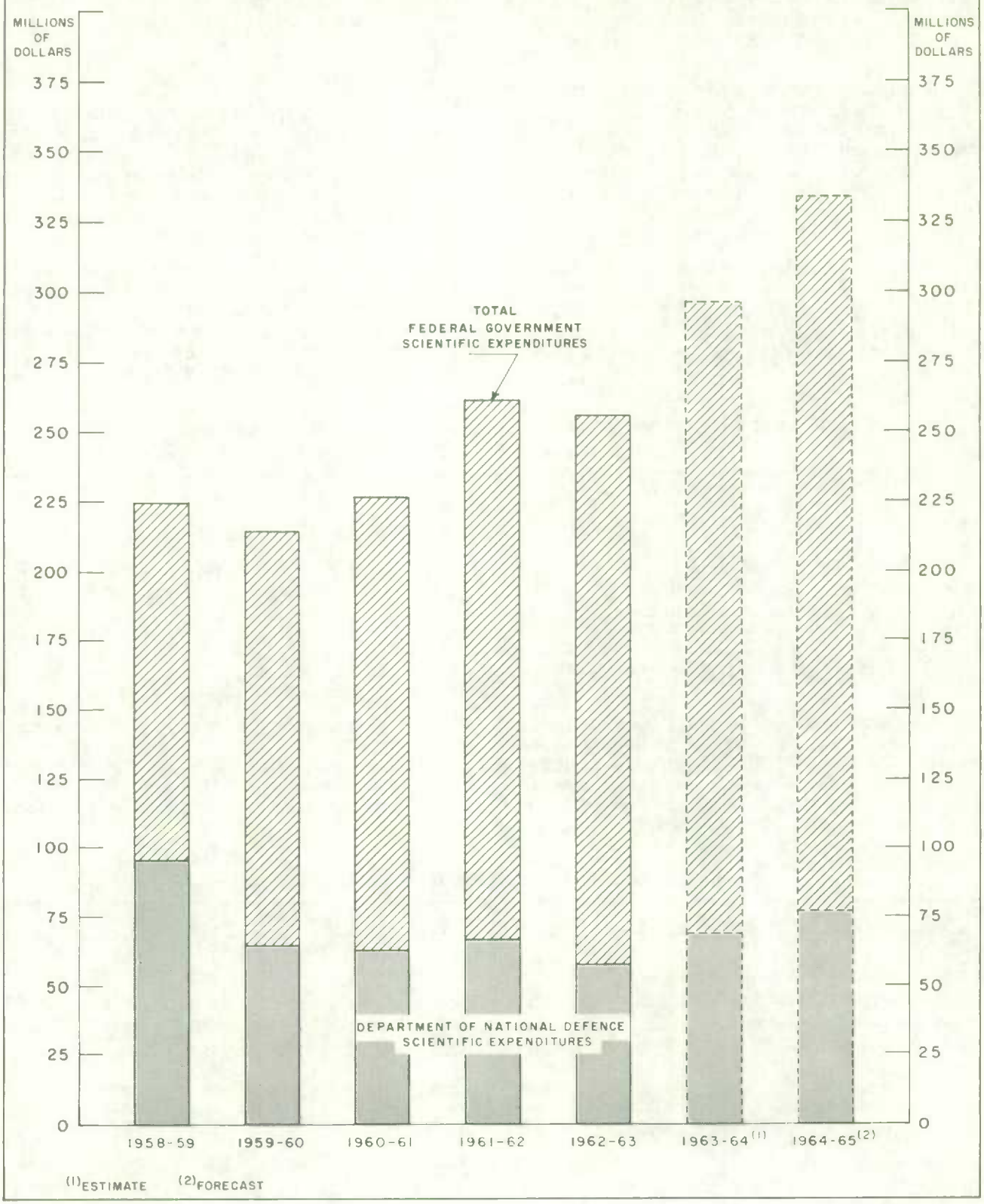
Five organizations continue to account for the bulk of all scientific work—in 1964-65 they accounted for 80.3% of all scientific expenditures, although in 1958-59 their expenditures were relatively more important (91.4%). At present, the National Research Council—Medical Research Council (NRC-MRC) is the largest civilian spending group, with 18.8% of total disbursements. The costs of the scientific activities of Atomic Energy Control Board—Atomic Energy of Canada Limited (AECB-AECL) are next in size, amounting to 16.4% of total scientific cost.

**Organizations Disbursing Funds for Scientific Activities**

| Organizations | 1958-59 | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 | 1964-65 |
|---|---|---|---|---|---|---|---|
| | millions of dollars | | | | | | |
| Agriculture | 27.5 | 31.4 | 28.8 | 32.1 | 29.6 | 30.6 | 33.7 |
| Atomic Energy (AECB and AECL) | 27.9 | 32.8 | 39.9 | 40.7 | 39.4 | 46.5 | 54.7 |
| Mines and Technical Surveys | 27.1 | 27.7 | 29.5 | 39.9 | 39.4 | 38.9 | 40.9 |
| National Research Council[1] | 27.2 | 32.8 | 36.6 | 40.1 | 44.7 | 52.5 | 62.6 |
| National Defence: | | | | | | | |
| Armed Forces | 66.2 | 34.0 | 31.0 | 32.1 | 26.1 | 30.2 | 36.8 |
| Defence Research Board | 29.3 | 30.6 | 31.9 | 34.7 | 31.8 | 38.5 | 39.3 |
| All other departments and agencies | 19.3[2] | 25.1[2] | 33.3[2] | 41.7[2] | 44.7 | 59.4 | 65.6 |
| **Totals** | **224.5** | **214.4** | **231.0** | **261.3** | **255.7** | **296.6** | **333.6** |

[1] Including the Medical Research Council.
[2] Including estimates for the Patent and Copyright office of the Secretary of State, which was first surveyed in 1962-63.

## COMPARISON OF SCIENTIFIC EXPENDITURES OF THE DEPARTMENT OF NATIONAL DEFENCE WITH TOTAL FEDERAL GOVERNMENT SCIENTIFIC EXPENDITURES



The chart below illustrates the relative decline in funds applied to the scientific work of the Department of National Defence. Thus in 1958-59 the expenditures of National Defence were 42.5% of total scientific expenditures, whereas by 1964-65 this percentage is expected to fall to 22.8%. The initial reduction (1958-59 to 1959-60) was due largely to the cessation of a program of aircraft development.

**Classes of Scientific Activities**

The largest scientific activity remains the conduct of Research and Development, which is expected to absorb about 63% of all funds for science in 1964-65. Conduct of R & D, as used in DBS surveys and reports, includes the performance, administration and planning of research and development. Capital expenditures in support of scientific activities are the next largest scientific cost. Capital items used for scientific activities range from survey ships to libraries, but would not include space satellites and similar "expendable research equipment"[2] which are included in Conduct of R & D. Expenditures on grants-in-aid of research and on scholarship and fellowship programmes have approximately quadrupled since 1958-59. Grants-in-aid of research, which formerly consisted largely of grants for research in universities, now include sizeable grants for industrial research. The use of grants to encourage industrial research began in 1962-63, when both the NRC and the Defence Research Board (DRB) were authorized to make grants to industry. Such payments are estimated to total about $6.9 million in 1964-65.

[2] For further notes on the concept of "expendable research equipment" see Notes on the Survey, p. 13

**Expenditures by Classes of Scientific Activities**

| Scientific activity | 1958-59 | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 | 1964-65 |
|---|---|---|---|---|---|---|---|
| | millions of dollars | | | | | | |
| Conduct of R & D | 163.3[1] | 142.8[1] | 158.3 | 177.4 | 168.5 | 193.9 | 210.0 |
| Grants-in-aid of research | 8.5[2] | 10.5[2] | 13.6 | 15.3 | 20.5 | 25.7 | 32.9 |
| Scientific data collection | 18.1 | 20.6 | 15.7 | 21.1 | 25.0 | 26.7 | 27.9 |
| Scientific information | 6.0[3] | 7.0[3] | 7.2[3] | 8.0[3] | 9.7 | 10.1 | 11.2 |
| Scholarship and fellowship programmes | 1.3 | 2.0 | 2.0 | 2.5 | 3.1 | 3.9 | 5.7 |
| Capital expenditures | 27.3[1] | 31.5[1] | 34.2 | 37.0 | 28.9 | 36.3 | 45.9 |
| **Totals** | **224.5** | **214.4** | **231.0** | **261.3** | **255.7** | **296.6** | **333.6** |

[1] Current and capital expenditures on R & D have been adjusted to conform with procedures followed in subsequent years.
[2] Estimate.
[3] Including extimates for the Patent and Copyright Office.

**Performers of Scientific Activities**

The Federal Government applies approximately three-quarters of its scientific funds to its own intra-mural programmes. Of course, this proportion is not constant; for example, the expenditures on R & D of the Department of Industry-Department of Defence Production ($19.5 million in 1964-65) are for industrial research and development contracts, whereas the Department of Agriculture uses almost all its funds intra-murally.

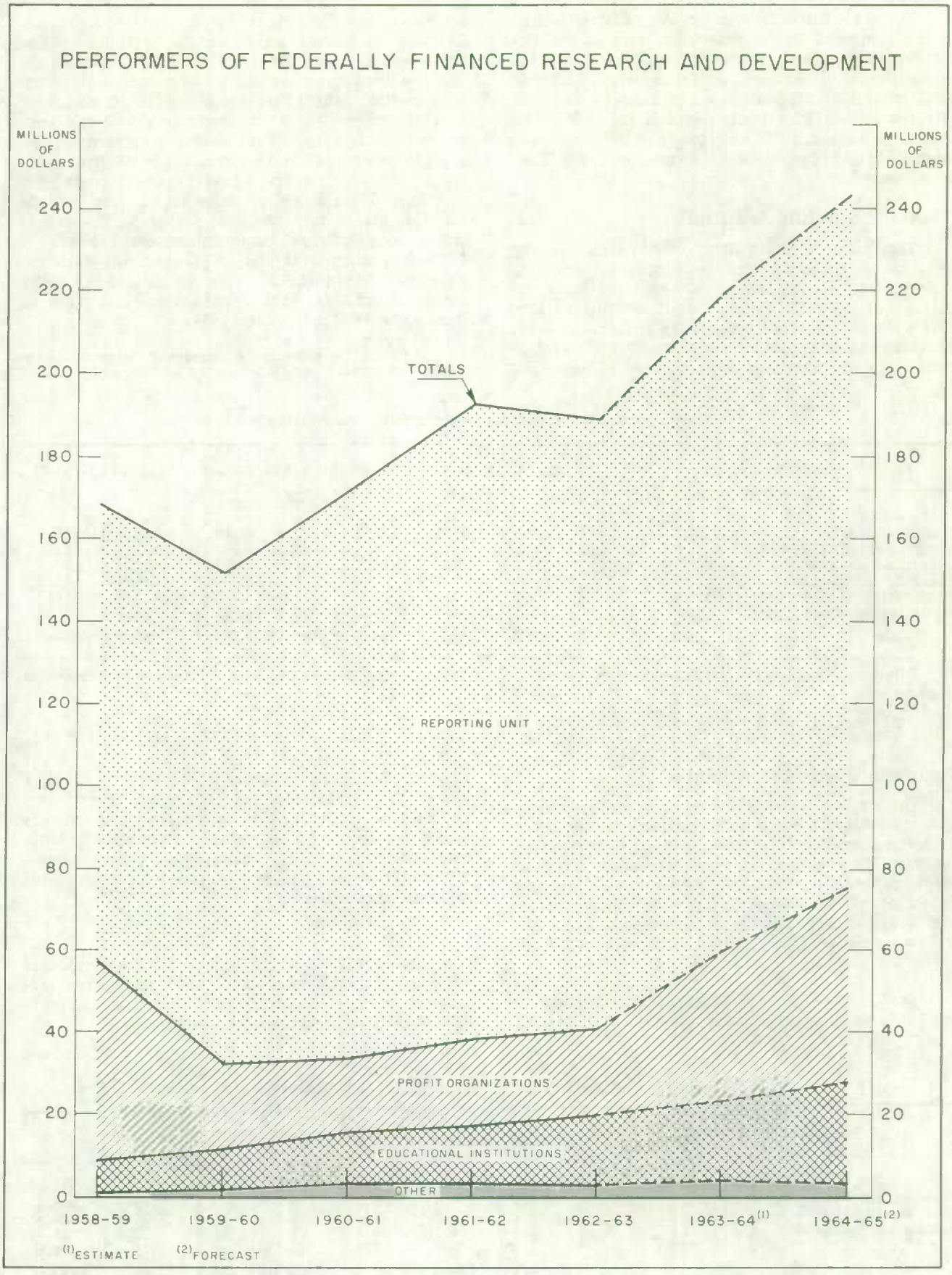
The proportion of government funds used to support industrial scientific programs has varied considerably, from a high of 21.7% in 1958-59 to a low of 7.6% in 1960-61. In 1964-65 it is expected to be about 15%. It should be realized that industry would supply most of the material for all scientific activities, but is considered a performing organization only when engaged in a government-supported scientific project.

Since the reporting unit must generally conduct most of its scientific data and information programmes itself, discussion of the performers of R & D alone is perhaps more meaningful.

**Performers of Federal Financed Scientific Activities**

| Performing organization | 1958-59 | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 | 1964-65 |
|---|---|---|---|---|---|---|---|
| | millions of dollars | | | | | | |
| Reporting unit[1] | 164.3 | 178.7 | 193.7 | 218.6 | 210.7 | 230.8 | 249.1 |
| Profit organizations | 48.7 | 21.2 | 17.6 | 21.0 | 21.8 | 38.6 | 50.8 |
| Educational institutions | 9.4 | 12.1 | 14.4 | 16.5 | 19.7 | 22.6 | 29.7 |
| Others[2] | 2.1 | 2.4 | 5.3 | 5.2 | 3.5 | 4.6 | 4.0 |
| **Totals** | **224.5** | **214.4** | **231.0** | **261.3** | **255.7** | **296.6** | **333.6** |

[1] The reporting unit is the government department or agency which completes the survey questionnaire.
[2] Includes organizations such as hospitals, health foundations and provincial research organizations.


PERFORMERS OF FEDERALLY FINANCED RESEARCH AND DEVELOPMENT
MILLIONS OF DOLLARS
MILLIONS OF DOLLARS
240
220
200
180
160
140
120
100
80
60
40
20
0
TOTALS
REPORTING UNIT
PROFIT ORGANIZATIONS
EDUCATIONAL INSTITUTIONS
OTHER
1958-59
1959-60
1960-61
1961-62
1962-63
1963-64(1)
1964-65(2)
(1)ESTIMATE
(2)FORECAST

### Analysis of Conduct of Research and Development

The table below shows an apparent trend towards greater government financial support of R & D performed by others. For example, in 1958-59, 4.6% of government financed R & D was performed by Canadian educational institutions, but by 1964-65 research by this group is estimated to be about 10% of the total. Approximately three-quarters of this is financed by the NRC and the Medical Research Council.

**Performers of Federally Financed Research and Development**

| Performing organization | 1958-59 | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 | 1964-65 |
|---|---|---|---|---|---|---|---|
| | millions of dollars | | | | | | |
| Reporting unit | 111.1 | 119.5 | 138.6 | 154.5 | 148.9 | 159.8 | 167.2 |
| Profit organization | 48.3 | 21.1 | 17.6 | 20.8 | 20.2 | 36.8 | 48.1 |
| Educational organization | 7.8 | 10.0 | 12.5 | 14.1 | 16.9 | 19.0 | 24.4 |
| Other | 1.0 | 1.3 | 3.2 | 3.4 | 3.0 | 4.0 | 3.4 |
| **Totals** | **168.2** | **151.9** | **171.9** | **192.8** | **189.0** | **219.6** | **243.1** |

The financial support of industrial research and development (R & D performed by profit organizations) has varied markedly since 1958-59 when it was 28.7% of the total federally-financed R & D program compared to a low of 10.2% in 1960-61. Since 1962-63, financial support of profit organizations has increased from 10.7% of total federal support to an expected $48.1 million or 19.8%.

An important feature of this increased financial support of industrial R & D is the change of sponsors. In 1958-59 virtually all of the funds for industrial R & D came from the Department of National Defence, but by 1964-65, this department will account for only about 39% of total government allocations. In the same year, the Department of Industry's (formerly the Department of Defence Production) contracts under the defence programme will amount to $19.5 million, or almost 41%.

About 14% of the total funds applied to industrial R & D will come from research grants administered by the NRC and the Defence Research Board.

### Fields of Research and Development

Expenditures on research and development in absolute terms, in the three main scientific fields have continued to increase since 1958. However, over the last seven years there would seem to be three different trends in relative terms. Thus expenditures on R & D in engineering have increased markedly relative to the total of expenditures; other physical sciences experienced a slight decrease while a more pronounced reduction, again in relative terms was felt in the life sciences.

**Federal Government Expenditures on Current Research and Development by Scientific Fields (Excluding the Department of National Defence and the Defence Research Board[1])**

| Fiscal year | Physical sciences | | | | Life sciences | | Total |
|---|---|---|---|---|---|---|---|
| | Engineering | | Other | | | | |
| | millions of dollars | per cent | millions of dollars | per cent | millions of dollars | per cent | millions of dollars |
| 1958-59 | 20.4 | 25.2 | 25.1 | 31.1 | 35.3 | 43.7 | 80.8 |
| 1959-60 | 27.4 | 28.6 | 28.0 | 29.2 | 40.4 | 42.2 | 95.8 |
| 1960-61 | 33.2 | 29.7 | 30.7 | 27.5 | 47.8 | 42.8 | 111.7 |
| 1961-62 | 40.4 | 31.3 | 36.5 | 28.3 | 52.0 | 40.3 | 128.9 |
| 1962-63 | 45.7 | 33.4 | 37.2 | 27.2 | 54.1 | 39.5 | 137.0 |
| 1963-64 | 60.3 | 37.8 | 41.7 | 26.2 | 57.4 | 36.0 | 159.4 |
| 1964-65 | 65.6 | 37.5 | 48.0 | 27.4 | 61.3 | 35.0 | 174.9 |

[1] Expenditures of these two organizations are largely in Engineering and Other Physical Sciences (mainly physics). They have not been included here because of lack of data for earlier years.

### Types of Research and Development

Information on the types of research and development[3] was requested for the first time in this latest survey. The proportion of the three types of research and development varies not only with the scientific field but also with the orientation of the performer. Thus the research of the Department of Agriculture is mostly applied, basic research costs account for over half of the NRC's expenditures on R & D, and the Department of Industry supports only development projects.

In the life sciences, about 70% of R & D expenditures are used for applied research, slightly more than 25% for basic research and the remainder for development. Expenditures on applied research are relatively much heavier in the agricultural than in either the medical or biological sciences. Over three-quarters of the basic research in the life sciences is sponsored by three organizations: the Department of Agriculture, the NRC and the Medical Research Council.

In the physical sciences, development is a considerably greater proportion of R & D costs, approximately one-third. This is due mainly to engineering development, which accounts for over one-half of all R & D expenditures in engineering. The Department of Industry and the Armed Forces are responsible for most of these development programmes.

A little less than half of the R & D expenditures in the physical sciences are believed to be for applied research. Over 75% of these applied research disbursements are financed by three organizations: the Defence Research Board, Atomic Energy of Canada Ltd. and the NRC. The greatest expenditures for applied research are made in engineering and physics.

The expenditures on basic research are slightly less than one-fifth of the total expenditures on R & D in the physical sciences. The National Research Council performs or pays for over half of this basic research, whilst the Atomic Energy agencies account for about a quarter. Basic research in physics, chemistry and the earth sciences is quantitatively the most important, being responsible for about three-quarters of expenditures for basic research.

[3] *Basic Research* is work undertaken primarily for the advancement of scientific knowledge, without a specific practical aim in view.
*Applied Research* is work undertaken primarily for the advancement of scientific knowledge, but with a specific practical aim in view.
*Development* is the use of the results of fundamental and applied research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones.

**Types of Research and Development**

| Scientific field | 1962-63 | | | 1963-64 | | | 1964-65 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Basic research | Applied research | Development | Basic research | Applied research | Development | Basic research | Applied research | Development |
| | millions of dollars | | | | | | | | |
| Physical sciences: | | | | | | | | | |
| Engineering | 2.3 | 34.7 | 36.8 | 2.9 | 39.7 | 50.3 | 3.4 | 41.9 | 60.0 |
| Other | 23.1 | 31.9 | 3.9 | 26.3 | 36.2 | 4.2 | 30.7 | 38.5 | 4.6 |
| **Sub-totals** | **25.4** | **66.6** | **40.7** | **29.2** | **75.9** | **54.5** | **34.1** | **80.4** | **64.6** |
| Life sciences | 14.4 | 40.2 | 1.6 | 15.6 | 42.5 | 1.8 | 18.2 | 43.9 | 1.9 |
| **Totals** | **39.8** | **106.8** | **42.3** | **44.8** | **118.4** | **56.3** | **52.3** | **124.3** | **66.5** |

### Areas of Investigation

About one-third of government sponsored R & D is directed toward military uses. Most of the funds for military R & D are administered by the Department of National Defence and the Department of Industry. At present approximately 45% of the work is performed by Canadian industry.

R & D in the area of nuclear science accounts for roughly one-sixth of total expenditures. Atomic Energy of Canada Ltd. and the Atomic Energy Control Board administer most of the funds. The bulk of the work is performed by government research units, although industry performs about 12% and universities about 4%.

Investigation in the field of space, although still relatively minor compared to the total government effort, is increasing quite rapidly. The Defence Research Board and the Telecommunications and Electronics Branch of the Department of Transport are the two organizations with the largest programmes in this area.

**General Areas of Investigation**

| Area | Current R & D expenditures | | |
|---|---|---|---|
| | 1962-63 | 1963-64 | 1964-65 |
| | millions of dollars | | |
| Nuclear science | 31.5 | 34.9 | 38.6 |
| Space travel and communications | 1.7 | 3.1 | 7.3 |
| Military science (excluding R & D in nuclear and space areas) | 60.2 | 78.9 | 84.9 |
| Other | 95.5 | 102.7 | 112.2 |
| **Totals** | **188.9** | **219.6** | **243.0** |

## NOTES ON THE SURVEY

### 1. Total Expenditures

Since scientific activities cut across the classifications used in government records (i.e. "standard objects" such as civil salaries and wages, postage, materials and supplies, etc.), it is generally difficult for the respondents to make accurate estimates. Organizations which are entirely engaged in scientific activities, or which have a division performing all their scientific work, can calculate their scientific costs more readily than others which do not have a clear distinction between their scientific and non-scientific activities. Another general problem is the allocation of "overhead" costs. For example, the Departments of Public Works and Finance, among others, provide services to other departments. Departments or agencies do not require the same degree of support, and, of course, the services provided any organization would normally vary from time to time. Estimates are provided of the more common forms of inter-departmental support, but only at department/agency level. There remains the problem of allocating the correct proportions to scientific activities. The imputed rent of an organization which provides its own buildings presents similar problems.

### 2. Classes of Scientific Activities

It is often difficult to distinguish between certain of the classifications used in these surveys. Research and development, scientific data collections and scientific information are often performed together and by the same people. A given project, if part of a larger research programme, would be classed as R & D; the same project, when outside of a research programme, is another scientific activity. The officials who can provide the financial data required may not always be able to classify the scientific activity.

The distinction between current and capital expenditures is sometimes hard to maintain. Much of the equipment used in research is extremely specialized and may have a very short life, large research units may also build some of their own equipment from materials on hand and perhaps with parts from discarded equipment. This has led to the concept of "expendable research equipment" which is used by some departments. To ensure that inter-departmental figures are comparable, adjustments are occasionally required to the capital expenditures reported by other departments. The inclusion of expendable research equipment in current expenditures may lead to fluctuations in costs not connected with variations in the amount of work performed. The allocation of expenditures on multi-purpose plant presents problems similar to those discussed in Section 1. Another problem is that the Armed Forces are not able to provide data on many of their capital projects.

### 3. Fields of Research and Development

It is extremely difficult to consistently distinguish between the scientific fields, since a project generally will require work in a number of fields. Furthermore, in a number of cases there is no longer a clear distinction between these fields, for example, "new" areas such as biochemistry, bio-physics and engineering physics, are becoming more common. The individual scientist may be able to classify his work by scientific field, but the person completing the questionnaire, who is generally an administrator, will often have to rely mainly on financial and other files which are readily available. Probably the most common way of allocating expenditures among the fields of science is on the basis of personnel, i.e. assuming that physicists are working only in physics, hence the amount of money spent in that field of research corresponds to the proportion of physicists among R & D personnel.

The exclusion of the social and psychological sciences from the survey has caused additional problems for a number of respondents. This is especially true for those involved in medical research. Research projects requiring anthropological as well as wildlife and botanical studies are also affected by this exclusion.

### 4. Types of Research and Development

The further classification of R & D expenditures into basic research, applied research and development was attempted for the first time in this last survey. There are a number of problems associated with such a classification. One problem is caused by the variety of definitions which people normally use – definitions which they may continue to use, perhaps only subconsciously, when completing a questionnaire. Even supposing that it were possible to clearly distinguish between the types of research or development, it should be realized that the progress of one project may take it through all three types at least once. A programme of R & D could contain a number of such projects, thus making the analysis quite complicated.

### 5. Personnel Engaged in R & D

For departments or agencies with distinct R & D units, the calculation of total R & D personnel should be relatively straightforward. In other cases the calculation may be quite difficult, since the persons must first be identified as employed in R & D, and then the proportion of time spent on R & D must be determined.

The information presented for March 1963 is not strictly comparable with the tables for earlier years. This is due to two factors (1) in earlier years there has been no distinction between total numbers and full-time equivalent, and (2) some classes of persons engaged in administrative support have been included for the first time.

# STATISTICAL TABLES

**TABLE 1 A. Federal Government Expenditures on Scientific Activities, by Activity and by Performing Organization, Fiscal Year 1962 - 63**

| Scientific activity | All departments and agencies | | | | | Excluding Department of National Defence | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Performing organization | | | | Total expenditures | Performing organization | | | | Total expenditures |
| | Reporting unit | Profit organizations | Educational institutions | Others[1] | | Reporting unit | Profit organizations | Educational institutions | Others[1] | |
| | thousands of dollars | | | | | | | | | |
| Scientific R & D: | | | | | | | | | | |
| Conduct of R & D | 148,755 | 18,431 | 227 | 1,071 | 168,484 | 106,706 | 12,624 | 227 | 142 | 119,699 |
| Grants in aid of research | 130 | 1,727 | 16,668 | 1,912 | 20,437 | 130 | 529 | 14,765 | 1,912 | 17,336 |
| **Sub-totals** | **148,885** | **20,158** | **16,895** | **2,983** | **188,921** | **106,836** | **13,153** | **14,992** | **2,054** | **137,035** |
| Capital expenditures | 23,395 | – | – | – | 23,395 | 21,205 | – | – | – | 21,205 |
| **Totals, scientific R & D** | **172,280** | **20,158** | **16,895** | **2,983** | **212,316** | **128,041** | **13,153** | **14,992** | **2,054** | **158,240** |
| Other scientific activities: | | | | | | | | | | |
| Scientific data collection | 23,208 | 1,651 | – | 149 | 25,008 | 19,693 | 1,651 | – | – | 21,344 |
| Scientific information | 9,550 | – | – | 151 | 9,701 | 9,440 | – | – | 151 | 9,591 |
| Capital expenditures | 5,532 | – | – | – | 5,532 | 5,532 | – | – | – | 5,532 |
| Scholarship and fellowship programmes | 70 | – | 2,809 | 216 | 3,095 | 70 | – | 2,779 | 216 | 3,065 |
| **Sub-totals** | **38,360** | **1,651** | **2,809** | **516** | **43,336** | **34,735** | **1,651** | **2,779** | **367** | **39,532** |
| **Totals, all scientific activities** | **210,640** | **21,809** | **19,704** | **3,499** | **255,652** | **162,776** | **14,804** | **17,771** | **2,421** | **197,772** |

[1] Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 1 B. Estimated Federal Government Expenditures on Scientific Activities, by Activity and by Performing Organization, Fiscal Year 1963 - 64**

| Scientific activity | All departments and agencies | | | | | Excluding Department of National Defence | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Performing organization | | | | Total expenditures | Performing organization | | | | Total expenditures |
| | Reporting unit | Profit organizations | Educational institutions | Others[1] | | Reporting unit | Profit organizations | Educational institutions | Others[1] | |
| | thousands of dollars | | | | | | | | | |
| Scientific R & D: | | | | | | | | | | |
| Conduct of R & D | 159,633 | 32,596 | 299 | 1,317 | 193,845 | 113,814 | 24,044 | 299 | 126 | 138,283 |
| Grants in aid of research | 159 | 4,182 | 18,663 | 2,710 | 25,714 | 159 | 1,508 | 16,778 | 2,710 | 21,155 |
| **Sub-totals** | **159,792** | **36,778** | **18,962** | **4,027** | **219,559** | **113,973** | **25,552** | **17,077** | **2,836** | **159,438** |
| Capital expenditures | 32,814 | – | – | – | 32,814 | 28,120 | – | – | – | 28,120 |
| **Totals, scientific R & D** | **192,606** | **36,778** | **18,962** | **4,027** | **252,373** | **142,093** | **25,552** | **17,077** | **2,836** | **187,558** |
| Other scientific activities: | | | | | | | | | | |
| Scientific data collection | 24,790 | 1,769 | – | 150 | 26,709 | 21,190 | 1,769 | – | – | 22,959 |
| Scientific information | 9,856 | – | – | 219 | 10,075 | 9,740 | – | – | 219 | 9,959 |
| Capital expenditures | 3,494 | – | – | – | 3,494 | 3,494 | – | – | – | 3,494 |
| Scholarship and fellowship programmes | 86 | – | 3,600 | 250 | 3,936 | 85 | – | 3,569 | 250 | 3,904 |
| **Sub-totals** | **38,226** | **1,769** | **3,600** | **619** | **44,214** | **34,509** | **1,769** | **3,569** | **469** | **40,316** |
| **Totals, all scientific activities** | **230,832** | **38,547** | **22,562** | **4,646** | **296,587** | **176,602** | **27,321** | **20,646** | **3,305** | **227,874** |

[1] Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 1 C. Estimated Federal Government Expenditures on Scientific Activities, by Activity and by Performing Organization, Fiscal Year 1964 - 65**

| Scientific activity | All departments and agencies | | | | | Excluding Department of National Defence | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Performing organization | | | | Total expenditures | Performing organization | | | | Total expenditures |
| | Reporting unit | Profit organizations | Educational institutions | Others[1] | | Reporting unit | Profit organizations | Educational institutions | Others[1] | |
| | thousands of dollars | | | | | | | | | |
| Scientific R & D: | | | | | | | | | | |
| Conduct of R & D | 166,981 | 41,236 | 495 | 1,356 | 210,068 | 120,309 | 26,935 | 495 | 151 | 147,890 |
| Grants in aid of research | 193 | 6,863 | 23,877 | 2,027 | 32,960 | 193 | 2,713 | 22,037 | 2,027 | 26,970 |
| **Sub-totals** | **167,174** | **48,099** | **24,372** | **3,383** | **243,028** | **120,502** | **29,648** | **22,532** | **2,178** | **174,860** |
| Capital expenditures | 41,647 | 600 | – | – | 42,247 | 37,707 | 600 | – | – | 38,307 |
| **Totals, scientific R & D** | **208,821** | **48,699** | **24,372** | **3,383** | **285,275** | **158,209** | **30,248** | **22,532** | **2,178** | **213,167** |
| Other scientific activities: | | | | | | | | | | |
| Scientific data collection | 25,577 | 2,171 | – | 150 | 27,898 | 21,977 | 2,171 | – | – | 24,148 |
| Scientific information | 10,992 | – | – | 204 | 11,196 | 10,875 | – | – | 204 | 11,079 |
| Capital expenditures | 3,618 | – | – | – | 3,618 | 3,618 | – | – | – | 3,616 |
| Scholarship and fellowship programmes | 108 | – | 5,302 | 250 | 5,660 | 108 | – | 5,252 | 250 | 5,610 |
| **Sub-totals** | **40,295** | **2,171** | **5,302** | **604** | **48,372** | **36,578** | **2,171** | **5,252** | **454** | **44,455** |
| **Totals, all scientific activities** | **249,116** | **50,870** | **29,674** | **3,987** | **333,647** | **194,787** | **32,419** | **27,784** | **2,632** | **257,622** |

[1] Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 2A. Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1962-63**

| Department or agency | Scientific R & D | | | | | Other scientific activities | | | | | Total, all scientific activities |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conduct of R & D | Grants in aid of research | Sub-total | Capital expenditures | Total, scientific R & D | Scientific data collection | Scientific information | Capital expenditures | Scholarship and fellowship programmes | Sub-total | |
| | thousands of dollars | | | | | | | | | | |
| Agriculture: | | | | | | | | | | | |
| Adminstration Branch – Information Division | – | – | – | – | – | – | 426 | – | – | 426 | 426 |
| Health of Animals Branch – Animal Pathology Division | 795 | – | 795 | 25 | 820 | – | 5 | – | – | 5 | 825 |
| Research Branch | 23,856 | 147 | 24,003 | 3,471 | 27,474 | – | 476 | – | – | 476 | 27,950 |
| **Sub-totals** | **24,651** | **147** | **24,798** | **3,496** | **28,294** | **–** | **907** | **–** | **–** | **907** | **29,201** |
| Board of Grain Commissioners Grain Research Laboratory | 330 | – | 330 | 27 | 357 | 8 | 33 | – | – | 41 | 398 |
| Atomic Energy: | | | | | | | | | | | |
| Atomic Energy Control Board | – | 770 | 770 | – | 770 | – | – | – | – | – | 770 |
| Atomic Energy of Canada Limited | 29,193 | – | 29,193 | 9,349 | 38,542 | – | – | – | 90 | 90 | 38,632 |
| **Sub-totals** | **29,193** | **770** | **29,963** | **9,349** | **39,312** | **–** | **–** | **–** | **90** | **90** | **39,402** |
| Canadian Arsenals Limited | 412 | – | 412 | – | 412 | – | – | – | – | – | 412 |
| Central Mortgage and Housing Corporation | 18 | 37 | 55 | – | 55 | – | – | – | – | – | 55 |
| Defence Production – Department of Industry | 8,000 | – | 8,000 | – | 8,000 | – | – | – | – | – | 8,000 |
| Fisheries: | | | | | | | | | | | |
| Conservation and Development Service | 1,004 | – | 1,004 | 817 | 1,821 | – | – | – | – | – | 1,821 |
| Industrial Development Service | 624 | 10 | 634 | 28 | 662 | – | – | – | – | – | 662 |
| Inspection Service | 371 | – | 371 | 25 | 396 | – | – | – | – | – | 396 |
| **Sub-totals** | **1,999** | **10** | **2,009** | **870** | **2,879** | **–** | **–** | **–** | **–** | **–** | **2,879** |
| Fisheries Research Board of Canada | 5,916 | 23 | 5,939 | 1,487 | 7,426 | – | – | – | 1 | 1 | 7,427 |
| Forestry: | | | | | | | | | | | |
| Administration Branch | – | 5 | 5 | – | 5 | – | – | – | – | – | 5 |
| Forest Entomology and Pathology Branch | 3,037 | 10 | 3,047 | 249 | 3,296 | 1,380 | 184 | – | – | 1,564 | 4,860 |
| Forest Products Research Branch | 1,417 | – | 1,417 | 80 | 1,497 | – | 54 | – | – | 54 | 1,551 |
| Forest Research Branch | 2,636 | – | 2,636 | 313 | 2,949 | – | 21 | – | – | 21 | 2,970 |
| **Sub-totals** | **7,090** | **15** | **7,105** | **642** | **7,747** | **1,380** | **259** | **–** | **–** | **1,639** | **9,386** |
| Medical Research Council | – | 3,644 | 3,644 | – | 3,644 | – | – | – | 724 | 724 | 4,368 |
| Mines and Technical Surveys: | | | | | | | | | | | |
| Dominion Observatories Branch | 2,183 | – | 2,183 | 521 | 2,704 | – | 32 | – | – | 32 | 2,736 |
| Geographical Branch | – | – | – | – | – | 660 | 25 | – | – | 685 | 685 |
| Geological Survey of Canada | 3,736 | 75 | 3,811 | 379 | 4,190 | 3,230 | 443 | – | – | 3,673 | 7,863 |
| Marine Sciences Branch | 867 | – | 867 | 658 | 1,525 | 6,142 | 47 | 4,944 | – | 11,133 | 12,658 |
| Mines Branch | 4,858 | 10 | 4,868 | 434 | 5,302 | 540 | 807 | – | – | 1,347 | 6,649 |
| Polar Continental Shelf Project | 158 | – | 158 | – | 158 | 1,424 | 1 | 262 | – | 1,687 | 1,845 |
| Surveys and Mapping Branch | – | – | – | – | – | 4,763 | 2,238 | – | – | 7,001 | 7,001 |
| **Sub-totals** | **11,802** | **85** | **11,887** | **1,992** | **13,879** | **16,759** | **3,593** | **5,206** | **–** | **25,558** | **39,437** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | 1,798 | 3,598 | 5,396 | 942 | 6,338 | 461 | 46 | 19 | 82 | 608 | 6,946 |
| National Research Council | 25,304 | 8,921 | 34,225 | 1,949 | 36,174 | 179 | 1,842 | – | 2,168 | 4,189 | 40,363 |
| Northern Affairs and National Resources: | | | | | | | | | | | |
| Canadian Wildlife Service | 596 | – | 596 | 91 | 687 | 255 | 40 | – | – | 295 | 982 |
| Northern Coordination and Research Centre | 60 | – | 60 | – | 60 | 80 | 17 | – | – | 97 | 157 |
| Water Resources Branch | 611 | – | 611 | – | 611 | 1,806 | 239 | 307 | – | 2,352 | 2,963 |
| **Sub-totals** | **1,267** | **–** | **1,267** | **91** | **1,358** | **2,141** | **296** | **307** | **–** | **2,744** | **4,102** |
| Post Office – Engineering Branch | 148 | – | 148 | 5 | 153 | – | 3 | – | – | 3 | 156 |
| Secretary of State: | | | | | | | | | | | |
| National Film Board | 29 | – | 29 | 7 | 36 | – | – | – | – | – | 36 |
| National Museum | 141 | – | 141 | – | 141 | 261 | 25 | – | – | 286 | 427 |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | 2,533 | – | – | 2,533 | 2,533 |
| **Sub-totals** | **170** | **–** | **170** | **7** | **177** | **261** | **2,558** | **–** | **–** | **2,819** | **2,996** |
| Transport: | | | | | | | | | | | |
| Civil Aviation Branch | 8 | – | 8 | – | 8 | – | – | – | – | – | 8 |
| Construction Branch | 50 | – | 50 | 20 | 70 | – | – | – | – | – | 70 |
| Marine Works Branch | 83 | – | 83 | 82 | 165 | 155 | – | – | – | 155 | 320 |
| Meteorological Branch | 792 | 86 | 878 | 231 | 1,109 | – | – | – | – | – | 1,109 |
| Telecommunications and Electronics Branch | 258 | – | 258 | 15 | 273 | – | 54 | – | – | 54 | 327 |
| **Sub-totals** | **1,191** | **86** | **1,277** | **348** | **1,625** | **155** | **54** | **–** | **–** | **209** | **1,834** |
| Veterans Affairs | 410 | – | 410 | – | 410 | – | – | – | – | – | 410 |
| **Totals, all departments and agencies except National Defence** | **119,699** | **17,336** | **137,035** | **21,205** | **158,240** | **21,344** | **9,591** | **5,532** | **3,065** | **39,532** | **197,772** |
| National Defence: | | | | | | | | | | | |
| Armed Forces | 22,302 | – | 22,302 | 96[1] | 22,398 | 3,664 | – | – | – | 3,664 | 26,062 |
| Defence Research Board | 26,483 | 3,101 | 29,584 | 2,094 | 31,678 | – | 110 | – | 30 | 140 | 31,818 |
| **Sub-totals** | **48,785** | **3,101** | **51,886** | **2,190** | **54,076** | **3,664** | **110** | **–** | **30** | **3,804** | **57,880** |
| **Totals, all departments and agencies** | **168,484** | **20,437** | **188,921** | **23,395** | **212,316** | **25,008** | **9,701** | **5,532** | **3,095** | **43,336** | **255,652** |

[1] Many of the capital costs of the Armed Forces are not available.

**TABLE 2 B. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1963 - 64**

| Department or agency | Scientific R & D | | | | | Other scientific activities | | | | | Total, all scientific activities |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conduct of R & D | Grants in aid of research | Sub-total | Capital expenditures | Total scientific R & D | Scientific data collection | Scientific information | Capital expenditures | Scholarship and fellowship programmes | Sub-total | |
| | thousands of dollars | | | | | | | | | | |
| Agriculture: | | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | 440 | – | – | 440 | 440 |
| Health of Animals Branch – Animal Pathology Division | 858 | – | 858 | 18 | 876 | – | 5 | – | – | 5 | 881 |
| Research Branch | 24,048 | 128 | 24,176 | 4,194 | 28,370 | – | 485 | – | – | 485 | 28,855 |
| **Sub-totals** | **24,906** | **128** | **25,034** | **4,212** | **29,246** | **–** | **930** | **–** | **–** | **930** | **30,176** |
| Board of Grain Commissioners – Grain Research Laboratory | 325 | – | 325 | 32 | 357 | 9 | 35 | – | – | 44 | 401 |
| Atomic Energy: | | | | | | | | | | | |
| Atomic Energy Control Board | – | 900 | 900 | – | 900 | – | – | – | – | – | 900 |
| Atomic Energy of Canada Limited | 32,093 | – | 32,093 | 13,466 | 45,559 | – | – | – | 35 | 35 | 45,594 |
| **Sub-totals** | **32,093** | **900** | **32,993** | **13,466** | **46,459** | **–** | **–** | **–** | **35** | **35** | **46,494** |
| Canadian Arsenals Limited | 355 | – | 355 | – | 355 | – | – | – | – | – | 355 |
| Central Mortgage and Housing Corporation | 14 | 29 | 43 | – | 43 | – | – | – | – | – | 43 |
| Defence Production – Department of Industry | 19,000 | – | 19,000 | – | 19,000 | – | – | – | – | – | 19,000 |
| Fisheries: | | | | | | | | | | | |
| Conservation and Development Service | 1,048 | – | 1,048 | 457 | 1,505 | – | – | – | – | – | 1,505 |
| Industrial Development Service | 599 | 10 | 609 | 18 | 827 | – | – | – | – | – | 627 |
| Inspection Service | 377 | – | 377 | 32 | 409 | – | – | – | – | – | 409 |
| **Sub-totals** | **2,024** | **10** | **2,034** | **507** | **2,541** | **–** | **–** | **–** | **–** | **–** | **2,541** |
| Fisheries Research Board of Canada | 6,192 | 25 | 6,217 | 970 | 7,187 | – | – | – | 5 | 5 | 7,192 |
| Forestry: | | | | | | | | | | | |
| Administration Branch | – | 24 | 24 | – | 24 | – | – | – | – | – | 24 |
| Forest Entomology and Pathology Branch | 3,216 | – | 3,216 | 1,554 | 4,770 | 1,466 | 195 | – | – | 1,661 | 6,431 |
| Forest Products Research Branch | 1,443 | – | 1,443 | 80 | 1,523 | – | 62 | – | – | 62 | 1,585 |
| Forest Research Branch | 2,740 | – | 2,740 | 237 | 2,977 | – | 25 | – | – | 25 | 3,002 |
| **Sub-totals** | **7,399** | **24** | **7,423** | **1,871** | **9,294** | **1,466** | **282** | **–** | **–** | **1,748** | **11,042** |
| Medical Research Council | – | 4,286 | 4,286 | – | 4,286 | – | – | – | 898 | 898 | 5,184 |
| Mines and Technical Surveys: | | | | | | | | | | | |
| Dominion Observatories Branch | 2,404 | – | 2,404 | 551 | 2,955 | – | 30 | – | – | 30 | 2,985 |
| Geographical Branch | – | – | – | – | – | 771 | 27 | – | – | 798 | 798 |
| Geological Survey of Canada | 3,925 | 75 | 4,000 | 251 | 4,251 | 3,485 | 481 | – | – | 3,966 | 8,217 |
| Marine Sciences Branch | 910 | – | 910 | 100 | 1,010 | 7,150 | 55 | 3,000 | – | 10,205 | 11,215 |
| Mines Branch | 4,896 | 35 | 4,931 | 505 | 5,436 | 544 | 813 | – | – | 1,357 | 6,793 |
| Polar Continental Shelf Project | 155 | – | 155 | – | 155 | 1,397 | 1 | 166 | – | 1,564 | 1,719 |
| Surveys and Mapping Branch | – | – | – | – | – | 4,838 | 2,364 | – | – | 7,202 | 7,202 |
| **Sub-totals** | **12,290** | **110** | **12,400** | **1,407** | **13,807** | **18,185** | **3,771** | **3,166** | **–** | **25,122** | **38,929** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | 1,801 | 4,308 | 6,109 | 824 | 6,933 | 491 | 47 | 21 | 205 | 764 | 7,697 |
| National Research Council | 26,831 | 11,249 | 38,080 | 4,334 | 42,414 | 195 | 1,908 | – | 2,761 | 4,864 | 47,278 |
| Northern Affairs and National Resources: | | | | | | | | | | | |
| Canadian Wildlife Service | 740 | – | 740 | 71 | 811 | 317 | 40 | – | – | 357 | 1,168 |
| Northern Coordination and Research Centre | 70 | – | 70 | – | 70 | 91 | 20 | – | – | 111 | 181 |
| Water Resources Branch | 1,007 | – | 1,007 | – | 1,007 | 1,831 | 214 | 307 | – | 2,352 | 3,359 |
| **Sub-totals** | **1,817** | **–** | **1,817** | **71** | **1,888** | **2,239** | **274** | **307** | **–** | **2,820** | **4,708** |
| Post Office – Engineering Branch | 215 | – | 215 | 18 | 231 | – | 3 | – | – | 3 | 234 |
| Secretary of State: | | | | | | | | | | | |
| National Film Board | 38 | – | 38 | 2 | 40 | – | – | – | – | – | 40 |
| National Museum | 119 | – | 119 | – | 119 | 216 | 25 | – | – | 241 | 360 |
| Patent and Copyright Office-Patent – Division | – | – | – | – | – | – | 2,664 | – | – | 2,664 | 2,664 |
| **Sub-totals** | **157** | **–** | **157** | **2** | **159** | **216** | **2,689** | **–** | **–** | **2,905** | **3,064** |
| Transport: | | | | | | | | | | | |
| Civil Aviation Branch | 8 | – | 8 | – | 8 | – | – | – | – | – | 8 |
| Construction Branch | 50 | – | 50 | 6 | 56 | – | – | – | – | – | 56 |
| Marine Works Branch | 201 | – | 201 | 81 | 282 | 158 | – | – | – | 158 | 440 |
| Meteorological Branch | 970 | 86 | 1,056 | 306 | 1,362 | – | – | – | – | – | 1,362 |
| Telecommunications and Electronics Branch | 1,215 | – | 1,215 | 15 | 1,230 | – | 20 | – | – | 20 | 1,250 |
| **Sub-totals** | **2,444** | **86** | **2,530** | **408** | **2,938** | **158** | **20** | **–** | **–** | **178** | **3,116** |
| Veterans Affairs | 420 | – | 420 | – | 420 | – | – | – | – | – | 420 |
| **Totals, all departments and agencies except National Defence** | **138,283** | **21,155** | **159,438** | **28,120** | **187,558** | **22,959** | **9,959** | **3,494** | **3,904** | **40,316** | **227,874** |
| National Defence: | | | | | | | | | | | |
| Armed Forces | 23,939 | – | 23,939 | 2,500[1] | 26,439 | 3,750 | – | – | – | 3,750 | 30,189 |
| Defence Research Board | 31,623 | 4,559 | 36,182 | 2,194 | 38,376 | – | 116 | – | 32 | 148 | 38,524 |
| **Sub-totals** | **55,562** | **4,559** | **60,121** | **4,694** | **64,815** | **3,750** | **116** | **–** | **32** | **3,898** | **68,713** |
| **Totals, all departments and agencies** | **193,845** | **25,714** | **219,559** | **32,814** | **252,373** | **26,709** | **10,075** | **3,494** | **3,936** | **44,214** | **296,587** |

[1] Many of the capital expenditures of the Armed Forces are not available.

**TABLE 2C. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1964-65**

| Department or agency | Scientific R & D | | | | | Other scientific activities | | | | | Total, all scientific activities |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conduct of R & D | Grants in aid of research | Sub-total | Capital expenditures | Total, all scientific R & D | Scientific data collection | Scientific information | Capital expenditures | Scholarship and fellowship programmes | Sub-total | |
| | thousands of dollars | | | | | | | | | | |
| Agriculture: | | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | 457 | – | – | 457 | 457 |
| Health of Animals Branch – Animal Pathology Division | 940 | – | 940 | 185 | 1,125 | – | 5 | – | – | 5 | 1,130 |
| Research Branch | 25,036 | 145 | 25,181 | 6,002 | 31,183 | – | 500 | – | – | 500 | 31,683 |
| **Sub-totals** | **25,976** | **145** | **26,121** | **6,187** | **32,308** | **–** | **962** | **–** | **–** | **962** | **33,270** |
| Board of Grain Commissioners – Grain Research Laboratory | 342 | – | 342 | 42 | 384 | 9 | 37 | – | – | 46 | 430 |
| Atomic Energy: | | | | | | | | | | | |
| Atomic Energy Control Board | – | 1,250 | 1,250 | – | 1,250 | – | – | – | – | – | 1,250 |
| Atomic Energy of Canada Limited | 35,547 | – | 35,547 | 17,807 | 53,354 | – | – | – | 50 | 50 | 53,404 |
| **Sub-totals** | **35,547** | **1,250** | **36,797** | **17,807** | **54,604** | **–** | **–** | **–** | **50** | **50** | **54,654** |
| Canadian Arsenals Limited | – | – | – | – | – | – | – | – | – | – | – |
| Central Mortgage and Housing Corporation | 32 | 64 | 96 | – | 96 | – | – | – | – | – | 96 |
| Defence Production – Department of Industry | 19,500 | – | 19,500 | – | 19,500 | – | – | – | – | – | 19,500 |
| Fisheries: | | | | | | | | | | | |
| Conservation and Development Service | 1,060 | – | 1,060 | 545 | 1,605 | – | – | – | – | – | 1,605 |
| Industrial Development Service | 692 | 10 | 702 | 26 | 728 | – | – | – | – | – | 728 |
| Inspection Service | 392 | – | 392 | 29 | 421 | – | – | – | – | – | 421 |
| **Sub-totals** | **2,144** | **10** | **2,154** | **600** | **2,754** | **–** | **–** | **–** | **–** | **–** | **2,754** |
| Fisheries Research Board of Canada | 6,465 | 45 | 6,510 | 1,693 | 8,203 | – | – | – | 5 | 5 | 8,208 |
| Forestry: | | | | | | | | | | | |
| Administration Branch | – | 59 | 59 | 600 | 659 | – | – | – | – | – | 659 |
| Forest Entomology and Pathology Branch | 3,423 | – | 3,423 | 1,441 | 4,864 | 1,564 | 209 | – | – | 1,773 | 6,637 |
| Forest Products Research Branch | 1,591 | – | 1,591 | 426 | 2,017 | – | 71 | – | – | 71 | 2,088 |
| Forest Research Branch | 2,876 | – | 2,876 | 396 | 3,272 | – | 31 | – | – | 31 | 3,303 |
| **Sub-totals** | **7,890** | **59** | **7,949** | **2,863** | **10,812** | **1,564** | **311** | **–** | **–** | **1,875** | **12,687** |
| Medical Research Council | – | 5,354 | 5,354 | – | 5,354 | – | – | – | 1,680 | 1,680 | 7,034 |
| Mines and Technical Surveys: | | | | | | | | | | | |
| Dominion Observatories Branch | 2,401 | – | 2,401 | 944 | 3,345 | – | 38 | – | – | 38 | 3,383 |
| Geographical Branch | – | – | – | – | – | 831 | 34 | – | – | 865 | 865 |
| Geological Survey of Canada | 4,025 | 100 | 4,125 | 394 | 4,519 | 3,713 | 567 | – | – | 4,280 | 8,799 |
| Marine Sciences Branch | 1,009 | – | 1,009 | 200 | 1,209 | 7,756 | 68 | 3,160 | – | 10,984 | 12,193 |
| Mines Branch | 5,013 | 50 | 5,063 | 395 | 5,458 | 557 | 832 | – | – | 1,389 | 6,847 |
| Polar Continental Shelf Project | 146 | – | 146 | – | 146 | 1,406 | 1 | 132 | – | 1,539 | 1,685 |
| Surveys and Mapping Branch | – | – | – | – | – | 4,651 | 2,438 | – | – | 7,089 | 7,089 |
| **Sub-totals** | **12,594** | **150** | **12,744** | **1,933** | **14,677** | **18,914** | **3,978** | **3,292** | **–** | **26,184** | **40,861** |
| Dominion Coal Board | 50 | – | 50 | – | 50 | – | – | – | – | – | 50 |
| National Health and Welfare | 2,037 | 3,546 | 5,583 | 801 | 6,384 | 529 | 79 | 21 | 311 | 940 | 7,324 |
| National Research Council | 27,649 | 16,247 | 43,896 | 5,487 | 49,383 | 200 | 2,384 | – | 3,560 | 6,144 | 55,527 |
| Northern Affairs and National Resources: | | | | | | | | | | | |
| Canadian Wildlife Service | 795 | – | 795 | 294 | 1,089 | 341 | 60 | – | 4 | 405 | 1,494 |
| Northern Coordination and Research Centre | 120 | – | 120 | – | 120 | 135 | 21 | – | – | 156 | 276 |
| Water Resources Branch | 1,525 | – | 1,525 | – | 1,525 | 2,021 | 267 | 305 | – | 2,593 | 4,118 |
| **Sub-totals** | **2,440** | **–** | **2,440** | **294** | **2,734** | **2,497** | **348** | **305** | **4** | **3,154** | **5,888** |
| Post Office – Engineering Branch | 181 | – | 181 | 8 | 189 | – | 3 | – | – | 3 | 192 |
| Secretary of State: | | | | | | | | | | | |
| National Film Board | 42 | – | 42 | – | 42 | – | – | – | – | – | 42 |
| National Museum | 133 | – | 133 | – | 133 | 245 | 25 | – | – | 270 | 403 |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | 2,922 | – | – | 2,922 | 2,922 |
| **Sub-totals** | **175** | **–** | **175** | **–** | **175** | **245** | **2,947** | **–** | **–** | **3,192** | **3,367** |
| Transport: | | | | | | | | | | | |
| Civil Aviation Branch | 8 | – | 8 | – | 8 | – | – | – | – | – | 8 |
| Construction Branch | 50 | – | 50 | 6 | 56 | – | – | – | – | – | 56 |
| Marine Works Branch | 108 | – | 108 | 170 | 278 | 190 | – | – | – | 190 | 468 |
| Meteorological Branch | 1,159 | 100 | 1,259 | 406 | 1,665 | – | – | – | – | – | 1,665 |
| Telecommunications and Electronics Branch | 3,104 | – | 3,104 | 10 | 3,114 | – | 30 | – | – | 30 | 3,144 |
| **Sub-totals** | **4,429** | **100** | **4,529** | **592** | **5,121** | **190** | **30** | **–** | **–** | **220** | **5,341** |
| Veterans Affairs | 439 | – | 439 | – | 439 | – | – | – | – | – | 439 |
| **Totals, all departments and agencies except National Defence** | **147,890** | **26,970** | **174,860** | **38,307** | **213,167** | **24,148** | **11,079** | **3,618** | **5,610** | **44,455** | **257,622** |
| National Defence: | | | | | | | | | | | |
| Armed Forces | 30,882 | – | 30,882 | 2,135[1] | 33,017 | 3,750 | – | – | – | 3,750 | 36,767 |
| Defence Research Board | 31,296 | 5,990 | 37,286 | 1,805 | 39,091 | – | 117 | – | 50 | 167 | 39,258 |
| **Sub-totals** | **62,178** | **5,990** | **68,168** | **3,940** | **72,108** | **3,750** | **117** | **–** | **50** | **3,917** | **76,025** |
| **Totals, all departments and agencies** | **210,068** | **32,960** | **243,028** | **42,247** | **285,275** | **27,898** | **11,196** | **3,618** | **5,660** | **48,372** | **333,647** |

[1] Many of the Armed Forces' expenditures on plant for scientific R & D are not available.

**TABLE 3A. Federal Government Expenditures on Scientific Activities, by Department or Agency and by Performing Organization, Fiscal Year 1962-63**

| Department or Agency | Conduct of R & D[1] | | | | | All scientific activities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Performing organization | | | | Total expenditures | Performing organization | | | | Total expenditures |
| | Reporting unit | Profit organizations | Educational institutions | Others[2] | | Reporting unit | Profit organizations | Educational institutions | Others[2] | |
| | thousands of dollars | | | | | | | | | |
| Agriculture: | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | 400 | – | – | 26 | 426 |
| Health of Animals Branch – Animal Pathology Division | 795 | – | – | – | 795 | 825 | – | – | – | 825 |
| Research Branch | 23,856 | – | 147 | – | 24,003 | 27,803 | – | 147 | – | 27,950 |
| **Sub-totals** | **24,651** | **–** | **147** | **–** | **24,798** | **29,028** | **–** | **147** | **26** | **29,201** |
| Board of Grain Commissioners – Grain Research Laboratory | 330 | – | – | – | 330 | 398 | – | – | – | 398 |
| Atomic Energy: | | | | | | | | | | |
| Atomic Energy Control Board | – | – | 770 | – | 770 | – | – | 770 | – | 770 |
| Atomic Energy of Canada Limited | 24,638 | 4,473 | 82 | – | 29,193 | 33,986 | 4,473 | 173 | – | 38,632 |
| **Sub-totals** | **24,638** | **4,473** | **852** | **–** | **29,963** | **33,986** | **4,473** | **943** | **–** | **39,402** |
| Canadian Arsenals Limited | 412 | – | – | – | 412 | 412 | – | – | – | 412 |
| Central Mortgage and Housing Corporation | 18 | 2 | – | 35 | 55 | 18 | 2 | – | 35 | 55 |
| Defence Production – Department of Industry | – | 7,963 | – | 37 | 8,000 | – | 7,963 | – | 37 | 8,000 |
| Fisheries: | | | | | | | | | | |
| Conservation and Development Service | 1,004 | – | – | – | 1,004 | 1,821 | – | – | – | 1,821 |
| Industrial Development Service | 554 | – | 10 | 70 | 634 | 582 | – | 10 | 70 | 662 |
| Inspection Service | 371 | – | – | – | 371 | 396 | – | – | – | 396 |
| **Sub-totals** | **1,929** | **–** | **10** | **70** | **2,009** | **2,799** | **–** | **10** | **70** | **2,879** |
| Fisheries Research Board of Canada | 5,916 | – | 23 | – | 5,939 | 7,404 | – | 23 | – | 7,427 |
| Forestry: | | | | | | | | | | |
| Administration Branch | – | – | 5 | – | 5 | – | – | 5 | – | 5 |
| Forest Entomology and Pathology Branch | 3,037 | – | 10 | – | 3,047 | 4,850 | – | 10 | – | 4,860 |
| Forest Products Research Branch | 1,417 | – | – | – | 1,417 | 1,551 | – | – | – | 1,551 |
| Forest Research Branch | 2,636 | – | – | – | 2,636 | 2,970 | – | – | – | 2,970 |
| **Sub-totals** | **7,090** | **–** | **15** | **–** | **7,105** | **9,371** | **–** | **15** | **–** | **9,386** |
| Medical Research Council | 30 | – | 3,591 | 23 | 3,644 | 61 | – | 4,285 | 22 | 4,368 |
| Mines and Technical Surveys: | | | | | | | | | | |
| Dominion Observatories Branch | 2,183 | – | – | – | 2,183 | 2,736 | – | – | – | 2,736 |
| Geographical Branch | – | – | – | – | – | 685 | – | – | – | 685 |
| Geological Survey of Canada | 3,736 | – | 75 | – | 3,811 | 6,316 | 1,472 | 75 | – | 7,863 |
| Marine Sciences Branch | 867 | – | – | – | 867 | 12,658 | – | – | – | 12,658 |
| Mines Branch | 4,858 | – | 10 | – | 4,668 | 6,639 | – | 10 | – | 6,649 |
| Polar Continental Shelf Project | 46 | 112 | – | – | 158 | 1,733 | 112 | – | – | 1,845 |
| Surveys and Mapping Branch | – | – | – | – | – | 7,001 | – | – | – | 7,001 |
| **Sub-totals** | **11,690** | **112** | **85** | **–** | **11,887** | **37,768** | **1,584** | **85** | **–** | **39,437** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | 1,798 | – | 2,243 | 1,355 | 5,396 | 3,266 | – | 2,325 | 1,355 | 6,946 |
| National Research Council | 25,293 | 537 | 7,919 | 476 | 34,225 | 28,998 | 716 | 9,831 | 818 | 40,363 |
| Northern Affairs and National Resources: | | | | | | | | | | |
| Canadian Wildlife Service | 596 | – | – | – | 596 | 982 | – | – | – | 982 |
| Northern Coordination and Research Centre | – | – | 21 | 39 | 60 | 97 | – | 21 | 39 | 157 |
| Water Resources Branch | 611 | – | – | – | 611 | 2,963 | – | – | – | 2,963 |
| **Sub-totals** | **1,207** | **–** | **21** | **39** | **1,267** | **4,042** | **–** | **21** | **39** | **4,102** |
| Post Office – Engineering Branch | 127 | 2 | – | 19 | 148 | 135 | 2 | – | 19 | 156 |
| Secretary of State: | | | | | | | | | | |
| National Film Board | 29 | – | – | – | 29 | 36 | – | – | – | 36 |
| National Museum | 141 | – | – | – | 141 | 427 | – | – | – | 427 |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | 2,533 | – | – | – | 2,533 |
| **Sub-totals** | **170** | **–** | **–** | **–** | **170** | **2,996** | **–** | **–** | **–** | **2,996** |
| Transport: | | | | | | | | | | |
| Civil Aviation Branch | 8 | – | – | – | 8 | 8 | – | – | – | 8 |
| Construction Branch | 50 | – | – | – | 50 | 70 | – | – | – | 70 |
| Marine Works Branch | 83 | – | – | – | 83 | 320 | – | – | – | 320 |
| Meteorological Branch | 792 | – | 86 | – | 678 | 1,023 | – | 86 | – | 1,109 |
| Telecommunications and Electronics Branch | 194 | 64 | – | – | 258 | 263 | 64 | – | – | 327 |
| **Sub-totals** | **1,127** | **64** | **86** | **–** | **1,277** | **1,684** | **64** | **86** | **–** | **1,834** |
| Veterans Affairs | 410 | – | – | – | 410 | 410 | – | – | – | 410 |
| **Totals, all departments and agencies except National Defence** | **106,836** | **13,153** | **14,992** | **2,054** | **137,035** | **162,776** | **14,804** | **17,771** | **2,421** | **197,772** |
| National Defence: | | | | | | | | | | |
| Armed Forces | 17,382 | 4,433 | – | 487 | 22,302 | 20,993 | 4,433 | – | 636 | 26,061 |
| Defence Research Board | 24,667 | 2,572 | 1,903 | 442 | 29,584 | 26,871 | 2,572 | 1,933 | 442 | 31,818 |
| **Sub-totals** | **42,049** | **7,005** | **1,903** | **929** | **51,886** | **47,864** | **7,005** | **1,933** | **1,078** | **57,880** |
| **Totals, all departments and agencies** | **148,885** | **20,158** | **16,895** | **2,983** | **188,921** | **210,640** | **21,809** | **19,704** | **3,499** | **255,652** |

[1] Including grants in aid of research.
[2] Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 3 B. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Performing Organization, Fiscal Year 1963-64**

| Department or agency | Conduct of R & D[1] | | | | | All scientific activities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Performing organization | | | | Total expenditures | Performing organization | | | | Total expenditures |
| | Reporting unit | Profit organizations | Educational institutions | Others[2] | | Reporting unit | Profit organizations | Educational institutions | Others[2] | |
| | thousands of dollars | | | | | | | | | |
| Agriculture: | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | 415 | – | – | 25 | 440 |
| Health of Animals Branch – Animal Pathology Division | 858 | – | – | – | 858 | 881 | – | – | – | 881 |
| Research Branch | 24,048 | – | 128 | – | 24,176 | 28,727 | – | 128 | – | 28,855 |
| **Sub-totals** | **24,906** | **–** | **128** | **–** | **25,034** | **30,023** | **–** | **128** | **25** | **30,176** |
| Board of Grain Commissioners – Grain Research Laboratory | 325 | – | – | – | 325 | 401 | – | – | – | 401 |
| Atomic Energy: | | | | | | | | | | |
| Atomic Energy Control Board | – | – | 900 | – | 900 | – | – | 900 | – | 900 |
| Atomic Energy of Canada Limited | 27,987 | 4,000 | 106 | – | 32,093 | 41,453 | 4,000 | 141 | – | 45,594 |
| **Sub-totals** | **27,987** | **4,000** | **1,006** | **–** | **32,993** | **41,453** | **4,000** | **1,041** | **–** | **46,494** |
| Canadian Arsenals Limited | 355 | – | – | – | 355 | 355 | – | – | – | 355 |
| Central Mortgage and Housing Corporation | 14 | 8 | – | 21 | 43 | 14 | 8 | – | 21 | 43 |
| Defence Production – Department of Industry | – | 18,982 | – | 18 | 19,000 | – | 18,982 | – | 18 | 19,000 |
| Fisheries: | | | | | | | | | | |
| Conservation and Development Service | 1,048 | – | – | – | 1,048 | 1,505 | – | – | – | 1,505 |
| Industrial Development Service | 531 | – | 9 | 69 | 609 | 549 | – | 9 | 69 | 627 |
| Inspection Service | 377 | – | – | – | 377 | 409 | – | – | – | 409 |
| **Sub-totals** | **1,956** | **–** | **9** | **69** | **2,034** | **2,463** | **–** | **9** | **69** | **2,541** |
| Fisheries Research Board of Canada | 6,192 | – | 25 | – | 6,217 | 7,162 | – | 30 | – | 7,192 |
| Forestry: | | | | | | | | | | |
| Administration Branch | – | – | 23 | 1 | 24 | – | – | 23 | 1 | 24 |
| Forest Entomology and Pathology Branch | 3,216 | – | – | – | 3,216 | 6,431 | – | – | – | 6,431 |
| Forest Products Research Branch | 1,443 | – | – | – | 1,443 | 1,585 | – | – | – | 1,585 |
| Forest Research Branch | 2,740 | – | – | – | 2,740 | 3,002 | – | – | – | 3,002 |
| **Sub-totals** | **7,399** | **–** | **23** | **1** | **7,423** | **11,018** | **–** | **23** | **1** | **11,042** |
| Medical Research Council | 35 | – | 4,219 | 32 | 4,286 | 70 | – | 5,082 | 32 | 5,184 |
| Mines and Technical Surveys: | | | | | | | | | | |
| Dominion Observatories Branch | 2,404 | – | – | – | 2,404 | 2,985 | – | – | – | 2,985 |
| Geographical Branch | – | – | – | – | – | 781 | 17 | – | – | 798 |
| Geological Survey of Canada | 3,925 | – | 75 | – | 4,000 | 6,585 | 1,557 | 75 | – | 8,217 |
| Marine Sciences Branch | 910 | – | – | – | 910 | 11,215 | – | – | – | 11,215 |
| Mines Branch | 4,896 | – | 35 | – | 4,931 | 6,758 | – | 35 | – | 6,793 |
| Polar Continental Shelf Project | 109 | 46 | – | – | 155 | 1,673 | 46 | – | – | 1,719 |
| Surveys and Mapping Branch | – | – | – | – | – | 7,202 | – | – | – | 7,202 |
| **Sub-totals** | **12,244** | **46** | **110** | **–** | **12,400** | **37,199** | **1,620** | **110** | **–** | **38,929** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | 1,801 | – | 2,118 | 2,190 | 6,109 | 3,184 | – | 2,323 | 2,190 | 7,697 |
| National Research Council | 26,824 | 1,500 | 9,321 | 435 | 38,080 | 32,922 | 1,695 | 11,782 | 879 | 47,278 |
| Northern Affairs and National Resources: | | | | | | | | | | |
| Canadian Wildlife Service | 740 | – | – | – | 740 | 1,168 | – | – | – | 1,168 |
| Northern Coordination and Research Centre | – | – | 32 | 38 | 70 | 111 | – | 32 | 38 | 181 |
| Water Resources Branch | 1,007 | – | – | – | 1,007 | 3,359 | – | – | – | 3,359 |
| **Sub-totals** | **1,747** | **–** | **32** | **38** | **1,817** | **4,638** | **–** | **32** | **38** | **4,708** |
| Post Office – Engineering Branch | 137 | 46 | – | 32 | 215 | 156 | 46 | – | 32 | 234 |
| Secretary of State: | | | | | | | | | | |
| National Film Board | 38 | – | – | – | 38 | 40 | – | – | – | 40 |
| National Museum | 119 | – | – | – | 119 | 360 | – | – | – | 360 |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | 2,664 | – | – | – | 2,664 |
| **Sub-totals** | **157** | **–** | **–** | **–** | **157** | **3,064** | **–** | **–** | **–** | **3,064** |
| Transport: | | | | | | | | | | |
| Civil Aviation Branch | 8 | – | – | – | 8 | 8 | – | – | – | 8 |
| Construction Branch | 50 | – | – | – | 50 | 56 | – | – | – | 56 |
| Marine Works Branch | 201 | – | – | – | 201 | 440 | – | – | – | 440 |
| Meteorological Branch | 970 | – | 86 | – | 1,056 | 1,276 | – | 86 | – | 1,362 |
| Telecommunications and Electronics Branch | 245 | 970 | – | – | 1,215 | 280 | 970 | – | – | 1,250 |
| **Sub-totals** | **1,474** | **970** | **86** | **–** | **2,530** | **2,060** | **970** | **86** | **–** | **3,116** |
| Veterans Affairs | 420 | – | – | – | 420 | 420 | – | – | – | 420 |
| **Totals, all departments and agencies except National Defence** | **113,973** | **25,552** | **17,077** | **2,836** | **159,438** | **176,602** | **27,321** | **20,646** | **3,305** | **227,874** |
| National Defence: | | | | | | | | | | |
| Armed Forces | 16,729 | 8,435 | – | 775 | 23,939 | 22,829 | 6,435 | – | 925 | 30,189 |
| Defence Research Board | 29,090 | 4,791 | 1,885 | 416 | 36,182 | 31,401 | 4,791 | 1,916 | 416 | 38,524 |
| **Sub-totals** | **45,819** | **11,226** | **1,885** | **1,191** | **60,121** | **54,230** | **11,226** | **1,916** | **1,341** | **68,713** |
| **Totals, all departments and agencies** | **159,792** | **38,778** | **18,962** | **4,027** | **219,559** | **230,832** | **38,547** | **22,562** | **4,646** | **296,587** |

[1] Including grants in aid of research.
[2] Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 3C. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Performing Organization, Fiscal Year 1964 - 65**

| Department or agency | Conduct of R & D[1] | | | | | All scientific activities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Performing organization | | | | Total expenditures | Performing organization | | | | Total expenditures |
| | Reporting unit | Profit organizations | Educational institutions | Others[2] | | Reporting unit | Profit organizations | Educational institutions | Others[2] | |
| | thousands of dollars | | | | | | | | | |
| Agriculture: | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | 457 | – | – | – | 457 |
| Health of Animals Branch – Animal Pathology Division | 940 | – | – | – | 940 | 1,130 | – | – | – | 1,130 |
| Research Branch | 25,036 | – | 145 | – | 25,181 | 31,538 | – | 145 | – | 31,683 |
| **Sub-totals** | **25,976** | **–** | **145** | **–** | **26,121** | **33,125** | **–** | **145** | **–** | **33,270** |
| Board of Grain Commissioners – Grain Research Laboratory | 342 | – | – | – | 342 | 430 | – | – | – | 430 |
| Atomic Energy: | | | | | | | | | | |
| Atomic Energy Control Board | – | – | 1,250 | – | 1,250 | – | – | 1,250 | – | 1,250 |
| Atomic Energy of Canada Limited | 30,881 | 4,502 | 164 | – | 35,547 | 48,688 | 4,502 | 214 | – | 53,404 |
| **Sub-totals** | **30,881** | **4,502** | **1,414** | **–** | **36,797** | **48,688** | **4,502** | **1,464** | **–** | **54,654** |
| Canadian Arsenals Limited | – | – | – | – | – | – | – | – | – | – |
| Central Mortgage and Housing Corporation | 32 | 13 | – | 51 | 96 | 32 | 13 | – | 51 | 96 |
| Defence Production – Department of Industry | – | 19,460 | – | 40 | 19,500 | – | 19,460 | – | 40 | 19,500 |
| Fisheries: | | | | | | | | | | |
| Conservation and Development Service | 1,060 | – | – | – | 1,060 | 1,605 | – | – | – | 1,605 |
| Industrial Development Service | 607 | – | 10 | 85 | 702 | 633 | – | 10 | 85 | 728 |
| Inspection Service | 392 | – | – | – | 392 | 421 | – | – | – | 421 |
| **Sub-totals** | **2,059** | **–** | **10** | **85** | **2,154** | **2,659** | **–** | **10** | **85** | **2,754** |
| Fisheries Research Board of Canada | 6,465 | – | 45 | – | 6,510 | 8,158 | – | 50 | – | 8,208 |
| Forestry: | | | | | | | | | | |
| Administration Branch | – | – | 58 | 1 | 59 | – | 600 | 58 | 1 | 659 |
| Forest Entomology and Pathology Branch | 3,423 | – | – | – | 3,423 | 6,637 | – | – | – | 6,637 |
| Forest Products Research Branch | 1,591 | – | – | – | 1,591 | 2,088 | – | – | – | 2,088 |
| Forest Research Branch | 2,876 | – | – | – | 2,876 | 3,303 | – | – | – | 3,303 |
| **Sub-totals** | **7,890** | **–** | **58** | **1** | **7,949** | **12,028** | **600** | **58** | **1** | **12,687** |
| Medical Research Council | 39 | – | 5,281 | 34 | 5,354 | 77 | – | 6,923 | 34 | 7,034 |
| Mines and Technical Surveys: | | | | | | | | | | |
| Dominion Observatories Branch | 2,401 | – | – | – | 2,401 | 3,383 | – | – | – | 3,383 |
| Geographical Branch | – | – | – | – | – | 831 | 34 | – | – | 865 |
| Geological Survey of Canada | 4,025 | – | 100 | – | 4,125 | 6,762 | 1,937 | 100 | – | 8,799 |
| Marine Sciences Branch | 1,009 | – | – | – | 1,009 | 12,193 | – | – | – | 12,193 |
| Mines Branch | 5,013 | – | 50 | – | 5,063 | 6,797 | – | 50 | – | 6,847 |
| Polar Continental Shelf Project | 81 | 65 | – | – | 146 | 1,620 | 65 | – | – | 1,685 |
| Surveys and Mapping Branch | – | – | – | – | – | 7,089 | – | – | – | 7,089 |
| **Sub-totals** | **12,529** | **65** | **150** | **–** | **12,744** | **38,675** | **2,036** | **150** | **–** | **40,861** |
| Dominion Coal Board | – | 50 | – | – | 50 | – | 50 | – | – | 50 |
| National Health and Welfare | 2,037 | – | 2,118 | 1,428 | 5,583 | 3,468 | – | 2,428 | 1,428 | 7,324 |
| National Research Council | 27,638 | 2,700 | 13,126 | 432 | 43,898 | 35,374 | 2,900 | 16,367 | 886 | 55,527 |
| Northern Affairs and National Resources: | | | | | | | | | | |
| Canadian Wildlife Service | 795 | – | – | – | 795 | 1,490 | – | 4 | – | 1,494 |
| Northern Coordination and Reasearch Centre | – | – | 85 | 35 | 120 | 156 | – | 85 | 35 | 276 |
| Water Resources Branch | 1,525 | – | – | – | 1,525 | 4,118 | – | – | – | 4,118 |
| **Sub-totals** | **2,320** | **–** | **85** | **35** | **2,440** | **5,764** | **–** | **89** | **35** | **5,888** |
| Post Office – Engineering Branch | 147 | 17 | – | 17 | 181 | 158 | 17 | – | 17 | 192 |
| Secretary of State: | | | | | | | | | | |
| National Film Board | 42 | – | – | – | 42 | 42 | – | – | – | 42 |
| National Museum | 133 | – | – | – | 133 | 403 | – | – | – | 403 |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | 2,922 | – | – | – | 2,922 |
| **Sub-totals** | **175** | **–** | **–** | **–** | **175** | **3,367** | **–** | **–** | **–** | **3,367** |
| Transport: | | | | | | | | | | |
| Civil Aviation Branch | 8 | – | – | – | 8 | 8 | – | – | – | 8 |
| Construction Branch | 50 | – | – | – | 50 | 56 | – | – | – | 56 |
| Marine Works Branch | 108 | – | – | – | 108 | 488 | – | – | – | 488 |
| Meteorological Branch | 1,104 | – | 100 | 55 | 1,259 | 1,510 | – | 100 | 55 | 1,665 |
| Telecommunications and Electronics Branch | 263 | 2,841 | – | – | 3,104 | 303 | 2,841 | – | – | 3,144 |
| **Sub-totals** | **1,533** | **2,841** | **100** | **55** | **4,529** | **2,345** | **2,841** | **100** | **55** | **5,341** |
| Veterans Affairs | 439 | – | – | – | 439 | 439 | – | – | – | 439 |
| **Totals, all departments and agencies except National Defence** | **120,502** | **29,648** | **22,532** | **2,178** | **174,860** | **194,787** | **32,419** | **27,784** | **2,632** | **257,622** |
| National Defence: | | | | | | | | | | |
| Armed Forces | 17,601 | 12,492 | – | 789 | 30,882 | 23,336 | 12,492 | – | 939 | 36,767 |
| Defence Research Board | 29,071 | 5,959 | 1,840 | 416 | 37,286 | 30,993 | 5,959 | 1,890 | 416 | 39,258 |
| **Sub-totals** | **46,672** | **18,451** | **1,840** | **1,205** | **68,168** | **54,329** | **18,451** | **1,890** | **1,355** | **76,025** |
| **Totals, all departments and agencies** | **167,174** | **48,099** | **24,372** | **3,383** | **243,028** | **249,116** | **50,870** | **29,674** | **3,987** | **333,647** |

[1] Including grants in aid of research.
[2] Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 4A. Federal Government Expenditures on the Conduct of R & D[1] in the Life Sciences, by Department or Agency, by Scientific Field and by Type of R & D Activity, Fiscal Year 1962-63**

| Department or agency | Scientific field | | | Total, life sciences | Type of R & D activity | | |
|---|---|---|---|---|---|---|---|
| | Agricultural sciences | Biological sciences | Medical sciences | | Basic research | Applied research | Development |
| | thousands of dollars | | | | | | |
| Agriculture: | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | 795 | – | – | 795 | – | 795 | – |
| Research Branch | 24,003 | – | – | 24,003 | 4,800 | 18,963 | 240 |
| **Sub-totals** | **24,798** | **–** | **–** | **24,798** | **4,800** | **19,758** | **240** |
| Board of Grain Commissioners – Grain Research Laboratory | 330 | – | – | 330 | 152 | 158 | 20 |
| Atomic Energy: | | | | | | | |
| Atomic Energy Control Board | – | – | – | – | – | – | – |
| Atomic Energy of Canada Limited | – | 1,665 | – | 1,665 | 1,665 | – | – |
| **Sub-totals** | **–** | **1,665** | **–** | **1,665** | **1,665** | **–** | **–** |
| Canadian Arsenals Limited | – | – | – | – | – | – | – |
| Central Mortgage and Housing Corporation | – | 52 | – | 52 | – | 52 | – |
| Defence Production – Department of Industry | – | – | – | – | – | – | – |
| Fisheries: | | | | | | | |
| Conservation and Development Service | – | 602 | – | 602 | – | 120 | 482 |
| Industrial Development Service | – | – | – | – | – | – | – |
| Inspection Service | – | 297 | – | 297 | – | – | 297 |
| **Sub-totals** | **–** | **899** | **–** | **899** | **–** | **120** | **779** |
| Fisheries Research Board of Canada | – | 5,535 | – | 5,535 | – | 5,535 | – |
| Forestry: | | | | | | | |
| Administration Branch | 5 | – | – | 5 | – | 5 | – |
| Forest Entomology and Pathology Branch | 2,285 | 762 | – | 3,047 | 305 | 2,742 | – |
| Forest Products Research Branch | – | 170 | – | 170 | – | 170 | – |
| Forest Research Branch | 2,636 | – | – | 2,636 | – | 2,636 | – |
| **Sub-totals** | **4,926** | **932** | **–** | **5,858** | **305** | **5,553** | **–** |
| Medical Research Council | – | – | 3,644 | 3,644 | 3,644 | – | – |
| Mines and Technical Surveys: | | | | | | | |
| Dominion Observatories Branch | – | – | – | – | – | – | – |
| Geographical Branch | – | – | – | – | – | – | – |
| Geological Survey of Canada | – | – | – | – | – | – | – |
| Marine Sciences Branch | – | – | – | – | – | – | – |
| Mines Branch | – | – | – | – | – | – | – |
| Polar Continental Shelf Project | – | – | – | – | – | – | – |
| Surveys and Mapping Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **–** | **–** | **–** | **–** | **–** | **–** |
| Dominion Coal Board | – | – | – | – | – | – | – |
| National Health and Welfare | – | 70 | 5,326 | 5,396 | – | 5,132 | 264 |
| National Research Council | 828 | 3,291 | 643 | 4,762 | 3,606 | 1,127 | 29 |
| Northern Affairs and National Resources: | | | | | | | |
| Canadian Wildlife Service | – | 596 | – | 596 | 60 | 238 | 298 |
| Northern Coordination and Research Centre | – | 30 | – | 30 | – | 30 | – |
| Water Resources Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **626** | **–** | **626** | **60** | **268** | **298** |
| Post Office – Engineering Branch | – | – | – | – | – | – | – |
| Secretary of State: | | | | | | | |
| National Film Board | – | – | – | – | – | – | – |
| National Museum | – | 141 | – | 141 | 141 | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **141** | **–** | **141** | **141** | **–** | **–** |
| Transport: | | | | | | | |
| Civil Aviation Branch | – | 8 | – | 8 | – | 8 | – |
| Construction Branch | – | – | – | – | – | – | – |
| Marine Works Branch | – | – | – | – | – | – | – |
| Meteorological Branch | – | – | – | – | – | – | – |
| Telecommunications and Electronics Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **8** | **–** | **8** | **–** | **8** | **–** |
| Veterans Affairs | – | – | 410 | 410 | – | 410 | – |
| **Totals, all departments and agencies except National Defence** | **30,882** | **13,219** | **10,023** | **54,124** | **14,373** | **38,121** | **1,630** |
| National Defence: | | | | | | | |
| Armed Forces | – | – | – | – | – | – | – |
| Defence Research Board | – | 1,183 | 888 | 2,071 | – | 2,071 | – |
| **Sub-totals** | **–** | **1,183** | **888** | **2,071** | **–** | **2,071** | **–** |
| **Totals, all departments and agencies** | **30,882** | **14,402** | **10,911** | **56,195** | **14,373** | **40,192** | **1,630** |

[1] Includes grants in aid of research.

**TABLE 4 B. Estimated Federal Government Expenditures on the Conduct of R & D[1] in the Life Sciences, by Scientific Field, and by Type of R & D Activity, Fiscal Year 1963-64**

| Department or agency | Scientific field | | | Total, life sciences | Type of R & D activity | | |
|---|---|---|---|---|---|---|---|
| | Agricultural sciences | Biological sciences | Medical sciences | | Basic research | Applied research | Development |
| | thousands of dollars | | | | | | |
| Agriculture: | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | 858 | – | – | 858 | – | 858 | – |
| Research Branch | 24,176 | – | – | 24,176 | 4,835 | 19,099 | 242 |
| **Sub-totals** | **25,034** | **–** | **–** | **25,034** | **4,835** | **19,957** | **242** |
| Board of Grain Commissioners – Grain Research Laboratory | 325 | – | – | 325 | 150 | 156 | 19 |
| Atomic Energy: | | | | | | | |
| Atomic Energy Control Board | – | – | – | – | – | – | – |
| Atomic Energy of Canada Limited | – | 1,804 | – | 1,804 | 1,804 | – | – |
| **Sub-totals** | **–** | **1,804** | **–** | **1,804** | **1,804** | **–** | **–** |
| Canadian Arsenals Limited | – | – | – | – | – | – | – |
| Central Mortgage and Housing Corporation | – | 31 | – | 31 | – | 31 | – |
| Defence Production – Department of Industry | – | – | – | – | – | – | – |
| Fisheries: | | | | | | | |
| Conservation and Development Service | – | 629 | – | 629 | – | 126 | 503 |
| Industrial Development Service | – | – | – | – | – | – | – |
| Inspection Service | – | 301 | – | 301 | – | – | 301 |
| **Sub-totals** | **–** | **930** | **–** | **930** | **–** | **126** | **804** |
| Fisheries Research Board of Canada | – | 5,831 | – | 5,831 | – | 5,831 | – |
| Forestry: | | | | | | | |
| Administration Branch | 24 | – | – | 24 | – | 24 | – |
| Forest Entomology and Pathology Branch | 2,412 | 804 | – | 3,216 | 322 | 2,894 | – |
| Forest Products Research Branch | – | 173 | – | 173 | – | 173 | – |
| Forest Research Branch | 2,740 | – | – | 2,740 | – | 2,740 | – |
| **Sub-totals** | **5,176** | **977** | **–** | **6,153** | **322** | **5,831** | **–** |
| Medical Research Council | – | – | 4,286 | 4,286 | 4,286 | – | – |
| Mines and Technical Surveys: | | | | | | | |
| Dominion Observatories Branch | – | – | – | – | – | – | – |
| Geographical Branch | – | – | – | – | – | – | – |
| Geological Survey of Canada | – | – | – | – | – | – | – |
| Marine Sciences Branch | – | – | – | – | – | – | – |
| Mines Branch | – | – | – | – | – | – | – |
| Polar Continental Shelf Project | – | – | – | – | – | – | – |
| Surveys and Mapping Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **–** | **–** | **–** | **–** | **–** | **–** |
| Dominion Coal Board | – | – | – | – | – | – | – |
| National Health and Welfare | – | 123 | 5,986 | 6,109 | – | 5,803 | 306 |
| National Research Council | 890 | 3,810 | 851 | 5,551 | 4,029 | 1,491 | 31 |
| Northern Affairs and National Resources: | | | | | | | |
| Canadian Wildlife Service | – | 740 | – | 740 | 74 | 296 | 370 |
| Northern Coordination and Research Centre | – | 35 | – | 35 | – | 35 | – |
| Water Resources Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **775** | **–** | **775** | **74** | **331** | **370** |
| Post Office – Engineering Branch | – | – | – | – | – | – | – |
| Secretary of State: | | | | | | | |
| National Film Board | – | – | – | – | – | – | – |
| National Museum | – | 119 | – | 119 | 119 | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **119** | **–** | **119** | **119** | **–** | **–** |
| Transport: | | | | | | | |
| Civil Aviation Branch | – | 8 | – | 8 | – | 8 | – |
| Construction Branch | – | – | – | – | – | – | – |
| Marine Works Branch | – | – | – | – | – | – | – |
| Meteorological Branch | – | – | – | – | – | – | – |
| Telecommunications and Electronics Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **8** | **–** | **8** | **–** | **8** | **–** |
| Veterans Affairs | – | – | 420 | 420 | – | 420 | – |
| **Totals, all departments and agencies except National Defence** | **31,425** | **14,408** | **11,543** | **57,376** | **15,619** | **39,985** | **1,772** |
| National Defence: | | | | | | | |
| Armed Forces | – | – | – | – | – | – | – |
| Defence Research Board | – | 1,447 | 1,086 | 2,533 | – | 2,533 | – |
| **Sub-totals** | **–** | **1,447** | **1,086** | **2,533** | **–** | **2,533** | **–** |
| **Totals, all departments and agencies** | **31,425** | **15,855** | **12,629** | **59,909** | **15,619** | **42,518** | **1,772** |

[1] Includes grants in aid of research.

**TABLE 4C. Estimated Federal Government Expenditures on the Conduct of R & D[1] in the Life Sciences, by Scientific Field and by Type of R & D Activity, Fiscal Year 1964-65**

| Department or agency | Scientific field | | | Total, life sciences | Type of R & D activity | | |
|---|---|---|---|---|---|---|---|
| | Agricultural sciences | Biological sciences | Medical sciences | | Basic research | Applied research | Development |
| | thousands of dollars | | | | | | |
| Agriculture: | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | 940 | – | – | 940 | – | 940 | – |
| Research Branch | 25,181 | – | – | 25,181 | 5,036 | 19,893 | 252 |
| **Sub-totals** | **26,121** | **–** | **–** | **26,121** | **5,036** | **20,833** | **252** |
| Board of Grain Commissioners – Grain Research Laboratory | 342 | – | – | 342 | 157 | 164 | 21 |
| Atomic Energy: | | | | | | | |
| Atomic Energy Control Board | – | – | – | – | – | – | – |
| Atomic Energy of Canada Limited | – | 1,914 | – | 1,914 | 1,914 | – | – |
| **Sub-totals** | **–** | **1,914** | **–** | **1,914** | **1,914** | **–** | **–** |
| Canadian Arsenals Limited | – | – | – | – | – | – | – |
| Central Mortgage and Housing Corporation | – | 32 | – | 32 | – | 32 | – |
| Defence Production – Department of Industry | – | – | – | – | – | – | – |
| Fisheries: | | | | | | | |
| Conservation and Development Service | – | 636 | – | 636 | – | 127 | 509 |
| Industrial Development Service | – | – | – | – | – | – | – |
| Inspection Service | – | 314 | – | 314 | – | – | 314 |
| **Sub-totals** | **–** | **950** | **–** | **950** | **–** | **127** | **823** |
| Fisheries Research Board of Canada | – | 6,113 | – | 6,113 | – | 6,113 | – |
| Forestry: | | | | | | | |
| Administration Branch | 59 | – | – | 59 | – | 59 | – |
| Forest Entomology and Pathology Branch | 2,567 | 856 | – | 3,423 | 342 | 3,081 | – |
| Forest Products Research Branch | – | 191 | – | 191 | – | 191 | – |
| Forest Research Branch | 2,876 | – | – | 2,876 | – | 2,876 | – |
| **Sub-totals** | **5,502** | **1,047** | **–** | **6,549** | **342** | **6,207** | **–** |
| Medical Research Council | – | – | 5,354 | 5,354 | 5,354 | – | – |
| Mines and Technical Surveys: | | | | | | | |
| Dominion Observatories Branch | – | – | – | – | – | – | – |
| Geographical Branch | – | – | – | – | – | – | – |
| Geological Survey of Canada | – | – | – | – | – | – | – |
| Marine Sciences Branch | – | – | – | – | – | – | – |
| Mines Branch | – | – | – | – | – | – | – |
| Polar Continental Shelf Project | – | 10 | – | 10 | 10 | – | – |
| Surveys and Mapping Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **10** | **–** | **10** | **10** | **–** | **–** |
| Dominion Coal Board | – | – | – | – | – | – | – |
| National Health and Welfare | – | 447 | 5,136 | 5,583 | – | 5,209 | 374 |
| National Research Council | 1,146 | 4,685 | 1,064 | 6,895 | 5,124 | 1,736 | 35 |
| Northern Affairs and National Resources: | | | | | | | |
| Canadian Wildlife Service | – | 795 | – | 795 | 80 | 318 | 397 |
| Northern Coordination and Research Centre | – | 60 | – | 60 | – | 60 | – |
| Water Resources Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **855** | **–** | **855** | **80** | **378** | **397** |
| Post Office – Engineering Branch | – | – | – | – | – | – | – |
| Secretary of State: | | | | | | | |
| National Film Board | – | – | – | – | – | – | – |
| National Museum | – | 133 | – | 133 | 133 | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **133** | **–** | **133** | **133** | **–** | **–** |
| Transport: | | | | | | | |
| Civil Aviation Branch | – | 8 | – | 8 | – | 8 | – |
| Construction Branch | – | – | – | – | – | – | – |
| Marine Works Branch | – | – | – | – | – | – | – |
| Meteorological Branch | – | – | – | – | – | – | – |
| Telecommunications and Electronics Branch | – | – | – | – | – | – | – |
| **Sub-totals** | **–** | **8** | **–** | **8** | **–** | **8** | **–** |
| Veterans Affairs | – | – | 439 | 439 | – | 439 | – |
| **Totals, all departments and agencies except National Defence** | **33,111** | **16,194** | **11,993** | **61,298** | **18,150** | **41,246** | **1,902** |
| National Defence: | | | | | | | |
| Armed Forces | – | – | – | – | – | – | – |
| Defence Research Board | – | 1,491 | 1,119 | 2,610 | – | 2,610 | – |
| **Sub-totals** | **–** | **1,491** | **1,119** | **2,610** | **–** | **2,610** | **–** |
| **Totals, all departments and agencies** | **33,111** | **17,685** | **13,112** | **63,908** | **18,150** | **43,856** | **1,902** |

[1] Includes grants in aid of research.

**TABLE 5A. Federal Government Expenditures on the Conduct of R & D[1] in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1962-63**

| Department or agency | All engineering | Astronomy | Chemistry | Earth sciences | Metallurgy | Meteorology | Oceanography | Physics | Other | Total, physical sciences |
|---|---|---|---|---|---|---|---|---|---|---|
| | thousands of dollars | | | | | | | | | |
| Agriculture: | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | – | – | – | – | – | – | – | – | – | – |
| Research Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | – | – | – | – | – | – | – | – | – | – |
| Board of Grain Commissioners – Grain Research Laboratory | – | – | – | – | – | – | – | – | – | – |
| Atomic Energy: | | | | | | | | | | |
| Atomic Energy Control Board | – | – | – | – | – | – | – | 770 | – | 770 |
| Atomic Energy of Canada Limited | 22,092 | – | – | – | – | – | – | 5,436 | – | 27,528 |
| **Sub-totals** | **22,092** | – | – | – | – | – | – | **6,206** | – | **28,298** |
| Canadian Arsenals Limited | 412 | – | – | – | – | – | – | – | – | 412 |
| Central Mortgage and Housing Corporation | 3 | – | – | – | – | – | – | – | – | 3 |
| Defence Production – Department of Industry | 7,963 | – | 37 | – | – | – | – | – | – | 8,000 |
| Fisheries: | | | | | | | | | | |
| Conservation and Development Service | 402 | – | – | – | – | – | – | – | – | 402 |
| Industrial Development | 634 | – | – | – | – | – | – | – | – | 634 |
| Inspection Service | – | – | 74 | – | – | – | – | – | – | 74 |
| **Sub-totals** | **1,036** | – | **74** | – | – | – | – | – | – | **1,110** |
| Fisheries Research Board of Canada | – | – | – | – | – | – | 404 | – | – | 404 |
| Forestry: | | | | | | | | | | |
| Administration Branch | – | – | – | – | – | – | – | – | – | – |
| Forest Entomology and Pathology Branch | – | – | – | – | – | – | – | – | – | – |
| Forest Products Research Branch | 397 | – | 302 | – | – | – | – | 170 | 378 | 1,247 |
| Forest Research Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **397** | – | **302** | – | – | – | – | **170** | **378** | **1,247** |
| Medical Research Council | – | – | – | – | – | – | – | – | – | – |
| Mines and Technical Surveys: | | | | | | | | | | |
| Dominion Observatories Branch | – | 437 | – | 1,746 | – | – | – | – | – | 2,183 |
| Geographical Branch | – | – | – | – | – | – | – | – | – | – |
| Geological Survey of Canada | – | – | 229 | 3,430 | – | – | – | 152 | – | 3,811 |
| Marine Sciences Branch | – | – | – | – | – | – | 867 | – | – | 867 |
| Mines Branch | 1,382 | – | 587 | 279 | 2,144 | – | – | 476 | – | 4,868 |
| Polar Continental Shelf Project | 119 | – | – | 29 | – | – | – | 10 | – | 158 |
| Surveys and Mapping Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **1,501** | **437** | **816** | **5,484** | **2,144** | – | **867** | **638** | – | **11,887** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | – | – | – | – | – | – | – | – | – | – |
| National Research Council | 11,755 | 1,083 | 5,521 | 1,777 | 641 | – | 201 | 7,945 | 540 | 29,463 |
| Northern Affairs and National Resources: | | | | | | | | | | |
| Canadian Wildlife Service | – | – | – | – | – | – | – | – | – | – |
| Northern Coordination and Research Centre | – | – | – | 30 | – | – | – | – | – | 30 |
| Water Resources Branch | – | – | – | – | – | – | – | – | 611 | 611 |
| **Sub-totals** | – | – | – | **30** | – | – | – | – | **611** | **641** |
| Post Office – Engineering Branch | 148 | – | – | – | – | – | – | – | – | 148 |
| Secretary of State: | | | | | | | | | | |
| National Film Board | 29 | – | – | – | – | – | – | – | – | 29 |
| National Museum | – | – | – | – | – | – | – | – | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **29** | – | – | – | – | – | – | – | – | **29** |
| Transport: | | | | | | | | | | |
| Civil Aviation Branch | – | – | – | – | – | – | – | – | – | – |
| Construction Branch | 50 | – | – | – | – | – | – | – | – | 50 |
| Marine Works Branch | 83 | – | – | – | – | – | – | – | – | 83 |
| Meteorological Branch | – | – | – | – | – | 878 | – | – | – | 878 |
| Telecommunications and Electronics Branch | 258 | – | – | – | – | – | – | – | – | 258 |
| **Sub-totals** | **391** | – | – | – | – | **878** | – | – | – | **1,269** |
| Veterans Affairs | – | – | – | – | – | – | – | – | – | – |
| **Totals, all departments and agencies except National Defence** | **45,727** | **1,520** | **6,750** | **7,291** | **2,785** | **878** | **1,472** | **14,959** | **1,529** | **82,911** |
| National Defence: | | | | | | | | | | |
| Armed Forces | 16,933 | – | – | – | – | – | 895 | 1,913 | 2,561 | 22,302 |
| Defence Research Board | 11,094 | – | 5,177 | 296 | 296 | 592 | 1,183 | 8,875 | – | 27,513 |
| **Sub-totals** | **28,027** | – | **5,177** | **296** | **296** | **592** | **2,078** | **10,788** | **2,561** | **49,815** |
| **Totals, all departments and agencies** | **73,754** | **1,520** | **11,927** | **7,587** | **3,081** | **1,470** | **3,550** | **25,747** | **4,090** | **132,726** |

[1] Includes grants in aid of research.

**TABLE 5 B. Estimated Federal Government Expenditures on the Conduct of R & D[1] in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1963-64**

| Department or agency | All engineering | Astronomy | Chemistry | Earth sciences | Metallurgy | Meteorology | Oceanography | Physics | Other | Total, physical sciences |
|---|---|---|---|---|---|---|---|---|---|---|
| | thousands of dollars | | | | | | | | | |
| Agriculture: | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | – | – | – | – | – | – | – | – | – | – |
| Research Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | – | – | – | – | – | – | – | – | – | – |
| Board of Grain Commissioners – Grain Research Laboratory | – | – | – | – | – | – | – | – | – | – |
| Atomic Energy: | | | | | | | | | | |
| Atomic Energy Control Board | – | – | – | – | – | – | – | 900 | – | 900 |
| Atomic Energy of Canada Limited | 23,197 | – | – | – | – | – | – | 7,092 | – | 30,289 |
| **Sub-totals** | **23,197** | – | – | – | – | – | – | **7,992** | – | **31,189** |
| Canadian Arsenals Limited | 355 | – | – | – | – | – | – | – | – | 355 |
| Central Mortgage and Housing Corporation | 12 | – | – | – | – | – | – | – | – | 12 |
| Defence Production – Department of Industry | 18,951 | – | 18 | – | 31 | – | – | – | – | 19,000 |
| Fisheries: | | | | | | | | | | |
| Conservation and Development Service | 419 | – | – | – | – | – | – | – | – | 419 |
| Industrial Development Service | 609 | – | – | – | – | – | – | – | – | 609 |
| Inspection Service | – | – | 76 | – | – | – | – | – | – | 76 |
| **Sub-totals** | **1,028** | – | **76** | – | – | – | – | – | – | **1,104** |
| Fisheries Research Board of Canada | – | – | – | – | – | – | 386 | – | – | 386 |
| Forestry: | | | | | | | | | | |
| Administration Branch | – | – | – | – | – | – | – | – | – | – |
| Forest Entomology and Pathology Branch | – | – | – | – | – | – | – | – | – | – |
| Forest Products Research Branch | 404 | – | 308 | – | – | – | – | 173 | 385 | 1,270 |
| Forest Research Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **404** | – | **308** | – | – | – | – | **173** | **385** | **1,270** |
| Medical Research Council | – | – | – | – | – | – | – | – | – | – |
| Mines and Technical Surveys: | | | | | | | | | | |
| Dominion Observatories Branch | – | 481 | – | 1,923 | – | – | – | – | – | 2,404 |
| Geographical Branch | – | – | – | – | – | – | – | – | – | – |
| Geological Survey of Canada | – | – | 240 | 3,600 | – | – | – | 160 | – | 4,000 |
| Marine Sciences Branch | – | – | – | – | – | – | 910 | – | – | 910 |
| Mines Branch | 1,401 | – | 594 | 282 | 2,173 | – | – | 481 | – | 4,931 |
| Polar Continental Shelf Project | 35 | – | – | 111 | – | – | – | 9 | – | 155 |
| Surveys and Mapping Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **1,436** | **481** | **834** | **5,916** | **2,173** | – | **910** | **650** | – | **12,400** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | – | – | – | – | – | – | – | – | – | – |
| National Research Council | 13,203 | 1,133 | 6,250 | 1,810 | 748 | – | 253 | 8,512 | 620 | 32,529 |
| Northern Affairs and National Resources: | | | | | | | | | | |
| Canadian Wildlife Service | – | – | – | – | – | – | – | – | – | – |
| Northern Coordination and Research Centre | – | – | – | 35 | – | – | – | – | – | 35 |
| Water Resources Branch | – | – | – | – | – | – | – | – | 1,007 | 1,007 |
| **Sub-totals** | – | – | – | 35 | – | – | – | – | **1,007** | **1,042** |
| Post Office – Engineering Branch | 215 | – | – | – | – | – | – | – | – | 215 |
| Secretary of State: | | | | | | | | | | |
| National Film Board | 38 | – | – | – | – | – | – | – | – | 38 |
| National Museum | – | – | – | – | – | – | – | – | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **38** | – | – | – | – | – | – | – | – | **38** |
| Transport: | | | | | | | | | | |
| Civil Aviation Branch | – | – | – | – | – | – | – | – | – | – |
| Construction Branch | 50 | – | – | – | – | – | – | – | – | 50 |
| Marine Works Branch | 201 | – | – | – | – | – | – | – | – | 201 |
| Meteorological Branch | – | – | – | – | – | 1,056 | – | – | – | 1,056 |
| Telecommunications and Electronics Branch | 1,215 | – | – | – | – | – | – | – | – | 1,215 |
| **Sub-totals** | **1,466** | – | – | – | – | **1,056** | – | – | – | **2,522** |
| Veterans Affairs | – | – | – | – | – | – | – | – | – | – |
| **Totals, all departments and agencies except National Defence** | **60,305** | **1,614** | **7,486** | **7,761** | **2,952** | **1,056** | **1,549** | **17,327** | **2,012** | **102,062** |
| National Defence: | | | | | | | | | | |
| Armed Forces | 18,940 | – | – | – | – | – | 695 | 1,521 | 2,783 | 23,939 |
| Defence Research Board | 13,568 | – | 6,332 | 362 | 362 | 724 | 1,447 | 10,854 | – | 33,649 |
| **Sub-totals** | **32,508** | – | **6,332** | **362** | **362** | **724** | **2,142** | **12,375** | **2,783** | **57,588** |
| **Totals, all departments and agencies** | **92,813** | **1,614** | **13,818** | **8,123** | **3,314** | **1,780** | **3,691** | **29,702** | **4,795** | **159,650** |

[1] Includes grants in aid of research.

**TABLE 5C. Estimated Federal Government Expenditures on the Conduct of R & D[1] in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1964 - 65**

| Department or agency | All engineering | Astronomy | Chemistry | Earth sciences | Metallurgy | Meteorology | Oceanography | Physics | Other | Total, physical sciences |
|---|---|---|---|---|---|---|---|---|---|---|
| | thousand of dollars | | | | | | | | | |
| Agriculture: | | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | – | – | – | – | – | – | – | – | – | – |
| Research Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | – | – | – | – | – | – | – | – | – | – |
| Board of Grain Commissioners – Grain Research Laboratory | – | – | – | – | – | – | – | – | – | – |
| Atomic Energy: | | | | | | | | | | |
| Atomic Energy Control | – | – | – | – | – | – | – | 1,250 | – | 1,250 |
| Atomic Energy of Canada Limited | 25,257 | – | – | – | – | – | – | 8,376 | – | 33,633 |
| **Sub-totals** | **25,257** | – | – | – | – | – | – | **9,626** | – | **34,833** |
| Canadian Arsenals Limited | – | – | – | – | – | – | – | – | – | – |
| Central Mortgage and Housing Corporation | 64 | – | – | – | – | – | – | – | – | 64 |
| Defence Production – Department of Industry | 19,370 | – | 40 | – | 90 | – | – | – | – | 19,500 |
| Fisheries: | | | | | | | | | | |
| Conservation and Development Service | 424 | – | – | – | – | – | – | – | – | 424 |
| Industrial Development Service | 702 | – | – | – | – | – | – | – | – | 702 |
| Inspection Service | – | – | 78 | – | – | – | – | – | – | 78 |
| **Sub-totals** | **1,126** | – | **78** | – | – | – | – | – | – | **1,204** |
| Fisheries Research Board of Canada | – | – | – | – | – | – | 397 | – | – | 397 |
| Forestry: | | | | | | | | | | |
| Administration Branch | – | – | – | – | – | – | – | – | – | – |
| Forest Entomology and Pathology Branch | – | – | – | – | – | – | – | – | – | – |
| Forest Products Research Branch | 446 | – | 339 | – | – | – | – | 191 | 424 | 1,400 |
| Forest Research Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **446** | – | **339** | – | – | – | – | **191** | **424** | **1,400** |
| Medical Research Council | – | – | – | – | – | – | – | – | – | – |
| Mines and Technical Surveys: | | | | | | | | | | |
| Dominion Observatories Branch | – | 552 | – | 1,849 | – | – | – | – | – | 2,401 |
| Geographical Branch | – | – | – | – | – | – | – | – | – | – |
| Geological Survey of Canada | – | – | 247 | 3,713 | – | – | – | 165 | – | 4,125 |
| Marine Sciences Branch | – | – | – | – | – | – | 1,009 | – | – | 1,009 |
| Mines Branch | 1,438 | – | 610 | 289 | 2,232 | – | – | 494 | – | 5,063 |
| Polar Continental Shelf Project | 10 | – | – | 97 | – | – | – | 29 | – | 136 |
| Surveys and Mapping Branch | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **1,448** | **552** | **857** | **5,948** | **2,232** | – | **1,009** | **688** | – | **12,734** |
| Dominion Coal Board | 50 | – | – | – | – | – | – | – | – | 50 |
| National Health and Welfare | – | – | – | – | – | – | – | – | – | – |
| National Research Council | 14,314 | 1,276 | 7,370 | 2,585 | 947 | – | 325 | 9,077 | 1,107 | 37,001 |
| Northern Affairs and National Resources: | | | | | | | | | | |
| Canadian Wildlife Service | – | – | – | – | – | – | – | – | – | – |
| Northern Coordination and Research Centre | – | – | – | 60 | – | – | – | – | – | 60 |
| Water Resources Branch | – | – | – | – | – | – | – | – | 1,525 | 1,525 |
| **Sub-totals** | – | – | – | **60** | – | – | – | – | **1,525** | **1,585** |
| Post Office – Engineering Branch | 181 | – | – | – | – | – | – | – | – | 181 |
| Secretary of State: | | | | | | | | | | |
| National Film Board | 42 | – | – | – | – | – | – | – | – | 42 |
| National Museum | – | – | – | – | – | – | – | – | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **42** | – | – | – | – | – | – | – | – | **42** |
| Transport: | | | | | | | | | | |
| Civil Aviation Branch | – | – | – | – | – | – | – | – | – | – |
| Construction Branch | 50 | – | – | – | – | – | – | – | – | 50 |
| Marine Works Branch | 108 | – | – | – | – | – | – | – | – | 108 |
| Meteorological Branch | – | – | – | – | – | 1,259 | – | – | – | 1,259 |
| Telecommunications and Electronics Branch | 3,104 | – | – | – | – | – | – | – | – | 3,104 |
| **Sub-totals** | **3,262** | – | – | – | – | **1,259** | – | – | – | **4,521** |
| Veterans Affairs | – | – | – | – | – | – | – | – | – | – |
| **Totals, all departments and agencies except National Defence** | **65,560** | **1,828** | **8,684** | **8,593** | **3,269** | **1,259** | **1,731** | **19,582** | **3,056** | **113,562** |
| National Defence: | | | | | | | | | | |
| Armed Forces | 25,717 | – | – | – | – | – | 704 | 1,427 | 3,034 | 30,882 |
| Defence Research Board | 13,982 | – | 6,525 | 373 | 373 | 746 | 1,491 | 11,186 | – | 34,876 |
| **Sub-totals** | **39,699** | – | **6,525** | **373** | **373** | **746** | **2,195** | **12,613** | **3,034** | **65,558** |
| **Totals, all departments and agencies** | **105,259** | **1,828** | **15,209** | **8,966** | **3,642** | **2,005** | **3,926** | **32,195** | **6,090** | **179,120** |

[1] Includes grants in aid of research.

**TABLE 6. Federal Government Expenditures on the Conduct of R & D[1] in the Physical Sciences, by Department or Agency and by Type of R & D Activity, Fiscal Years 1962-63 to 1964-65**

| Department or agency | 1962-63 | | | 1963-64[2] | | | 1964-65[2] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Basic research | Applied research | Development | Basic research | Applied research | Development | Basic research | Applied research | Development |
| | thousands of dollars | | | | | | | | |
| Agriculture: | | | | | | | | | |
| Administration Branch – Information Division | – | – | – | – | – | – | – | – | – |
| Health of Animals Branch – Animal Pathology Division | – | – | – | – | – | – | – | – | – |
| Research Branch | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | – | – | – | – | – | – | – | – | – |
| Board of Grain Commissioners – Grain Research Laboratory | – | – | – | – | – | – | – | – | – |
| Atomic Energy: | | | | | | | | | |
| Atomic Energy Control Board | 770 | – | – | 900 | – | – | 1,250 | – | – |
| Atomic Energy of Canada Limited | 5,436 | 15,497 | 6,595 | 7,092 | 17,111 | 6,086 | 8,376 | 18,167 | 7,140 |
| **Sub-totals** | **6,206** | **15,497** | **6,595** | **7,992** | **17,111** | **6,086** | **9,626** | **18,167** | **7,140** |
| Canadian Arsenals Limited | – | – | 412 | – | – | 355 | – | – | – |
| Central Mortgage and Housing Corporation | – | – | 3 | – | – | 12 | – | 45 | 19 |
| Defence Production – Department of Industry | – | – | 8,000 | – | – | 19,000 | – | – | 19,500 |
| Fisheries: | | | | | | | | | |
| Conservation and Development Service | – | 80 | 322 | – | 84 | 335 | – | 85 | 339 |
| Industrial Development Service | – | – | 634 | – | – | 609 | – | – | 702 |
| Inspection Service | – | – | 74 | – | – | 76 | – | – | 78 |
| **Sub-totals** | – | **80** | **1,030** | – | **84** | **1,020** | – | **85** | **1,119** |
| Fisheries Research Board of Canada | – | 404 | – | – | 386 | – | – | 397 | – |
| Forestry: | | | | | | | | | |
| Administration Branch | – | – | – | – | – | – | – | – | – |
| Forestry Entomology and Pathology Branch | – | – | – | – | – | – | – | – | – |
| Forest Products Research Branch | – | 1,247 | – | – | 1,270 | – | – | 1,400 | – |
| Forest Research Branch | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | – | **1,247** | – | – | **1,270** | – | – | **1,400** | – |
| Medical Research Council | – | – | – | – | – | – | – | – | – |
| Mines and Technical Surveys: | | | | | | | | | |
| Dominion Observatories Branch | 2,183 | – | – | 2,404 | – | – | 2,401 | – | – |
| Geographical Branch | – | – | – | – | – | – | – | – | – |
| Geological Survey of Canada | 1,334 | 2,439 | 38 | 1,400 | 2,560 | 40 | 1,444 | 2,640 | 41 |
| Marine Sciences Branch | – | 867 | – | – | 910 | – | – | 1,009 | – |
| Mines Branch | 925 | 1,996 | 1,947 | 942 | 2,002 | 1,987 | 967 | 2,056 | 2,040 |
| Polar Continental Shelf Project | 20 | 49 | 89 | 28 | 92 | 35 | 59 | 67 | 10 |
| Surveys and Mapping Branch | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | **4,462** | **5,351** | **2,074** | **4,774** | **5,564** | **2,062** | **4,871** | **5,772** | **2,091** |
| Dominion Coal Board | – | – | – | – | – | – | – | – | – |
| National Health and Welfare | – | – | – | – | – | – | – | – | – |
| National Research Council | 14,632 | 12,025 | 2,806 | 16,333 | 13,250 | 2,946 | 19,432 | 14,576 | 2,993 |
| Northern Affairs and National Resources: | | | | | | | | | |
| Canadian Wildlife Service | – | – | – | – | – | – | – | – | – |
| Northern Coordination and Research Centre | – | 30 | – | – | 35 | – | – | 60 | – |
| Water Resources Branch | – | 611 | – | – | 1,007 | – | – | 1,525 | – |
| **Sub-totals** | – | **641** | – | – | **1,042** | – | – | **1,585** | – |
| Post Office – Engineering Branch | – | – | 148 | – | – | 215 | – | – | 181 |
| Secretary of State: | | | | | | | | | |
| National Film Board | – | – | 29 | – | – | 38 | – | – | 42 |
| National Museum | – | – | – | – | – | – | – | – | – |
| Patent and Copyright Office – Patent Division | – | – | – | – | – | – | – | – | – |
| **Sub-totals** | – | – | **29** | – | – | **38** | – | – | **42** |
| Transport: | | | | | | | | | |
| Civil Aviation Branch | – | – | – | – | – | – | – | – | – |
| Construction Branch | – | – | 50 | – | – | 50 | – | – | 50 |
| Marine Works Branch | – | 83 | – | – | 201 | – | – | 108 | – |
| Meteorological Branch | 125 | 621 | 132 | 127 | 746 | 183 | 179 | 853 | 227 |
| Telecommunications and Electronics Branch | – | 26 | 232 | – | 122 | 1,093 | – | 310 | 2,794 |
| **Sub-totals** | **125** | **730** | **414** | **127** | **1,069** | **1,326** | **179** | **1,271** | **3,071** |
| Veterans Affairs | – | – | – | – | – | – | – | – | – |
| **Totals, all departments and agencies except National Defence** | **25,425** | **35,975** | **21,511** | **29,226** | **39,776** | **33,060** | **34,108** | **43,298** | **36,156** |
| National Defence: | | | | | | | | | |
| Armed Forces | – | 3,084 | 19,218 | – | 2,481 | 21,458 | – | 2,438 | 28,444 |
| Defence Research Board | – | 27,513 | – | – | 33,649 | – | – | 34,676 | – |
| **Sub-totals** | – | **30,597** | **19,218** | – | **36,130** | **21,458** | – | **37,114** | **28,444** |
| **Totals, all departments** | **25,425** | **66,572** | **40,729** | **29,226** | **75,906** | **54,518** | **34,108** | **80,412** | **64,600** |

[1] Includes grants in aid of research.
[2] Preliminary estimates.

**TABLE 7. Federal Government Expenditures on the Conduct of R & D[1] by Scientific Field and by Type of R & D Activity, Fiscal Years 1962-63 to 1964-65**

| Scientific field | 1962-63 | | | 1963-64[2] | | | 1964-65[2] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Basic research | Applied research | Development | Basic research | Applied research | Development | Basic research | Applied research | Development |
| | thousands of dollars | | | | | | | | |
| Physical sciences: | | | | | | | | | |
| Engineering: | | | | | | | | | |
| Aeronautical | 128 | 1,384 | 10,007 | 135 | 1,535 | 19,071 | 137 | 1,563 | 18,862 |
| Chemical | 310 | 1,688 | 466 | 361 | 2,011 | 426 | 461 | 2,181 | 432 |
| Civil | 176 | 1,487 | 746 | 283 | 1,560 | 319 | 420 | 1,680 | 342 |
| Electrical and electronic | 818 | 8,229 | 10,151 | 957 | 10,089 | 13,702 | 1,146 | 10,666 | 18,418 |
| Hydraulic | 81 | 1,126 | 505 | 86 | 1,409 | 526 | 87 | 1,353 | 534 |
| Mechanical | 505 | 4,988 | 4,062 | 637 | 5,654 | 5,474 | 693 | 5,955 | 11,109 |
| Mining | – | 164 | 789 | – | 172 | 805 | – | 204 | 876 |
| Other | 259 | 15,608 | 10,077 | 436 | 17,224 | 9,939 | 461 | 18,282 | 11,397 |
| **Sub-totals** | **2,277** | **34,674** | **36,803** | **2,895** | **39,854** | **50,264** | **3,405** | **41,884** | **59,970** |
| Other physical sciences: | | | | | | | | | |
| Astronomy | 1,275 | 245 | – | 1,355 | 259 | – | 1,560 | 268 | – |
| Chemistry | 4,496 | 7,296 | 135 | 4,903 | 8,794 | 121 | 5,572 | 9,490 | 147 |
| Earth sciences | 4,314 | 3,239 | 34 | 4,548 | 3,539 | 36 | 5,250 | 3,679 | 37 |
| Mathematics | 230 | 415 | – | 191 | 397 | – | 295 | 462 | – |
| Metallurgy | 565 | 1,639 | 877 | 833 | 1,755 | 926 | 699 | 1,933 | 1,010 |
| Meteorology | 125 | 1,213 | 132 | 127 | 1,470 | 163 | 179 | 1,599 | 227 |
| Oceanography | 201 | 3,210 | 139 | 253 | 3,306 | 132 | 325 | 3,446 | 155 |
| Physics, nuclear | 7,456 | 281 | 35 | 9,469 | 309 | 33 | 10,893 | 337 | 34 |
| Physics, non-nuclear | 4,176 | 13,371 | 428 | 4,423 | 15,031 | 437 | 5,117 | 15,366 | 448 |
| Other | 310 | 989 | 2,146 | 429 | 1,392 | 2,386 | 813 | 1,948 | 2,572 |
| **Totals, physical sciences** | **25,425** | **66,572** | **40,729** | **29,226** | **75,906** | **54,518** | **34,108** | **80,412** | **64,600** |
| Life sciences: | | | | | | | | | |
| Agricultural sciences: | | | | | | | | | |
| Agronomy and animal husbandry | 3,632 | 14,143 | 179 | 3,661 | 14,301 | 179 | 3,808 | 14,941 | 186 |
| Forestry | 152 | 4,773 | – | 161 | 5,023 | – | 171 | 5,362 | – |
| Other | 1,959 | 5,962 | 82 | 1,955 | 6,062 | 83 | 2,198 | 6,358 | 87 |
| **Sub-totals** | **5,743** | **24,878** | **261** | **5,777** | **25,386** | **262** | **8,177** | **26,661** | **273** |
| Biological sciences | 4,570 | 8,726 | 1,106 | 5,068 | 9,582 | 1,205 | 5,997 | 10,433 | 1,255 |
| Medical sciences | 4,060 | 6,588 | 263 | 4,774 | 7,550 | 305 | 5,976 | 8,762 | 374 |
| **Totals, life sciences** | **14,373** | **40,192** | **1,630** | **15,819** | **42,518** | **1,772** | **18,150** | **43,856** | **1,902** |
| **Totals, all scientific fields** | **39,798** | **106,764** | **42,359** | **44,845** | **118,424** | **56,290** | **52,258** | **124,268** | **66,502** |

[1] Includes grants in aid of research.
[2] Preliminary estimates.

**TABLE 8. Personnel Employed by the Federal Government in the Conduct of R & D, by Field and Level of Training, as of 31 March 1963**

| Field of scientific training | All departments and agencies, except the Armed Forces | | | | |
|---|---|---|---|---|---|
| | Level of training | | | Total employed | Full-time equivalent |
| | Bachelor | Master | Doctorate | | |
| Physical sciences: | | | | | |
| Engineering: | | | | | |
| Aeronautical | 11 | 24 | 4 | 39 | 39.0 |
| Chemical | 97 | 17 | 17 | 131 | 126.3 |
| Civil | 53 | 17 | 3 | 73 | 66.8 |
| Electrical and electronic | 171 | 67 | 27 | 265 | 251.5 |
| Hydraulic | 31 | 8 | – | 39 | 39.0 |
| Mechanical | 176 | 52 | 13 | 241 | 235.3 |
| Other[1] | 50 | 22 | 4 | 76 | 76.0 |
| **Sub-totals** | **589** | **207** | **68** | **864** | **833.9** |
| Other physical sciences: | | | | | |
| Chemistry | 162 | 60 | 253 | 475 | 469.0 |
| Earth sciences | 165 | 26 | 167 | 358 | 273.5 |
| Mathematics | 32 | 23 | 22 | 77 | 77.0 |
| Metallurgy | 44 | 15 | 24 | 83 | 82.3 |
| Meteorology | 6 | 30 | 2 | 38 | 38.0 |
| Physics, nuclear | 12 | 22 | 49 | 83 | 83.0 |
| Physics, non-nuclear | 129 | 95 | 172 | 396 | 395.5 |
| Other[2] | 2 | 12 | 15 | 29 | 29.0 |
| **Totals, physical sciences** | **1,141** | **490** | **772** | **2,403** | **2,281.2** |
| Life sciences: | | | | | |
| Agricultural sciences: | | | | | |
| Agronomy and animal husbandry | 183 | 237 | 265 | 685 | 685.0 |
| Forestry | 69 | 85 | 76 | 230 | 229.3 |
| Other | 74 | 87 | 95 | 256 | 242.0 |
| **Sub-totals** | **326** | **409** | **436** | **1,171** | **1,156.3** |
| Biological sciences | 73 | 100 | 175 | 348 | 345.0 |
| Medical sciences | 147 | 67 | 113 | 327 | 136.0 |
| **Totals, life sicences** | **546** | **576** | **724** | **1,846** | **1,637.3** |
| Administrators of R & D | 86 | 48 | 123 | 257 | 248.3 |
| **Totals, all scientists and engineers** | **1,773** | **1,114** | **1,619** | **4,506** | **4,166.8** |
| Supporting personnel: | | | | | |
| R & D technicians | | | | 4,498 | 3,931.2 |
| Skilled craftsmen | | | | 1,665 | 1,644.2 |
| Other supporting personnel | | | | 6,174 | 5,904.1 |
| **Totals, all supporting personnel** | | | | **12,337** | **11,479.5** |
| **Total employed in R & D** | | | | **16,843** | **15,646.3** |

[1] Includes mining engineers (16).
[2] Includes astromers (13) and oceanographers (14).

**TABLE 9. Personnel Employed[1] by the Federal Government[2] in the Conduct of R & D, by Major Departments or Agencies, as of 31 March 1963**

| Department or agency | Professional personnel | | | | Supporting personnel | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Bachelor degree | Master degree | Doctorate | Total | Technicians | Skilled workers | Other | Total | |
| Agriculture | 290 | 356 | 434 | 1,080 | 816 | 152 | 2,370 | 3,338 | 4,418 |
| Atomic Energy of Canada Ltd. | 247 | 62 | 100 | 409 | 587 | 895 | 630 | 2,112 | 2,521 |
| Defence Research Board | 218 | 164 | 166 | 548 | 592 | 96 | 1,150 | 1,838 | 2,386 |
| Fisheries | 101 | 65 | 67 | 233 | 463 | 7 | 201 | 671 | 904 |
| Forestry | 104 | 103 | 122 | 329 | 598 | 63 | 355 | 1,016 | 1,345 |
| Mines and Technical Surveys | 361 | 83 | 250 | 694 | 336 | 124 | 574 | 1,034 | 1,728 |
| National Health and Welfare | 95 | 58 | 110 | 263 | 234 | – | 41 | 275 | 538 |
| National Research Council | 181 | 144 | 349 | 674 | 636 | 297 | 759 | 1,692 | 2,386 |
| Other | 176 | 79 | 21 | 276 | 236 | 31 | 94 | 361 | 837 |
| **Totals** | **1,773** | **1,114** | **1,619** | **4,506** | **4,498** | **1,665** | **6,174** | **12,337** | **16,843** |

[1] Total numbers of personnel performing R & D and estimated administrative support staff. Includes seasonal staff and persons working part time only in R & D.
[2] Excluding the Armed Forces.

# QUESTIONNAIRE

Complete in duplicate. Keep one copy for your files and return one copy in the enclosed envelope to the Dominion Bureau of Statistics, Ottawa.

FOR IMMEDIATE ATTENTION

DOMINION BUREAU OF STATISTICS

Business Finance Division

# FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES

FISCAL YEAR 1962-63 ACTUAL

AND ESTIMATES 1963-64 AND 1964-65

This survey is being conducted in cooperation with the National Research Council, in an effort to assess the magnitude and direction of the federal government scientific program.

It is desired to publish the results of this survey in detail giving figures for each reporting unit. Permission is requested to consider all information reported on this form as available for publication. If your unit does not wish to give this permission please indicate in an accompanying letter.

Complete the questionnaire as fully as possible. If precise figures are not available, your best estimates will be satisfactory. Address enquiries to Business Finance Division, Dominion Bureau of Statistics.

Name of reporting unit _____

Name of person making this report _____ (Please print) Telephone _____ Date _____

6602–97: 17-10-63

A. IDENTIFICATION OF FUNDS FOR SCIENTIFIC ACTIVITIES

| Source of Funds | Funds | | |
|---|---|---|---|
| | Actual expenditures 1962-63 | Estimated expenditures 1963-64 | Estimated expenditures 1964-65 |
| 1. Funds available as a result of annual estimates | | | |
| 2. Cost of indirect support | | | |
| 3. Transfers from other units of your dept. or agency (identify) | | | |
| | | | |
| | | | |
| 4. Transfers from other depts. or agencies of the Federal Government (identify) | | | |
| | | | |
| | | | |
| 5. Funds received from other sources (identify) | | | |
| | | | |
| | | | |
| Sub-totals | | | |
| Deduct: | | | |
| 6. Transfers to other units of your dept. or agency (identify) | | | |
| | | | |
| 7. Transfers to other depts. or agencies of the Federal Government (identify) | | | |
| | | | |
| | | | |
| 8. Support provided non-scientific activities | | | |
| Sub-totals | | | |
| Total funds available | | | |

6602–97: 17-10-63

## A. IDENTIFICATION OF FUNDS

### Definitions

**Scientific activities** – all activities in the natural sciences concerned with the creation of new knowledge, new applications of knowledge to useful purposes, or the furtherance of both the creation of new knowledge or new applications. Routine applications of scientific knowledge or skills are NOT included, except when these are related to the creation and furtherance of new knowledge or applications. The social and psychological sciences are NOT included in this survey.

If required at this time, definitions of the various types of scientific activity may be found in the definitions sections of questions B, C and D.

### Instructions

A1 **Funds available as a result of annual estimates.** These are funds allotted to the department or agency by parliament. The 1962-63 expenditures would be the expenditures prepared for the Public Accounts by the department. The 1963-64 expenditures should be the suballotments when available, otherwise the estimates and supplementary estimates must be used. The 1964-65 expenditures are from the 1964-65 estimates.

A2 **Cost of indirect support.** This is mainly funds administered by other departments or agencies which are used for the benefit of your scientific activities. The departments involved are usually Public Works, Finance, Labour and the Post Office. Overhead costs at remote sites are to include net costs of requisite services such as housing, restaurants and utilities.

The relevant proportion of the value of the accommodation provided by your own department is also to be included.

A3 **Transfers from other units of your dept. or agency.** This includes all funds transferred from other units in support of your scientific activities. If this questionnaire is being completed at department or agency level this question is not applicable.

A4 **Transfers from other depts. or agencies.** These are funds received for the scientific activities of your organization from other departments or agencies.

A5 **Funds received from other sources.** These are mainly funds received as a result of sales or contracts and which are applied to the scientific activities of the unit, department or agency.

A6, A7 **Transfers.** All funds allocated to your organization which have been transferred to others within the Federal Government for scientific activities.

A8 **Support provided non-scientific activities.** Any portion of the funds shown in the answers to A1 to A5 which have been spent on non-scientific activities must be included here.

**Time periods** – The years 1962-63, 1963-64 and 1964-65 are the fiscal years April 1 to March 31.

**General** – If there is not sufficient space allowed for the names requested in A3 – A7, please put the total amount of the transfer in the applicable space and attach a separate sheet with the required names to your return.

**B. PERFORMERS OF SCIENTIFIC ACTIVITIES**

| Type of Scientific Activity | Performers | | | | | |
|---|---|---|---|---|---|---|
| | Reporting unit | Profit organizations | Educational institutions | Other non-profit institutions | Other | Total |
| **Actual expenditures 1962-63** | | | | | | |
| 1. R & D costs | | | | | | |
| 2. Grants-in-aid of research | | | | | | |
| Sub-totals | | | | | | |
| 3. Capital expenditures on R & D plant | | | | | | |
| 4. Capital expenditures on plant for other scientific activities | | | | | | |
| 5. Scientific data collection | | | | | | |
| 6. Scientific information | | | | | | |
| 7. Scholarship and fellowship programs | | | | | | |
| **Total expenditures** | | | | | | |
| **Estimated expenditures 1963-64** | | | | | | |
| 1. R & D costs | | | | | | |
| 2. Grants-in-aid of research | | | | | | |
| Sub-totals | | | | | | |
| 3. Capital expenditures on R & D plant | | | | | | |
| 4. Capital expenditures on plant for other scientific activities | | | | | | |
| 5. Scientific data collection | | | | | | |
| 6. Scientific information | | | | | | |
| 7. Scholarship and fellowship programs | | | | | | |
| **Total expenditures** | | | | | | |
| **Estimated expenditures 1964-65** | | | | | | |
| 1. R & D costs | | | | | | |
| 2. Grants-in-aid of research | | | | | | |
| Sub-totals | | | | | | |
| 3. Capital expenditures on R & D plant | | | | | | |
| 4. Capital expenditures on plant for other scientific activities | | | | | | |
| 5. Scientific data collection | | | | | | |
| 6. Scientific information | | | | | | |
| 7. Scholarship and fellowship programs | | | | | | |
| **Total expenditures** | | | | | | |

Identify the following performers from the above reply.

| | Actual expenditures 1962-63 | Estimated expenditures 1963-64 |
|---|---|---|
| 1. The 5 profit organizations to which you made the largest payments for their performance of scientific activities – | | |
| ..... | | |
| ..... | | |
| ..... | | |
| ..... | | |
| ..... | | |
| 2. Educational institutions – | | |
| ..... | | |
| ..... | | |
| ..... | | |
| **Total payments to educational institutions** ..... | | |
| 3. Other non-profit institutions – | | |
| ..... | | |
| ..... | | |
| ..... | | |
| **Total payments to other non-profit institutions** ..... | | |
| 4. Others – | | |
| ..... | | |
| ..... | | |
| **Total payments to others** ..... | | |

6602–97: 17-10-63

## B. PERFORMERS OF SCIENTIFIC ACTIVITIES

### Definitions

**R & D** – consists of basic research, applied research and development.

Research is investigative, experimental and generally original work undertaken primarily for the advancement of scientific knowledge. There may, or may not, be a specific practical application in view.

Development is the use of the results of research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. It includes the design, construction and testing of pilot plants and prototypes.

(More extensive notes on research and development are in the definitions of question C.)

**Grants-in-aid of research** – grants which are expressly designated as being in support of scientific research.

**Capital expenditures** – expenditures on land, buildings, facilities and major equipment used for either R & D or other scientific activities.

**Reporting unit** – any department or agency, or part of a department or agency, for which a questionnaire is completed.

**Profit organization** – Canadian business enterprises, research institutions and trade associations operated by industries for their own benefit, public utilities and other commercial-type corporations owned by Canadian governments.

**Education institutions** – Canadian universities and colleges.

**Other non-profit institutions** – institutions and foundations conducting some scientific activity and not primarily designed to make a profit or to provide profit organizations with research results.

**Others** – includes all foreign recipients of Federal Government funds for scientific activities, units of the Federal Government performing scientific activities for the reporting unit without a precedent transfer of funds (cf. A6 and A7), and units of provincial or municipal government receiving funds for scientific activities.

### Instructions

B1 **R & D costs.** Include all expenditures which are attributable to R & D as defined above. Remember to include the costs of planning and administering R & D. Depreciation of capital equipment is NOT to be included here or elsewhere as a cost of R & D, nor is R & D into the social and psychological sciences to be considered.

B2 **Grants-in-aid of research.** Include the costs of administering such programs. The performer of such administration would be usually the reporting unit. The performer of the research is normally an education institution or an industry (profit organization).

B3 **Capital expenditures on R & D plant.** Only the amounts estimated to be **spent** or actually spent during the years 1962-63, 1963-64 and 1964-65 are to be reported. Capital R & D expenditures for multi-purpose plant should be based on the proportion of the plant used for R & D.

B4 **Capital expenditures on plant for other scientific activities.** The expenditures on plant used for scientific data collection or the processing, indexing, cataloguing and dissemination of scientific information. When this plant is also used for other purposes, only the relevant proportion of capital expenditures may be given.

B5 **Scientific data collection.** This is the cost of collecting scientific data on natural phenomena. It includes data used for mapping; collection of geologic, hydrologic, geo-magnetic, meteorologic, astronomic and other physical data; and the collection of entomological specimens and other biologic data. Exclude data collection done in the course of carrying out a specific R & D project or program as this activity should be included under the conduct of R & D. Exclude also data collection done solely for internal operating purposes. If, however, these data are made available for general use, additional costs of material and personnel are to be included. The presentation of these data in reports, maps and other publications is included under the dissemination of scientific information described below.

B6 **Scientific information.** This includes the costs of library operations, translation, procurement and publication services in connection with information required in, or resulting from, scientific activities; standardization of terminology and the making of scientific or technical glossaries; and the support, including travel allowances, of scientific conferences and symposia.

B7 **Scholarship and fellowship programs.** Costs, including administrative costs, of scholarships and fellowships granted to persons who are or who will be engaged in a scientific activity. The reporting unit would normally be a performer in respect of the costs of its administration of such a program. An educational institution is normally the performer of the scientific activity.

### General

(a) The row total of the column "total" must equal the total funds provided in question A for each of the years 1962-63, 1963-64 and 1964-65.

(b) If there is not sufficient spaces for you to name all the institutions performing scientific activities for you, please attach a separate sheet with a complete list.

(c) If you are aware that the recipient of funds for a scientific activity did not perform the activity but allocated it to some other performer, please complete this question for the **ultimate** performer.

C. FIELD OF RESEARCH

| Field of Research | Actual expenditures 1962-63 | | | Estimated expenditures 1963-64 | | | Estimated expenditures 1964-65 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Basic research | Applied research | Development | Basic research | Applied research | Development | Basic research | Applied research | Development |
| **Physical sciences:** | | | | | | | | | |
| Engineering: | | | | | | | | | |
| Aeronautical | | | | | | | | | |
| Chemical | | | | | | | | | |
| Civil | | | | | | | | | |
| Electrical and electronic | | | | | | | | | |
| Hydraulic | | | | | | | | | |
| Mechanical | | | | | | | | | |
| Mining | | | | | | | | | |
| Other (identify) | | | | | | | | | |
| **Totals, engineering** | | | | | | | | | |
| Other physical sciences: | | | | | | | | | |
| Astronomy | | | | | | | | | |
| Chemistry | | | | | | | | | |
| Geology, geophysics and other earth sciences | | | | | | | | | |
| Mathematics | | | | | | | | | |
| Metallurgy | | | | | | | | | |
| Meteorology | | | | | | | | | |
| Oceanography | | | | | | | | | |
| Physics, nuclear | | | | | | | | | |
| Physics, non-nuclear | | | | | | | | | |
| Other (identify) | | | | | | | | | |
| **Totals, all physical sciences** | | | | | | | | | |
| **Life Sciences:** | | | | | | | | | |
| Agricultural sciences: | | | | | | | | | |
| Agronomy | | | | | | | | | |
| Animal husbandry | | | | | | | | | |
| Forestry | | | | | | | | | |
| Veterinary science | | | | | | | | | |
| Other (identify) | | | | | | | | | |
| Biological sciences: | | | | | | | | | |
| Biology, bio-chemistry, bio-physics | | | | | | | | | |
| Other (identify) | | | | | | | | | |
| Medical sciences: | | | | | | | | | |
| Dentistry | | | | | | | | | |
| Medicine | | | | | | | | | |
| Pharmacy | | | | | | | | | |
| **Totals, all life sciences** | | | | | | | | | |
| **Totals, all fields of research** | | | | | | | | | |

6602–97: 17-10-63

## C. FIELD OF RESEARCH

### Definitions

**Field of research** – divided into two groups:

(a) The **physical sciences,** which consist of those sciences concerned primarily with understanding the natural phenomena associated with non-living things; mathematics, pure and applied; and the engineering sciences, which are concerned with studies directed toward developing scientific principles usable in engineering practice.

(b) The **life sciences,** which are those sciences dealing with the physical processes and characteristics of all living matter. They include agriculture, which is directed toward understanding and improving agricultural productivity; the biological sciences, which study the life processes and classify living organisms; and medicine, which comprises those sciences that, apart from the strictly clinical aspects of professional medicine, are concerned primarily with the utilization of scientific principles in understanding human diseases and in maintaining and improving human health.

**Basic research** is work undertaken primarily for the advancement of scientific knowledge, without a specific practical aim in view.

**Applied research** is work undertaken primarily, for the advancement of scientific knowledge, but with a specific practical aim in view.

Practical distinctions between basic and applied research may be based on the **aim,** the **method** and the **results** of the research.

The aims of basic and applied research are different. The aim of basic research is to satisfy curiosity or to extend theoretical knowledge; the object of applied research is to solve a particular problem, to improve an existing product or process or to enable a discovery or existing knowledge to be used in a specific situation or area.

The methods of research will often be different. In basic research the investigators will be less restricted in the subject and direction of their work than will be the case in applied research. Basic research is probably conducted as an individual project rather than a group project oftener than is the case in applied research.

The results of the two types of research may well be different. The findings of a basic research project are more likely to have a broad, fundamental significance. They may lead to a multiple number of applications, whereas the results of applied research will often be of use only to a particular area or project.

**Development** is the use of the results of fundamental and applied research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. Difficulty is often experienced in distinguishing between development and production costs.

The criterion must be the reason for which the work is undertaken. If the primary aim is to improve the quality of the product or process, the relevent expenditures are for development. If the primary motive is to get the production process set up, the work is NOT development.

The design, construction and testing of prototypes is R & D, but the costs of trial production runs are NOT development costs. After an original prototype has been successfully tested and no more development work is required, limited scale manufacture of the item, even though they may still be called "prototypes", cannot be included in development.

The cost of changes in design made necessary because of changed fashions or styles unaccompanied by technological innovation is NOT R & D.

Once the experimental phase of a pilot plant is over, it may be operated as a productive unit. As soon as the primary purpose in operating a pilot plant is for production, the costs of operation may no longer be attributed to development.

### Instructions

**General** – The R & D expenditures to be considered in this question are the total R & D current expenditures of question **B** (i.e. **B1** and **B2**). Hence the sum of total expenditures of each of the three components of R & D in this question must equal the total of **B1** and **B2**.

In many cases you may have to ask for estimates of field of research and type of work from the scientists employed on R & D. Unless there are particularly heavy expenditures on some experimental apparatus or material, this method will yield a sufficiently accurate break-down of R & D for this question.

If your unit, department or agency has an accounting system that will supply you with more accurate figures, or if the directors of the R & D program can make a more exact estimate, please disregard the above suggestion.

D. FIELD OF APPLICATION

1. Application expected to benefit industry directly.

| Industry | Application costs | | | | | |
|---|---|---|---|---|---|---|
| | Actual expenditures 1962-63 | | Estimated expenditures 1963-64 | | Estimated expenditures 1964-65 | |
| | % | Amount | % | Amount | % | Amount |
| Mines, quarries and oil wells | | | | | | |
| Food and beverage | | | | | | |
| Rubber | | | | | | |
| Textile | | | | | | |
| Wood | | | | | | |
| Furniture and fixtures | | | | | | |
| Paper and allied industries | | | | | | |
| Primary metal | | | | | | |
| Metal fabricating | | | | | | |
| Machinery | | | | | | |
| Aircraft and parts | | | | | | |
| Other transportation equipment | | | | | | |
| Electrical products | | | | | | |
| Non-metallic mineral products | | | | | | |
| Petroleum and coal products | | | | | | |
| Chemical and chemical products | | | | | | |
| Professional and scientific equipment | | | | | | |
| Transportation, storage, communication and other utilities | | | | | | |
| Construction | | | | | | |
| Other (identify) | | | | | | |
| | | | | | | |
| | | | | | | |
| Totals, application for industry | | | | | | |

2. Application not expected to aid industry directly.

| Field of Science | | | | | | |
|---|---|---|---|---|---|---|
| Military science | | | | | | |
| Nuclear science | | | | | | |
| Space travel and communications | | | | | | |
| Life sciences: Agricultural | | | | | | |
| Biological | | | | | | |
| Medical | | | | | | |
| Physical sciences (identify) | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Totals, application not for industry | | | | | | |
| Total application costs | | | | | | |

6602–97: 17-10-63

## D. FIELD OF APPLICATION

### Definitions

**Field of application** – the economic area or scientific field expected to benefit from the application of the results of research.

**Industry** – the industries are defined as follows:

a) **Mines, quarries and oil wells** – companies primarily engaged in both mineral and non-mineral mining, the extraction of mineral fuels, the operation of quarries and sand pits, or the provision of certain services to these operations.

b) **Food and beverage** – companies primarily engaged in preparing food and beverage materials for consumption.

c) **Rubber** – companies primarily engaged in manufacturing all kinds of natural or synthetic rubber products.

d) **Textile** – companies primarily engaged in preparing thread, yarn or fabrics made of cotton, wool or synthetic materials; in the processing of fibres and felt; in the manufacture of cordage, carpets, cloth bags and coated fabrics such as linoleum; and in the dyeing and finishing of fabrics.

e) **Wood** – companies primarily engaged in producing lumber and wood basic materials, and manufacturing finished articles made entirely or mainly of wood.

f) **Furniture and fixtures** – companies primarily engaged in the manufacture of furniture and fixtures for the household, office or school, regardless of the materials used.

g) **Paper and allied industries** – companies primarily engaged in the manufacture of pulp either from wood or other fibres, conversion of these pulps into any kind of paper or paper board, or the manufacture of paper and paper board into converted products such as asphalt shingles or fibre tubes.

h) **Primary metal** – includes iron and steel mills, steel pipe and tube mills, iron foundries, and companies primarily engaged in smelting and refining ores, or in rolling, casting and extruding metals.

i) **Metal fabricating** – companies primarily engaged in fabricating structural steels; in stamping, pressing and coating sheet metal; in manufacturing ornamental metal products, wire and wire products, hardware, tools and cutlery, and heating equipment. Machine shops, boiler and plate works are also included.

j) **Machinery** – companies primarily engaged in manufacturing agricultural implements, commercial refrigeration and air conditioning equipment, office and store machinery, and machinery and equipment used for construction, mining, processing and manufacturing.

k) **Aircraft and parts** – companies primarily engaged in manufacturing, assembling or repairing aircraft and parts.

l) **Other transportation equipment** – companies primarily engaged in manufacturing or assembling motor vehicles, railroad rolling stock, ships and boats, or in the repair of all of the above items except motor vehicles.

m) **Electrical products** – companies primarily engaged in the manufacture of electrical machinery and appliances, communication equipment, and other electrical products such as electric wires, batteries, fixtures, computors and data processors.

n) **Non-metallic mineral products** – companies primarily engaged in the manufacture of articles made entirely or mainly of non-metallic minerals such as cement, asbestos, clay, glass, stone and concrete, or in the preparation of such materials.

o) **Petroleum and coal products** – companies primarily engaged in refining crude petroleum, and in manufacturing petroleum and coal products.

p) **Chemical and chemical products** – companies primarily engaged in manufacturing industrial chemicals, medicinal and pharmaceutical preparations, soaps and washing compounds, paints and varnishes and miscellaneous chemicals including fertilizers, sweeping compounds, adhesives, polishes and dressings.

q) **Scientific and professional equipment** – companies primarily engaged in manufacturing instruments and equipment used in scientific apparatus or laboratories, or used by professions such as medicine, dentistry, photography and engineering. Miscellaneous equipment such as eye glasses, artifical limbs, bomb sights and range finders are also included.

r) **Transportation, storage, communication and other utilities** – companies primarily engaged in the operation of air, land or water transportation services, in the storage of grain and other commodities, in the operation and maintenance of communication systems, or in providing utilities such as electric power, gas, water and steam.

s) **Construction** – contractors engaged in the construction of buildings, highways, bridges and utilities.

**Field of science** – the definitions are as follows:

a) **Nuclear science** includes both nuclear physics and nuclear energy. Work directed toward the creation or improvement of instruments, equipment and buildings used in the production, investigation, control and utilization of nuclear energy is included, as are all programs to provide devices and clothing designed for protection against the effects of releases of nuclear energy. The utilization of auclear science for military purposes is to be included.

b) **Space travel and communications** include the conception, design, construction and launching of space vehicles, the communications between such vehicles and the earth or with other vehicles, and the exploration of non-terrestial phenomena by means of such vehicles or communications.

Work on the materials and fuels required for space vehicles or the protection of passengers is included, as is work on missiles not intended for space but using similar designs or fuel. All space travel and communications are covered, whether or not there are military applications of the equipment or techniques. Astronomy and earth-to-earth communications are NOT included.

c) **Military science** covers all projects undertaken primarily because of their military implications, but excluding all such work in the fields of nuclear science or space travel and communications. When a project or study is of interest to both the civil and military authorities the criteria should be:

(1) the degree of security imposed,
(2) the source of funds, and
(3) the amount of cooperation with other civil and military units or programs.

d) **Life and physical sciences** and defined in question C above.

### Instructions

**General** – the total amount assigned to application must be the sum of the totals of applied research and development (question C).

The percentage required in the two small columns is the percentage of total application costs spent for that industry or field of science. Hence the percentage of "Total application costs" at the bottom of question D must be 100.

**Industry vs Field of Science** – the costs of application are to he entered in D1 when the application is expected to aid industry directly. Examples might be the preservation of foods, the development of new metal alloys, or experiments in construction in the Arctic. The costs of R & D contracts from an industry or firm are, of course, to be entered in D1. If you are not certain of the industry but are working for a particular firm, you may supply the name of the firm instead of the industry. Indirect benefits to industry, such as paymeats to the electrical products industry for work performed oa space vehicles, are NOT to be considered in D1.

In section D2, when assigning the cost of an application aot expected to benefit industry directly, you must decide the **primary** reason for the project. For example, work on the chemical properties of war gases would normally be considered as a project ia the field of military sciences. However, if the same gas were being developed as a plant spray it would probably be included as an application in agricultural science. In neither case would it be considered as being undertaken for the benefit of the chemical industry.

## E. PERSONNEL EMPLOYED IN R & D

The number of persons engaged in the conduct of R & D in your unit, department or agency as of 31 March 1963.

1. Scientists and engineers

| Field of Training | Level of training | | | Total number employed | Full-time equivalent |
|---|---|---|---|---|---|
| | Bachelor | Master | Doctorate | | |
| **Physical scientists:** | | | | | |
| Aeronautical engineering | | | | | |
| Chemical | | | | | |
| Civil | | | | | |
| Electrical and electronic | | | | | |
| Hydraulic | | | | | |
| Mechanical | | | | | |
| Mining | | | | | |
| Other engineering (identify) | | | | | |
| | | | | | |
| **Sub-totals** | | | | | |
| Astronomy | | | | | |
| Chemistry | | | | | |
| Geology, geophysics and other earth sciences | | | | | |
| Mathematics | | | | | |
| Metallurgy | | | | | |
| Meteorology | | | | | |
| Oceanography | | | | | |
| Physics, nuclear | | | | | |
| Physics, non-nuclear | | | | | |
| Others (identify) | | | | | |
| | | | | | |
| **Totals, physical scientists** | | | | | |
| **Life scientists:** | | | | | |
| Agricultural sciences: | | | | | |
| Agronomy | | | | | |
| Animal husbandry | | | | | |
| Forestry | | | | | |
| Veterinary science | | | | | |
| Other (identify) | | | | | |
| Biological sciences: | | | | | |
| Biology, bio-chemistry, bio-physics | | | | | |
| Other (identify) | | | | | |
| Medical sciences: | | | | | |
| Dentistry | | | | | |
| Medicine | | | | | |
| Pharmacy | | | | | |
| **Totals, life scientists** | | | | | |
| Administrators of R & D | | | | | |
| **Totals, all scientists and engineers** | | | | | |

2. Supporting personnel

| | Total number | Full-time equivalent |
|---|---|---|
| R & D technicians | | |
| Skilled craftsmen | | |
| Other supporting personnel | | |
| **Total, supporting personnel** | | |

6602–97: 17-10-63

## E. PERSONNEL EMPLOYED IN R & D

### Definitions

**Field of training** – the branch of engineering or the field of science in which each person in your organization, engaged in the conduct or administration of R & D, trained in preparation for his highest academic degree or professional qualification.

**Level of training** – the highest academic degree of each of the persons engaged in the conduct or administration of R & D. Those employed as scientists and engineers who do not have a university degree but possess an equivalent diploma or who have the qualifactions required for admission to their professional society will normally be considered as being at the bachelor level of training.

**Full-time equivalent** – full-time employment on scientific activities is considered as being about 30 hours (or more) a week, excluding normal holidays. This time need not be spent only in the laboratory or project area, but might include time spent in administering R & D, using the library or recruiting other R & D workers. For example, a scientist who normally spends 40 hours a week on such activities is considered one full-time unit, but two scientists, each devoting 20 hours a week to R & D, would be considered one and one-third full-time units.

**Supporting personnel** – there are three classes of supporting personnel.

a) **R & D Technicians** are technical personnel having high school graduation or equivalent and with additional technical training, who assist scientists and engineers in R & D work (e.g. draughtsmen, laboratory assistants, electronic technicians).

b) **Skilled craftsmen** are workers in positions requiring specialized training or experience and who are engaged in R & D work (e.g. glass blowers, machinists, model makers).

c) **Other supporting personnel** are all other persons whose pay is included in the direct cost of the conduct of R & D or the administration of grants-in-aid of research (e.g. clerical staff and apprentices, but NOT janitors or canteen attendents).

### Instructions

**Full-time equivalent** – to derive the full-time equivalent, it is recommended that you first consider how many people are employed full time in the conduct or administration of R & D, and then add an estimate of the full-time equivalent of the remainder.

**Administrators of R & D** – do not consider their field of training but describe them only by their highest degree or professional qualification.

**Seasonal staff** – if the employment in R & D within your unit, department or agency varied by more than 10% during the fiscal year 1962-63, please estimate the deviation from the figure for March 31, 1963.

(a) If there was a total employment in R & D of 90% or less of the March 31 employment during 1962-63, please estimate the average number of R & D workers, professionals and supporting personnel, employed during the year.

(b) If the total employment exceeded the March 31 figure by 10% or more, estimate, on a separate sheet of paper, the man-year equivalent of the excess (presumably seasonal staff). Consider one year as equal to 48 weeks. Give this man-year equivalent for the applicable fields of training for those employed as professionals. Do not break down the figures by level of training. Also give the man-year equivalent for those who were employed as supporting personnel. Do not break down this estimate into the three classes of supporting personnel. For example, if your organization hired 15 chemistry undergraduates for R & D for the period May 15 to September 1, of whom 10 were used at the professional level and 5 were employed as supporting personnel, the correct man-year estimates would be 2.75 man-years at the professional level for the field of training of chemistry and 1.38 man-years for supporting personnel.

**NOTE:** Only personnel engaged in the conduct or administration of R & D are to be considered. Do NOT include personnel engaged in the other scientific activities.

## F. GENERAL AREA OF R & D

### 1. Current expenditures on R & D

| Area | Actual expenditures 1962-63 | | Estimated expenditures 1963-64 | | Estimated expenditures 1964-65 | |
|---|---|---|---|---|---|---|
| | % | Amount | % | Amount | % | Amount |
| Nuclear science | | | | | | |
| Space travel and communications | | | | | | |
| Military science (excluding nuclear and space) | | | | | | |
| Other projects | | | | | | |
| **Total R & D current expenditures** | | | | | | |

### 2. Capital expenditures on R & D

| Area | Actual expenditures 1962-63 | | Estimated expenditures 1963-64 | | Estimated expenditures 1964-65 | |
|---|---|---|---|---|---|---|
| | % | Amount | % | Amount | % | Amount |
| Nuclear science | | | | | | |
| Space travel and communications | | | | | | |
| Military science (excluding nuclear and space) | | | | | | |
| Other projects | | | | | | |
| **Total R & D capital expenditures** | | | | | | |

**Instructions**

1. The definitions to be used are those of question **D**.
2. The total R & D current expenditures must equal the sum of the totals of R & D costs and grants-in-aid of research of question **B**.
3. "Other projects" is merely the difference between total R & D current or capital expenditures, and the sum of nuclear science, space travel and communications, and military science.
4. Capital equipment does not include equipment such as missiles or space vehicles, which since they will be used only once, are considered current expenditures
5. The first half of this question, **F1**, differs from question **D** only that basic research is now included.
6. In **F2**, "Total R & D capital expenditures" must equal the totals of question **B3**.
7. The percentage of the totals of both current and capital expenditures on R & D must be 100.

6602–97: 17-10-63

FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES — FISCAL YEAR 1962-63