

Ken Kelly

SCIENTIFIC ACTIVITIES

FEDERAL GOVERNMENT COSTS 1958-59 TO 1971-72



Ministry
of State

Science and
Technology

NOVEMBER, 1971

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SCIENTIFIC ACTIVITIES

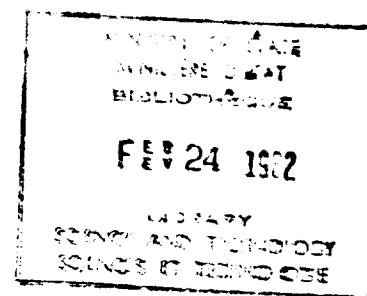
FEDERAL GOVERNMENT COSTS 1958-59 TO 1971-72

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Ministry

of State

Science and
Technology



NOVEMBER, 1971

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F O R E W O R D

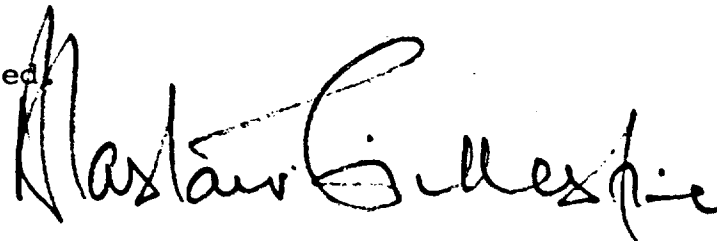
This latest edition of the "Green Book" of charts, maps and tables, presenting statistics of interest to policymakers in the natural sciences and engineering, has now been released. On this occasion, the booklet has been produced under the auspices of the Ministry of State for Science and Technology which has taken over the task from the former Science Secretariat of the Privy Council Office.

In order to carry out its mandate, the Ministry will be creating an information centre and, accordingly, it is probable that future issues of the "Green Book", which is expected to be an annual feature, will be more comprehensive in scope.

It should be noted that the statistics quoted in this booklet have been produced at an earlier date than has been possible in former years. This is due, in large measure, to the activities of the Interdepartmental Committee on Scientific Expenditures and of Statistics Canada.

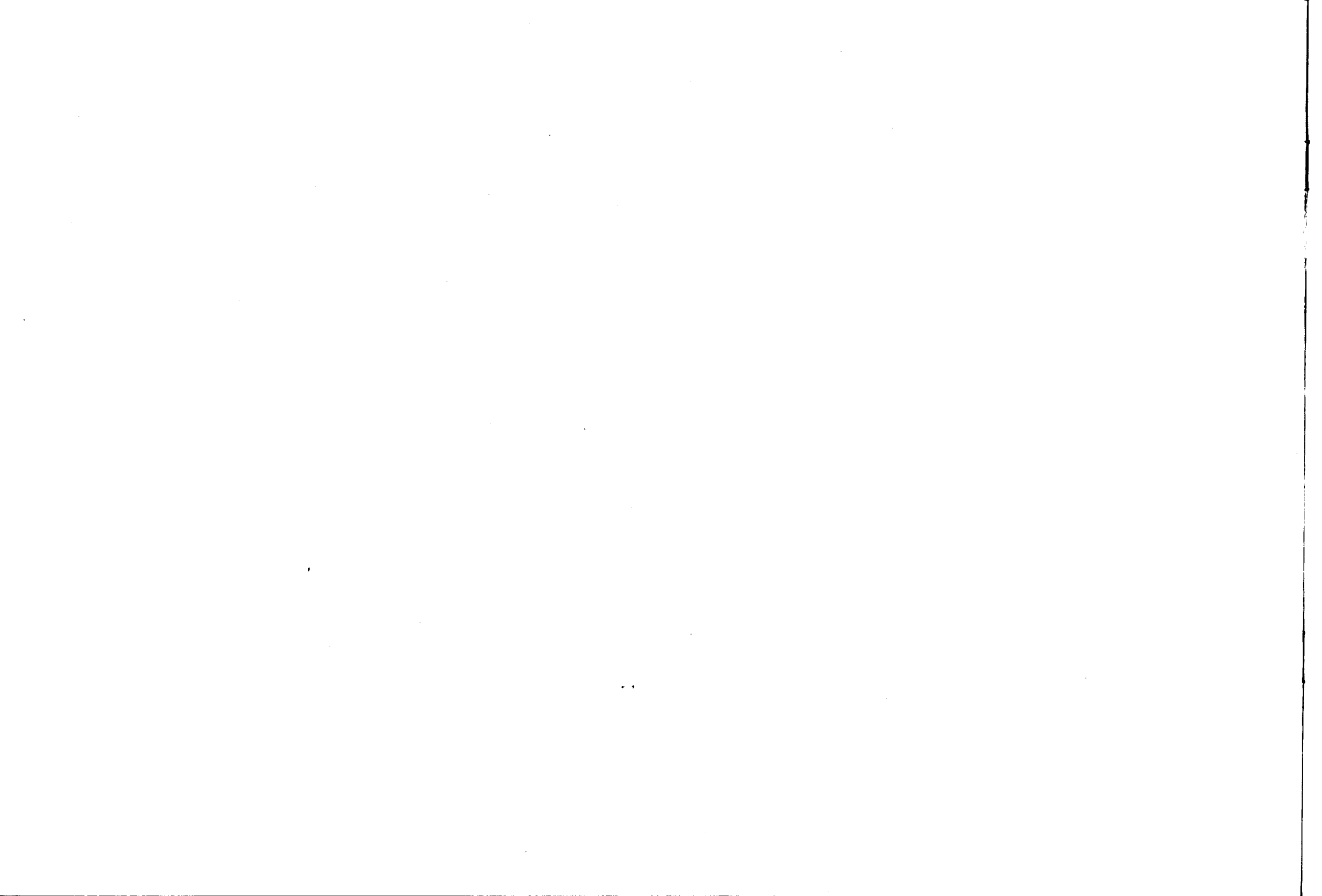
The Ministry gratefully acknowledges the cooperation of Statistics Canada in providing most of the data used herein.

Comments and criticisms will be welcomed.

A handwritten signature in black ink, reading "Alastair Gillespie". The signature is written in a cursive style with a large initial 'A'.

The Honourable Alastair Gillespie
Minister of State
for Science and Technology

October 1971
Ottawa



E X P L A N A T O R Y N O T E S

The data presented in Table 1 and Charts 3 - 8 of this publication represent the 'costs' of scientific activities. In previous years the term 'expenditures' has been used. However, as re-defined in 1971 by the Interdepartmental Committee on Scientific Expenditures, this latter term now has a more limited meaning. Expenditures are only the direct costs of the scientific activities of a department or agency; the indirect costs of scientific activities - the value of services provided by other departments, accommodation provided by the reporting agency and administration program costs attributable to scientific activities - are excluded. This narrower definition was adopted to obtain scientific expenditure data that are more directly comparable to the government financial record system. The total costs of science are equal to the total expenditures on science plus indirect costs. This distinction between costs and expenditures is relevant only to the intramural activities of federal departments and agencies, where indirect costs are a factor. These concepts should be kept in mind when comparing data presented here with Statistics Canada publications on scientific activities.

The year 1971 also marked the creation of the new Department of the Environment from the former Department of Fisheries and Forestry, the Water Resources Program of the Department of Energy, Mines and Resources, the Canadian Wildlife Service of the Department of Indian Affairs and Northern Development, the Meteorological Branch of the Ministry of Transport and elements of the Department of National Health and Welfare. The new department is now the single largest spender on science in Canada.

It should be noted that Charts 1 and 2 are based on advance data supplied by the Organization for Economic Co-operation and Development (OECD). These figures are preliminary and subject to revision. The data for Canada in this series includes indirect costs.

GROSS EXPENDITURES ON RESEARCH & DEVELOPMENT - 1969

AS A PERCENTAGE OF GROSS NATIONAL PRODUCT

SOURCE: OECD PREPARED BY M.O.S.S.T

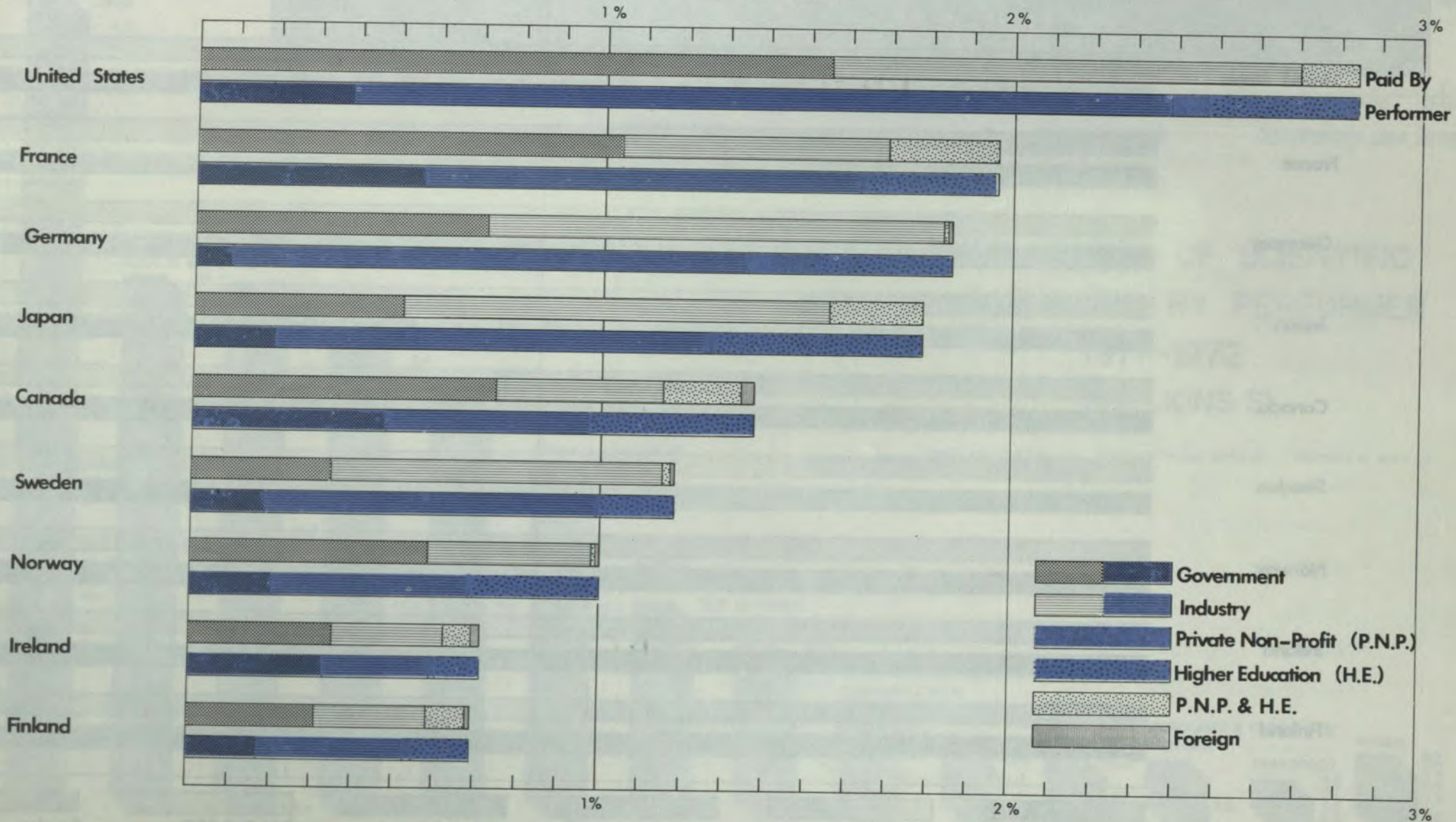


CHART 1

GROSS EXPENDITURES ON RESEARCH & DEVELOPMENT - 1969 AS PER CENT OF TOTALS

SOURCE: OECD PREPARED BY M.O.S.S.T.

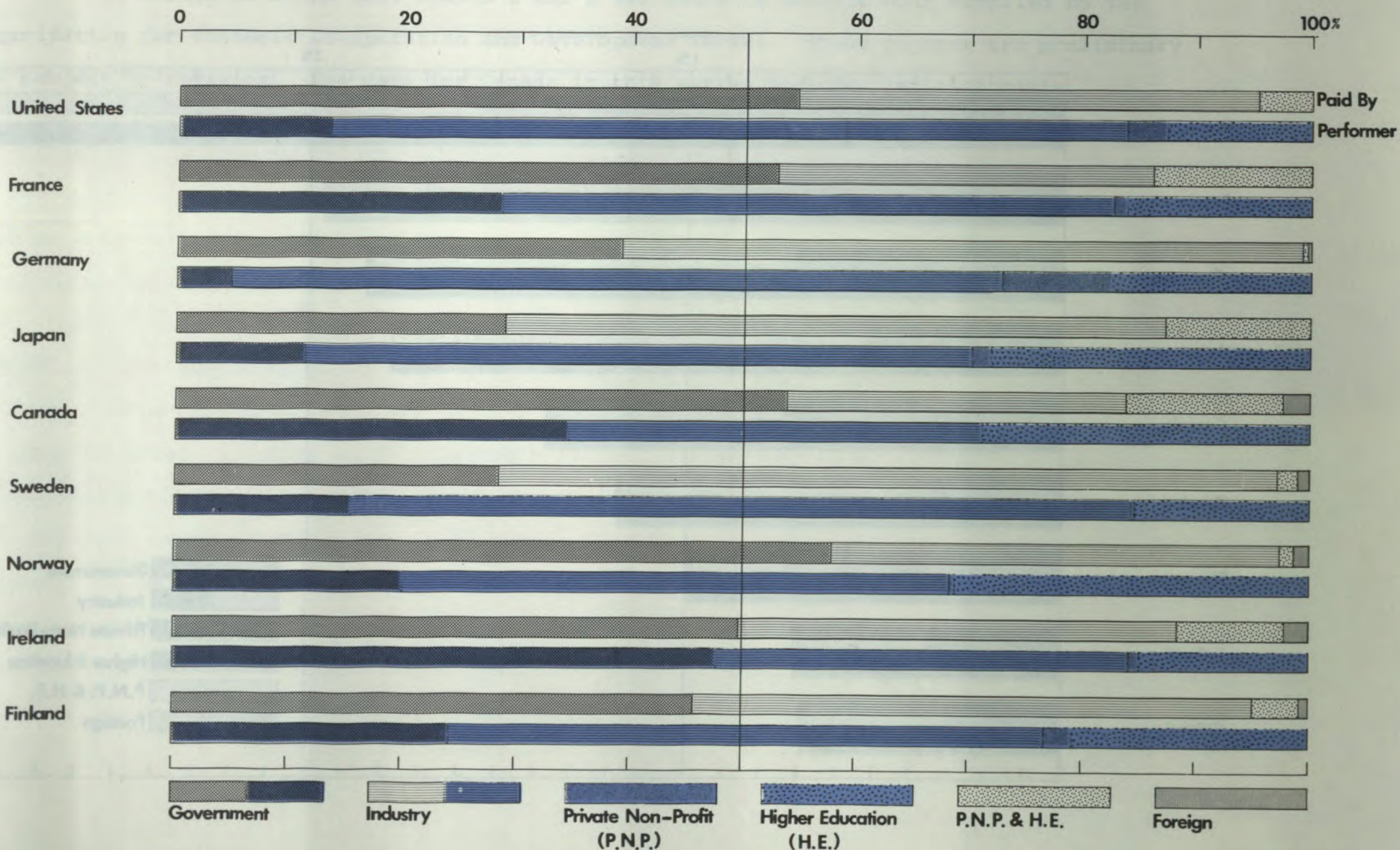
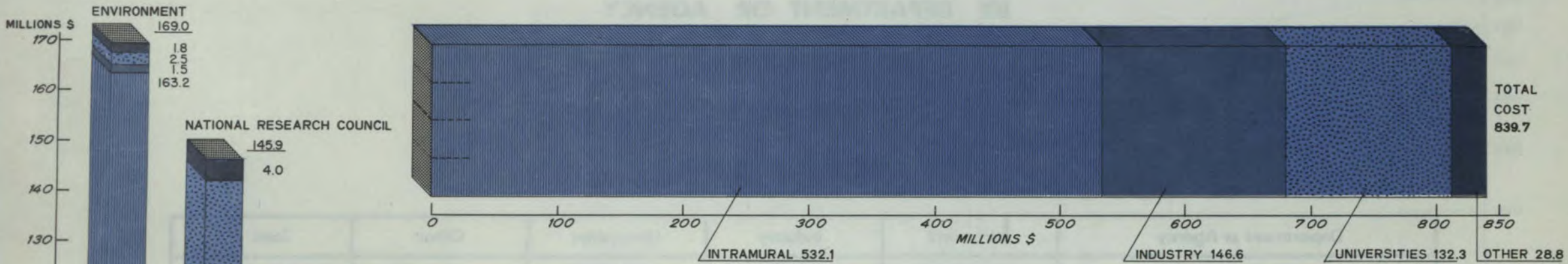


CHART 2

TOTAL COSTS OF RESEARCH & DEVELOPMENT
BY DEPARTMENT OR AGENCY



TOTAL COSTS OF SCIENTIFIC ACTIVITIES BY PERFORMER 1971-1972 (MILLIONS \$)

SOURCE: STATISTICS, CANADA, DEPARTMENTS AND AGENCIES. PREPARED BY M.O.S.S.T.

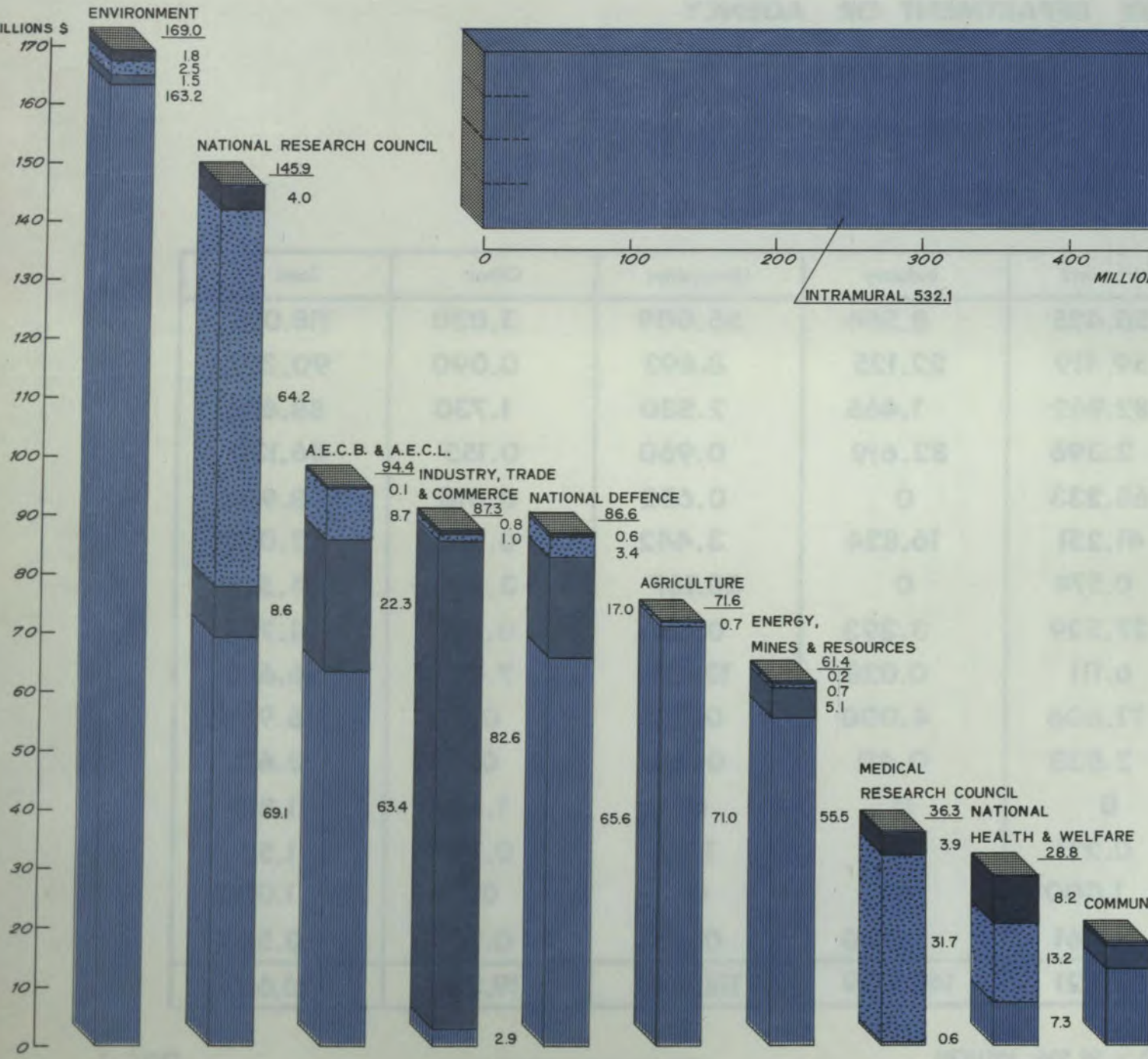


CHART 3

TOTAL COSTS OF RESEARCH & DEVELOPMENT

BY DEPARTMENT OR AGENCY

BY PERFORMER

1971-72

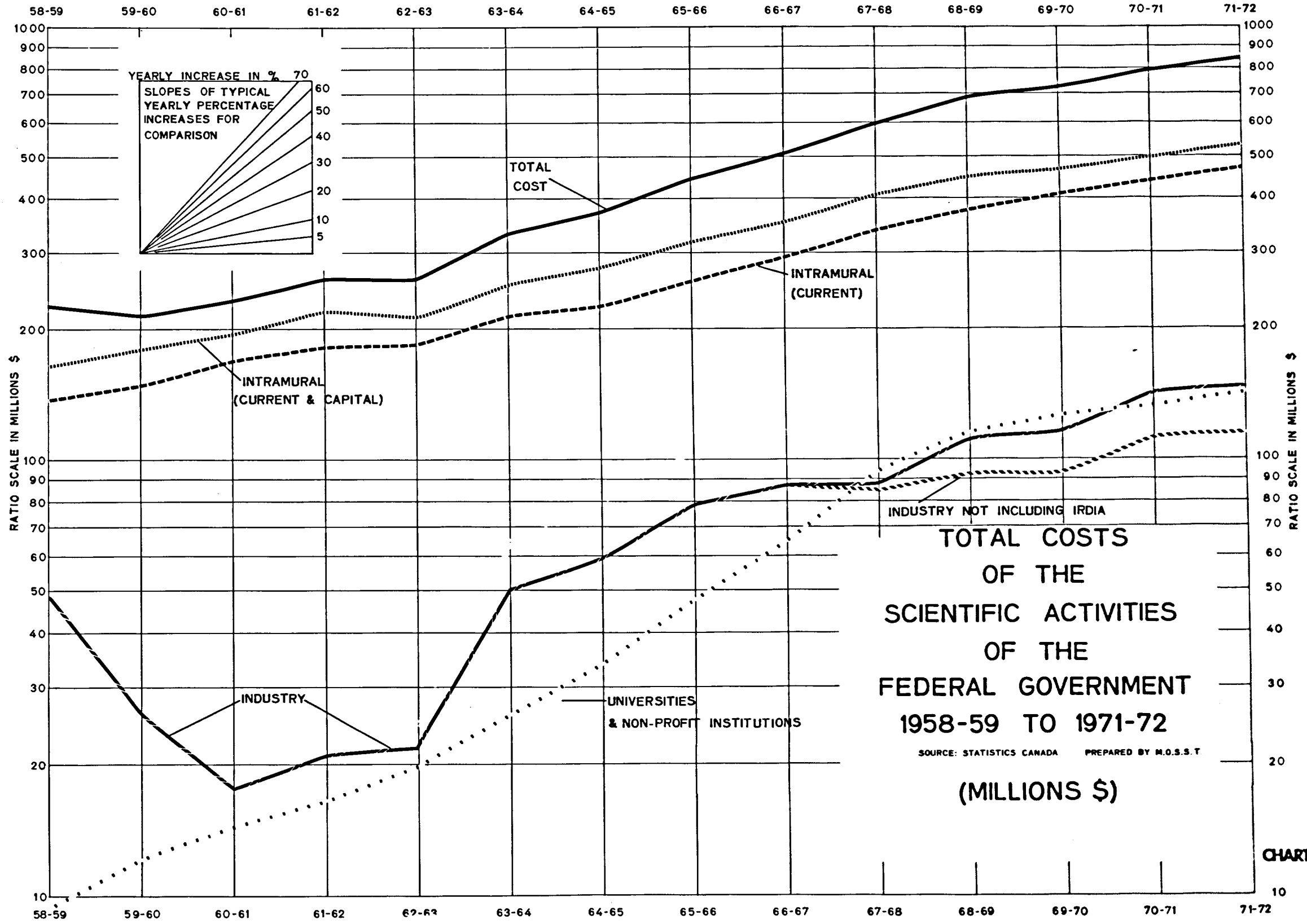
(MILLIONS \$)

Department or Agency	Intramural	Industry	Universities	Other	Total
NATIONAL RESEARCH COUNCIL	50.425	8.564	56.009	3.030	118.028
A. E. C. B. & A. E. C. L.	59.419	22.125	8.693	0.090	90.327
ENVIRONMENT	82.962	1.465	2.530	1.730	88.678
INDUSTRY, TRADE & COMMERCE	2.396	82.619	0.960	0.155	86.130
AGRICULTURE	68.233	0	0.652	0.018	68.903
NATIONAL DEFENCE	41.251	16.824	3.442	0.580	62.097
MEDICAL RESEACH COUNCIL	0.574	0	30.167	3.779	34.520
ENERGY, MINES & RESOURCES	27.529	3.393	0.656	0.150	31.728
NATIONAL HEALTH & WELFARE	6.111	0.028	13.129	7.408	26.676
COMMUNICATIONS	12.606	4.000	0.325	0	16.931
TRANSPORT	2.833	0.411	0.367	0	3.611
C.I.D.A.	0	0	0	1.887	1.887
REGIONAL ECONOMIC EXPANSION	0.221	0	1.175	0.133	1.529
NATIONAL MUSEUMS	1.000	0	0	0	1.000
OTHER	2.061	0.630	0.488	0.374	3.553
TOTAL	357.621	140.059	118.593	19.334	635.607

TOTAL INDIRECT COSTS ASSIGNED TO R & D = 59.536 MILLION

SOURCE: STATISTICS CANADA PREPARED BY: M.O.S.S.T.

TABLE 1

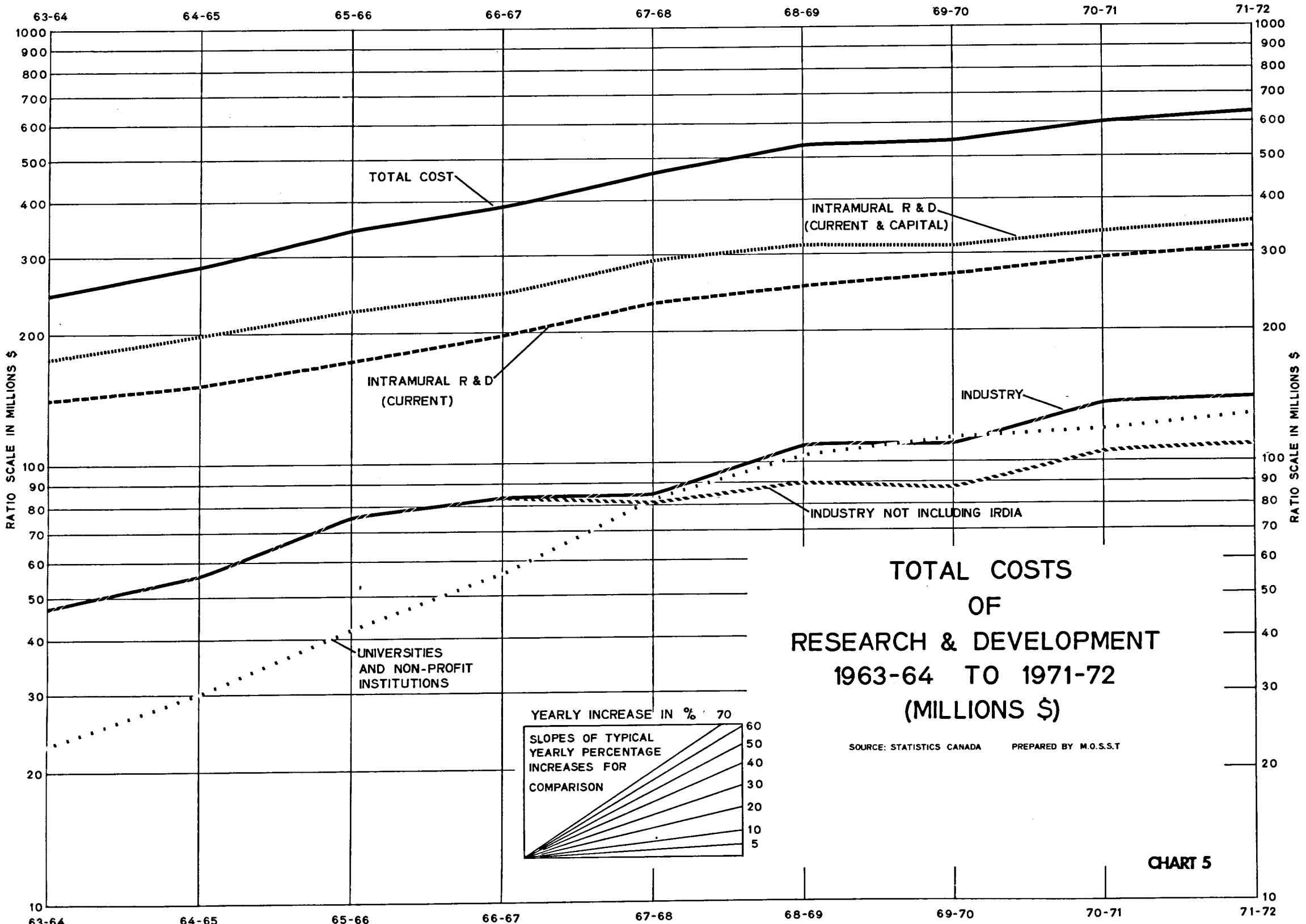


**TOTAL COSTS
OF THE
SCIENTIFIC ACTIVITIES
OF THE
FEDERAL GOVERNMENT
1958-59 TO 1971-72**

SOURCE: STATISTICS CANADA PREPARED BY M.O.S.S.T

(MILLIONS \$)

CHART 4



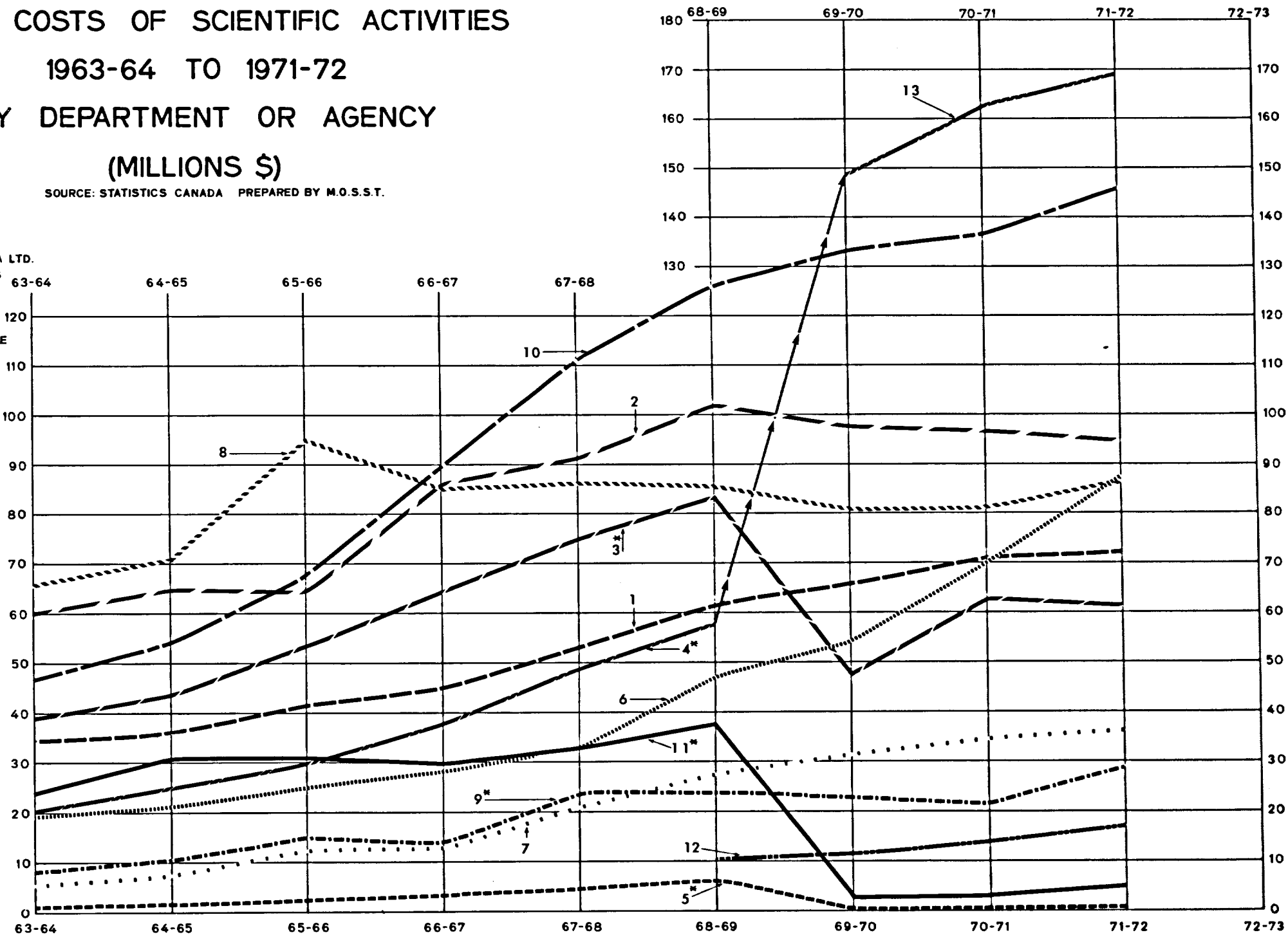
TOTAL COSTS OF SCIENTIFIC ACTIVITIES 1963-64 TO 1971-72 BY DEPARTMENT OR AGENCY (MILLIONS \$)

SOURCE: STATISTICS CANADA PREPARED BY M.O.S.S.T.

DEPARTMENTS & AGENCIES

- 1-- AGRICULTURE
- 2-- ATOMIC ENERGY OF CANADA LTD.
- *3-- ENERGY, MINES & RESOURCES
- *4-- FISHERIES & FORESTRY
- *5-- INDIAN AFFAIRS
& NORTHERN DEVELOPMENT
- 6-- INDUSTRY, TRADE & COMMERCE
- 7-- MEDICAL RESEARCH
COUNCIL
- 8-- NATIONAL DEFENCE
- *9-- NATIONAL HEALTH
& WELFARE
- 10-- NATIONAL RESEARCH
COUNCIL
- *11-- TRANSPORT
- 12-- COMMUNICATIONS
- 13-- ENVIRONMENT

* CERTAIN PROGRAMS
FROM THESE DEPARTMENTS
HAVE BEEN TRANSFERRED
TO ENVIRONMENT.



TOTAL COSTS OF RESEARCH DEVELOPMENT BY DEPARTMENT OR AGENCY 1963-64 TO 1971-72 (MILLIONS \$)

SOURCE: STATISTICS CANADA

PREPARED BY M.O.S.S.T.

DEPARTMENT OR AGENCY

- 1--AGRICULTURE
- 2--ATOMIC ENERGY OF CANADA LTD.
- 3*--ENERGY, MINES & RESOURCES
- 4*--FISHERIES & FORESTRY
- 5*--INDIAN AFFAIRS & NORTHERN DEVELOPMENT
- 6--INDUSTRY, TRADE & COMMERCE
- 7--MEDICAL RESEARCH COUNCIL
- 8--NATIONAL DEFENCE
- 9*--NATIONAL HEALTH & WELFARE
- 10--NATIONAL RESEARCH COUNCIL
- 11*--TRANSPORT
- 12--COMMUNICATIONS
- 13--ENVIRONMENT

* CERTAIN PROGRAMS FROM THESE DEPARTMENTS HAVE BEEN TRANSFERRED TO ENVIRONMENT

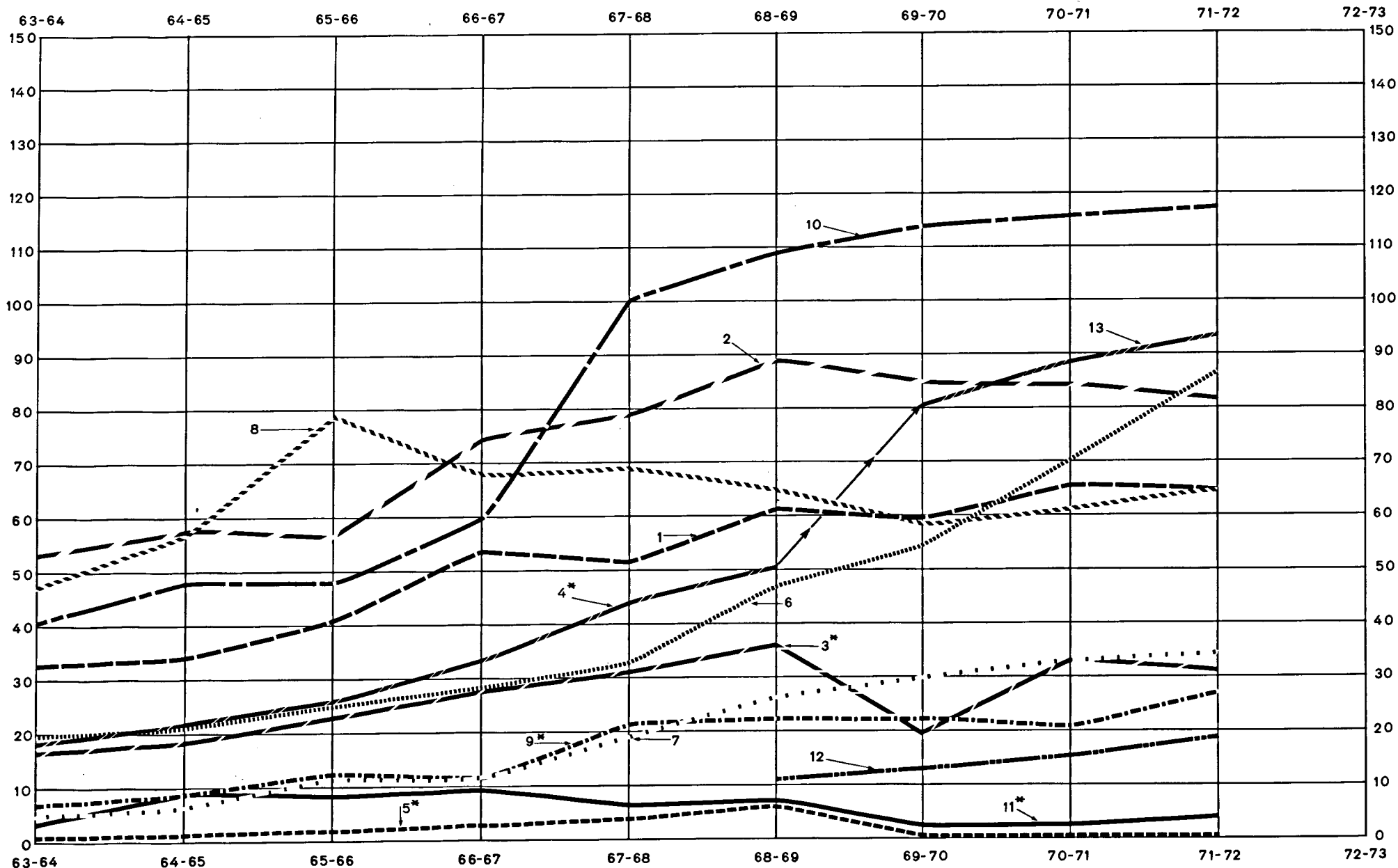









CHART 7

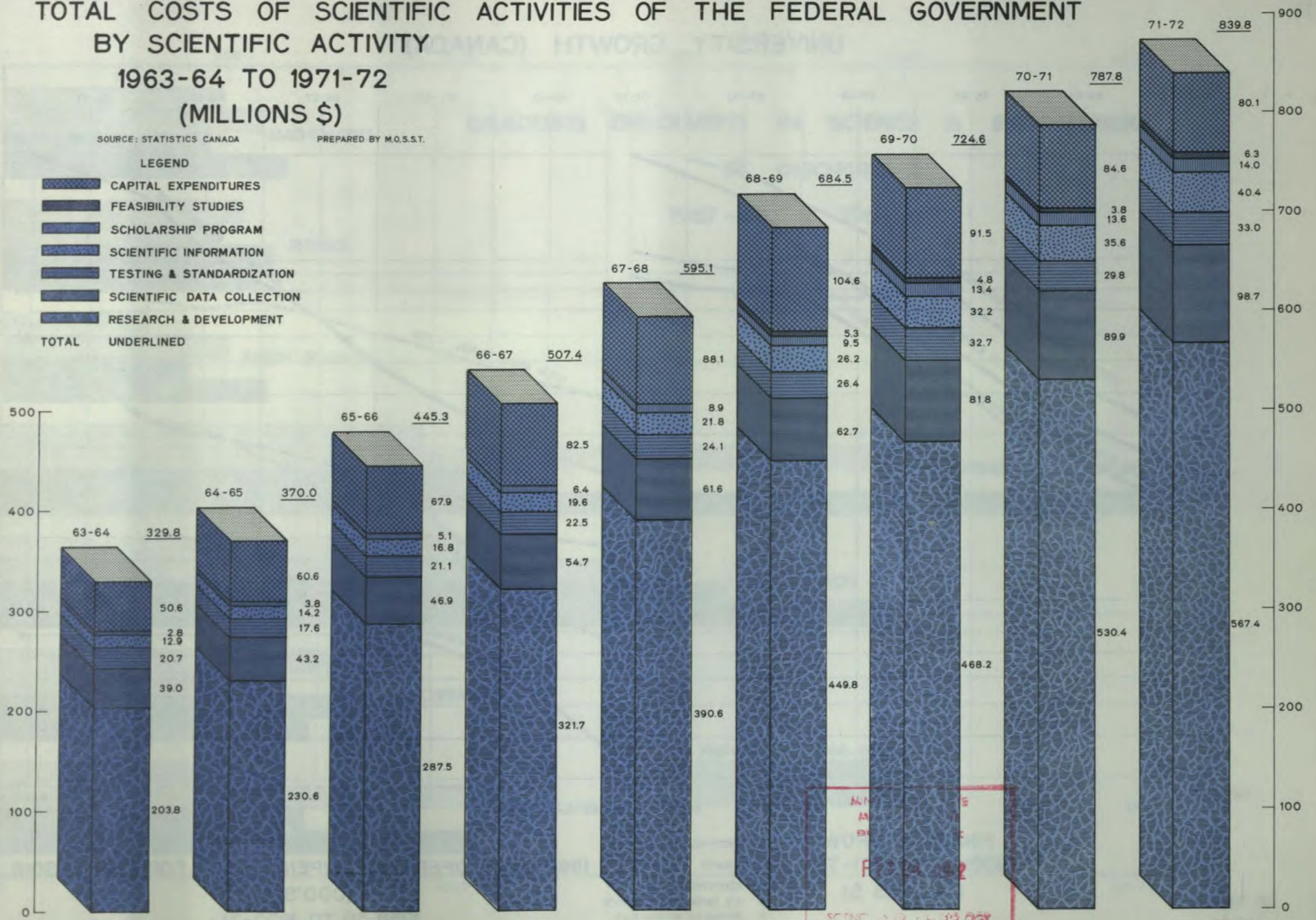
TOTAL COSTS OF SCIENTIFIC ACTIVITIES OF THE FEDERAL GOVERNMENT BY SCIENTIFIC ACTIVITY 1963-64 TO 1971-72 (MILLIONS \$)

SOURCE: STATISTICS CANADA

PREPARED BY M.O.S.S.T.

LEGEND

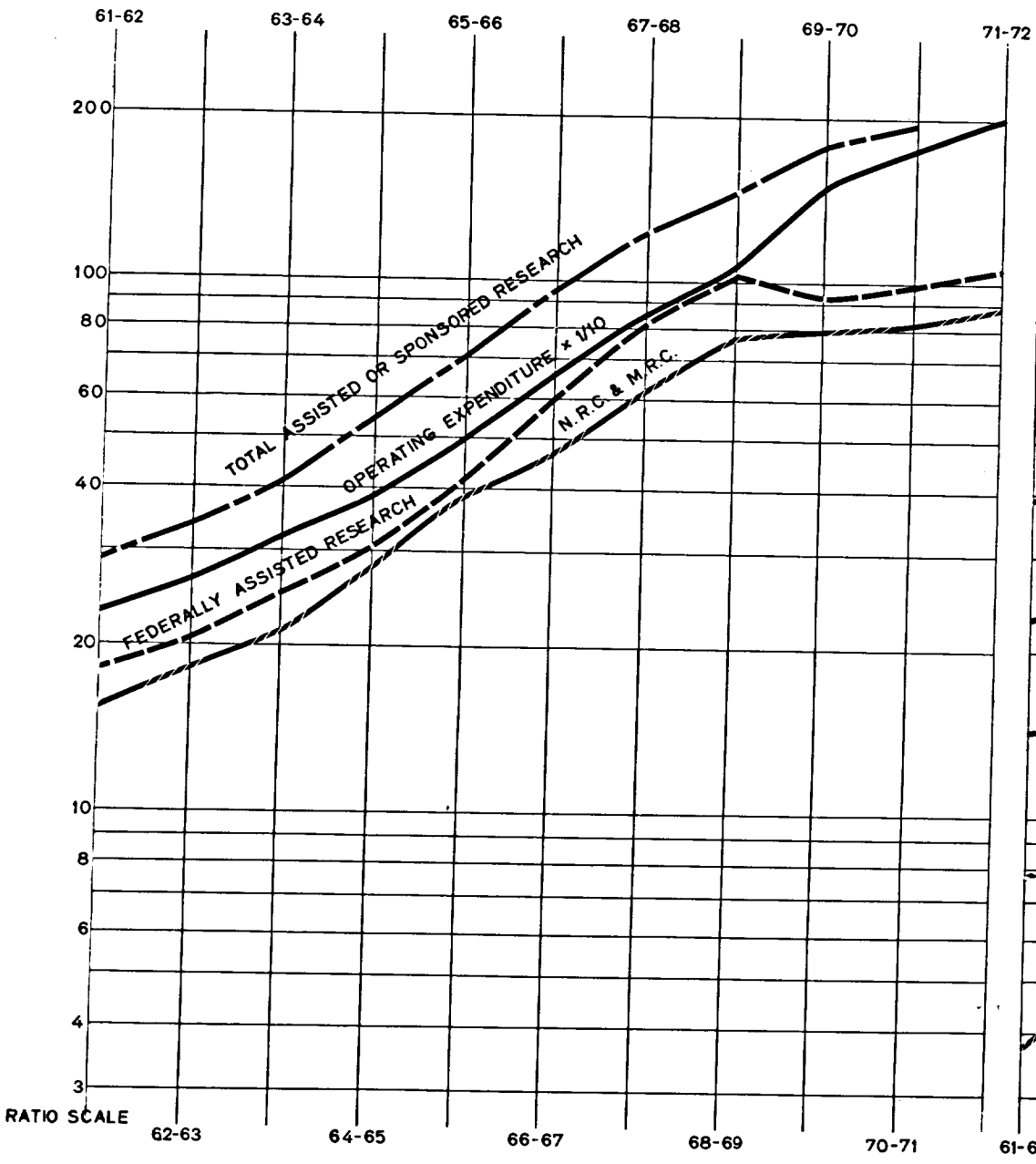
-  CAPITAL EXPENDITURES
-  FEASIBILITY STUDIES
-  SCHOLARSHIP PROGRAM
-  SCIENTIFIC INFORMATION
-  TESTING & STANDARDIZATION
-  SCIENTIFIC DATA COLLECTION
-  RESEARCH & DEVELOPMENT
- TOTAL UNDERLINED



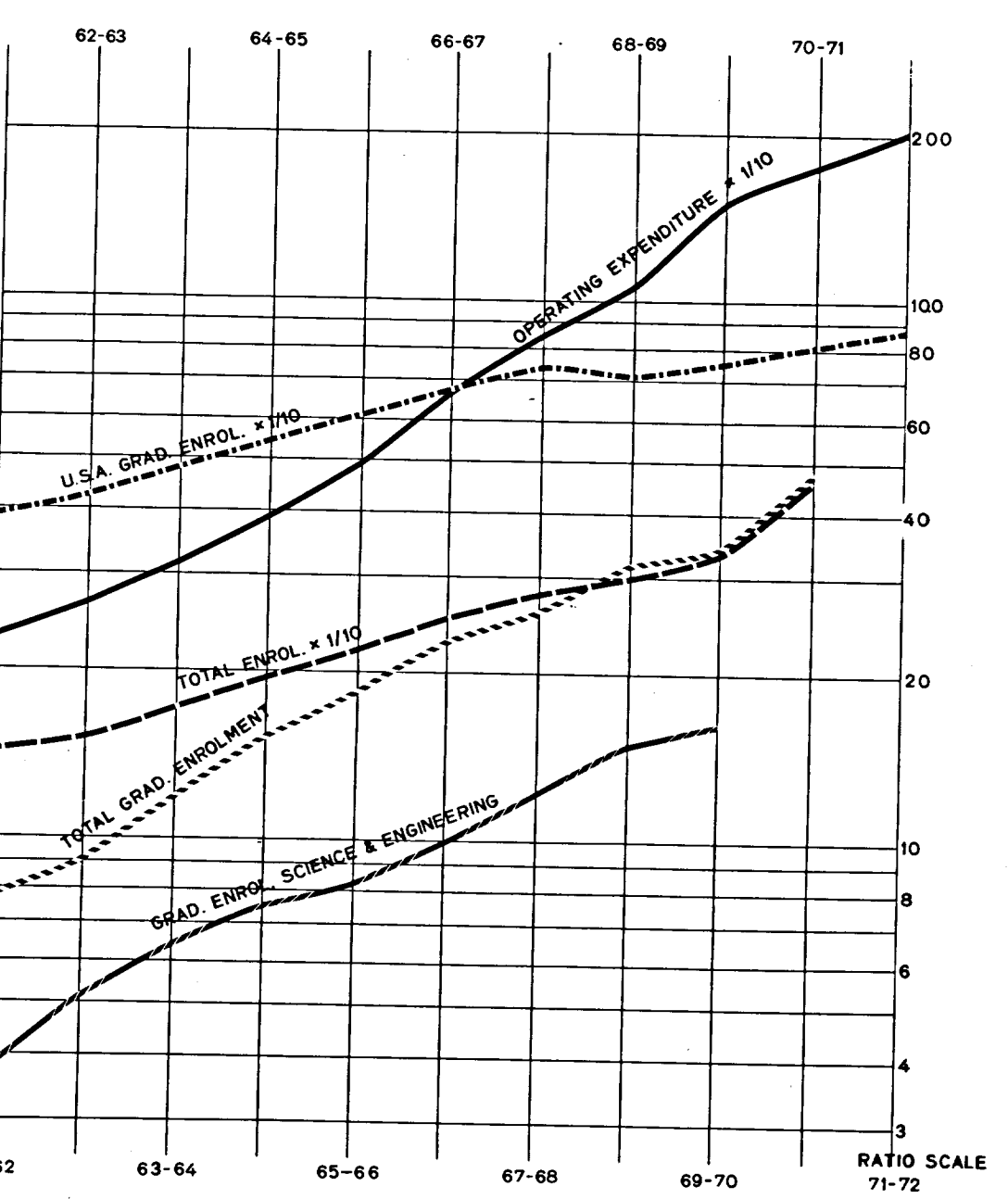
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 SCIENCE AND TECHNOLOGY
 DEPARTMENT
 OTTAWA, ONTARIO
 1972

CHART 8

UNIVERSITY GROWTH (CANADA)



**FINANCIAL GROWTH
1958-59 TO 1971-72
(MILLIONS \$)**



**STUDENT ENROLMENT
(INCLUDING OPERATING EXPENDITURES FOR COMPARISON)
(000'S)
1958-59 TO 1970-71**

PREPARED BY M.O.S.S.T.
SOURCE
1 STATISTICS CANADA
2 U.S. INFORMATION SERVICE
3 ESTIMATED BY M.O.S.S.T.

GRADUATE ENROLMENT IN SCIENCE & ENGINEERING BY DISCIPLINE 1967-68 & 1968-69

SOURCE: C. N. R. PREPARED BY: M. OSST

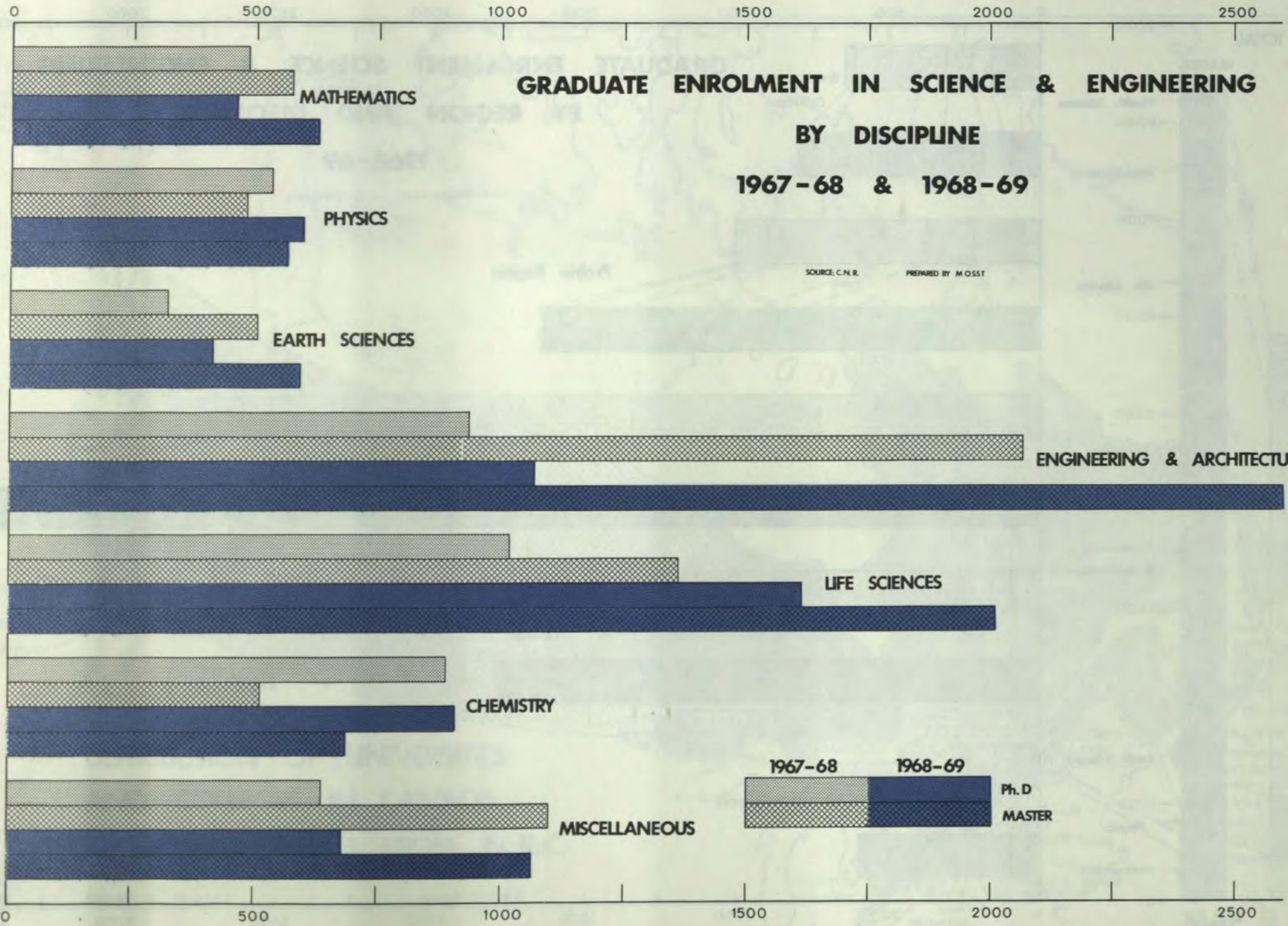


CHART 10

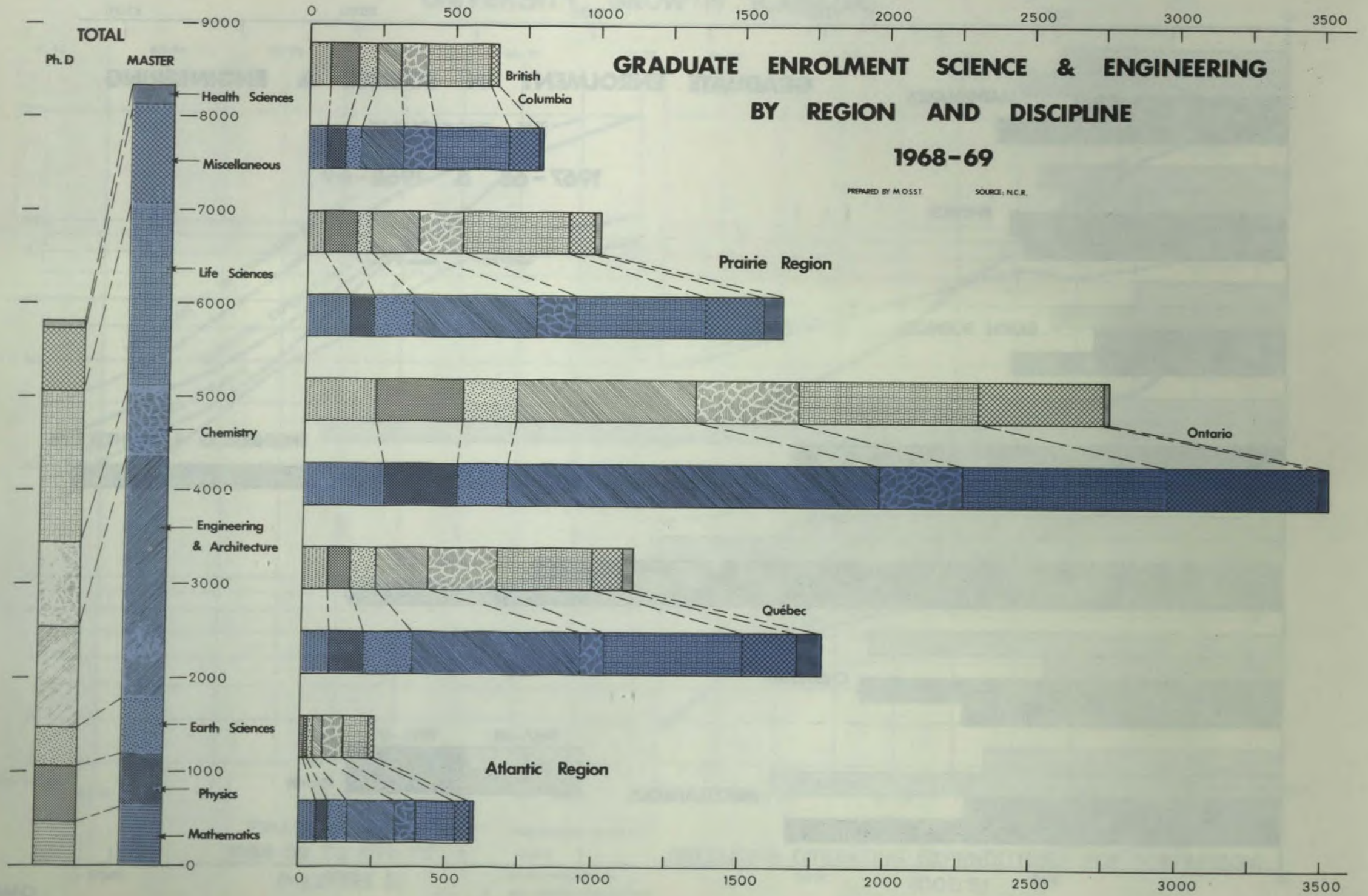
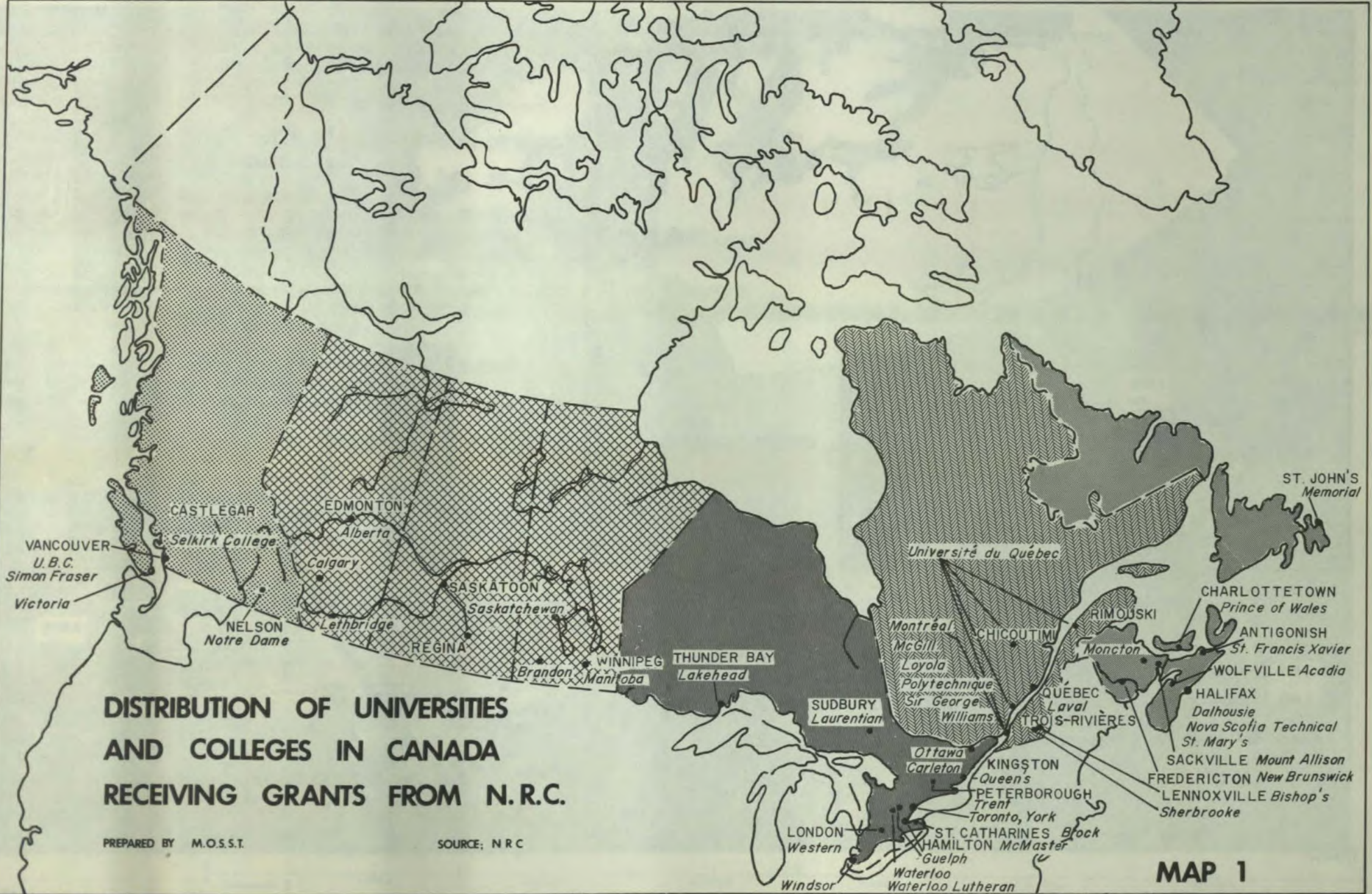


CHART 11



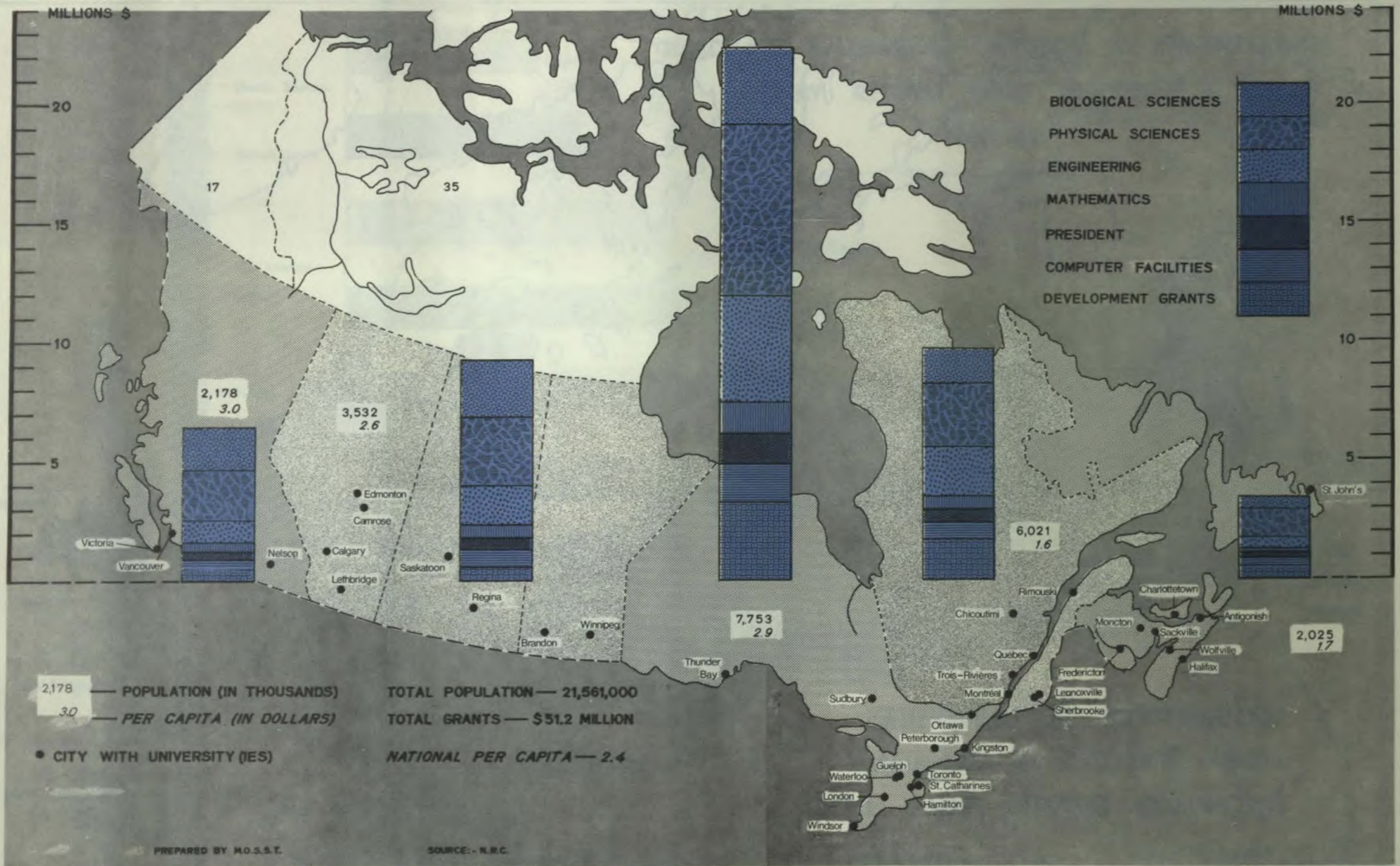
**DISTRIBUTION OF UNIVERSITIES
AND COLLEGES IN CANADA
RECEIVING GRANTS FROM N.R.C.**

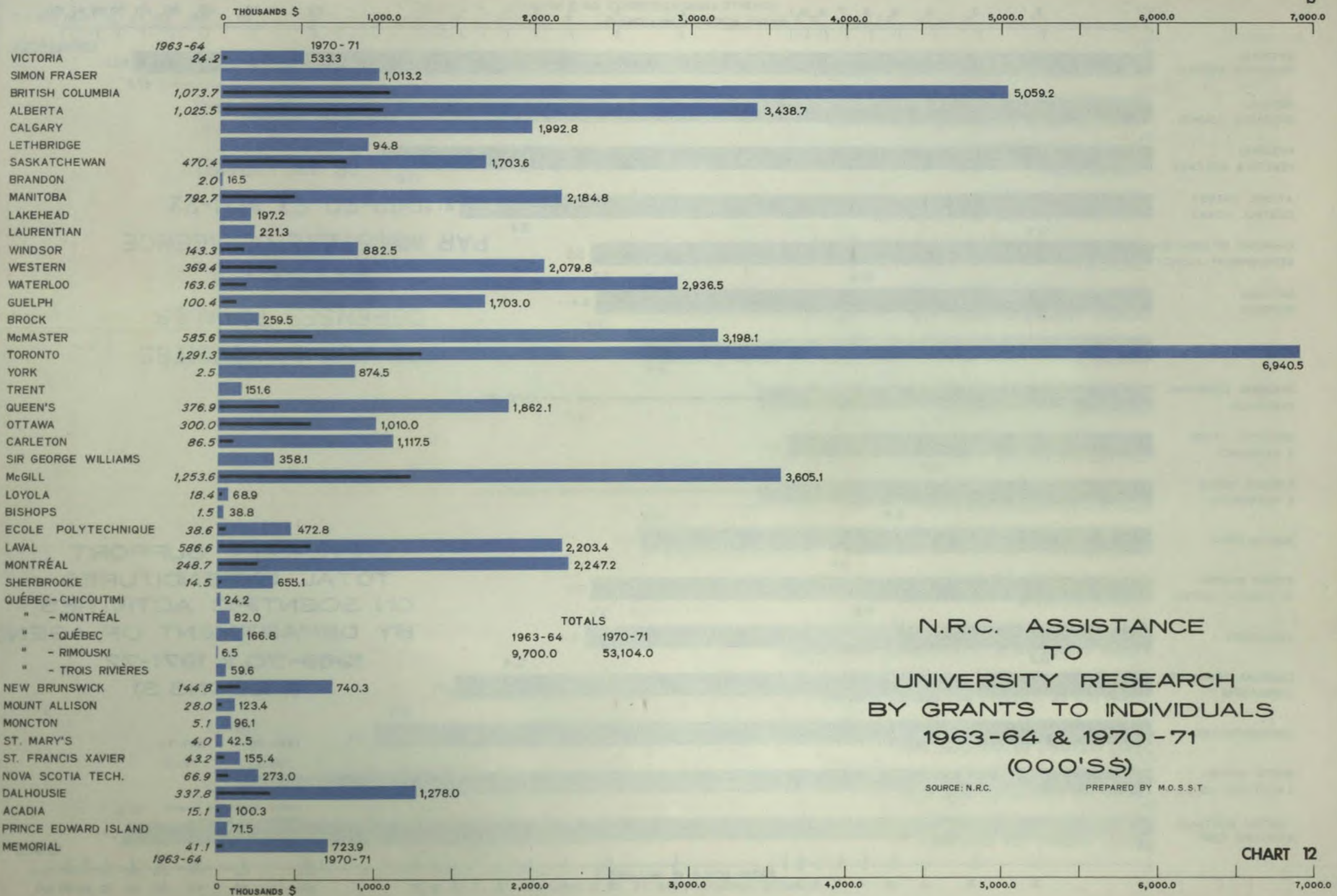
PREPARED BY M.O.S.S.T.

SOURCE: N R C

MAP 1

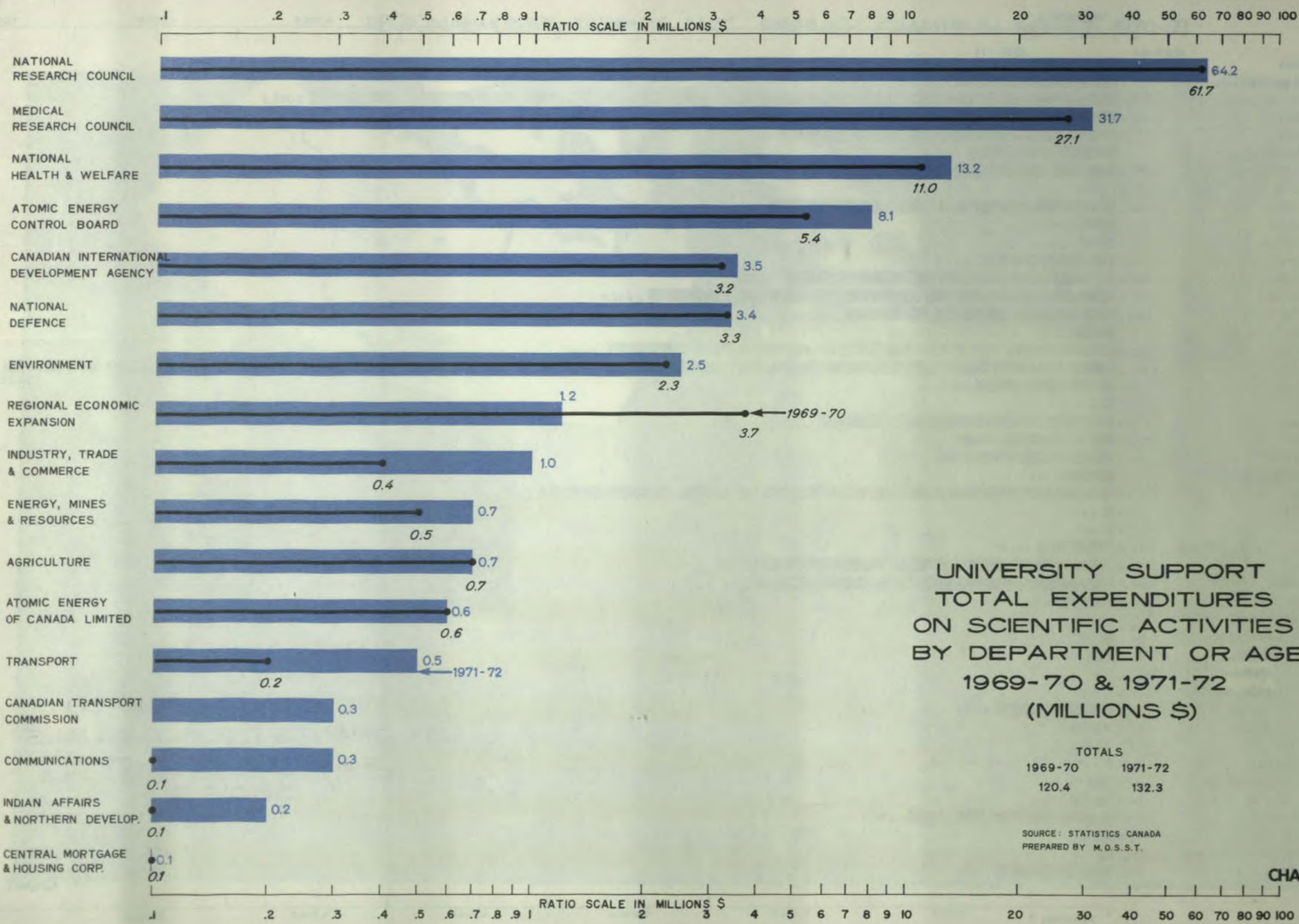
REGIONAL DISTRIBUTION OF N.R.C. RESEARCH GRANTS IN SCIENCE 1970-71





N.R.C. ASSISTANCE
TO
UNIVERSITY RESEARCH
BY GRANTS TO INDIVIDUALS
1963-64 & 1970-71
(000'S\$)

SOURCE: N.R.C. PREPARED BY M.O.S.S.T



UNIVERSITY SUPPORT
 TOTAL EXPENDITURES
 ON SCIENTIFIC ACTIVITIES
 BY DEPARTMENT OR AGENCY
 1969-70 & 1971-72
 (MILLIONS \$)

TOTALS	
1969-70	1971-72
120.4	132.3

SOURCE: STATISTICS CANADA
 PREPARED BY M.O.S.S.T.