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FEDERAL FUNDING OF
UNIVERSITY RESEARCH

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MOSST

University Branch

OUTLINE

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SUMMARY

SUMMARY

The following are the highlights of the review:

- federal expenditures on all scientific activities¹ rose at an average annual rate of 10 per cent over the period 1970-71 to 1978-79, from \$911 million to \$1,939 million;
 - by comparison, over the same eight-year period, GNE grew by 13 per cent, the federal budget by 16 per cent, and inflation (the implicit GNE price index) by 8 per cent.
- Thus, while total federal science expenditures grew somewhat in real terms (by about 1-2 per cent per year), their share in the GNE and in the federal budget diminished considerably. As a percentage of the federal budget, science expenditures fell by one-third, from 6.2 per cent to 4 per cent of the total;
- within federal funding, support of related scientific activities (RSA) grew at a much faster rate (12.5 per cent per year) than support of R&D (which rose at 8.5 per cent), with the consequence that the proportion of the total federal support going to R&D has fallen from 69 per cent to 62 percent over this eight-year period;

¹Included in the concept "scientific activities" are intramural and extramural activities in R&D as well as in research related areas - "RSA" - such as research training, publication support, conference grants, the collection of scientific information, and other research-related activities, in the natural and in the social sciences and humanities.

- the funding of social sciences and humanities has grown over twice as fast as funding of natural sciences over this period (16.7 vs 8.2 per cent per year), with the consequence that the proportion of the federal science budget allocated to natural sciences has fallen from 85 to 75 per cent;
- regarding the performance of federally-financed science activities, the intramural proportion has grown somewhat more rapidly than the extramural (10.4 vs 9.0 per cent per year), with the consequence that the proportion of funds allocated intramurally has risen from 64.7 per cent to 67.1 per cent;
- while the entire extramurally-performed proportion has declined over this period, the experience for the various components of extramural activities was not uniform. Funding of university-based scientific activities rose at only 5.6 per cent per year from 1970-71 to 1976-77, but has grown at 12.6 per cent per year for the two years since then. Thus, the share of the federal science budget allocated to university science had declined from 15.1 per cent in 1970-71 to 11.5 per cent in 1976-77, but has risen somewhat again, to 12.5 per cent, in 1978-79. The share allocated to industry has also fallen, but the decline has persisted over the entire 8-year period;

- total federal support of scientific activities in Canadian universities amounts to \$242 million in 1978-79. This compares with \$138 million in 1970-71, and \$191 million in 1976-77. Both R&D and RSA increased at about the same rate, and in 1978-79 RSA amounted to about 13 per cent of the total;
- federal support of R&D in Canadian universities rose at a substantially lower rate than support from other sources, over the period 1970-71 to 1976-77. The annual growth rate of federal funding was 5.4 per cent, while that for provincial funding was 24 per cent. Other sources, including investment income, non-government gifts and grants, etc, grew at 18 per cent per year. This information refers only to R&D, and only for the six years ending 1976-77;
- of the \$1,735 million spent by the federal departments and agencies (excluding the three granting councils) on scientific activities, some \$48 million, or 2.8 per cent, go to Canadian universities (1978-79). Of these \$48 million, \$23 million are available in the form of R&D grants, \$12 million in the form of R&D contracts, and \$13 million for RSA, such as education support;
- the amount available in the form of R&D contracts to universities by departments has grown from \$5.5 million in 1972-73 to \$12 million in 1978-79; support of RSA has

- grown from \$5.5 million to \$13.2 million; and support of R&D grants has declined from \$25.7 million to \$23.2 million;
- among the federal departments, National Health and Welfare has traditionally been the largest single funder of science activities in the universities, providing over one-third of the total for all departments. In 1978-79, this department spent \$16.8 million for university support. Other departments with relatively large budgets for support of science at universities are Agriculture (\$3.8 million), Environment (\$3.3 million), Transport (\$2.8 million), ^{and} EMR (\$2.7 million), ~~and CIDA~~ (~~\$3.6 million~~);
 - the budgets of the three granting councils amounted to the following:

Budgets of Granting Councils¹

	<u>1970-71</u>	<u>1976-77</u>	<u>1978-79</u>
	(\$ millions)		
Canada Council (SSHRC)	20	29	34
NRC (NSERC)	62	82	105
Medical Research Council	<u>34</u>	<u>52</u>	<u>64</u>
TOTAL	116	163	204

¹These estimates include non-program costs: Source, table 4.

- support by the three research councils rose at a higher rate between 1976-77 and 1978-79 than over the six years ending in 1976-77 (11.9 per cent vs 5.8 per cent per year);

- over these two periods, the comparable growth rates for the individual councils were:

Growth of Council Budgets

	<u>1970-71 to</u> <u>1976-77</u>	<u>1976-77 to</u> <u>1978-79</u>
	(per cent per year)	
Canada Council (SSHRC)	6.4	8.2
NRC (NSERC)	4.9	13.2
MRC	7.0	11.4

Source: Based on Table 4.

- For the councils taken as a group, the bulk of funding is in the form of R&D grants and fellowships (90 per cent in 1978-79), with the remainder going to support of RSA (the distribution varies by council). The greater part of the increases in funding since the beginning of the decade has been used for R&D grants and fellowships;
- Over the six years ending 1976-77, none of the three councils' budgets grew as fast as the federal budget, GNE, or total federal science spending. The NRC (NSERC) budget grew the least, while the MRC and the Canada Council (SSHRC) budgets grew somewhat faster. The Canada Council (SSHRC) redistributed its funds, away from research training into a range of relatively new and special programs. The MRC, through its variety of programs, managed to support a more or less constant number of R&D investigators, at the same time increasing significantly its support for collaborative research programs.

The NRC (NSERC) adapted its programs by allowing some growth in the number of individual investigators in R&D and by shifting significant portions of its funding into operating grants.

- The data for the past two years, during which time the council budgets were increased at a higher rate than over the preceding six, are not yet available in sufficient detail to permit a description of the various program changes. However, during this period, the rate increase was lowest for the Canada Council (SSHRC), and highest for the NRC (NSERC).

INTRODUCTION

INTRODUCTION

The purpose of this report is to provide an overview of the funding that the federal government makes available to university researchers for scientific activities. The report is divided into three parts. The first provides an overall perspective of the federal science programs, their composition in terms of R&D and related scientific activities, and the relative importance of natural and human sciences. It also delineates the proportion of the total federal science budget that is available for support of scientific activities in universities. Regional expenditure patterns are also shown.

The second part contains a review of federal expenditures on university research for each of the major funding departments. Included in this part is a general discussion of the major programs which support university research.

The third part is devoted to the three research councils, and contains historical as well as current information on each of the council's programs and budgets. Regional expenditure patterns are also shown.

Generally, the time period covered is 1970-71 to 1978-79.

OVERVIEW

OVERVIEW

Federal Programs and Policies

The federal role in funding university research may be justified primarily by the federal government's requirements for an adequate scientific capacity to respond to Canada's domestic and international problems. In addition to meeting the need for a capability to carry out R&D, the federal government must also ensure the production of sufficient highly qualified scientific manpower for the country. The universities provide the most important source of scientific expertise and resources to carry out R&D and to train highly qualified manpower.

The support of university research is ensured through two main avenues: the Granting Councils and the government departments and agencies. The Granting Councils have, in the past, allocated the greater part of their funds for R&D in the form of research grants. These have generally been awarded on a project basis rather than on an institutional basis. In the case of government departments, a number of instruments are used for the support of university research. These include contracts as well as grants and contributions. Both government departments and the Granting Councils offer programs in support of research training.

The Ministry of State for Science and Technology (MOSST) has been charged with the responsibility of advising the federal government on federal scientific activities. In this capacity, MOSST advises the Treasury Board on the appropriate allocation of resources for federal support of science, both intramurally and to the universities. In addition, the Secretary of MOSST chairs the newly-created Inter-Council Coordinating Committee (ICCC) which is responsible for advising the Minister of State for Science and Technology on the allocation of funds between the Councils and on the coordination of policies for the Granting Councils¹. Finally, the Secretary of MOSST acts as chairman of the Canadian Committee on the Financing of University Research (CCFUR), the federal-provincial committee established to study the problems of funding university research.

¹Of course, some of the ICCC members report to other Ministers who have certain responsibilities for the councils.

Recent Policy Announcement

On June 1, 1978 the government announced a new national priority for research and development, and is implementing new long-term policies and immediate measures in order to increase the level of R&D, particularly industrial R&D, to encourage Canadian industry to take advantage of the results of research conducted by university and government scientists and to create job opportunities in research and development.

Among these measures, several are designed to increase the R&D contribution to economic and national priorities by researchers, especially at universities. Measures have been announced to create university-based industrial innovation centres to aid industry, particularly small businesses and private inventors, in the development of new products and technologies; to assist in the development of regional centres of excellence, (largely university-based, both to build upon the diverse strengths of Canada, to ensure local expertise and initiation) by integrating university, industry and government R&D capability to assist in the development of the industrial capacity of the region; and to increase funding for university research into areas of national concern.

Up to five Industrial Innovation Centres (IIC's) will be established at universities. They will be chosen in response to proposals submitted by universities and subject to the concurrence of the province concerned. These centres will provide a focus for technical, market, legal and patent advice on new ideas to university researchers and businessmen in the region. They will provide industrial access to university expertise and facilities. The IIC's will also facilitate the movement of research workers from industry to university, and vice versa. They will assist in combining the appropriate marketing, management and financial skills necessary to effect transfer of technology, and to establish the entrepreneurial activity needed to spin-off new business based on technology developed in, or with the assistance of university laboratories. In 1978-79, \$2.0 million will be made available for IIC's.

Centres of excellence responsive to national needs will be established. This will require the closest consultation with the provinces, industry and universities in the context of the opportunity and problem areas the centres are to address.

One of the main objectives of these centres will be to achieve better integration of government, university and industrial capability. They will be based on the natural and human resources of each area and should assist in the development of the industrial capacity of the region. A sum of \$6.8 million will be provided this year towards the establishment of such centres.

In accordance with its policy of encouraging further efforts in the universities in areas of national concern, the Natural Sciences and Engineering Research Council (NSERC) will now receive \$5 million, the Medical Research Council (MRC) \$3 million, and the Social Sciences and Humanities Research Council (SSHRC) \$2 million, for the purposes of strategic grants in 1978-79. These sums are in addition to the \$194 million already provided for in the estimates.

Science Expenditures in Perspective

Over the decade since 1970, federal science expenditures, and especially those to the universities, have grown at a substantially lower rate than the federal budget. Table 1 shows that federal support to the universities rose over this period from \$138 million in 1970-71 to \$242 million in 1978-79. In terms of growth, this is a 7 per cent annual rate, which compares with a rate of 10 per cent for total federal science expenditures, and 16 per cent for the federal budget¹. As a consequence, funding of university science as a proportion of the federal budget dropped to almost half over this period, from .93 to .50 per cent.

TABLE 1

EXPENDITURES ON SCIENTIFIC ACTIVITIES
IN RELATION TO GNE AND THE FEDERAL BUDGET

		\$ MILLIONS		PER CENT OF GNE		PER CENT OF FED. BUD.	
		1970-71	1978-79	1970-71	1978-79	1970-71	1978-79
GNE		85,700.0	235,100.0	-	-	-	-
FEDERAL BUDGET		14,800.0	48,300.0	17.27	20.54	-	-
FEDERAL EXPENDITURES ON SCIENTIFIC ACTIVITIES	TOTAL	911.1	1,939.0	1.06	0.82	6.20	4.01
	TO UNIVERSITIES	138.0	241.9	0.16	0.10	0.93	0.50

SOURCE: UNIVERSITY BRANCH, MOSST

NOTE: TRIUMF PAYMENTS EXCLUDED

¹Unless otherwise specified, all annual rates of growth are calculated on an annual average compounded basis, throughout this report.

Federal science expenditures for recent years are shown in Table 2. Nearly two-thirds of the federal science budget is allocated to research and development, while just over a third is devoted to related scientific activities (RSA) such as education support and the collection and dissemination of scientific information. Between 1970-71

TABLE 2

FEDERAL EXPENDITURES ON SCIENTIFIC ACTIVITIES
BY TYPE OF ACTIVITY

		HUMAN AND NATURAL SCIENCES		
		R&D	RSA	TOTAL
EXPENDITURES (MIL \$)	1970-71	626.7	284.4	911.1
	1976-77	1,020.2	642.9	1,663.1
	1977-78	1,105.5	688.2	1,793.7
	1978-79	1,207.4	731.3	1,938.8
PERCENTAGE DISTRIBUTION	1970-71	68.8	31.2	100.0
	1976-77	61.3	38.7	100.0
	1977-78	61.6	38.4	100.0
	1978-79	62.3	37.7	100.0

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976/77 TO 1978/79

NOTE: THESE FIGURES INCLUDE NON-PROGRAM COSTS (eg ACCOMMODATION) FOR FEDERAL INTRAMURAL SCIENTIFIC ACTIVITIES

EXPENDITURES EXCLUDE PAYMENTS FOR TRIUMF

and 1976-77, federal expenditures increased at an annual rate of 11 per cent, with RSA growing more rapidly (15 per cent per year) than R&D (8 per cent per year). Between 1976-77 and 1978-79, federal expenditures on scientific activities increased by 8 per cent per year to \$1.9 billion in 1978-79. Both R&D and RSA grew at about 8 per cent per year over this same two year period.

In terms of type of science, federal funding is allocated largely to the natural sciences (about 75 per cent)¹, totalling some \$1.2 billion in 1976-77. Human sciences research activities assumed about one-quarter of the federal science program, or \$419 million in 1976-77 (Table 3). Between 1976-77 and 1978-79, expenditures on the natural sciences increased by 17 per cent to \$1.5 billion and expenditures on Human Sciences increased by 15 per cent to \$482 million. It should be noted that Human Science activities have increased substantially, from 15 per cent of the federal science program in 1970-71 to 25 per cent in recent years.

Regarding federal science expenditures by funder, Table 4 shows the originators of expenditures within the government. Departmental science programs account for the major proportion of expenditures, and their share has increased since

¹Unless specified otherwise, expenditures on the "health sciences" are included under the category of "natural science", throughout this report.

TABLE 3
FEDERAL EXPENDITURES ON SCIENTIFIC ACTIVITIES
BY TYPE OF SCIENCE

		HUMAN AND NATURAL SCIENCES		TOTAL
		HUMAN SCIENCES	NATURAL SCIENCES	
EXPENDITURES (MIL \$)	1970-71	140.4	770.6	911.1
	1976-77	419.0	1,244.1	1,663.1
	1977-78	446.0	1,347.7	1,793.7
	1978-79	482.3	1,456.4	1,938.8
PERCENTAGE DISTRIBUTION	1970-71	15.4	84.6	100.0
	1976-77	25.2	74.8	100.0
	1977-78	24.9	75.1	100.0
	1978-79	24.9	75.1	100.0

SOURCE: MOSSY: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976/77 TO 1978/79

NOTE: THESE FIGURES INCLUDE NON-PROGRAM COSTS (eg ACCOMMODATION) FOR FEDERAL INTRAMURAL SCIENTIFIC ACTIVITIES

EXPENDITURES EXCLUDE PAYMENTS FOR TRIUMF

1970-71 from 87.2 per cent to 89.5 per cent of the total in 1978-79. The share of the research councils, which are concerned mainly with university research, declined from 12.8 per cent in 1970-71 to 9.8 per cent in 1976-77, but has risen slightly since then to 10.5 per cent in 1978-79.

Total federal science funding available to universities, including the research councils and government departments, is shown in Table 5. In the fiscal year 1978-79, Canadian

TABLE 4

FEDERAL EXPENDITURES ON SCIENTIFIC ACTIVITIES
BY FUNDER

		1970-71	1976-77	1977-78	1978-79
EXPENDITURES (MIL \$)	TOTAL	911.1	1,663.1	1,793.7	1,938.8
	FEDERAL DEPARTMENTS	794.8	1,499.3	1,610.2	1,734.8
	RESEARCH COUNCILS	116.3	163.3	182.9	204.0
	CANADA COUNCIL	20.1	29.2	31.4	34.2
	NRC - UNIVERSITIES	61.7	82.2	93.4	105.4
	MRC	34.9	51.9	58.1	64.4
PERCENTAGE DISTRIBUTION	TOTAL	100.0	100.0	100.0	100.0
	FEDERAL DEPARTMENTS	87.2	90.2	89.8	89.5
	RESEARCH COUNCILS	12.8	9.8	10.2	10.5
	CANADA COUNCIL	2.2	1.8	1.8	1.8
	NRC - UNIVERSITIES	6.8	4.9	5.2	5.4
	MRC	3.8	3.1	3.2	3.3

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976/77 TO 1978/79

NOTE: THESE FIGURES INCLUDE NON-PROGRAM COSTS (eg ACCOMMODATION) FOR FEDERAL INTRAMURAL SCIENTIFIC ACTIVITIES

EXPENDITURES EXCLUDE PAYMENTS FOR TRIUMF

universities performed \$242 million in federally-funded scientific activities, an increase of 27 per cent since 1976-77. In comparison, federal intramural scientific activities increased by 18 per cent between 1976-77 and 1978-79 amounting to \$1.3 billion in 1978-79. In terms of the total, universities performed about 13 per cent of the federal science program in 1978-79, compared with 15 per cent in 1970-71, and 12 per cent in 1976-77.

TABLE 5

FEDERAL EXPENDITURE ON SCIENTIFIC ACTIVITIES
BY PERFORMER

		1970-71	1976-77	1977-78	1978-79
EXPENDITURES (MIL \$)	TOTAL	911.1	1,663.1	1,793.7	1,938.8
	INTRAMURAL	589.5	1,102.5	1,191.9	1,300.1
	EXTRAMURAL	321.6	560.6	601.7	638.7
	INDUSTRY	151.2	268.2	269.1	275.4
	UNIVERSITIES	137.8	190.2	218.8	241.9
	CAN. NON-PROFIT	15.6	21.9	23.6	26.1
	OTHER CANADIAN	3.1	32.7	46.9	48.6
FOREIGN	13.8	47.1	43.3	46.7	
PERCENTAGE DISTRIBUTION	TOTAL	100.0	100.0	100.0	100.0
	INTRAMURAL	64.7	66.3	66.4	67.1
	EXTRAMURAL	35.3	33.7	33.5	32.9
	INDUSTRY	16.6	16.1	15.0	14.2
	UNIVERSITIES	15.1	11.5	12.2	12.5
	CAN. NON-PROFIT	1.7	1.3	1.3	1.3
	OTHER CANADIAN	0.3	2.0	2.6	2.5
FOREIGN	1.5	2.8	2.4	2.4	

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976/77 TO 1978/79

NOTE: THESE FIGURES INCLUDE NON-PROGRAM COSTS(eg ACCOMMODATION) FOR FEDERAL INTRAMURAL SCIENTIFIC ACTIVITIES

EXPENDITURES EXCLUDE PAYMENTS FOR TRIUMF

Table 6 presents a summary of the sources of funding for R&D in the universities, including funds from non-federal sources. This table is based on the R&D series provided by CAUBO and Statistics Canada for the non-federal sources, and R&D expenditure data from the research councils and federal departments for the federal sources. (It does not include funds for related scientific activities).

As shown in Table 6, the federal government's share of total university research funding has declined from 77 per cent in 1970-71 to 60 per cent in 1976-77. Most of this decline has occurred as a result of the fact that funding by federal departments declined. Research council funding has increased at a lower annual rate (7 per cent) than the total funding from all sources to universities (10 per cent). The largest rates of increase in university research funding were recorded for provincial and "other" sources, some 24 per cent and 18 per cent per year, respectively.

The regional distribution of federal, provincial and "other" sources of funds for R&D in universities are shown in Table 7. (These data originate from CAUBO and for various reasons including differing fiscal years, do not balance exactly with the data shown in Table 5). As Table 7 makes

TABLE 6

SOURCES OF ASSISTED RESEARCH FUNDS TO CANADIAN UNIVERSITIES

		RESEARCH COUNCILS (1)	FEDERAL DEPARTMENTS (1)	PROVINCIAL GOVERNMENTS (2)	OTHERS (2) (3)	TOTAL
FUNDS (MIL \$)	1970-71	88.6	30.3	13.2	23.4	155.5
	1971-72	92.9	30.5	12.2	34.2	169.8
	1972-73	92.9	31.3	12.6	37.5	185.7
	1973-74	104.6	33.5	26.1	38.9	203.1
	1974-75	109.1	34.0	31.4	51.7	226.2
	1975-76	124.6	35.7	41.4	53.0	254.7
	1976-77	135.3	27.8	48.1	61.7	272.9
	1977-78	152.2	34.4	-	-	-
PERCENTAGE DISTRIBUTION	1970-71	57.0	19.5	8.5	15.0	100.0
	1971-72	54.7	18.0	7.2	20.1	100.0
	1972-73	52.9	16.9	10.0	20.2	100.0
	1973-74	51.5	16.5	12.9	19.2	100.0
	1974-75	48.2	15.0	13.9	22.9	100.0
	1975-76	48.9	14.0	16.3	20.8	100.0
	1976-77	49.6	10.2	17.6	22.6	100.0
	1977-78	-	-	-	-	-
AVERAGE ANNUAL GROWTH RATE		8.0	-	24.0	17.5	9.8

SOURCE:

(1) DATA OBTAINED FROM STATISTICS CANADA HISTORICAL SERIES (1977 SURVEY); THESE FIGURES REPORTED REFER TO PAYMENTS TO CANADIAN UNIVERSITIES FOR R&D

(2) DATA PROVIDED BY THE CANADIAN ASSOCIATION OF UNIVERSITY BUSINESS OFFICERS (CAUBO)

(3) IN THE LATEST YEAR FOR WHICH DATA WERE AVAILABLE, THE LARGEST COMPONENT OF "OTHER" WAS GIFTS, NON-GOV'T GRANTS (\$54 M); FOLLOWED BY INVESTMENT INCOME (\$3 M); INTERFUND TRANSFERS(\$2.2 M); MISCELLANEOUS (\$2.2 M) AND MUNICIPAL GOV'T GRANTS (\$2.2 M).

NOTE: THE NUMBER OF INSTITUTIONS REPORTING FINANCIAL INFORMATION TO CAUBO IN ANY ONE YEAR IS NOT CONSTANT

ALL PAYMENTS TO TRIUMF HAVE BEEN EXCLUDED

- - - NOT AVAILABLE

clear, the level of federal participation in university R&D varies significantly by region, ranging from 85 per cent of funding in the Atlantic region to about 56 per cent in Ontario and Quebec in 1976-77. It is also evident that the federal share has declined in all regions since the start of the decade, but most sharply in Ontario, where the federal share of research funding declined from 74 per cent (1970-71) to 56 per cent (1976-77).

Provincial and "Other" sources of financing increased in importance during the early 1970s rising in the aggregate from 26 per cent to 40 per cent of the total.

(The "other" category of financing consists mainly of gifts and non-government grants -- see footnote 3, Table 6).

TABLE 7

REGIONAL DISTRIBUTION OF ASSISTED R&D TO UNIVERSITIES

REGION		MILLIONS OF DOLLARS			PERCENTAGE DISTRIBUTION		
		1970-71	1975-76	1976-77	1970-71	1975-76	1976-77
ATLANTIC	FEDERAL FUNDS	6.4	12.0	13.6	90.1	83.9	85.0
	PROVINCIAL FUNDS	0.1	0.4	0.7	1.4	2.8	4.4
	OTHER	0.6	1.9	1.7	8.5	13.3	10.6
	TOTAL	7.1	14.3	16.0	100.0	100.0	100.0
QUEBEC	FEDERAL FUNDS	24.8	41.9	40.8	67.8	61.2	55.7
	PROVINCIAL FUNDS	6.4	14.2	17.1	17.5	20.7	23.4
	OTHER	5.4	12.4	15.3	14.8	18.1	20.9
	TOTAL	36.6	68.5	73.2	100.0	100.0	100.0
ONTARIO	FEDERAL FUNDS	42.1	58.1	63.1	73.9	57.3	56.1
	PROVINCIAL FUNDS	3.7	17.2	19.3	6.5	17.0	17.2
	OTHER	11.2	26.1	30.0	19.6	25.7	26.7
	TOTAL	57.0	101.4	112.4	100.0	100.0	100.0
WESTERN	FEDERAL FUNDS	31.2	43.0	46.6	77.2	65.8	64.5
	PROVINCIAL FUNDS	3.0	9.7	11.0	7.4	14.9	15.0
	OTHER	6.2	12.6	14.7	15.3	19.3	20.3
	TOTAL	40.4	65.3	72.3	100.0	100.0	100.0

SOURCE: CANADIAN ASSOCIATION OF BUSINESS OFFICERS (CAUBO), ANNUAL REPORTS 1970-71, 1975-76 AND 1976-77.

FEDERAL DEPARTMENTS AND AGENCIES (excluding Councils)

FEDERAL DEPARTMENTS AND AGENCIES (excluding Councils)¹

Introduction

During the period 1970-71 to 1976-77, federal payments to Canadian universities for scientific activities increased from \$32 million (1970-71) to \$38 million (1976-77). This represents a 3 per cent average annual increase over the period (see Table 8). From 1976-77 to 1977-78 payments to universities rose by 24 per cent to \$47 million. Just under 45 per cent of this increase could be accounted for by an increase in funding by the Department of Health and Welfare (mainly within its Health Care Program); 11 per cent by Energy, Mines and Resources (mainly in its Energy Program) and, 9 per cent by the Department of Agriculture (mainly in its Research Program). It should be noted as well that in 1976-77, funding by Urban Affairs to the United Nations Audio Visual Information Centre was classified as a foreign expenditure. The large increase shown between 1976-77 and 1977-78 (92 per cent) was mainly a result of a change in classification of the performer of these activities from foreign to the university sector.

From 1977-78 to 1978-79, departmental funding of university research increased by 3 per cent from \$47 million to \$49 million.

¹Expenditures for TRIUMF have been excluded from all tables, and are discussed separately in Appendix I.

TABLE 8

PAYMENTS TO CANADIAN UNIVERSITIES FOR SCIENTIFIC ACTIVITIES BY
FEDERAL GOVERNMENT DEPARTMENTS AND AGENCIES (1)

DEPARTMENTS AND AGENCIES	(\$ THOUSANDS)			
	1970/71	1976/77	1977/78	1978/79
AGRICULTURE	849	2,992	3,773	3,813
ATOMIC ENERGY CONTROL BOARD (2)	2,500	480	290	272
CANADIAN INTERNATIONAL DEVELOPMENT AGENCY	600	2,867	3,254	3,550
CENTRAL MORTGAGE AND HOUSING	1,382	1,242	1,099	1,409
COMMUNICATIONS	205	650	750	751
'ENERGY, MINES AND RESOURCES'	609	1,546	2,547	2,687
ENVIRONMENT	4,128	3,184	3,227	3,270
INDIAN AND NORTHERN AFFAIRS	531	942	985	1,041
'INDUSTRY, TRADE AND COMMERCE'	437	944	1,158	1,231
INTERNATIONAL DEVELOPMENT RESEARCH CENTRE	40	920	1,023	816
JUSTICE	-	96	9	11
NATIONAL DEFENCE	3,314	1,302	1,420	1,698
NATIONAL HEALTH AND WELFARE	12,739	12,590	16,641	16,247
SECRETARY OF STATE	73	904	950	1,108
SOLICITOR GENERAL	30	399	635	792
SUPPLY AND SERVICES	-	1,074	1,226	1,226
TRANSPORT	60	2,142	2,945	2,831
URBAN AFFAIRS	-	1,000	2,023	1,923
OTHERS	4,873	2,616	2,918	3,251
TOTAL	32,480	37,896	46,933	48,539

SOURCE: STATISTICS CANADA, SCIENCE STATISTICS CENTRE, 1976 FEDERAL SURVEY

(1) RESEARCH COUNCILS (INCLUDING EXPENDITURES ON TRIUMF) ARE EXCLUDED

(2) EXPENDITURES FOR TRIUMF HAVE BEEN EXCLUDED FROM AECB IN 1970-71

The funding mechanisms used by Federal departments and agencies generally take the following forms:

- Contracts, are used to solve specific problems and obtain well identified results within restricted time and quality limits.
- Grants and contributions, to support more systematic research which is allied to problem areas rather than specific problems which are of interest to a department; this research may be basic as well as applied.
- Block grants, in support of centres of specialization. The intention of block grants is to make a concerted effort to promote the calibre of university research and enhance qualified manpower in selected areas of importance to the departments.
- Personnel support programs, are a further mechanism to develop qualified manpower. These programs usually involve graduate students, and are either for training or career development, in which case the programs involve post-doctoral students and more senior researchers.

Although most Federal departments and agencies provide general assistance to the universities through these mechanisms, not all have specific university support programs. An extensive review aimed at identifying the specific programs for each was undertaken, the results of which are provided below. Summary details on expenditures for research and development and related scientific activities by department are also provided.

The Canadian International Development Agency and the International Development Research Centre are major funders of the university sector, but they have been excluded because the nature of their financing is somewhat different from that of the other departments.

Appendix II provides expenditure data for other departments which finance science activities in Canadian universities but which have not specific university support programs.

Departmental Details

Department of National Health and Welfare

As shown in Table 9, almost one half of this Department's 1978-79 science budget will be spent in support of extramural activities while the corresponding figure for total federal science expenditures is less than one third (Table 5). As shown in Table 8, National Health and Welfare is the largest departmental sponsor of scientific activities in universities. Thus, the Department of National Health and Welfare is unique among government departments and agencies with respect to the extent of its reliance on extramurally-performed, especially university-performed, scientific activities. This is primarily due to the high degree of concentration of Canada's health and social sciences research capability in the university sector.

The largest of the Department's four science funding programs is the National Health Research and Development Program, which funds projects relevant to those functions and statutory responsibilities of the Department which concern the promotion, protection and maintenance of the health of the residents of Canada. This program also offers a variety of research personnel training and career awards.

The other science programs include: the National Welfare Grants Program, which supports activities aimed at improving welfare services and self-help activities; the Family Planning Grants Program, which exists to help Canadians make, if they so choose, informed decisions concerning the number and spacing of their children; and the Research on Drug Abuse Program, which funds investigations into the physical, mental and social problems associated with the non-medical use of alcohol, tobacco and drugs.

A fifth program, the Health Activities Summer Employment Program for Students, does not support scientific activities per se, but rather makes funds available to organizations, including universities, for the purpose of employing students in connection with health-related activities, which may include research projects.

In addition to those programs which help defray the direct costs of university research, departmental funds, in the form of contributions from the Health Resources Fund, are also provided to support the construction, acquisition, renovation and equipping of education and research facilities for health personnel. Expenditures from this fund are conditional upon equivalent amounts being provided from other non-federal sources.

TABLE 9
NATIONAL HEALTH AND WELFARE
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
	TOTAL	36,501	61,089	100.0	100.0
	R&D	27,273	37,909	74.7	62.1
	INTRAMURAL	10,310	15,523	28.2	25.4
	EXTRAMURAL	16,963	22,386	46.5	36.6
	GRANTS	16,480	20,461	45.1	33.5
TOTAL EXPENDITURES	CONTRACTS	139	1,215	0.4	2.0
	RESEARCH FELLOWSHIPS	344	710	0.9	1.2
	RSA	9,228	23,180	25.3	37.9
	INTRAMURAL	4,932	16,562	13.5	27.1
	EXTRAMURAL	4,296	6,618	11.8	10.8
	TOTAL	15,741	16,847	43.1	27.6
	R&D	14,141	13,644	38.7	22.3
	GRANTS	13,789	12,984	37.8	21.3
TO CANADIAN UNIVERSITIES	CONTRACTS	8	110	0.0	0.2
	RESEARCH FELLOWSHIPS	344	550	0.9	0.9
	RSA	1,600	3,203	4.4	5.2

SOURCE: NOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES,
(2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Department of Agriculture

The Research Program of the Department is the major vehicle for support of university research. Under this program three types of grants are available. Extramural Research Grants are provided to university researchers for projects in which the initiative comes from the Department and for which expertise and facilities are not available internally. Operating Grants provide support to Canadian universities for research proposals from them, that are applicable to agriculture. In awarding these grants priority is given to projects and fields where new knowledge is urgently needed and trained investigators are in short supply. Grants are approved annually by a panel of experts mainly from agricultural faculties of Canadian universities. In addition, Deans of Agriculture and Veterinary Medicine are awarded small grants for use on projects of their own choice.

Other major programs by the Department which provide support to university researchers include the Food Production and Marketing Program, Health of Animals Program and the Market and Product Research Program of the Canadian Dairy Commission.

TABLE 10
 AGRICULTURE
 EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	73,992	134,661	100.0	100.0
R&D	71,080	129,210	96.1	96.0
INTRAMURAL	70,123	123,812	94.8	91.9
EXTRAMURAL	957	5,398	1.3	4.0
GRANTS	945	2,376	1.3	1.8
CONTRACTS	12	3,022	0.0	2.2
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	2,912	5,451	3.9	4.0
INTRAMURAL	2,912	5,378	3.9	4.0
EXTRAMURAL	-	73	-	0.1
TOTAL	889	3,813	1.2	2.8
R&D	889	3,813	1.2	2.8
GRANTS	877	1,826	1.2	1.4
CONTRACTS	12	1,987	0.0	1.5
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	-	-	-	-
TO CANADIAN UNIVERSITIES				

SOURCE: NOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Department of Environment

The Science Subvention Program is the major university support program and is divided into four components. The Water Resource Research Support Program provides support for innovative research relevant to the Department for Water Resource Research in the natural and social sciences with emphasis on water management. The University Research Support fund provides financial assistance to graduate students to carry out graduate research in the field of wildlife. The Atmospheric Research Program provides funds to promote atmosphere and ice research to improve economic, environmental or social conditions. The Fisheries and Marine Program provides funds to promote management for the conservation and development of fisheries and the understanding required to predict the effects of natural and human disturbances to the environment. All of these components under the Science Subvention Program are designed to assist in the development of ideas and the investigation of problems of departmental interest and to improve contacts with the university community.

University Forestry faculties are also provided with assistance under a Program of Block Grants.

TABLE 11

ENVIRONMENT
EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	194,597	308,564	100.0	100.0
R&D	87,311	125,632	44.9	40.7
INTRAMURAL	82,471	112,931	42.4	36.6
EXTRAMURAL	4,840	12,701	2.5	4.1
GRANTS	2,047	3,380	1.1	1.1
CONTRACTS	2,736	9,261	1.4	3.0
RESEARCH FELLOWSHIPS	57	60	0.0	0.0
RSA	107,286	182,932	55.1	59.3
INTRAMURAL	102,796	176,099	52.8	57.1
EXTRAMURAL	4,490	6,833	2.3	2.2
TOTAL	3,050	3,270	1.6	1.1
R&D	3,003	2,970	1.5	1.0
GRANTS	1,984	1,917	1.0	0.6
CONTRACTS	962	993	0.5	0.3
RESEARCH FELLOWSHIPS	57	60	0.0	0.0
RSA	47	300	0.0	0.1

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Department of Transport

The Department supports several university support programs through its Transport Canada Research and Development Centre. Within the University Transportation Centres Program, the Centre provides grants for the purpose of increasing the number of Canadian graduates with expertise in transportation problem solving and improving the quality of university research. Transportation centres at the University of British Columbia, the University of Manitoba, the Universities of Toronto and York (joint ventures), the Université de Montréal, and the Canadian Marine Transportation Centre at Dalhousie University are supported under this program.

The Development Centre also provides Negotiated Research Contributions in which research proposals are circulated to the universities and selected projects are funded directly by the Department. All Canadian universities may compete for these projects.

A Fellowship Program provides annual awards to post-graduate students for studies in transportation research. These fellowships are awarded by competition and are tenable at any Canadian university. The Department also provides senior fellowships from time to time to post-doctoral students and eminent academics to pursue research.

The Road Safety Branch of the Department also supports university research through its Countermeasures Development Program and data acquisition contracts to Accident Investigation Teams.

TABLE 12

TRANSPORT
EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	8,588	40,672	100.0	100.0
R&D	6,177	17,362	71.9	42.7
INTRAMURAL	3,621	3,870	42.2	9.5
EXTRAMURAL	2,556	13,492	29.8	33.2
GRANTS	16	2,202	0.2	5.4
CONTRACTS	2,340	11,015	27.2	27.1
RESEARCH FELLOWSHIPS	200	275	2.3	0.7
RSA	2,411	23,310	28.1	57.3
INTRAMURAL	891	13,063	10.4	32.1
EXTRAMURAL	1,520	10,247	17.7	25.2
TOTAL	1,249	2,831	14.5	7.0
R&D	784	2,631	9.1	6.5
GRANTS	6	756	0.1	1.9
CONTRACTS	578	1,600	6.7	3.9
RESEARCH FELLOWSHIPS	200	275	2.3	0.7
RSA	465	200	5.4	0.5
TOTAL EXPENDITURES				
TO CANADIAN UNIVERSITIES				

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Energy, Mines and Resources

Although no specific university support program exists, university research is mainly encouraged through the Research Agreements Program. A circulated guide solicits proposals from universities as well as other institutions and selections are made based principally on departmental relevance.

TABLE 13

ENERGY, MINES AND RESOURCES
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
	TOTAL	74,756	124,128	100.0	100.0
	R&D	39,566	79,801	52.9	64.3
	INTRAMURAL	34,820	50,390	46.6	40.6
	EXTRAMURAL	4,746	29,411	6.3	23.7
	GRANTS	3,427	17,243	4.6	13.9
TOTAL EXPENDITURES	CONTRACTS	1,319	12,168	1.8	9.8
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	35,190	44,327	47.1	35.7
	INTRAMURAL	32,377	37,219	43.3	30.0
	EXTRAMURAL	2,813	7,108	3.8	5.7
	TOTAL	1,051	2,687	1.4	2.2
	R&D	996	2,544	1.3	2.0
	GRANTS	504	1,265	0.7	1.0
TO CANADIAN UNIVERSITIES	CONTRACTS	492	1,279	0.7	1.0
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	55	143	0.1	0.1

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Industry, Trade and Commerce

This Department supports numerous programs directly related to the support of university research. Since 1967 IT&C has sponsored ten university-based research institutes under its Industrial Research Institute Program. Federal assistance takes the form of grants to underwrite the administrative cost of operating an institute during its formative years when income from contracts is insufficient to meet start-up expenditures. By December 1977, nine industrial institutes were operating, seven of which were self-supporting. The remaining two institutes, one located at the University of Quebec at Montreal and the other at the University of Manitoba were still receiving financial support.

In 1970, IT&C introduced the Centres of Advanced Technology Program. It was principally designed to encourage universities and others with research capabilities to establish centres of expertise in specific technologies. Ten Centres of Advanced Technology have been established, five at Canadian universities and five at the Provincial Research Councils. At the present time five centres are no longer receiving financial support.

Through the Technological Innovation Studies Program the Department solicits proposals from the universities on topics which are useful and relevant to the Department's work in developing programs and policies to promote the innovative performance of Canadian industries and encourage continued academic interest in technological innovation.

The Management Advancement Program has resulted in the establishment of two university-based management advisory institutes. One institute is located at the University of Alberta, the other at Laval University. The major objective of these institutes is to meet business needs with university expertise. The Management Advancement Program also provides grants for university studies in international business. The Centres of International Business Studies Program has as its major objective the strengthening of the long-term competitiveness of Canadian industry through the improvement of the quality of international business management. There are four centres in existence and they are funded for a five-year period.

TABLE 14

INDUSTRY, TRADE AND COMMERCE
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
TOTAL EXPENDITURES	TOTAL	93,166	61,917	100.0	100.0
	R&D	92,210	59,943	99.0	96.8
	INTRAMURAL	2,481	77	2.7	0.1
	EXTRAMURAL	89,729	59,866	96.3	96.7
	GRANTS	89,676	59,710	96.3	96.4
	CONTRACTS	53	156	0.1	0.3
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	956	1,974	1.0	3.2
	INTRAMURAL	200	603	0.2	1.0
	EXTRAMURAL	756	1,371	0.8	2.2
TO CANADIAN UNIVERSITIES	TOTAL	1,024	1,231	1.1	2.0
	R&D	523	631	0.6	1.0
	GRANTS	523	631	0.6	1.0
	CONTRACTS	-	-	-	-
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	501	600	0.5	1.0

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Central Mortgage and Housing

This Department supports university research through three major programs. The Institutional Support Program provides funding to university-based institutes for research on housing and related issues. The Educational Support Program provides scholarships for full-time study in fields relating to housing and housing development. Students apply through the universities for support in a graduate study program or in an open competition for support of an individually designed study program. The Policy Research Program awards contracts for specific research projects through a tendering process, in which universities are eligible to compete.

TABLE 15
CENTRAL MORTGAGE AND HOUSING
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
TOTAL EXPENDITURES	TOTAL	4,328	13,648	100.0	100.0
	R&D	3,261	6,612	75.3	48.4
	INTRAMURAL	495	2,301	11.4	16.9
	EXTRAMURAL	2,766	4,311	63.9	31.6
	GRANTS	2,122	51	49.0	0.4
	CONTRACTS	644	4,260	14.9	31.2
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	1,067	7,036	24.7	51.6
	INTRAMURAL	324	2,687	7.5	19.7
	EXTRAMURAL	743	4,349	17.2	31.9
TO CANADIAN UNIVERSITIES	TOTAL	551	1,409	12.7	10.3
	R&D	263	88	6.1	0.6
	GRANTS	263	6	6.1	0.0
	CONTRACTS	-	82	-	0.6
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	288	1,321	6.7	9.7

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Department of Communications

The University Research Contract Program is one of the major activities directed towards university research. All research proposals for this program are processed by the Department and the Department of Supply and Services (DSS) is then requested to negotiate the contract under the normal DSS guidelines.

Another important activity in this domain is the many other contracts awarded each year to universities for specific research needs of individual Branches of the Department.

TABLE 16

COMMUNICATIONS
EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	26,221	52,300	100.0	100.0
R&D	25,393	48,035	96.8	91.8
. INTRAMURAL	11,806	16,719	45.0	32.0
. EXTRAMURAL	13,587	31,316	51.8	59.9
. GRANTS	-	600	-	1.1
. CONTRACTS	12,341	30,716	47.1	58.7
. RESEARCH FELLOWSHIPS	1,246	-	4.8	-
RSA	828	4,265	3.2	8.2
. INTRAMURAL	573	2,975	2.2	5.7
. EXTRAMURAL	255	1,290	1.0	2.5
TOTAL	744	751	2.8	1.4
R&D	573	700	2.2	1.3
. GRANTS	-	-	-	-
. CONTRACTS	573	700	2.2	1.3
. RESEARCH FELLOWSHIPS	-	-	-	-
RSA	171	51	0.7	0.1

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

(a) NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Indian and Northern Affairs

The Department administers through the Northern Social Research Division a program of training grants to universities. On the advice of a Committee with representatives drawn from appropriate government departments and research councils, grants are made to institutes and committees for northern research at approximately a dozen universities across Canada. These grants are made for the purpose of providing northern experience to scientists in training, with the intention of developing a commitment to northern work. When a grant is made to an institute or committee, it becomes that institute's responsibility to allocate funds to support specific students. The Northern Scientific Training Grants Committee provides some guidance for the establishment of priorities in fields of training.

Support is also provided through the Specified Grants Program, wherein grants are provided for specific areas identified as a department priority. Funds go directly to the researchers through the university.

TABLE 17
INDIAN AND NORTHERN AFFAIRS
EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	6,667	13,043	100.0	100.0
R&D	5,070	10,033	76.0	76.9
INTRAMURAL	3,294	7,697	49.4	59.0
EXTRAMURAL	1,776	2,336	26.6	17.9
GRANTS	430	490	6.4	3.8
CONTRACTS	1,346	1,846	20.2	14.2
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	1,597	3,010	24.0	23.1
INTRAMURAL	1,342	2,408	20.1	18.5
EXTRAMURAL	255	602	3.8	4.6
TOTAL	1,210	1,041	18.1	8.0
R&D	1,107	933	16.6	7.2
GRANTS	311	419	4.7	3.2
CONTRACTS	796	514	11.9	3.9
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	103	108	1.5	0.8
TOTAL EXPENDITURES				
TO CANADIAN UNIVERSITIES				

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Department of Justice

This Department supports only one major program related to university research. The Duff-Rinfret Scholarship Program provides assistance for masters students in Canadian law schools for one year on the basis of academic ability and the relevance of the proposed research.

TABLE 18
JUSTICE
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
TOTAL EXPENDITURES	TOTAL	2,384	5,798	100.0	100.0
	R&D	2,060	4,141	86.4	71.4
	INTRAMURAL	1,828	2,019	76.7	34.8
	EXTRAMURAL	232	2,122	9.7	36.6
	GRANTS	20	1,415	0.8	24.4
	CONTRACTS	212	707	8.9	12.2
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	324	1,657	13.6	28.6
	INTRAMURAL	324	728	13.6	12.6
	EXTRAMURAL	-	929	-	16.0
TO CANADIAN UNIVERSITIES	TOTAL	-	11	-	0.2
	R&D	-	-	-	-
	GRANTS	-	-	-	-
	CONTRACTS	-	-	-	-
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	-	11	-	0.2

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

Departmental Summary

Table 19 summarizes the preceding departmental details for university funding. The information is broken down between R&D and RSA. R&D is further broken down between grants and contracts. The funding by the research councils is shown in this table for comparison.

The bulk of the federal science support to universities is in the form of grants. In the case of the granting councils, this is true for their entire support. The proportion of departmental funding that is in the form of grants has decreased from 70 per cent in 1972-73 to 48 per cent in 1978-79. At the same time, federal contracts and support of related scientific activities have risen in relative importance over this period: from 15 to 25 per cent in the case of contracts, and from 15 to 27 per cent in the case of RSA, expressed as a percentage of the departmental funding total excluding that of the councils. In absolute terms, the amount allocated to contracts is still small, however, it has grown from \$5.9 million out of a total of \$151 million in 1972-73, to \$12.1 million out of a total of \$241.1 million in 1978-79.

TABLE 19

FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES
IN CANADIAN UNIVERSITIES - 1978-79

DEPARTMENTS AND AGENCIES

(\$ MILLIONS)

	TOTAL	TOTAL R&D	GRANTS (1)	CONTRACTS	RSA
NATIONAL HEALTH AND WELFARE	16.8	13.6	13.5	0.1	3.2
AGRICULTURE	3.2	3.8	1.8	2.0	-
ENVIRONMENT	3.3	3.0	2.0	1.0	0.3
TRANSPORT	2.2	2.6	1.0	1.6	0.2
ENERGY, MINES AND RESOURCES	2.7	2.5	1.3	1.3	0.1
INDUSTRY, TRADE AND COMMERCE	1.2	0.6	0.6	-	0.6
CENTRAL MORTGAGE AND HOUSING	1.4	0.1	0.0	0.1	1.3
COMMUNICATIONS	0.8	0.7	-	0.7	0.1
INDIAN AND NORTHERN AFFAIRS	1.0	0.9	0.4	0.5	0.1
JUSTICE	0.0	-	-	-	0.0
URBAN AFFAIRS	1.9	0.2	-	0.2	1.7
CANADIAN INTERNATIONAL DEVELOPMENT AGENCY	3.6	0.3	0.3	-	3.3
INTERNATIONAL RESEARCH CENTRE	0.8	0.8	0.8	-	-
ATOMIC ENERGY CONTROL BOARD	0.3	0.3	-	0.3	-
SECRETARY OF STATE	1.1	0.6	0.2	0.4	0.5
NATIONAL RESEARCH COUNCIL	1.2	1.2	-	1.2	-
SUPPLY AND SERVICES	1.2	1.0	-	1.0	0.2
NATIONAL DEFENCE	1.7	1.7	0.7	1.0	-
SOLICITOR GENERAL	0.8	0.8	0.3	0.5	0.0
OTHER DEPARTMENTS AND AGENCIES	2.1	0.5	0.2	0.4	1.5
SUB TOTAL	48.5	35.3	23.2	12.1	13.2
NSERC	105.4	96.7	96.7	-	3.7
SSHRC	26.4	13.2	13.2	-	8.2
MRC	60.8	59.0	59.0	-	1.8
SUB TOTAL	192.6	173.9	173.9	-	13.7
TOTAL	241.1	209.2	197.1	12.1	31.9

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79, UPDATED AUGUST 1978.

(1) SUM OF GRANTS AND RESEARCH FELLOWSHIPS

NOTE: TRIUMF PAYMENTS EXCLUDED

TABLE 19 (concl'd)

FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES
IN CANADIAN UNIVERSITIES - 1972-73

DEPARTMENTS AND AGENCIES

(\$ MILLIONS)

	TOTAL	TOTAL R&D	GRANTS (1)	CONTRACTS	RSA
NATIONAL HEALTH AND WELFARE	15.7	14.1	14.1	0.0	1.6
AGRICULTURE	0.9	0.9	0.9	0.0	-
ENVIRONMENT	3.1	3.0	2.0	1.0	0.9
TRANSPORT	1.2	0.8	0.2	0.6	0.5
ENERGY, MINES AND RESOURCES	1.1	1.0	0.5	0.5	0.1
INDUSTRY, TRADE AND COMMERCE	1.0	0.5	0.5	-	0.5
CENTRAL MORTGAGE AND HOUSING	0.6	0.3	0.3	-	0.3
COMMUNICATIONS	0.7	0.6	-	0.6	0.2
INDIAN AND NORTHERN AFFAIRS	1.2	1.1	0.3	0.8	0.1
JUSTICE	-	-	-	-	-
URBAN AFFAIRS	0.7	0.7	-	0.7	0.0
CANADIAN INTERNATIONAL DEVELOPMENT AGENCY	1.1	-	-	-	1.1
INTERNATIONAL RESEARCH CENTRE	0.1	0.1	0.1	-	0.0
ATOMIC ENERGY CONTROL BOARD	2.6	2.6	2.6	-	-
SECRETARY OF STATE	1.3	0.5	0.4	0.2	0.2
SUPPLY AND SERVICES	-	-	-	-	-
NATIONAL DEFENCE	3.3	3.3	3.0	0.3	0.0
SOLICITOR GENERAL	0.1	0.1	-	0.1	0.1
OTHER DEPARTMENTS AND AGENCIES	2.0	1.7	0.8	0.9	0.3
SUB TOTAL	36.8	31.3	25.7	5.5	5.5
NSERC	63.8	57.0	56.6	0.4	6.8
SSHRC	15.0	7.6	7.6	0.0	7.4
MRC	35.3	33.8	33.8	-	1.5
SUB TOTAL	114.0	98.3	97.9	0.4	15.7
TOTAL	150.8	129.6	123.7	5.9	21.2

SOURCE: DATA OBTAINED FROM STATISTICS CANADA HISTORICAL SERIES (1976 SURVEY);

(1) SUM OF GRANTS AND RESEARCH FELLOWSHIPS

NOTE: TRIUMF PAYMENTS EXCLUDED

RESEARCH COUNCILS

RESEARCH COUNCILS

In accordance with Bill C-26, the granting councils were reorganized in the spring of 1978. The analysis presented here relates mainly to the time prior to this reorganization.

The objectives and historical development of the three Councils show a number of interesting differences. The support of university research in the health sciences has been the sole responsibility of the MRC. By contrast, support for university research in natural sciences and engineering and in the human sciences has evolved under the umbrella of much larger organizations, namely the Office of Grants and Scholarships of the NRC and the Humanities and Social Sciences Branch of the Canada Council. Consequently, the support of university research developed as sub-objectives of these latter two Councils.

The constituencies for which the three Councils were responsible differ considerably in their size, geographical concentration, and their reliance on Council support. In addition, the research areas which each Council addresses reflect distinctive characteristics. It was natural therefore that these particular features should result in programs tailored to the needs of each constituency.

The primary aim of the Canadian medical research community is the understanding and improvement of human health. A well-focussed and integrated environment made up of sixteen

universities with faculties of medicine and dentistry or pharmacy and their affiliated hospitals and institutions, facilitates communications among researchers. The main constituency, whose responsibilities include service as well as research and education, numbers approximately 3,300 full-time medical school faculty with nearly 1,500 of these participating in MRC's programming. Because of the close inter-relatedness of the medical science disciplines, programs which foster collaboration are encouraged. In addition, since MRC only provides about 50 per cent of the funding for health science research in Canada, its programs have been developed in concert with other funding bodies, both governmental and private.

In contrast to the well focussed research efforts and integrated membership of the MRC's constituency, the natural science and engineering community includes some 9,000 professors from over 60 universities who undertake research in a wide variety of disparate disciplines. NRC (now NSERC) supported about 65 per cent of this population, but this varied with discipline. The increasing specialization of the natural sciences, together with the practice of the NRC of apportioning funds to disciplinary committees, resulted in the compartmentalized development of natural science and

engineering research in Canada in programs adjudicated on the basis of excellence and productivity alone. Support for more problem-oriented research has been available from other government sources and industry.

The constituency supported by the humanities and social science branch of the Canada Council (now SSHRC) is heterogeneous; the disciplines vary widely in objective and methodology. The potential clientele numbers over 16,000 professors, together with non-university researchers, and is dispersed among 65 institutions in the country.

The constituency is relatively loosely organized. Many researchers received their training abroad and their research interests lie outside Canada. The research tradition, particularly in the social sciences, is relatively young and development must be fostered before it will be possible to undertake more applied studies with reasonable success.

Unlike the clientele of the other two Councils, researchers in the human sciences must rely almost completely on the federal government and the universities for support of their research. The participation rate in Canada Council's two main R&D programs (i.e., the Research Grants Program, and the Leave Fellowships Program) was about 10 per cent of faculty.

Expenditures of the three research councils increased from \$116 million in 1970-71 to \$163 million in 1976-77 (see Table 20). This amounts to an average annual increase of 6 per cent over the period.

TABLE 20
EXPENDITURES ON SCIENTIFIC ACTIVITIES BY THE RESEARCH COUNCILS
(\$ MILLIONS - CURRENT)

	1970-71	1976-77	1977-78	1978-79
NRC (NSERC) (1)	61.7	82.2	93.4	105.4
CC (SSHRC)	20.1	29.2	31.4	34.2
MRC	34.5	51.9	58.1	64.4
TOTAL	116.3	163.3	182.9	204.0

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976/77 TO 1978/79

(1) DATA FOR NRC(NSERC) ARE FOR EXPENDITURES ON SCIENTIFIC ACTIVITIES AT CANADIAN UNIVERSITIES BY THE OFFICE OF GRANTS AND SCHOLARSHIPS (NSERC) WHICH REPRESENTED OVER 95% OF NSERC'S TOTAL EXPENDITURES ON SCIENTIFIC ACTIVITIES (1976-77)

NOTE: EXPENDITURES EXCLUDE PAYMENTS BY NRC(NSERC) TO TRIUMF

Between 1976-77 and 1977-78 expenditures increased by \$20 million. This represents a 12 per cent annual increase. A major factor for this increase was the provision of \$8 million to NRC (NSERC) to expand that part of its university support program directed at areas of particular importance and concern to Canada.

In the original main estimates for the fiscal year starting April 1, 1978, total funds to the Councils were increased by \$12 million, which amounts to a growth of 6 per cent. On June 1, 1978 it was announced that NSERC receive a further \$5 million, MRC \$3 million and SSHRC \$2 million. When these increases are included in the 1978-79 main estimates, available funding of the Councils rises to \$204 million in 1978-79, which implies an increase of 12 per cent over the previous year.

Total expenditures by NRC (NSERC) in 1970-71 were \$62 million. By 1976-77 these expenditures had increased at an average annual rate of 5 per cent to \$82 million. Mainly as a result of the federal thrust fund initiatives, expenditures by NRC (NSERC) increased by 14 per cent from 1976-77 to 1977-78 and a further 13 per cent from 1977-78 to 1978-79 (including the \$5 million increase announced on June 1, 1978).

Expenditures by the Canada Council (SSHRC) increased by 6 per cent per annum from 1970-71 to 1976-77 to \$29 million. Between 1976-77 and 1977-78 expenditures increased by 8 per cent, and between 1977-78 and 1978-79 expenditures rose by

9 per cent (including the \$2 million increase announced June 1, 1978),

In the case of the Medical Research Council, expenditures increased by 7 per cent per annum from 1970-71 to 1976-77. Between 1976-77 and 1977-78 expenditures increased by 12 per cent and a further 11 per cent from 1977-78 to 1978-79 (including the \$3 million increase announced June 1, 1978).

The following sections describe the program funding of each of the Councils in more detail. The more detailed information regarding the funding is, however, available only up to 1976-77.

MEDICAL RESEARCH COUNCIL PROGRAMS

Since 1970-71 the total level of support increased from \$34 million (\$ current) to \$51 million (\$ current) in 1976-77 (see Table 21). This represents a 7 per cent annual increase over the six year period.

TABLE 21
MEDICAL RESEARCH COUNCIL LEVEL OF SUPPORT
(SELECTED YEARS)

PROGRAMS	PAYMENTS IN THOUSANDS OF DOLLARS			PERCENTAGE DISTRIBUTION			
	1970-71	1973-74	1976-77	1970-71	1973-74	1976-77	
R&D <i>R&D</i>	GRANTS	25,747	30,818	40,838	75.8	76.4	80.3
	FELLOWSHIPS	5,217	6,056	6,439	15.4	15.0	12.7
	SUB-TOTAL	30,964	36,869	47,277	91.2	91.4	93.0
RESEARCH RELATED ACTIVITIES	RESEARCH TRAINING	2,871	3,317	3,392	8.5	8.2	6.7
	OTHER RRA	128	172	179	0.4	0.4	0.4
	SUB-TOTAL	2,999	3,489	3,571	8.8	8.6	7.0
TOTAL	TOTAL	33,963	40,358	50,848	100.0	100.0	100.0

SOURCE: MEDICAL RESEARCH COUNCIL ANNUAL REPORTS

Historically, the Council has developed two major areas of support programs. Payments towards R&D represent the largest program expenditure amounting to 93 per cent of the total level of support in 1976-77. These funds

provide direct support of research activities by investigators in the form of various grants and special awards which are considered as personnel support. Funds allocated for R&D have also shown a stable pattern historically, amounting to 91 per cent of the total in 1970-71 and 93 per cent in 1976-77.

The largest proportion of R&D expenditures are for grants-in-aid of research. These grants rose slightly from 76 per cent of total expenditures in 1970-71 to 80 per cent in 1976-77. R&D grants are awarded to assist in defraying the running costs of research programs including grants for specific items of equipment. Applications from investigators on staff at Canadian universities and affiliated institutions are considered on two occasions each year. The basis for consideration is peer assessment. Each application is reviewed by external referees, expert in the field involved, and then considered by one of seventeen grants committees, each composed of eight to ten senior investigators drawn from universities, government and industry. The recommendations by these committees are then forwarded to the Council and awards are approved to the extent that funds permit.

The R&D portion of MRC's expenditure also includes awards for associateships, scholarships, Centennial Fellowships (for PhDs)¹ and visiting scientists. These expenditures accounted for 13 per cent of the total MRC payments in 1976-77, which has also been in rather constant proportion historically.

The second major area of support known as Research Related Activities (RRA) is composed of two components - research training and other RRA. Research training was the largest expenditure of the RRA accounting for 7 per cent of the total expenditures in 1976-77. Under this component, awards are provided to post-graduate students registered for a degree as well as to recent holders of a doctorate degree in need of further research training. This area consists of such programs as studentships, summer scholarships and fellowships.

The third area, Other Research Related Activities, accounted for only a small proportion of expenditures. It provides support for various activities related to the performance of research, such as conferences, visiting professors, symposiums, travel grants to attend scientific meetings, seminars, etc.

¹Centennial Fellowships to non-PhD's are included under "Research Training".

A breakdown of the regional distribution of payments towards R&D is provided in Table 22 . Ontario received the largest proportion of R&D grants, (36 per cent), followed by Quebec (33 per cent), the Western Provinces (24 per cent) and the Atlantic (5 per cent) in 1976-77.

TABLE 22.
MRC EXPENDITURES ON SCIENTIFIC ACTIVITIES
PAYMENTS TOWARDS R&D.

REGION	1975-76		1976-77	
	(\$'000)	(%)	(\$'000)	(%)
ATLANTIC PROVINCES	2,052	4.7	2,163	4.6
QUEBEC	14,973	34.5	15,804	33.3
ONTARIO	15,187	35.0	17,000	35.9
WESTERN PROVINCES	10,000	23.0	11,260	23.7
CANADIAN NON-UNIVERSITIES	38	0.1	182	0.4
OUTSIDE CANADA	1,150	2.6	1,005	2.1
TOTAL	43,400	100.0	47,414	100.0

SOURCE: BASED ON MEDICAL RESEARCH COUNCIL TABULATIONS

Although not shown in Table 22, a comparison of the average yearly percentage increase of payments to R&D between 1971 and 1976 revealed that Newfoundland had the highest value (19 per cent) while Saskatchewan had the lowest with a decline over this period at a yearly average of -2.2 per cent.

Manitoba and British Columbia showed about a 2 per cent yearly increase over this period. In contrast to the other three western provinces, Alberta has had a strong average increase of 12 per cent. Quebec and Ontario have had average increases of 7.0 and 9.9 per cent respectively and were the only two provinces which never sustained a decline in payments over the period examined.

National Research Council (NSERC) Programs

In 1976-77 total expenditure by NRC totalled \$86 million. This amounted to a 5 per cent annual increase since 1970-71 as shown in Table 23.

TABLE 23

NRC (NSERC) LEVEL OF SUPPORT
(SELECTED YEARS)

PROGRAMS		PAYMENTS IN THOUSANDS OF DOLLARS			PERCENTAGE DISTRIBUTION		
		1970-71	1973-74	1976-77 (1)	1970-71	1973-74	1976-77
R&D	PEER ADJUDICATED GRANTS	46,960	48,362	67,025	72.5	70.5	77.9
	DEVELOPMENT GRANTS	8,644	12,205	6,832	13.3	17.8	7.9
	SUB-TOTAL	55,604	60,567	73,857	85.8	88.3	85.8
RESEARCH RELATED ACTIVITIES	RESEARCH TRAINING	2,046	6,863	10,994	12.4	10.0	12.8
	OTHER RRA	1,145	1,162	1,212	1.8	1.7	1.4
	SUB-TOTAL	9,191	8,025	12,206	14.2	11.7	14.2
TOTAL	TOTAL	64,795	68,592	86,063	100.0	100.0	100.0

SOURCE: NRC ANNUAL REPORTS

(1) PAYMENTS TO TRIUMF EXCLUDED

The granting program that NRC has developed to support research in Canadian universities can be grouped into two categories - R&D and Research Related Activities (RRA).

Research and development programs accounted for the largest proportion of expenditures in 1976-77 (86 per cent). This relative proportion has remained constant since 1970-71.

The R&D activities are composed of two major groups, Peer-Adjudicated Grants and Development Grants. Peer-Adjudicated Grants have accounted for the largest percentage of NRC's expenditures; representing about 78 per cent of the total expenditures in 1976-77. These grants are provided to both individuals and groups. However, most of the funds in this category were distributed to individuals as opposed to groups of researchers. For example, in 1975-76, \$53 million was distributed as grants to individuals as compared with \$3.1 million as grants to groups. Grants to individuals included operating grants, equipment grants for requests up to \$5 thousand, special computing grants and major equipment grants. Grants to groups included nuclear physics grants, high energy physics grants, institute grants and International Biological Program Grants.

Development Grants are the other major component of the R&D expenditures. Included in this category are grants for Specific Research Undertaking, General Development and Assistance Grants, Post-doctoral Level Awards and Senior Level Awards. In 1976-77 these grants accounted for 8 per cent of the total expenditures. This proportion has decreased rather dramatically from 13 per cent in 1970-71 and 18 per cent in 1973-74.

In 1976-77 NRC allocated \$12 million towards Research Related Activities. This represented 14 per cent of the total expenditures which has remained relatively constant since 1970-71. The major component of this activity has been the Research Training Awards which included Post-Graduate Level Awards. In 1976-77 Research Training Awards represented 13 per cent of the total expenditures and this has remained relatively constant since 1970-71.

Other Research Related Activities included such items as Publication Grants, General Promotion Grants, Conference Grants and Grants for International Activities such as Exchange programs. In 1976-77 these activities represented only 1.4 per cent of the total expenditures. This proportion was down slightly from the 1970-71 level of 1.8 per cent.

Table 24 shows the regional distribution of NRC operating expenditures which accounted for the largest proportion of total expenditures. In 1976-77 Ontario received the largest share of operating grants, roughly 45 per cent; Quebec was next with roughly 17 per cent of the total expenditures; Alberta and British Columbia each received about the same proportion, roughly 12 per cent, whereas, the two remaining Prairie Provinces each received about 4 per cent of the funds; and the Atlantic Provinces about 7 per cent. Note that the ranking of the provinces according to the percentage of number of awards parallels the ranking according to the percentage of expenditures. However, for Ontario, Alberta and British Columbia the percentage of number of awards is less than the percentage of expenditures whereas for all the other provinces the reverse holds true. Historically, (since 1971-72), the percentage distributions of both awards and expenditures remained relatively constant.

TABLE 24

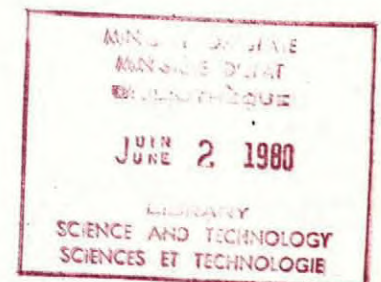
NRC(NSSRC) - DISTRIBUTION OF OPERATING GRANTS(1)
BY PROVINCE

PROVINCE	(PERCENTAGE DISTRIBUTION)			
	1975-76		1976-77	
	AWARDS	EXPENDITURES	AWARDS	EXPENDITURES
ATLANTIC PROVINCES	9.1	7.1	9.0	6.9
QUEBEC	19.3	16.6	19.6	16.9
ONTARIO	42.4	45.7	42.3	45.4
MANITOBA	4.7	4.3	4.5	4.0
SASKATCHEWAN	3.6	3.3	3.4	3.4
ALBERTA	10.0	10.8	10.2	10.9
BRITISH COLUMBIA	11.0	12.3	10.9	13.4
TOTAL (2)	5,124.0	48,880.0	5,228.0	52,103.0

SOURCE: DATA OBTAINED FROM THE OFFICE OF GRANTS AND SCHOLARSHIPS OF NRC.

(1) INCLUDES FUNDS DISTRIBUTED AS SPECIAL COMPUTING GRANTS.

(2) TOTALS FOR EXPENDITURES ARE IN THOUSANDS OF DOLLARS.



CANADA COUNCIL (SSHRC) PROGRAMS

Total support by the Canada Council (SSHRC) amounted to nearly \$28 million in 1976-77. This was a 7.2 per cent annual increase in support from 1970-71, as shown in Table 25.

TABLE 25
CANADA COUNCIL (SSHRC) LEVEL OF SUPPORT
(SELECTED YEARS)

PROGRAMS		PAYMENTS IN THOUSANDS OF DOLLARS			PERCENTAGE DISTRIBUTION		
		1970-71	1973-74	1976-77	1970-71	1973-74	1976-77
R&D	GRANTS	4,588	5,641	10,548	25.2	27.1	37.9
	FELLOWSHIPS	1,269	3,200	3,813	7.0	15.4	13.7
	SUB-TOTAL	5,857	8,841	14,361	32.1	42.5	51.7
RESEARCH RELATED ACTIVITIES	RESEARCH TRAINING	11,316	9,627	10,486	62.0	46.2	37.7
	OTHER RRA	1,065	2,351	2,956	5.8	11.3	10.6
	SUB-TOTAL	12,381	11,978	13,442	67.9	57.5	48.3
TOTAL	TOTAL	18,238	20,819	27,803	100.0	100.0	100.0

SOURCE: CANADA COUNCIL ANNUAL REPORTS

A variety of granting instruments have been developed to meet the needs of the social sciences and humanities community. These granting instruments can be classified into the two major categories: R&D and Research Related Activities (RRA).

Payments Towards Costs of R&D now play a considerably more prominent role in the Canada Council funding activities than previously. While in 1970-71, this area of support accounted for 32 per cent of total expenditures, it had grown to 52 per cent in 1976-77. This growth, from \$5.9 million to \$14.4 million represents an average annual rate of 16 per cent.

The largest component of the Council's grants towards Research and Development are referred to as Research Grants. Included in this category are Negotiated Grants, General Research Grants, Explorations Program Grants and the Special Grants and Studies Program. In the six years since 1970-71, Research Grants have increased from \$4.6 million to \$10.5 million or by some 14.7 per cent per year. Their share of total expenditures has increased from 25 per cent to 38 per cent over this period.

Also included in the R&D category is the Leave Fellowships Program. Expenditures on this program have increased substantially since 1970-71 totalling nearly \$4 million in 1976-77 and accounting for nearly 14 per cent of the total expenditures.

The second category of support, Research Related Activities (RRA), is composed of two groups, Research Training and other research related activities. Support for these activities amounted to 48 per cent in 1976-77 of the total expenditures which was down from the 1970-71 level of 68 per cent. The Research Training component of RRA provides Doctoral Fellowships to students in a PhD program and Special MA Scholarships to students studying for a MA degree or equivalent. This is the main area in which there has been a noticeable decline in Council emphasis. In 1970-71 it accounted for 62 per cent of the Council's expenditures, whereas in 1976-77 it accounted for 38 per cent of total expenditures.

The second category of RRA, "Other Research Related Activities", includes Publication Grants, Conference and Travel Grants and Research Support Services. These activities accounted for 11 per cent of the total Council expenditures in 1976-77 up from 6 per cent in 1970-71.

Table 26 shows the regional distribution of payments towards R&D and Research Training, the largest components of the Council's expenditure. In both categories Ontario received

the largest proportion 48 per cent; followed by Quebec 27 per cent; the Western Provinces 21 per cent; and the Atlantic 5 per cent. It should be noted that historically (since 1971-72) this has also been the pattern. Ontario and Quebec received approximately two-thirds of total expenditures, with Ontario receiving twice as much as Quebec. The Western Provinces have received slightly less than Quebec with British Columbia being the main recipient. The Atlantic Provinces received, on the average, 5 per cent of total expenditures, the highest recipient being Nova Scotia.

TABLE 26

CANADA COUNCIL - DISTRIBUTION OF FUNDS BY REGION
PERCENTAGES - 1976 AND 1977

REGIONS	PAYMENTS TOWARDS COSTS OF R&D (1)		RESEARCH TRAINING (2)	
	1976	1977 (3)	1976	1977 (3)
	ATLANTIC PROVINCES	6.4	6.4	4.7
QUEBEC	28.5	24.6	27.6	26.6
ONTARIO	43.6	46.0	48.1	48.1
WESTERN PROVINCES	21.5	23.0	19.6	20.6

SOURCE: CANADA COUNCIL ANNUAL REPORTS AND INTERNAL DOCUMENTS.

(1) INCLUDES RESEARCH GRANTS AND LEAVE FELLOWSHIPS.

(2) DOCTORAL FELLOWSHIPS AND SPECIAL MA SCHOLARSHIPS (DISTRIBUTION OF FUNDS CALCULATED FROM THAT OF AWARDS RECIPIENTS AND THE NATIONAL AVERAGES OF AWARDS LEVELS).

(3) CALCULATED ACCORDING TO REAL DISTRIBUTION OF FUNDS BY PROVINCE.

NOTE: FIGURES IN COLUMNS DO NOT ADD TO 100.0% DUE TO FUNDS ALLOCATED OUTSIDE UNIVERSITIES.

Comparison of the Councils' Funding

The largest share of the MRC's funding, approximately two-thirds, is paid as grants in aid-of-research. Over the years from 1971-1976, this support rose by 35 per cent, from \$22.5 million to \$30.3 million. The constant dollar growth was less than the rate of inflation.

The sharpest growth in any of the MRC programs, however, was recorded in the group grants, to which now are allocated some 8.5 per cent of the total budget, compared with only 1-2 per cent some five years ago. The group grants are designed to give special support to intensive research in particularly productive and promising areas. In 1975-76 there were ten groups operating in Canada, receiving over \$4 million.

The total number of investigators supported by the MRC rose very slightly, from 1,395 in 1970-71 to 1,508 in 1975-76, or by 8 per cent, compared with a growth of some 40 per cent in total R&D funding (including groups).

On balance, the MRC-financed research tends to be mission-oriented, due to the nature of the problems arising in the

bio-medical field. MRC spends a relatively small portion of its funds (some 8-9 per cent) on research training, and even less on "related activities" other than R&D or training.

The largest single program of the NRC is the Operating Grants to individuals. This amounted to some \$48.9 million (in 1975-76), compared with \$35.2 million five years earlier. The nominal growth rate was about 6.8 per cent per year, which is slightly less than the rate of inflation over the same time period. This program has also been the fastest growing among the major NRC programs, constituting now some 62 per cent of total funding. (All other R&D programs together account for another 25 per cent, but have not grown as strongly as operating grants).

The number of awards for operating grants rose from 4,625 in 1971 to 5,124 in 1976, implying an annual growth rate of 2.1 per cent.

Support for research training, now amounting to some 10 per cent of the NRC expenditures, has not grown as rapidly as the support of R&D, reflecting recent supply-demand conditions for researchers in the labour market. (See Table 27 below for a comparison of the councils' expenditures by R&D, education support, and other activities).

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The NRC program has a general orientation towards basic research support. It is not possible, nor necessary, to quantify this precisely, but it is interesting to note that over the past five years a little less than one-third of the operating grants have been made in aid of applied science programs such as engineering, and over two-thirds in aid of disciplines in the basic natural sciences. The proportions have remained fairly steady over this period. This generalization probably would remain true even if reasonable allowance were made for the fact that some basic research is carried on by engineers, and some mission-oriented research by scientists in the basic natural sciences.

As expected, the basic orientation of the Canada Council (SSHRC) programs is quite different from the others. The research training aspect is relatively much larger but, over the period since 1971, it has been significantly reduced, while the support of some R&D programs, and also publication grants, has become more pronounced.

The most significant feature of the Canada Council program has been a reduction in the number of doctoral fellowships; but the total budget for this program has decreased less, so that there was actually an increase in the amount per fellowship awarded. ✓

Funds for this program were reduced from \$11.3 million in 1971 to \$8.8 million in 1976. This represents an average annual decline of about 5 per cent. The number of candidates supported shrank to about 1,400, from about 2,400, over this period, or by an average annual rate of over 10 per cent.

The largest single program, Research Grants, has more or less retained its relative importance, amounting to around 23 per cent of the total. But there has been a slight reduction in the number of investigators being supported by this program.

The most rapid expansion in the Canada Council's expenditures, however, took place in such areas as editorial and program grants, leave fellowships, and publication grants. For example, the number of leave fellowships rose from 240 in 1971-72 to about 350 in 1975-76, or by about 10 per cent per year. The expenditures for this program, on the other hand, rose by an annual rate of 22 per cent, from \$1.7 million in 1971-72 to \$3.8 million in 1975-76.

TABLE 27

DISTRIBUTION OF THE COUNCILS' EXPENDITURES

(Per cent of Total)

Y E A R	R&D			Research Training			Research Related Activities		
	N.R.C.	M.R.C.	C.C.	N.R.C.	M.R.C.	C.C.	N.R.C.	M.R.C.	C.C.
1970-71	83.7	91.2	32.1	14.5	8.4	62.0	1.8	0.4	4.9
1971-72	84.3	90.1	32.9	13.9	9.2	59.4	1.8	0.7	7.7
1972-73	85.2	90.5	40.8	13.0	9.0	47.9	1.8	0.6	11.3
1973-74	85.4	91.4	42.5	12.9	8.2	46.2	1.7	0.4	11.3
1974-75	84.9	91.7	45.1	13.2	7.9	41.7	1.9	0.4	13.2
1975-76	85.0	91.5	52.0	13.3	8.1	37.4	1.7	0.4	10.6

APPENDIX I

APPENDIX I

Funding of TRIUMF

In 1968 the Atomic Energy Control Board (AECB) began payments for construction and design of TRIUMF (Tri-University Meson Facility). Funding by AECB continued until 1975-76. In 1976-77 responsibility for such payments was transferred to the Office of Scholarships and Grants (NRC). As of 1977-78, the responsibility has been located at NRC under their general science and engineering programs. Payments to TRIUMF are kept out of all expenditure tables in this report because responsibility for this program has been transferred several times and such accounting changes, if not removed, would introduce discontinuities in the various components of expenditure. Payments to TRIUMF for the years 1968-69 to 1978-79 are shown separately in the following table:

FEDERAL PAYMENTS TO TRIUMF FOR
CONSTRUCTION AND OPERATION

Year	\$,000 (current)	Year	\$,000 (current)
1968-69	975	1974-75	7,650
1969-70	2,900	1975-76	4,650
1970-71	4,600	1976-77	6,780
1971-72	9,125	1977-78	7,062
1972-73	5,300	1978-79	8,695
1973-74	4,650		

APPENDIX II

APPENDIX II

Additional Departmental Details

Many federal departments and agencies provide significant funding to Canadian universities but do not have specific programs designed to support university researchers. Provided below are a series of tables showing the expenditure patterns of these departments.

TABLE A-1

ATOMIC ENERGY CONTROL BOARD
EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	2,628	1,635	100.0	100.0
R&D	2,628	1,635	100.0	100.0
INTRAMURAL	-	-	-	-
EXTRAMURAL	2,628	1,635	100.0	100.0
GRANTS	2,595	-	98.7	-
CONTRACTS	33	1,635	1.3	100.0
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	-	-	-	-
INTRAMURAL	-	-	-	-
EXTRAMURAL	-	-	-	-
TOTAL	2,595	278	98.7	17.0
R&D	2,595	278	98.7	17.0
GRANTS	2,595	-	98.7	-
CONTRACTS	-	278	-	17.0
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	-	-	-	-

SOURCE: NOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

(a) NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

TABLE A-2

URBAN AFFAIRS
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
	TOTAL	3,770	8,678	100.0	100.0
	R&D	2,394	1,603	63.5	18.5
	INTRAMURAL	1,551	403	41.1	4.6
	EXTRAMURAL	843	1,200	22.4	13.8
	GRANTS	-	400	-	4.6
	CONTRACTS	843	800	22.4	9.2
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	1,376	7,075	36.5	81.5
	INTRAMURAL	827	1,537	21.9	17.7
	EXTRAMURAL	549	5,538	14.6	63.8
	TOTAL	734	1,923	19.5	22.2
	R&D	718	200	19.0	2.3
	GRANTS	-	-	-	-
	CONTRACTS	718	200	19.0	2.3
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	16	1,723	0.4	19.9
TOTAL EXPENDITURES					
TO CANADIAN UNIVERSITIES					

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

TABLE A-3

SECRETARY OF STATE
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
	TOTAL	2,487	9,597	100.0	100.0
	R&D	638	4,148	25.7	43.2
	INTRAMURAL	76	2,718	3.1	28.3
	EXTRAMURAL	562	1,430	22.6	14.9
	GRANTS	412	945	16.6	9.8
TOTAL EXPENDITURES	CONTRACTS	150	485	6.0	5.1
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	1,849	5,449	74.3	56.8
	INTRAMURAL	446	2,802	17.9	29.2
	EXTRAMURAL	1,403	2,647	56.4	27.6
	TOTAL	1,319	1,108	53.0	11.5
	R&D	516	616	20.7	6.4
	GRANTS	366	171	14.7	1.8
TO CANADIAN UNIVERSITIES	CONTRACTS	150	445	6.0	4.6
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	803	492	32.3	5.1

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

TABLE A-4
 NATIONAL DEFENCE
 EXPENDITURES ON SCIENTIFIC ACTIVITIES

	THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
	1972-73	1978-79	1972-73	1978-79
TOTAL	95,658	94,503	100.0	100.0
R&D	53,835	88,782	56.3	93.9
INTRAMURAL	38,914	61,437	40.7	65.0
EXTRAMURAL	14,921	27,345	15.6	28.9
GRANTS	7,213	743	7.5	0.8
CONTRACTS	7,708	26,539	8.1	28.1
RESEARCH FELLOWSHIPS	-	63	-	0.1
RSA	41,823	5,721	43.7	6.1
INTRAMURAL	41,736	5,721	43.6	6.1
EXTRAMURAL	87	-	0.1	-
TOTAL	3,283	1,698	3.4	1.8
R&D	3,267	1,698	3.4	1.8
GRANTS	3,000	743	3.1	0.8
CONTRACTS	267	955	0.3	1.0
RESEARCH FELLOWSHIPS	-	-	-	-
RSA	16	-	0.0	-
TOTAL EXPENDITURES				
TO CANADIAN UNIVERSITIES				

SOURCE: MOSTT: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

TABLE A-5

SOLICITOR GENERAL
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
	TOTAL	692	2,795	100.0	100.0
	R&D	102	1,769	14.7	63.3
	INTRAMURAL	49	349	7.1	12.5
	EXTRAMURAL	53	1,420	7.7	50.8
	GRANTS	-	370	-	13.2
	CONTRACTS	53	975	7.7	34.9
	RESEARCH FELLOWSHIPS	-	75	-	2.7
	RSA	590	1,026	85.3	36.7
	INTRAMURAL	253	169	36.6	6.0
	EXTRAMURAL	337	857	48.7	30.7
	TOTAL	141	798	20.4	28.6
	R&D	53	765	7.7	27.4
	GRANTS	-	240	-	8.6
	CONTRACTS	53	450	7.7	16.1
	RESEARCH FELLOWSHIPS	-	75	-	2.7
	RSA	88	33	12.7	1.2
TOTAL EXPENDITURES					
TO CANADIAN UNIVERSITIES					

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

TABLE A-6

SUPPLY AND SERVICES
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		THOUSANDS OF DOLLARS		PERCENTAGE DISTRIBUTION	
		1972-73	1978-79	1972-73	1978-79
	TOTAL	-	12,000	-	100.0
	R&D	-	8,337	-	69.5
	INTRAMURAL	-	-	-	-
	EXTRAMURAL	-	8,337	-	69.5
	GRANTS	-	-	-	-
	CONTRACTS	-	8,337	-	69.5
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	-	3,663	-	30.5
	INTRAMURAL	-	-	-	-
	EXTRAMURAL	-	3,663	-	30.5
	TOTAL	-	1,226	-	10.2
	R&D	-	996	-	8.3
	GRANTS	-	-	-	-
	CONTRACTS	-	996	-	8.3
	RESEARCH FELLOWSHIPS	-	-	-	-
	RSA	-	230	-	1.9
TOTAL EXPENDITURES					
TO CANADIAN UNIVERSITIES					

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79

NOTE: EXPENDITURES DO NOT INCLUDE: (1) ADMINISTRATION OF EXTRAMURAL ACTIVITIES, (2) NON-PROGRAM COSTS AND (3) PAYMENTS FOR TRIUMF

TABLE A-7

NATIONAL RESEARCH COUNCIL¹
EXPENDITURES ON SCIENTIFIC ACTIVITIES

		EXPENDITURES	PERCENTAGE
		(\$ 000'S)	DISTRIBUTION
		1978-79	1978-79
TOTAL EXPENDITURES	TOTAL	183,383	100.0
	R&D	156,280	85.2
	INTRAMURAL	101,342	55.3
	EXTRAMURAL	54,938	30.0
	GRANTS	18,563	10.1
	CONTRACTS	36,375	19.8
	RESEARCH FELLOWSHIPS	-	-
	RSA	27,103	14.8
	INTRAMURAL	26,355	14.4
	EXTRAMURAL	748	0.4
TO CANADIAN UNIVERSITIES	TOTAL	1,160	0.6
	R&D	1,160	0.6
	GRANTS	-	-
	CONTRACTS	1,160	0.6
	RESEARCH FELLOWSHIPS	-	-
	RSA	-	-

SOURCE: MOSST: FEDERAL SCIENCE EXPENDITURES AND MANPOWER, 1976-77 TO 1978-79.

¹EXPENDITURES SHOWN ARE FOR THE ENGINEERING AND NATURAL SCIENCES RESEARCH PROGRAM AND THE SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM. COMPARABLE FIGURES FOR 1972-73 ARE NOT AVAILABLE. THESE EXPENDITURES DO NOT INCLUDE: ADMINISTRATION OF EXTRAMURAL ACTIVITIES, NON-PROGRAM COSTS AND PAYMENTS FOR TRIUMF.

