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The Changing Profile of Full-Time Faculty at Canadian Universities

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ABSTRACT

Canadian universities underwent a remarkable expansion from the late sixties until the mid-seventies. However, they are entering the eighties on an uncertain note, due to financial restraints imposed by governments, the sudden growth in university enrolment and the shift to professionally oriented programs. These developments have had an impact on the socio-economic characteristics of the 33,000 full-time university teachers: their age, sex, academic rank, salary, citizenship, and qualifications. Especially uncertain is the demand for new faculty in this decade and the implications for the health of Canadian universities. This statistical series documents the changes which are occuring in the demand and supply patterns of doctoral recipients from Canadian universities with the purpose of providing a statistical base from which policy analyses could be developed.

RÉSUMÉ

Les universités canadiennes ont subi au cours des années 1960/mi-1970 un épanouissement remarquable. Cependant, elles se voient entrer dans une période d'incertitude au début des années 1980 due aux contraintes financières imposées par les gouvernements, l'accroissement soudain de l'inscription au niveau universitaire, et au déplacement vers les programmes de métier. Ces développements ont eu un impact sur les caractéristiques socio-économiques des quelques 33,000 professeurs engagés à plein temps soit l'âge, le sexe, le rang académique, le salaire, la citoyenneté et les qualifications. Comme la demande de professeurs est restreinte dans cette décade, le fonctionnement des universités canadiennes en est affecté. Les différentes statistiques présentent les changements qui surviennent face aux modèles d'offre et de demande chez les détenteurs de doctorats d'universités canadiennes. Cette documentation a pour but de fournir une ligne de conduite qui servira au développement de nouvelles politiques.

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INTRODUCTION

The purpose of the documentation is to provide a statistical overview of full-time faculty at Canadian universities. The data have been derived from the Statistics Canada University Teachers file. No attempt is made to assess the implications of the tables, but they do constitute a base from which such analyses could be developed.

During the last 15 years the demographic and socio-economic characteristics of full-time university teachers have changed substantially. These trends assume added significance because of the severe financial restraints imposed by governments and the sudden growth in university enrolment during the early eighties. In the two years, 1981-82 and 1982-83, full-time enrolment grew by more than 10 percent, and the shift in student preferences to professionally oriented programs continued.

This article traces, within an historical context, changes in the age, sex, academic rank, salary and citizenship of full-time teachers at Canadian universities.

At the same time, an attempt is made to estimate, for this decade, both the replacement demand for full-time university teachers and the supply of doctoral degrees available from Canadian universities.

FULL-TIME UNIVERSITY TEACHERS

The number of full-time university teachers increased sixfold from 5,000 during the mid-fifties to about 30,000 by 1974-75. Since then this number has levelled off at about 33,000.

A basic assumption of this article is that despite shifts in the distribution of full-time faculty from arts and science to professionally oriented disciplines, the total number of teachers will not decline drastically during the next few years.

This picture differs from the late sixties and early seventies when, for about ten years, an average of about 2,000 additional full-time teachers were added to the expanding Canadian university system each year.

University teaching has long been the preserve of males, and this pattern continues only slightly changed into the 1980s. In 1958-59 only 11% of university teachers were women, a proportion that increased to 13% in 1970-71 and to 15% in 1980-81 (Table 1). In education and fine and applied arts, the proportion of full-time female faculty has been above 20%. Over the years, the percentage of women teaching engineering, and mathematics and physical sciences has remained small (1% and 5%, respectively).

Without special efforts or incentives to hire them, women may continue to be underrepresented because of the expected lack of employment opportunities at Canadian universities for the next fifteen years.

AGE STRUCTURE

This scarcity of positions for new faculty affects another important variable – the age structure of full-time university teachers. In 1974-75, 69% of them were

TABLE 1. Full-time University Teachers by Teaching Field and Sex, 1980-81

Teaching Field	Male (%)	Female (%)	Total (No. and %)
Education	76 (80)	24 (20)	3,148 10.0
Fine and Applied Arts	79 (85)	21 (15)	1,382 4.4
Humanities	82 (83)	18 (17)	5,549 17.7
Social Sciences	86 (91)	14 (9)	8,237 26.3
Agriculture and Biological Sciences	83 (84)	17 (16)	1,983 6.3
Engineering & Applied Sciences	99 (99)	1 (1)	2,395 7.6
Health Sciences	78 (79)	22 (21)	4,523 14.4
Mathematics & Physical Sciences	95 (96)	5 (4)	4,165 13.3
TOTAL	85 (87)	15 (13)	31,382* 100.0

*Excludes 1,917 unclassified and not reported full-time university teachers.

Note: Percentages in brackets show the sex distribution for 1970-71.

35 or older (Table 2). By 1982-83 the proportion had risen to 86%. Meanwhile, the under 30 group dropped from 8% of the total to 3%. The accompanying rise in the median age since the mid-seventies from 39 to 44 indicates the same pattern.

The age structure of full-time university teachers varies among disciplines, reflecting the stage of development and demand for each one. In 1980, more than 20% of the teachers in disciplines such as agriculture, forestry, dentistry, and library science were older than 55. In contrast, fewer than 10% in linguistics, business, law, and psychology were 55 or older.

TABLE 2. Age Distribution of Full-time University Teachers, 1971-72 to 1982-83

Age Group	1971-72	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82*	1982-83*
20-24	0.9	0.4	0.4	0.4	0.3	0.2	0.2	0.4	0.2	0.2
25-29	13.8	7.7	6.9	5.8	5.2	4.5	3.9	3.5	3.1	2.9
30-34	23.6	22.7	21.4	19.9	18.0	15.7	14.1	12.6	11.0	10.1
SUB-TOTAL (20-34)	38.3	30.8	28.7	26.1	23.5	20.4	18.2	16.5	14.3	13.2
35-39	20.2	21.9	22.3	22.6	23.4	23.7	23.3	22.1	20.2	18.6
40-44	15.6	17.3	17.5	18.1	18.3	19.2	19.9	20.8	21.5	22.0
45-49	11.2	12.6	13.2	13.8	14.4	14.9	15.5	16.1	16.8	17.6
SUB-TOTAL (35-39)	47.0	51.8	53.0	54.5	56.1	57.8	58.7	59.0	58.5	58.2
50-54	7.3	9.0	9.3	9.7	10.0	10.7	11.3	11.9	12.7	13.8
55-59	4.6	5.2	5.7	6.2	6.6	7.1	7.7	8.3	9.2	9.2
60-64	2.8	3.2	3.3	3.5	3.8	4.0	4.1	4.3	5.3	5.6
SUB-TOTAL (50-64)	14.7	17.4	18.3	19.4	20.4	21.8	23.1	24.5	27.2	28.6
TOTAL (percent)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL NUMBER REPORTED	26,675	29,672	30,498	31,280	31,895	32,357	32,500	31,107	25,713	18,196
Not reported	99	75	61	138	37	48	58	1,917	-	-
Older than 64	200	212	225	230	235	240	245	275	177	114
GRAND TOTAL	26,973	29,959	30,784	31,648	32,167	32,645	32,803	33,299	25,890	18,310
Median Age	38	39	39	40	40	41	42	42	43	44

*Excludes Quebec institutions, and for 1982-83, some other universities.

TABLE 3. Actual and Projected Academic Rank Distribution of Full-time University Teachers, 1967-68 to 1990-91

Academic year	Full professor	Associate professor	Sub-total two senior ranks	Assistant professor	Rank below assistant professor	Sub-total two junior ranks
			(Percent)			
Actual:						
1967-68	18.5	25.2	43.7	37.0	19.3	56.3
1968-69	18.5	26.3	44.8	37.9	17.3	55.2
1969-70	18.6	26.8	45.4	38.0	16.6	54.6
1970-71	**18.8**	**27.2**	**46.0**	**37.7**	**16.3**	**54.0**
1971-72	21.3	29.1	50.4	37.4	12.2	49.6
1972-73	21.7	29.9	51.6	37.2	11.1	48.3
1973-74	23.2	32.5	55.7	34.7	9.8	44.5
1974-75	**24.5**	**34.2**	**58.7**	**33.2**	**8.1**	**41.3**
1975-76	25.7	35.6	61.3	31.3	7.4	38.7
1976-77	26.7	37.1	63.8	29.9	6.5	36.4
1977-78	27.8	37.8	65.6	28.1	6.3	34.4
1978-79	**28.7**	**39.3**	**68.0**	**26.2**	**5.8**	**32.0**
1979-80	30.2	39.7	69.9	24.7	5.4	30.1
1980-81	31.2	40.0	71.2	23.4	5.4	28.8
1981-82*	33.5	39.2	72.7	22.2	5.1	27.3
1982-83*	**34.8**	**38.6**	**73.4**	**21.1**	**5.5**	**26.6**
Projected:						
1983-84	35.7	38.7	74.4	20.2	5.4	25.6
1984-85	36.6	38.8	75.4	19.3	5.3	24.6
1985-86	37.5	38.9	76.4	18.4	5.2	23.6
1986-87	**38.4**	**39.0**	**77.4**	**17.5**	**5.1**	**22.6**
1987-88	39.3	39.1	78.4	16.6	5.0	21.6
1988-89	40.2	39.2	79.4	15.7	4.9	20.6
1989-90	41.1	39.3	80.4	14.8	4.8	19.6
1990-91	**42.0**	**39.4**	**81.4**	**13.9**	**4.7**	**18.6**

*Preliminary

Note: It has been estimated that 0.9 percent of the university cohort will be promoted from associate to full professor, and 0.1 percent from assistant to associate professor. Under these assumptions, the two junior ranks decline proportionately.

ACADEMIC RANK DISTRIBUTION

Academic rank distribution is related to teachers' age structure. In 1956-57, 52% of the full-time teachers were at the senior ranks (full and associate professor). During the expansionary sixties, this percentage fell to a low of 44% in 1967-68 (Table 3). It then rose gradually to 73% by 1982-83. Conversely, the proportions in the two junior ranks (assistant professor and instructor/lecturer) declined from 56% of the total in 1967-68, to 27% in 1982-83. Of particular note is the decrease of the rank below assistant professor from 19% in 1967-68 to the present 6%, further evidence of reduced hiring of junior faculty over the last fifteen years. If these trends continue, and if one assumes normal progression through the ranks as well as no net additions to full-time academic staff, the proportion at the two senior levels could rise to above 80% within a few years, even with a slower promotion rate.

SALARY STRUCTURE

The median salary of all full-time university teachers almost quadrupled between 1967-68 and 1982-83 from $11,400 to $43,000 (Table 4). The median for full professors went from $17,100 to $54,900; for assistant professors from $10,200 to $32,000. The financial implications of the rising percentage of teachers who have entered and will enter the senior ranks are obvious. To maintain current levels of remuneration, a larger share of university budgets will have to be allocated to teachers' salaries. But at the same time, demands from other expenditure sectors, such as non-academic salaries, administration, libraries, maintenance, research, and student assistance, are increasing.

An important factor in the higher education expenditure pattern is that university education is a labour-intensive service industry whose rate of inflation has been higher than that of the general economy. Growth of the median salary can be compared with the Consumer Price Index (CPI). Using 1967-68 as a base of 100.0, the median salary for all academic ranks increased to 377.3 in 1981-82, while the CPI rose to 303.6 in 1982.

To counteract escalating costs, some universities have already started to reduce the number of full-time faculty and/or have decided not to replace those on sabbatical leave. Other institutions are substituting part-time for full-time teachers, at substantial savings. Nevertheless, the cost per student, in constant dollars, is likely to grow. Opportunities for adjustment vary by size of institution; small universities have less flexibility.

FOREIGN FACULTY

The proportion of newly appointed full-time faculty with Canadian citizenship increased from 59% in 1972-73 to an estimated 75% in 1982-83 (Table 5). However, for a variety of reasons, Canadian universities must in some instances continue to rely on foreign faculty. In certain disciplines for which demand is heavy,

TABLE 4. Median Salary of Full-time University Teachers by Academic Rank, 1967-68 to 1982-83

Academic Rank	1967-68	1969-70	1971-72	1973-74	1975-76	1977-78	1979-80	1980-81	1981-82*	1982-83*
					(Current dollars)					
Full professor	17,100	19,900	22,600	25,200	31,500	36,500	41,500	45,300	49,600	54,900
Associate professor	13,000	14,000	16,800	18,600	23,100	27,700	31,700	34,700	37,600	41,700
Assistant professor	10,200	11,800	13,300	14,700	18,600	22,000	25,000	27,400	29,300	32,000
Rank below assistant professor	8,000	9,400	10,500	11,800	14,900	17,800	20,200	21,900	23,600	26,000
TOTAL	11,400	13,300	15,100	17,200	22,400	27,300	31,800	35,200	38,700	43,000
Salary Index (total)	100.0	116.3	132.3	150.4	196.0	239.0	278.9	309.0	339.1	377.3
Consumer Price Index (Calendar year)	100.0	108.8	115.6	130.2	160.1	185.9	221.0	243.5	274.0	303.6
U.S. Higher Education Price Index	100.0	113.2	128.6	143.0	166.1	188.7	216.9	238.3	N/A	N/A

*Excludes Quebec institutions, and for 1982-83 some other universities.

TABLE 5. Citizenship of Newly Appointed Full-time University Teachers, 1972-73 to 1982-83

Year of Appointment	Canada	United States	United Kingdom	Other Commonwealth	France and Belgium	Other Europe	Other Countries	Sub-total	Not reported	Total
1972-73	1,094	332	165	69	56	66	68	1,850	456	2,306
	59.1	17.9	8.9	3.7	3.0	3.6	3.7	100.0		
1973-74	1,108	296	134	63	31	67	51	1,750	187	1,937
	63.3	16.9	7.7	3.6	1.8	3.8	2.9	100.0		
1974-75	1,280	361	177	64	43	57	69	2,051	203	2,254
	62.4	17.6	8.6	3.1	2.1	2.8	3.4	100.0		
1975-76	1,293	325	144	78	40	62	72	2,014	134	2,148
	64.2	16.1	7.1	3.9	2.0	3.1	3.6	100.0		
1976-77	1,399	319	154	87	44	57	84	2,144	18	2,162
	65.3	14.9	7.2	4.0	2.0	2.7	3.9	100.0		
1977-78	1,422	273	148	56	41	48	67	2,055	51	2,106
	69.2	13.3	7.2	2.7	2.0	2.3	3.3	100.0		
1978-79	1,743	250	153	63	37	56	62	2,364	36	2,400
	73.7	10.6	6.5	2.7	1.5	2.4	2.6	100.0		
1979-80	1,380	209	134	64	22	49	58	1,916	53	1,969
	72.0	10.9	7.0	3.4	1.1	2.6	3.0	100.0		
1980-81*	1,301	234	102	51	9	37	66	1,800	63	1,863
	72.2	13.0	5.7	2.8	0.5	2.1	3.7	100.0		
1981-82*	1,301	206	104	64	14	46	65	1,800	92	1,892
	72.2	11.4	5.8	3.6	0.8	2.6	3.6	100.0		
1982-83*	961	109	64	45	13	36	50	1,278	44	1,322
	75.2	8.5	5.0	3.5	1.0	2.8	3.9	100.0		
11-year total	14,282	2,914	1,479	704	350	581	712	21,022	1,337	22,359
	67.9	13.9	7.0	3.3	1.7	2.8	3.4	100.0		
Total faculty 1980-81	23,943	3,743	1,406	596	389	555	459	31,091	291	31,382
	76.4	11.9	4.5	1.9	1.2	1.8	1.5	100.0		

*Excludes Quebec institutions, and for 1982-83 some other universities.

such as management and administrative studies, Canada produces an insufficient number of Ph.D.'s. Moreover, not enough senior persons with strong research experience are available in Canada. In addition, universities are by nature internationally oriented. Therefore, Canadian universities will continue to employ foreign faculty, although to a decreasing rate. The extent to which this has been true in the past is shown in Table 6.

Although it is not infallible, the geographic origin of the teachers' first degree can serve as an indicator of their nationality.

Overall, in 1980-81, 58% had obtained their first degree in Canada, including those who might have been permanent residents (landed immigrants). The second largest group, 17%, had graduated in the United States, and 10% had earned their first degree in the United Kingdom. In absolute numbers, 12,874 of the 30,861 full-time faculty had obtained their first degree abroad. However, variations among the eight fields were substantial: from a low of 30% in education to a high of 54% in fine and applied arts. Compared with the social sciences and humanities, a disproportionately large number in the natural and physical sciences had earned their first degree in countries other than Canada, the United States or the United Kingdom.

At the discipline level, in some social sciences such as archaeology and anthropology, American degrees outnumbered Canadian. This contrasts with most of the applied disciplines, in which better than two-thirds of the teachers had graduated from Canadian universities.

DEMAND AND SUPPLY OF FACULTY

An obvious consequence of the age structure (72% are between 35 and 54) is that few university teaching jobs will open up in the near future. During the period 1983 to 1991, just 13% of full-time teachers will reach the normal retirement age of 65 (Table 7). This means that retirement will free about 4,200 full-time positions. An estimated 1,500 more will be available on account of mortality. Consequently, retirement and mortality will create around 5,700 openings: an average of about 634 a year. But this may be an overestimation. Elimination of the mandatory retirement age in provinces such as New Brunswick, Quebec and Manitoba has reduced the retirement rate substantially, partly because of the unfavourable economic climate which erodes pensions. Moreover, possible financial savings and anticipation of an absolute decline in full-time enrolment might cause universities to leave these positions vacant, to replace them with temporary (term) appointments or to make greater use of part-time teachers. Such measures would further restrict employment opportunities. Besides retirement and mortality rates, a third variable affecting the need for replacement is mobility. Although no systematic attempt has been made in Canada to find out what happens to faculty who resign, there is evidence that mobility between universities and other employment sectors (and vice versa) is declining, not a surprising phenomenon in a strained labour market. Therefore, zero net mobility has been assumed.

TABLE 6. Geographic Area of First Degree of Full-time University Teachers by Teaching Field, 1980-81

	Canada	United States	United Kingdom	Other Common-wealth	France and Belgium	Other Europe	Other	Total
Education	2,179 (70.2)	551 (17.7)	160 (5.1)	67 (2.2)	50 (1.6)	49 (1.6)	49 (1.6)	3,105 (100.0)
Fine and Applied Arts	555 (45.7)	440 (36.3)	105 (8.7)	11 (0.9)	20 (1.6)	59 (4.9)	23 (1.9)	1,213 (100.0)
Humanities	2,903 (52.9)	1,236 (22.5)	629 (11.5)	76 (1.4)	226 (4.1)	290 (5.3)	123 (2.3)	5,483 (100.0)
Social Sciences	4,673 (57.3)	1,764 (21.6)	633 (7.7)	293 (3.6)	251 (3.1)	240 (2.9)	307 (3.8)	8,161 (100.0)
SUB-TOTAL - HUMAN SCIENCES	**10,310 (57.4)**	**3,991 (22.2)**	**1,527 (8.5)**	**447 (2.5)**	**547 (3.0)**	**638 (3.6)**	**502 (2.8)**	**17,962 (100.0)**
Agriculture & Biological Sciences	1,155 (58.6)	331 (16.8)	243 (12.3)	92 (4.7)	21 (1.1)	69 (3.5)	59 (3.0)	1,970 (100.0)
Engineering and Applied Sciences	1,373 (57.9)	159 (6.7)	296 (12.5)	134 (5.7)	64 (2.7)	170 (7.2)	174 (7.3)	2,370 (100.0)
Health Sciences	2,971 (66.9)	302 (6.8)	539 (12.1)	173 (3.9)	46 (1.0)	211 (4.8)	200 (4.5)	4,442 (100.0)
Mathematics and Physical Sciences	2,178 (52.9)	516 (12.5)	602 (14.6)	278 (6.8)	84 (2.1)	256 (6.2)	203 (4.9)	4,117 (100.0)
SUB-TOTAL - SCIENCES	**7,677 (59.5)**	**1,308 (10.1)**	**1,680 (13.0)**	**677 (5.3)**	**215 (1.7)**	**706 (5.5)**	**636 (4.9)**	**12,899 (100.0)**
TOTAL	**17,987 (58.3)**	**5,299 (17.2)**	**3,207 (10.4)**	**1,124 (3.6)**	**762 (2.5)**	**1,344 (4.3)**	**1,138 (3.7)**	**30,861 (100.0)**

TABLE 7. Projected Replacement Positions Available for Full-time University Teachers, 1983 to 1991

	Retirements (No.)	Retirement rate (%)	Mortality (%)	Mortality rate (%)	Total replacement (No.)	Replacement rate (%)
1983	265	0.8	165	0.5	430	1.3
1984	309	0.9	165	0.5	474	1.4
1985	388	1.2	165	0.5	553	1.7
1986	445	1.4	165	0.5	610	1.9
1987	474	1.4	165	0.5	639	1.9
1988	493	1.5	165	0.5	658	2.0
1989	555	1.7	165	0.5	720	2.2
1990	597	1.8	165	0.5	762	2.3
1991	650	1.9	165	0.5	815	2.4
Nine-year total	4,176	12.6	1,485	4.5	5,661	17.1

Note: This projection is based on a stock figure of 32,950 full-time university teachers in 1980-81 and assumes zero net mobility. The mortality rate is an approximation. The stock figure is held constant for the projection period, an assumption that must be qualified if universities, for financial and other reasons, reduce the total number of full-time faculty over the next nine years.

Table 8. Projected Supply of Doctoral Degrees from Canadian Universities, 1983 to 1987

Field of Study	Full-time and part-time doctoral students 1982-83[P]	Foreign students	Less foreign students	Withdrawal rate in percentage	Balance	Length of study in years	Degrees granted each year 1983 to 1987
Education	1,731	194	1,537	55	692	173	192
Music	78	5	73	50	37	5	7
Fine and Performing Arts	48	8	40	50	20	5	4
SUB-TOTAL: FINE AND APPLIED ARTS	126	13	113	50	57	5	11
Classics	52	12	40	30	28	4	7
English	595	106	489	50	245	4	61
French	218	28	190	50	95	4	24
Other Languages	323	68	255	50	128	5	26
History	444	47	397	45	218	4	54
Library Science	22	2	20	50	10	4	3
Linguistics	164	29	135	50	68	4	17
Media Studies	22	3	19	50	10	4	2
Philosophy	478	95	383	50	192	5	38
Religious Studies	270	49	221	50	111	5	22
SUB-TOTAL: HUMANITIES	2,588	439	2,149	30 to 50	1,105	4	254
Anthropology and Archaeology	272	42	230	50	115	4	29
Management	213	33	180	50	90	4	22
Area Studies	174	79	95	50	48	4	12
Economics	496	204	292	50	146	4	36
Geography	232	74	158	40	95	4	24
Law	67	18	49	50	25	4	6
Man and Environmental Studies	39	7	32	55	14	4	4
Political Science	431	111	320	50	160	4	40
Psychology	1,210	138	1,072	50	536	4	134
Social Work	64	3	61	50	30	4	8
Sociology	513	100	413	50	206	4	52
SUB-TOTAL: SOCIAL SCIENCES	3,711	809	2,902	50	1,465	4	367
TOTAL HUMAN SCIENCES	8,156	1,455	6,701	40 to 55	3,319	4 to 5	805

Agriculture	340	109	231	25	173	4	43
Biochemistry	140	33	107	25	80	4	20
Biology	502	110	392	40	235	4	59
Botany	73	19	54	40	32	4	8
Household Science	29	5	24	50	12	4	3
Veterinary Science	36	7	29	30	20	4	5
Zoology	224	37	187	40	75	4	19
SUB-TOTAL: AGRICULTURE AND BIOLOGICAL SCIENCES	1,344	320	1,024	25 to 50	627	4	157
Chemical Engineering	205	106	99	40	59	4	15
Civil Engineering	250	131	119	40	71	4	18
Electrical Engineering	325	151	174	40	104	4	26
Mechanical Engineering	179	84	95	40	57	4	14
Other Engineering	332	141	191	40	116	4	29
SUB-TOTAL: ENGINEERING	1,291	613	678	40	407	4	102
Forestry	68	28	40	40	24	4	6
TOTAL: ENGINEERING AND APPLIED SCIENCES	1,359	641	718	40	431	4	108
Dentistry	13	5	8	45	4	4	1
Basic Medical Sciences	533	82	451	45	248	4	62
Pharmacy	49	23	26	45	14	3	4
Other Health Sciences	396	53	343	45	189	4	47
SUB-TOTAL: HEALTH SCIENCES	991	163	828	45	455	3 to 4	114
Computer Science	181	61	120	30	84	4	21
Mathematics	317	133	184	30	129	4	32
Chemistry	745	278	467	30	327	4	82
Geology	288	106	182	45	100	4	25
Physics	480	101	379	35	246	4	62
Other Physical Sciences	95	39	56	35	39	4	10
SUB-TOTAL: MATHEMATICS AND PHYSICAL SCIENCES	2,106	718	1,388	35	902	4	232
TOTAL SCIENCES	5,800	1,842	3,958	25 to 45	2,415	3 to 4	611
Not Specified	43	10	33	50	17	3	5
GRAND TOTAL	13,999	3,307	10,692	25 to 55	5,751	3 to 5	1,421

Note: The rationale and methodology for this simulation exercise has been outlined by the author in the following publications: "The Ph.D. Dilemma in Canada: A Case Study", Canadian Higher Education in the Seventies, Economic Council of Canada, May 1972, pp. 75-131; "The Ph.D. Dilemma in Canada Revisited", The Canadian Journal of Higher Education, February 1978, pp. 49-92.

As already indicated, in most disciplines, the number of retirements over the next five years will be small: 1,881 full-time faculty members will reach the normal retirement age of 65 between 1983 and 1987. This figure is much lower than the anticipated supply of Ph.D. graduates during the same five years – well over 7,000 (Table 8). Furthermore, the chances of new graduates securing a university teaching position may be even slimmer than these numbers suggest, as not everyone who reaches 65 retires. It should also be remembered that all university appointments do not necessarily go to Ph.D.-holders; in some cases, foreign professors and persons from other employment sectors will be hired as well as returning Canadians with foreign earned doctorates.

CONCLUDING OBSERVATIONS

Changes in enrolment patterns, age structure, rank distribution and salary level of full-time faculty are affecting Canadian universities. This coincides with a severe curtailment of government spending.

Enrolment in recent years has grown more rapidly than full-time faculty, resulting in an increase in the student/teacher ratio, and a possible decline in the quality of university education and research. High student/teacher ratios are particularly evident in professional disciplines. For example, the ratio in business was 31.7 to one, 18.7 in engineering, and 18.3 in law, compared with 14.2 for all disciplines.

Slow growth of full-time faculty has meant a decrease in employment opportunities for recent Ph.D. graduates (especially in the arts and sciences) and a general aging of the faculty. The impact of this aging process on university teaching and research needs to be assessed. A further consequence of the hiring cutback has been a substantial decline in mobility and fewer foreign faculty. It is anticipated that these trends will persist in the next few years.

The median salary of university professors has risen more rapidly than the Consumer Price Index (CPI), and is likely to continue to do so. Salary structure reflects rank distribution. In 1982-83, 73% of the full-time university teachers will be either full or associate professors. Within a few years, four out of five may be in this senior category.

Under the best of circumstances, for the next few years, the annual replacement demand for full-time university teachers will be at around 500, whereas the supply of new doctoral degree-holders alone will be two or three times as high. This potential imbalance remains a cause for concern.