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*Studies of
the Royal Commission
on the Status of Women
in Canada*

**A Comparison of
Men's and Women's Salaries
and Employment Fringe Benefits
in the Academic Profession**

*Prepared for
the Canadian Association
of University Teachers*

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INTRODUCTION

The objective of this report is to determine the extent of discrimination in Canadian universities against female academics, particularly in the following areas:

- (a) salaries
- (b) promotions
- (c) hiring policies
- (d) retirement schemes, life and long-term disability insurance plans.

Our work began in 1965, under the auspices of the Canadian Association of University Teachers Committee on Women University Teachers, and a summary of this committee's interim report was published in the C.A.U.T. Bulletin for October 1966. Late in 1967, the Royal Commission on the Status of Women in Canada agreed to sponsor a further analysis of the data.

Because the resources available for research were limited, we confined our investigation of discrimination connected with salaries, promotions, and hiring policies to an analysis of existing data gathered by the Dominion Bureau of Statistics. Again, because of the nature of this data, our discussion of discrimination in terms of promotions and hiring policies is considerably less detailed and less conclusive than in the area of salaries.

Our findings connected with discrimination ~~against women~~ vis-à-vis retirement schemes, life and long-term disability insurance plans make up the second section of this report. These are based on data gathered in 1965-66 and 1968-69 through questionnaires forwarded to all Canadian universities.

CHAPTER 1

Discrimination Against Women in Salaries, Promotions and Hiring Policies.

1. The Data

In these areas, we based our research on an analysis of statistical reports which indicate the basic annual salary for all faculty members in Canadian universities for the academic year 1965/66. This information is reported by bursars to the Dominion Bureau of Statistics, and was made available to us on punchcards, with certain safeguards and omissions to ensure that individual universities, names and salaries could not be identified. Besides salary, the punchcards included the following related information, which we used in our analysis:

- (a) Sex
- (b) Region (4 classes: Atlantic, Ontario, Quebec, Western)
- (c) Size of University (5 classes, based on student enrolment: 5,000; 2,000 - 4,999; 1,000 - 1,999; 500 - 999; 0 - 499)
- (d) Control of University (3 classes: Provincial, Church, Other)
- (e) Highest Earned Degree (5 classes: Ph.D., M.A., 1st Prof. degree, B.A. and none)
- (f) Year of Birth¹ (4 classes: Under 34, 35 - 44, 45 - 54, 55 and over)
- (g) Field (We grouped the 67 fields reported to DBS into 18 classes)
- (h) Rank (6 classes: Dean, Chairman, Other Prof., Assoc. Prof., Assist. Prof., Other)

We obtained this information for 11,156 members of the academic profession, of whom 9,771 were males and 1,385 females.

2. Procedures²

In the academic year 1965/66, the mean salary for men in the academic profession was \$10,690 while women received an average of \$8,428 - a difference of \$2,262 per annum in favour of men.

Before we can suggest that this discrepancy constitutes discrimination against women, we must ask whether women score lower than men vis-à-vis the factors which legitimately determine university salaries. For example, assuming that a

professor's salary should be positively related to his competence, if women university teachers proved to be less competent than men, one would naturally expect them to receive less salary than men, and this would not constitute discrimination.

In this study, therefore, we first established how much each of the eight characteristics listed above influences an individual's salary.³ This, though, was no simple matter, since so many different factors are involved in even the simplest comparison. If, for example, one attempts to determine the salary differential between the Ontario and Atlantic regions, it quickly becomes evident that a comparison of average faculty salaries will not be enough, because these averages may reflect differences in the proportion of females, in the proportion of full professors, in the proportion of faculty members in medical schools, etc., each of which may in themselves affect the salaries of academicians in the two geographic areas.

Nor can the problem be resolved simply by refining the classification and confining the comparison between the two regions to standardized groups such as "male full professors with Ph.D.'s and 20 years' experience in departments of sociology in large provincial universities", because then the number of individuals available for comparison is so small that the result is likely to be dominated by chance factors. Fortunately, more sophisticated statistical techniques are available, and in this study we used that of multiple regression analysis. One of the most significant results of this technique was that we were able to establish the average effect that₄ the sex alone of the faculty member has on his or her salary.

Secondly, we set out to establish how much of the difference in the average salary of men and women can be attributed to differences between these two groups in terms of the characteristics which affect salaries. This we accomplished by taking the effect each class of the variables has on salaries, and weighting each of these by the appropriate difference between the distributions of men and women across each class of each characteristic.⁵

3. Results

(a) Sex

As Table 1 indicates, slightly more than one half of the discrepancy (\$2,262) between men's and women's average salaries

results from a direct sex difference.⁶ In other words, at the same type of university (based on size, control and region), in the same field, with the same rank and with the same competence (measured by highest earned degree) women earn, on the average \$1,199 less than men.

We should, however, note that very occasionally women earn higher salaries than their male counterparts. For example, at a provincial university with an enrolment of over 5,000 in the Atlantic and Western regions, a woman under 50 who has an appointment in a department of home economics as an assistant, associate or full professor, will, whatever her highest earned degree, tend to have a higher salary than a man with similar characteristics. Again, women under 30 at large provincial universities in the Atlantic and Western regions in the fields of optometry and pharmacy tend to have higher salaries than men similarly placed. Even so, such cases are relatively few and are more than outweighed by instances where the reverse is true.

Apart from the pure sex difference in salary, the other seven characteristics which govern university salaries affect women differently from men and result in their being paid, on the average, another \$1,050 annually less than men.

Beyond this, with the exception of age, each of the variables has the effect of increasing the difference between men's and women's average incomes. Rank, it is important to note, exerts by far the greatest influence.

We shall now study in some detail the effects of each of these seven variables on the difference between male and female salaries. These effects result from a combination of the differences in "pure component effect" (as shown in Table I) and differences in distributions of men and women over the various categories of a variable or attribute. In our analysis we shall attempt to summarize the relative importance of each of these characteristics in producing the combined effect on the difference between male and female salaries.

(b) Region

In the Atlantic and Western regions the proportions of women academicians are slightly higher than in Quebec and Ontario, and the salaries paid by universities are less discriminatory in respect to sex. Thus the difference between men's and women's average salaries is reduced by about \$70. This however, is more than offset by the fact that in Quebec

and Ontario female salaries are generally almost \$200 a year less than male salaries. The net effect, therefore, is to increase the male-female salary differential by about \$40, in favour of men.

Looking at the three regions where universities are predominantly English-speaking, it is interesting to note that in the Atlantic and Western areas, where sex discrimination in salaries is less, women tend to be over-represented, while in Ontario, where salaries reflect greater discrimination, they are under-represented. This may result from women's tendency to be attracted to universities where there is less salary discrimination, or it may mean that universities which have substantial salary differentials between men and women also favour men over women in their hiring policies. In Quebec on the other hand, where the discrepancy between men's and women's salaries is almost as great as in Ontario, a slightly higher proportion of women is employed in universities. This characteristic of Quebec universities may result from the lack of opportunities for French-speaking women in the predominantly English-speaking universities in the rest of Canada.

(c) Enrolment

In universities with enrolments between 500 and 4,999, the salary scales diminish the "pure" sex difference in average salaries. In universities with enrolments of less than 500, or of 5,000 or more, and particularly in the former case, the sex differences in salaries are greater, and it is precisely at these very small and very large universities that a somewhat higher proportion of women than men is to be found. The net effect is to increase the difference between average male and female salaries by just under \$30.

(d) Control

Over the three types of universities (provincial, religious, other) the distribution of men and women are essentially the same. Thus the net effect of this attribute is principally a function of sex discrimination in salaries, particularly at provincial universities where there is a greater discrepancy between average male and female salaries than in the other two classes. The net effect on the difference between men's and women's salaries is very small; it increases the difference by about \$15, in men's favour.

(e) Highest Earned Degree

Women who have Ph.D.'s tend to earn salaries closer to men's than women with lesser qualifications. This, however, is offset by the fact that a substantially smaller proportion of women in the academic profession have Ph.D.'s than men.

Similarly, although the sex difference in salaries is greater among those whose highest earned degree is a "first professional degree", the slightly smaller proportion of women in this category roughly offsets the effect of this component on the salary differential.

The effects of the other two types of "highest earned degree" on the male/female salary differential are more substantial, but they work in opposite directions: a woman who has an M.A. tends to earn a salary closer to that of a man, while a woman who has only a B.A. - or no degree at all - will earn less than a man in similar circumstances. Although, in each case, the proportion of women is substantially higher than that of men, when the two categories are combined, the effects on the sex differential in average salaries roughly cancel each other out. The net effect on salary differentials is therefore very small, about \$12 in men's favour.

(f) Age

Age reduces the average salary differential between the sexes by \$178, an apparent result of the fact that a higher proportion of women are in the under 35 age group, where the salary differential is between \$430 and \$750 less than for the other three age groups.

(g) Field

In every field but one - home economics - the average male salary is greater than the average female salary even though they are the same with respect to the six other factors. Men's salaries exceed women's by margins varying from \$550 to \$2,120. Even in the field of home economics, the typical female salary is only \$120 more than the typical male's.

These are the fields which have the effect of increasing or reducing the male/female salary differential by more than \$200 per annum:

<u>Increase Salary Differential</u>		<u>Differential Remains About the Same</u>		<u>Reduce Salary Differential</u>	
Hygiene and Nursing	\$921	Applied Physical Science	\$ 24	Home Economics	\$1,319
Administration	684	Other Pure Social Science	6	Optometry and Pharmacy	648
Dentistry and Medicine	553	Education	8	History	406
Pure Biological Sciences	433	Commerce	33	Other Applied Social Sciences	331
Agriculture and Forestry	328	Political Science	75		
Pure Physical Science	203	Economics and Political Science	88		
		Law	107		
		Humanities	121		

As this table indicates, there are four fields in which the salary sex differential is substantially reduced. This does not mean, however, that women earn higher salaries in these fields than in others; in all of these instances female salaries stand at about the average for female salaries in general. The reduced differential results from the fact that, in these four fields, men's salaries are lower than average. On the other hand, looking at the six instances where the sex differentials are substantially increased, in all except one (agriculture) men's salaries are about average or considerably higher and again, in all except one (dentistry and medicine) women's salaries are below the average for all fields.

In short, in the four fields in which the salary differential is reduced, the gap lessens not because women earn more in these fields but because men earn less. Where the discrepancy increases, it does so because women tend to earn less in these fields than in others, while men tend to earn more.

As Table III indicates, there are only five fields in which the proportion of women choosing them is greater than the proportion of men. These are: hygiene and nursing, education, the humanities, other applied social sciences and

home economics. The greatest salary discrimination against women occurs in hygiene and nursing; in education and the humanities, men's and women's salaries are roughly the same; in "other applied social sciences" the sex differential is reduced by about \$330 and, finally, in home economics, there is a kind of reverse sex discrimination in that the average male salary is somewhat less than the average female.

It is interesting to study in more detail the two cases at the extreme ends of the continuum: hygiene and nursing, and home economics. A relatively high proportion of women enter these fields (11.8% and 8.2% respectively) and their average salaries are quite similar -- within \$211 of each other. In hygiene and nursing, however, female salaries are more than \$900 less than for males, while in home economics they are over \$1,300 more than for males, a result of the fact that, in these two fields, men's salaries differ markedly, by more than \$2,000. In the field of home economics, these tend to be about \$1,250 less than men normally get, while in the field of hygiene and nursing they are over \$750 more than the typical male salary. It seems likely that the small number of males in hygiene and nursing come from the medical fields, which generally pay much higher than average salaries to males (plus \$1,367) while the men in home economics come from fields which are paid at, or below, the male average.

If our guess is correct, that the men in hygiene and nursing do indeed come from the field of medicine, it is interesting to note that the typical male salary received by these medical faculty is about \$600 less than males are paid in dentistry and medicine. This is consistent with the belief that men's salaries, when they are earned in a predominantly female discipline, are affected by the generally lower female salaries in that discipline. (Table IV indicates the proportions of males and females in each field).

Finally, in terms of this factor, the fields which have the greatest influence in increasing the salary differential between men and women are dentistry and medical, pure biological sciences, hygiene and nursing, (all closely related to medicine), pure physical sciences and administration. Female salaries in history, on the other hand, tend to somewhat reduce the difference in male and female average salaries. The net effect of the differences in the distributions of men and women across the disciplines is to increase the average salary difference in favour of men by just over \$90.

(h) Rank

In the three regular academic ranks of assistant, associate and full professor, salary discrimination against women is substantially less than it is in the two administrative ranks of dean and chairman, and in the residual category of "other". On the other hand, the proportions of women in the two administrative ranks and the top two academic ranks (associate and full professor) are lower than the proportions of men, while in the assistant professor rank, the proportions of men and women are about the same. Thus, the differences on the salary sex differential roughly cancel each other out.

As Table I indicates, there is an enormously higher proportion of women than men (43.7 per cent versus 17.9 per cent for men) in the "other" rank category. Although the pure sex salary differential is increased on the average by only \$102, the fact that almost two and a half times as many women as men are in this category increases the salary differential by \$1,115.

Since the combined effects of rank on the sex salary differential are substantially greater than those of all the other factors combined, we shall explore them in considerable detail. We should point out that the rate of progress through the academic ranks will have significant effects on salary levels, especially considering that salary differentials between the various ranks are much larger than for the components of other factors. Or, to put it more bluntly, one way of keeping salaries low is to retard or restrict promotion.

In each of the regular academic ranks, the typical woman's salary is lower than the comparable man's salary; the extent by which it is lower varies from \$433 for associate professors to \$2,790 for deans. Moreover, as we have already indicated, women are less likely than men to have an appointment in the top four ranks and indeed, are much more likely to be in the lowest rank. The question, therefore, is, whether the generally higher rank of men is justified by their being better qualified than women.

As Table V indicates, at every level of competence, as measured by both "highest earned degree" (training) and "age" (experience) the typical woman has a lower rank than her male counterpart. Table VII illustrates the results of statistical tests of the significance of the differences between the proportions of males and females in each rank who have the same competence (as measured by highest earned degree). It is evident that in most cases, the proportions of males in higher

ranks is significantly higher than might be expected, considering the proportion of males in each degree category. Conversely, in the lower ranks, the proportion of females is, in most cases, significantly higher.

With increasing age, sex discrimination in rank diminishes, and it is less also for those with higher earned degrees. Yet these data also demonstrate clearly that women progress through the ranks at a considerably slower pace than men.

Until they reach the age of 60, the proportions of female Ph.D.'s in the higher ranks tend to be lower than the proportion of males. With very few exceptions (chiefly in the associate professor rank, and over the age of 55) the proportions in all ranks of women who have Ph.D.'s are less than the proportions of men. On the other hand, with only one exception, the proportion of women with doctorates in the two lowest ranks is always higher than the proportion of comparable men. Almost the same situation occurs in the case of women in the other three "highest earned degree" categories.

Only women who have Ph.D.'s stand as much chance of attaining the rank of dean as men, and then only when they are 60 or older. At any age, a woman who holds an M.A. is much less likely than a man with an M.A. to become a dean, and there are no reported cases of female deans whose highest earned degree is a professional degree, a B.A., or no degree at all, although there are some men in these categories who have appointments at this rank.

The relative chances of comparable males and females being appointed as a department head is very similar to the situation vis-à-vis deans.

At best, the chances of a woman, with the same competence as a man, becoming a full professor before the age of 50 are only about a third as good as the man's chances.

In the case of associate and assistant professors we find, generally speaking, that at younger ages a higher proportion of men hold these positions, while at the older ages there is a higher proportion of women in these ranks. This, no doubt, is due to the fact that a higher proportion of older men have been promoted to the higher ranks, while women tend to remain longer in the lower ranks. The data in Table VI support our suggestion that the rate of promotion is slower for females than it is for males, even when they have the same competence as men. In each of the 21 comparisons which involve men and

women with the same highest earned degree and with the same rank, the average age of females is higher than that of males: the difference ranges from one year to 11.4 years.

We turn now to those academicians who do not have an appointment in one of the regular ranks -- those in the residual category, "others". As we have already noted, 43.7 per cent of women do not have regular academic appointments, compared to 17.9 per cent of men. While this is due in part to the lower qualifications of females (as measured by the highest earned degree) it is fairly clear that it is due also to the fact that women are less frequently placed in the higher regular academic ranks, even they have the same competence as men. We should note also that, taking the highest earned degree as constant, in every age group up to 59, a higher proportion of women remain outside the regular academic ranks.

In the case of persons under 34, the absolute difference in the proportions of females and males who are not in the regular academic ranks, is generally greater than it is at later ages. The single exception is in the case of those whose highest earned degree is a professional one. Since it seems reasonable to suppose that a relatively high proportion of persons in this age group will have been hired only recently, the data suggest that at the time of hiring women are more likely than men to be appointed to lower ranks, even though their competence is the same.

Conclusion

To conclude this section, we should like to point out what appears to be a disturbing trend. Over the years between 1956/7 to 1963/4, the sex differences in median salaries increased from \$1,232 to \$1,779. As a proportion of the median male salary, the median female salary diminished from 82 per cent to 80 per cent. Although the average male/female salaries used in our analysis are not directly comparable, since they are means rather than medians, in 1965/6 the difference between male/female average salaries was \$2,262, and the average female salary constituted only 78.8 per cent of the average male salary.⁹

TABLE 1

Effect of Differential Distribution
Across Variables on Differences Between
Male and Female Average Salaries 65/66

Variable or Attribute	Male Proportions	Component \$	Weighted Component	Female Proportions	Component \$	Weighted Component	Component Effect \$M - \$F	Combined Effect on \$M
Region								
Atlantic	9.76	- 996	- 96.73	11.19	- 830	- 98.88	- 166	- 2.15
Quebec	22.31	503	111.91	24.26	323	82.32	179	- 29.59
Ontario	37.40	389	148.14	31.91	201	65.16	197	- 82.98
Western	30.53	93	28.29	32.64	306	101.63	213	+ 73.34
		Effect on \$M = + 191.61		Effect on \$F = +150.23				41.38
Enrolment								
5,000 +	52.47	373	194.91	57.84	234	134.82	139	- 60.09
2,000 - 4,999	31.46	112	35.10	26.35	280	74.20	168	+ 39.10
1,000 - 1,999	6.05	- 134	- 8.07	4.77	- 33	- 1.64	- 101	+ 6.43
500 - 999	6.51	- 96	- 6.27	5.70	158	11.75	254	+ 18.02
0 - 499	3.51	- 256	- 8.93	5.34	- 639	- 41.07	383	- 32.14
		+ 206.74		+ 178.06				- 28.68
Control								
State	43.88	401	175.36	44.84	239	108.88	162	- 66.48
Church	20.54	- 89	- 18.18	22.89	10	2.44	- 99	+ 20.62
Other	35.58	- 312	- 110.58	32.27	- 249	- 80.19	63	+ 30.39
		+ 46.60		+ 31.13				- 15.47

(Table I continued)

Variable or Attribute	Male Proportions	Component \$	Weighted Component	Female Proportions	Component \$	Weighted Component	Component Effect \$ _M - \$ _F	Combined Effect on \$ _F - \$ _M
Highest Earned Degree								
Ph.D.	48.89	70	34.12	24.33	106	28.62	- 36	- 5.50
M.A.	32.88	157	51.38	45.63	3	1.36	- 160	+ 52.74
1st Prof.	6.60	354	23.55	5.56	213	11.99	141	- 11.56
B.A. & Home	11.63	267	30.65	24.48	- 322	- 78.58	55	- 47.93
			<u>24.36</u>			<u>- 36.61</u>		<u>- 12.25</u>
Age								
Under 34	7.90	830	319.06	12.36	- 338	- 116.89	- 492	+ 202.17
35 - 44	18.14	67	23.49	21.36	2	.62	- 69	+ 24.11
45 - 54	35.04	381	68.55	31.24	171	41.36	210	- 27.19
55 & over	38.92	516	41.93	35.04	165	21.09	351	- 20.84
			<u>232.07</u>			<u>- 53.82</u>		<u>+ 178.25</u>
Rank								
Dean	2.24	4,402	97.31	.51	2,811	28.42	1,591	- 69.89
Chairman	7.35	2,598	188.25	2.53	2,363	59.71	235	- 128.54
Other Prof.	12.63	1,439	179.67	3.54	2,181	83.46	- 742	- 96.21
Assoc. Prof.	25.68	-1,268	-325.07	15.67	- 502	- 83.72	- 766	+ 241.35
Assist. Prof.	34.23	-3,068	-1,050.30	35.08	-2,648	- 919.63	- 420	+ 130.67
Other	17.87	-4,103	-730.24	43.68	-4,205	-1,845.95	102	-1,115.71
			<u>-1,640.38</u>			<u>-2,677.71</u>		<u>-1,037.33</u>

(Table I continued)

Variable or Attribute	Male Proportions	Component \$	Weighted Component Proportions	Female Proportions	Component \$	Weighted Component	Component Effect \$ _M - \$ _F	Combined Effect on \$ _F - \$ _M
Field Administration	2.79	319	8.75	1.01	- 365	- 3.68	684	- 12.43
Humanities	21.67	- 429	- 92.29	32.42	- 308	- 98.74	- 121	- 6.45
Econ. Ec. & Pol. Sc.	3.77	14	.53	1.08	102	1.10	88	+ .57
Pol. Science	1.72	- 235	- 4.01	.58	- 160	- .92	- 75	+ 3.09
History	3.75	- 333	- 12.37	2.24	73	1.64	- 406	+ 14.01
Other Pure Soc. Sciences	7.63	- 140	- 10.65	5.70	- 134	- 7.65	- 6	+ 3.00
Commerce	3.00	155	4.65	.14	188	.27	- 33	- 4.38
Education	6.26	130	6.09	15.23	138	14.34	- 8	+ 8.25
Law	1.71	389	6.65	.29	496	1.44	- 107	- 5.21
Home Economics	.06	-1,252	- .76	8.16	67	5.47	-1,319	+ 6.23
Other Applied Soc. Sciences	.59	- 292	- 6.22	3.39	39	3.18	- 331	+ 9.40
Pure Biological Sciences	6.88	124	8.52	5.63	- 309	- 17.41	433	- 25.93
Agr., Forestry etc.	3.77	- 128	- 4.90	1.16	- 456	- 14.16	328	- 9.26
Dentistry & Medicine	5.32	1,367	72.61	3.61	814	34.08	553	- 38.53
Hygiene & Nursing	.29	777	1.67	11.84	- 144	- 14.45	921	- 16.12
Optom. & Pharm.	.63	- 552	- 3.50	.29	96	.28	- 648	- 3.78
Pure Physical Science	19.29	15	2.88	6.79	- 188	- 12.90	203	- 15.78
Appl. Physical Science	10.88	71	7.71	.43	47	.24	24	- 7.47
			<u>- 14.64</u>			<u>- 107.87</u>		<u>- 93.23</u>

TABLE II
Summary of Table I

	Male	Female	F - M
	\$	\$	\$
Common Term ("Pure" Sex Difference)	12,169.00	10,970.00	1,199.00
Effect of Differential Distribution Across: -			
Regions	+ 191.61	+ 150.23	- 41.38
Enrolment Size	+ 206.74	+ 178.06	- 28.68
Control	+ 46.60	+ 31.13	- 15.47
Rank	- 1,640.38	- 2,677.71	- 1,037.33
Highest Degree	- 24.36	- 36.61	- 12.25
Age	- 232.07	- 53.82	+ 178.25
Field	- 14.64	- 107.87	- 93.23
	\$10,702.50	\$8,453.41	-\$2,249.09
Resultant Average Salaries:*			
Actual Averages:-			
Male: $\frac{104,451,990}{9771}$	= \$10,690		
Female $\frac{11,672,780}{1385}$	=	\$8,428)) \$2,262.

* These figures differ slightly from the Actual Average, as the result of a combination of factors, viz: the "component effects" are estimates; there are a small number of persons for whom we did not have information with respect to all characteristics, and rounding of figures in computations.

TABLE III

Extent of Sex Discrimination in
Salary by Field and Proportions of
Males & Females in Each Field

Field	Component Effect on F Salaries	Component Effect on Salaries		%	%
	\$	\$	M - F	M	F
Hygiene & Nursing	-144	+ 921		.3	11.8
Administration	-365	+ 684		2.8	1.0
Dentistry & Medicine	+814	+ 553		5.3	3.6
Pure Biological Sciences	-309	+ 433		6.9	5.6
Agr., & Forestry	-456	+ 328		3.8	1.2
Pure Phys. Sciences	-188	+ 203		19.3	6.8
Appl. Phys. Sciences	+ 47	+ 24		10.9	.4
Other Pure Social Sciences	-134	- 6		7.6	5.7
Education	+138	- 8		6.2	15.2
Commerce	+188	- 33		3.0	.1
Pol. Science	-160	- 75		1.7	.5
Econ., Ec. & Pol. Sc.	+102	- 88		3.8	1.1
Law	+496	- 107		1.7	.3
Humanities	-308	- 121		21.1	32.4
Other Appl. Social Science	+ 39	- 331		.6	3.4
History	+ 73	- 406		3.7	2.2
Optom. & Pharm.	+ 96	- 648		.6	.3
Home Economics	+ 67	-1,319		<u>.1</u>	<u>8.2</u>
Totals:				100.0	100.0

TABLE 1V

Proportions of Males and
Females in Each Field

Field	N		%	
	M	F	M	F
Commerce	293	1	99.7	.3
Appl. Phys. Sciences	1,065	6	99.4	.6
Law	166	4	97.6	2.4
Econ., Ec. & Pol. Sc.	371	15	96.1	3.9
Agr., Forestry, etc.	371	17	95.6	4.4
Pol. Science	166	8	95.4	4.6
Pure Phys. Sciences	1,886	94	95.3	4.7
Administration	274	14	95.0	5.0
Optom. & Pharm.	59	4	94.7	5.3
History	362	30	92.3	7.7
Dent., & Med.	518	50	91.2	8.8
Other Pure Soc. Sciences	743	79	90.4	9.6
Pure Biological Sciences	674	78	89.6	10.4
Humanities	2,111	450	82.4	17.6
Education	616	211	74.5	25.5
Other Appl. Social Sciences	59	47	55.7	44.3
Hygiene & Nursing	29	163	15.1	84.9
Home Economics	10	114	8.1	91.9
Totals:	9,771	1,385	87.6	12.4

TABLE V

Proportions of Males and Females
Having Same Age and Highest Earned Degree,
In Each Academic Rank

Highest Earned Degree	Age	N		Dean %M %F	Heads		Other Prof. %M %F	Assoc.		Asst. %M %F	Others				
		Male	Female		%M	%F		%M	%F		%M	%F			
Ph.D.	34	1,532	88	.5	0	.9	1.1	2.1	0	18.4	13.5	71.5	63.7	6.5	21.6
	35 - 39	1,063	71	.7	0	4.5	0	11.0	1.4	49.6	25.4	31.6	63.4	2.7	10.1
	40 - 44	844	59	2.4	0	11.9	0	25.5	6.8	47.0	32.2	11.5	52.5	1.8	8.5
	45 - 49	556	33	4.1	0	19.8	6.1	34.6	9.1	33.4	36.4	6.7	42.4	1.4	6.1
	50 - 54	375	36	6.9	0	22.7	27.8	37.4	11.1	26.1	27.8	4.8	27.8	2.1	5.6
	55 - 59	242	22	10.3	4.5	26.8	18.2	42.0	40.9	17.3	31.8	2.1	0	1.2	4.5
	60 +	165	28	7.3	7.2	24.9	21.4	46.0	35.7	16.3	28.6	1.8	3.6	3.6	3.6
Totals		4,777	337	2.5	.9	9.7	6.8	18.2	9.2	32.6	25.5	33.3	46.6	3.5	11.0
Sub-Totals		120	3	464	23	874	31	1,557	86	1,593	157	1,690	37		
M.A.	34	1,563	210	.1	0	.2	0	.6	.5	5.3	0	45.0	20.0	49.0	79.5
	35 - 39	549	91	.9	0	1.1	0	3.3	0	24.8	8.8	51.0	46.2	18.7	45.0
	40 - 44	413	90	1.9	0	3.6	0	9.7	0	38.0	13.3	37.3	51.0	8.7	35.6
	45 - 49	301	76	5.3	1.3	10.	0	21.0	5.3	37.3	26.3	21.0	48.8	5.0	18.4
	50 - 54	182	72	7.7	2.8	14.8	4.2	18.7	0	36.2	33.3	16.5	36.1	6.1	23.6
	55 - 59	127	61	15.7	1.6	18.2	8.2	20.5	3.3	30.7	39.4	9.4	32.8	5.5	14.7
	60 +	78	32	3.8	0	29.5	6.3	30.8	18.7	21.8	43.7	5.1	21.8	9.0	9.4
Totals		3,213	632	2.1	0.6	4.0	1.6	6.7	2.1	19.0	16.1	38.8	34.8	29.3	44.8
Sub-Totals		68	4	129	10	215	13	609	102	1,248	220	943	283		

(Table V continued)

Highest Earned Degree	Age	N		Dean %M	Heads %M	Other Prof. %M	Assoc. %M	Asst. %M	Others %M						
		Male	Female												
1st Prof. Degree	34	233	29	.4	0	3.0	3.5	6.5	0	34.4	24.2	55.0	72.4		
	35 - 39	119	13	1.7	0	2.5	0	32.8	7.7	36.2	38.4	24.4	53.8		
	40 - 44	95	8	1.1	0	15.8	0	32.6	0	27.4	62.5	10.5	37.5		
	45 - 49	78	8	5.1	0	16.7	0	32.0	37.5	24.4	50.0	6.4	12.5		
	50 - 54	54	10	9.3	0	25.9	10.3	18.5	30.0	11.1	50.0	3.7	10.0		
	55 - 59	43	4	11.6	0	21.0	0	18.6	75.0	7.0	0	4.7	25.0		
	60 +	23	5	8.7	0	17.4	20.4	26.0	0	4.3	20.0	0	20.0		
Totals		645	77	3.1	0	9.3	2.6	20.8	3.0	27.6	35.1	27.3	45.5		
Sub-Totals				20	0	60	2	77	3	134	10	178	27	176	35
B.A. & None	34	516	162	0	0	.6	0	1.0	0	4.9	.6	29.4	7.4	64.5	92.0
	35 - 39	159	49	.6	0	3.1	0	1.9	0	25.0	0	42.8	30.6	26.4	69.4
	40 - 44	140	46	1.4	0	5.7	0	7.2	0	35.0	0	29.2	37.0	21.4	63.0
	45 - 49	116	27	1.7	0	11.2	0	6.0	0	37.8	18.5	22.4	33.3	20.7	48.2
	50 - 54	89	30	1.1	0	14.6	0	21.4	0	30.4	20.0	30.4	26.7	11.2	53.4
	55 - 59	81	17	3.7	0	22.2	0	19.8	5.9	29.6	17.7	11.1	35.3	13.6	41.1
	60 +	35	8	5.7	0	11.4	0	22.9	12.5	22.8	50.0	11.4	12.5	25.8	25.0
Totals		1,136	339	1.0	0	5.6	0	6.0	.6	18.4	5.6	28.7	20.1	40.3	73.7

TABLE VI

Average Age of Males and Females,
With Same Highest Earned Degree,
In Each Academic Rank

Highest Earned Degree	Academic Rank																	
	Deans		Heads		Other Full Profs.				Assoc. Profs.		Asst. Profs.		Other					
	M	F	Diff	M	F	Diff	M	F	Diff	M	F	Diff	M	F	Diff			
Ph.D.	49.3	60.7	11.4	48.1	54.2	6.1	47.1	54.6	7.5	40.1	44.3	4.2	33.0	37.5	4.5	35.7	36.7	1.0
M.A.	49.8	52.0	2.2	51.2	56.6	5.4	48.2	54.4	6.2	42.8	51.3	8.5	34.8	42.8	8.0	32.2	35.6	3.4
1st Prof.	50.2	--	--	48.4	57.3	8.9	49.5	51.7	2.2	42.7	50.5	7.8	36.6	41.3	4.7	32.9	35.2	2.3
B.A. & None	51.2	--	--	49.6	--	--	50.1	59.8	9.7	44.1	52.5	8.4	38.3	42.2	3.9	34.1	35.7	1.6

TABLE VII

Significance of Excess Proportions
Males/Females in Ranks Compared
To Proportions in Degrees

Degree	Rank	F Calculated	F Values	Proportional Excess of:-		Remarks
				Male	Female	
93.4% Males	Ph.D.'s					
	Deans (97.6%M)	2.12	$F_{40}^8 < 1.98 @ 5\% \text{ level}$	X		Significant @ 5%
	Heads (95.3%M)	1.37	$F_{928}^{48} = 1.37 @ 5\% \text{ level}$	X		Significant @ 5%
	Other Profs. (96.6%M)	1.93	$F_{1748}^{64} < 1.52 @ 1\% \text{ level}$	X		Significant @ 5%
	Assoc. Profs. (94.8%M)	1.26	$F_{3114}^{174} < 1.26 @ 5\% \text{ level}$	X		Just Significant @ 5%
	Asst. Profs. (9.10%M)	2.79	$F_{628}^{2188} < 1.32 @ 1\% \text{ level}$		X	Significant @ 1%
	Others (82.0%M)	3.08	$F_{74}^{340} < 1.62 @ 1\% \text{ level}$		X	Significant @ 1%
	Deans (94.4%M)	2.71	$F_{136}^{10} < 2.47 @ 1\% \text{ level}$		X	Significant @ 1%
	Heads (92.8%M)	2.30	$F_{258}^{22} < 1.97 @ 1\% \text{ level}$		X	Significant @ 1%
	Other Profs. (94.3%)	3.01	$F_{430}^{28} < 1.84 @ 1\% \text{ level}$		X	Significant @ 1%
	Assoc. Profs. (85.7%M)	1.16	$F_{1218}^{206} = 1.17 @ 5\% \text{ level}$		X	Not Significant @ 5%
	Asst. Profs. (85.0%M)	1.11	$F_{2496}^{442} > 1.11 @ 5\% \text{ level}$		X	Not Significant @ 5%
M.A.'s						
83.6% Males						

(Table VII continued)

Degree	Rank	F Calculated	Table F Values		Proportional Excess of:-		Remarks
			F	Values	Male	Female	
M.A.'s	Others (76.9%M)	1.53	F_{566}^{1888}	< 1.24 @ 1% level	X	Significant @ 1%	
1st Prof. Degree	Deans (100.0%M)	2.39	F_{40}^2	$= 3.23$ @ 5% level	X	Not Significant @ 5%	
89.3% Males	Heads (96.8%M)	2.40	F_{120}^6	< 2.19 @ 5% level	X	Significant @ 5%	
	Other Profs. (96.3%M)	2.31	F_{154}^8	< 2.00 @ 5% level	X	Significant @ 5%	
	Assoc. Profs. (93.1%M)	1.46	F_{268}^{22}	> 1.54 @ 5% level	X	Not Significant @ 5%	
	Asst. Profs. (86.8%M)	1.26	F_{54}^{358}	> 1.43 @ 5% level	X	Significant @ 5%	
	Others (83.4%M)	1.65	F_{70}^{354}	< 1.64 @ 1% level	X	Significant @ 1%	
B.A. and None	Deans (100%M)	3.29	F_{22}^2	$= 3.44$ @ 5% level	X	Not Significant @ 5%	
77.0% Males	Heads (100%M)	19.12	F_{128}^2	$= 4.78$ @ 1% level	X	Significant @ 1%	
	Other Profs. (97.1%M)	6.77	F_{136}^6	$= 2.95$ @ 1% level	X	Significant @ 1%	
	Assoc. Profs. (91.7%M)	3.12	F_{418}^{40}	$= 1.64$ @ 1% level	X	Significant @ 1%	
	Asst. Profs. (82.7%M)	1.41	F_{652}^{138}	$= 1.39$ @ 1% level	X	Just Significant @ 1%	
	Others (64.7%M)	1.82	F_{500}^{918}	< 1.24 @ 1% level	X	Significant @ 1%	

CHAPTER 2

Discrimination Against Female Faculty Members in Pension Plans and Insurance Plans.

1. The Data

The statistical data for the academic years 1965-1966 and 1968-1969 were gathered by means of questionnaires circulated by the Canadian Association of University Teachers; the results of both surveys were published in the C.A.U.T. Bulletin of April,¹⁰ and October,¹¹ 1966 and April,¹² 1969. In the course of the analysis, we shall also use unpublished findings of the 1965-1966 study. The 1965-1966 survey involved 30 institutions of higher learning; that of 1968-1969 furnished information on 42 institutions.¹³

2. Procedures

We shall examine the employment fringe benefits the provisions of which do not apply to all professors equally, regardless of sex, and those whose value is a function of salary, with reference to these areas:

- A. Pension Plans
- B. Life Insurance
- C. Long-term Disability Insurance

The factor to be kept in mind throughout, and the factor used in our calculations is that, as the first section of this report makes clear, female professors receive an average salary which is \$2,262 less than that of men. A little more than half of this difference, \$1,199, results directly from the sex of the professor. In estimating the significance of the differential in compensation due to sex in relation to fringe benefits plans, only the \$1,199 differential directly attributable to the sex of the faculty member is taken into account.

3. Findings

(a) Pension Plans

The various Pension Plans in Canadian universities are the same, whether they involve male or female professors. In our analysis, we are concerned with three factors which account for differences in the application of these various types of

plans: salary, retirement age, contributions as a percentage of salary. Factors related to differences in types of pension plans are taken into account separately: i) Money Purchase Pension Plan; ii) Fixed Formula Pension Plan.

i) Money Purchase Pension Plan

Retirement benefits from a money purchase pension plan which is fully documented in the C.A.U.T. Bulletin,¹⁴ take the form of a life annuity comprised of the accumulation of invested contributions (made by the professor and by the institution) and earnings from the investment. The professor's contributions, as a percentage of salary, range from 5 to 10 per cent.

Table VIII estimates the additional amounts, monthly and annual, which would be paid into the money purchase pension plan of a female if there were no sex salary differential.

TABLE VIII

Estimates of the Additional Monthly and Annual Amount That Would Be Paid Into a Money Purchase Pension Plan if There Were No Sex Salary Differential

Salary Differential	Contributions as Percentage of Salary					Total Contributions	
	Professor's		University			Annual	Monthly
\$	%	\$	%	\$	\$	\$	
1,199	5.0	59.95	5.0	59.95	119.90	9.99	
1,199	7.0	83.93	10.0	119.90	203.83	16.99	

Thus, between about \$120 and \$204 less per year is invested in the pension plans of female professors.

Table IX estimates the annual retirement benefits of a money purchase pension plan with monthly contributions based on an annual salary of \$1,199, and estimates also the additional annual benefits of a woman's additional contribution if the difference between average salaries according to sex were to be overcome at age 35, 40, 45 or 50. The estimates are based on the figures in Table X.¹⁵

TABLE IX

Based on Retirement Age, Estimates of the Value of Annual
Benefits from a Money Purchase Pension Plan,
Monthly Contributions Which Are Based
on an Annual Salary of \$1,199

Age when first monthly premium was paid to pension plan	Pension benefits on retirement age			
	Retirement age: 65		Retirement age: 68	
	monthly premium		monthly premium	
	\$9.99	\$16.99	\$9.99	\$16.99
	\$	\$	\$	\$
age 30	884	1,504	1,128	1,918
age 35	656	1,116	845	1,437
age 40	476	809	622	1,058
age 45	332	564	445	756
age 50	218	370	305	518

It is obvious that if that additional monthly amount was paid annually beginning at age 30 (which means that there was no salary differential by sex), on retirement a female professor would have additional pension benefits ranging from \$884 and \$1,504 (if she retires at age 65) and from \$1,128 and \$1,918 (if she retires at age 68).

Table X estimates the annual retirement income purchased by pension contributions of \$10 per month and invested only in fixed value bonds. This table, effective March 1, 1969, is published by Teachers' Insurance and Annuity Association - College Retirement Equity Fund (TIAA-CREF).

It is clear that the cost of a life annuity, with the annual benefits the same for men and women, is higher for women, because they have a longer life expectancy. For each dollar of the monthly contributions to the retirement fund, a woman draws only between 85 to 90 per cent of the annual pension benefits which would accrue to a man (estimate based on Table X). Thus, to ensure an income on retirement equal to a man's, a woman must either increase her premium payments, or delay her retirement. If she should decide to invest additional amounts, the burden of her premiums will increase still more since she must also compensate for the amount she

TABLE X

Yearly Single Life Annuity Purchased by Future Premiums of \$10
Monthly Continued from Age in Centre Column to
Retirement at Ages Shown in Other Columns¹⁵

<u>MALE</u>						<u>FEMALE</u>				
Annuity 60	Each Year - First Payment at Age				Age When Premium Is Paid	Annuity Each Year - First Payment at Age				
	62	65	68	70		60	62	65	68	70
\$	\$	\$	\$	\$		\$	\$	\$	\$	\$
903	1,057	1,345	1,723	2,043	25	804	934	1,174	1,485	1,745
852	999	1,273	1,633	1,937	26	758	882	1,110	1,407	1,654
804	943	1,203	1,546	1,836	27	715	833	1,050	1,332	1,568
757	890	1,138	1,464	1,740	28	674	786	993	1,261	1,486
713	839	1,075	1,385	1,648	29	634	741	938	1,193	1,407
670	790	1,015	1,310	1,560	30	596	698	885	1,129	1,332
630	744	957	1,238	1,476	31	560	657	835	1,067	1,261
591	700	903	1,170	1,396	32	526	618	788	1,008	1,192
554	657	850	1,104	1,319	33	493	581	742	952	1,127
519	617	800	1,042	1,246	34	462	545	698	898	1,065
485	579	753	982	1,177	35	432	511	657	846	1,005
453	542	707	926	1,110	36	403	478	617	797	948
423	507	664	871	1,047	37	376	447	579	751	894
393	473	623	819	986	38	350	418	543	706	842
365	441	583	770	928	39	325	390	509	663	793
339	411	545	723	873	40	301	363	476	623	746
313	382	509	678	820	41	279	337	444	584	701
289	354	475	635	770	42	257	312	414	547	658
266	327	442	593	722	43	237	289	386	511	617
244	302	411	554	676	44	217	267	358	478	578
223	278	381	517	632	45	198	245	332	445	540
202	254	352	481	591	46	180	225	307	414	504
183	232	325	447	551	47	163	205	283	385	470
165	211	299	414	513	48	147	187	261	357	438
147	191	274	383	476	49	131	169	239	330	407
130	172	250	354	442	50	116	152	218	305	377
114	154	227	325	408	51	102	136	198	280	349
99	136	206	298	377	52	88	120	180	257	322
85	120	185	272	347	53	75	106	162	235	296
71	104	165	248	318	54	63	91	144	213	271
57	88	147	224	290	55	51	78	128	193	248
45	74	129	202	264	56	40	65	112	174	225
33	60	112	180	239	57	29	53	97	155	204
21	47	95	160	215	58	19	41	83	137	183
10	34	79	140	192	59	9	30	69	121	164
	22	65	121	170	60		19	56	105	145
	11	50	104	149	61		9	44	89	127
		37	87	129	62			32	75	110
		24	70	110	63			21	61	94
		11	55	92	64			10	47	79
			40	75	65				34	64
			26	58	66				22	50
			12	43	67				11	36
				28	68					24
				13	69					11

Rate Basis: TIAA annuity rates effective March 1, 1969 including dividends based on the dividend scale effective January 1, 1969. Dividends, of course, are not guaranteed for the future.

loses in individual and university contributions because her salary is less than a male professor's. If she chooses to delay her retirement, she must put it off by sufficient years to counteract the higher cost of the life annuity, and the salary differential (loss of contributions from both the professor and the university).

ii) Fixed Formula Pension Plan

The annual income from a fixed formula pension plan, documented in the C.A.U.T. Bulletin,¹⁶ corresponds to the product of three factors: 1) a factor generally expressed as a percentage of an average salary;¹⁷ 2) the number of years of membership in the plan; 3) the average salary calculated over a specific period of time.¹⁷

In this plan, unlike that of money purchase pension plan, the pension benefits from the same investment by the professor is equal regardless of sex. But the female professor is in a less favoured position because her salary being lower than that of a man, less money is contributed to the pension plan.

Table XI indicates the additional retirement benefits which would be paid to a female professor if she received a salary equal to that of her male counterpart.

TABLE XI

Estimates of Supplementary Pension Benefits to Be
Granted a Female Faculty Member if She Were to
Receive a Salary Equal to that of a Male

Pension formula	Number of Years of Membership in the Pension Plan			Average salary differential	Pension benefits
	Age of retirement	Age when entering the plan	Number of years		
%			no.	\$	\$
1.5	(65	- 30)	35	1,199	629
2.0	(65	- 30)	35	1,199	839

Thus, depending on the percentage factor, the female professor receives between \$629 and \$839 less annually than her male counterpart. The female professor can balance this

difference by making additional contributions, or by delaying her retirement. At several universities, however, the female professor cannot put off her retirement because compulsory retirement ages are set, as Table XII indicates. Moreover, at some universities female professors must retire earlier than male professors.

TABLE XII

Normal Retirement Age and Compulsory Retirement Age by Sex in 1965-1966 and 1968-1969

University	Normal retirement age		Compulsory retirement age	
	Male	Female	Male	Female
Bishop's				
1965-1966	67	60	70	65
1968-1969	67	60	70	67
Laval				
1965-1966	67	65	67	65
1968-1969	-	-	67	65
Nova Scotia Technical College				
1965-1966	-	-	-	-
1968-1969	-	-	65	60
St. Dunstan's				
1965-1966	-	-	-	-
1968-1969	65	60	-	-
Waterloo				
1965-1966	68	65	-	-
1968-1969	65	65	65	65

(b) Life Insurance

All the universities for which we have information,¹⁸ with the exception of Bishop's, British Columbia, Mount Allison, Ottawa and St. Francis Xavier in 1965-1966, Alberta, British Columbia, Memorial, Mount Allison, Notre Dame of Nelson, St. Francis Xavier, Victoria in 1968-1969, offer their male professors a life insurance plan with a face value based on salary. This provision, however, does not apply uniformly to female professors: in 1965-1966, at the University of New Brunswick, female professors may choose between a face value based on salary, or a set face value of \$2,000.

Furthermore, at a number of universities in 1965-1966 (Acadia, Bishop's, Lakehead, Manitoba, New Brunswick, Ottawa, Sherbrooke, Winnipeg (United), Waterloo, Western, Windsor and York) and in 1968-1969 (Bishop's, Brock, Lethbridge, Loyola, New Brunswick, Notre Dame of Nelson, Sherbrooke, Trent, Waterloo, Western), the face value as a percentage of salary, or the maximum face value is less for female professors.

The 1968-1969 survey indicates that the situation has been rectified in six of these universities, Acadia, Lakehead, Manitoba, Ottawa, Winnipeg, Windsor, York. At Sherbrooke and Western, the changes in the life insurance plan, which occurred between 1965-1966 and 1968-1969, did not alter the principle of different face value by sex.

Since the salary level, together with age, generally determines the face value of the life insurance policy, uniform plans for male and female professors give in fact less coverage to the female professor because the average salary differential between male and female is \$1,199.

A life insurance plan obviously provides protection to survivors in case of death, but life insurance must also be considered as related to the pension plan. On this matter, therefore, we quote two excerpts from a report of a Commission of Study which indirectly advocate for uniform life insurance plans which should be uniform both in provisions and application, regardless of sex:

"Death benefits within a retirement plan need supplementation by group life insurance, preferably decreasing term-insurance. The increase of these provisions within the system may partly be offset by a less costly insurance plan."¹⁹

"The dovetailing of a decreasing term (life) insurance with the increasing savings in a retirement plan, especially if these include the institutional contributions, can form a satisfactory protection in case of death....!"²⁰

(c) Long-Term Disability Insurance

Our findings on long-term disability insurance²¹ permit only a limited analysis of the plans' operation according to sex.

Long-term disability insurance benefits are calculated as a percentage of salary. Thus disability benefits for a female professor are subject to the salary differential. Generally, the percentage of salary paid to a disabled professor by the insurance, varies between 50 and 60 per cent.

TABLE XIII

Estimates of the Annual Value of Supplementary Disability Benefits for Female Faculty if They Were to Receive Benefits Equal to Those Awarded Males

Formula of benefits as a percentage of salary	Salary differential	Annual differential in disability benefits
%	\$	\$
50.0	1,199	600
60.0	1,199	719

Thus, because of the salary differential by sex, a disabled female professor would receive monthly between \$50 and \$60 less during any period of disability.

Highlights from

"A Comparison of Men's and Women's Salaries and Employment Fringe Benefits in the Academic Profession"

A report prepared for the Royal Commission on the Status of Women in Canada by the Canadian Association of University Teachers.

-----During the academic year 1965/66, the mean salary for men in Canadian universities was \$10,690, while women received an average salary of \$8,428 - a difference of \$2,262 per annum in favour of men. In other words, the average female salary constituted only 78.8 per cent of the average male salary.

-----Slightly more than half (\$1,199) of this discrepancy results from a direct sex difference. The balance (approximately \$1,050) results from the different ways in which other factors affect the salaries of male and female academics. These factors are: Region, Size of University, Control of University, Highest Earned Degree (a measure of competence) Year of Birth, Field and Rank.

-----Rank exerts a greater influence on the male/female salary differential than all the other factors combined; it increases the differential by approximately \$1,115. With very few exceptions, even when women have the same degree of training and experience, men tend to dominate the higher academic and administrative ranks (Deans, Heads, full professors and associate professors) while women are concentrated in the lower ranks of assistant professor, and "other" (lecturers, instructors, etc.). Thus it appears that even when women have the same amount of training and experience as men, discrimination exists against women in terms of promotion.

-----The factor of age (used as a measure of experience) was the only one which reduced the salary differential, by about \$178 per annum. This appears to be due to the higher proportion of women in the under 30 age group, in which the sex differential for salaries is substantially lower than in the older age brackets.

-----The factors of region, enrolment and control had only a marginal effect on the sex differential.

-----Academic disciplines were grouped into 18 fields: in six of these (Hygiene and Nursing, Administration, Dentistry and

Medicine, Pure Biological Sciences, Agriculture and Forestry and Pure Physical Sciences) the salary sex differential was increased; in eight (Applied Physical Sciences, other Pure Social Sciences, Education, Commerce, Political Science, Economics and Political Science, Law and Humanities) the sex differential remained at the level of the "pure" sex difference; in four (Home Economics, Optometry and Pharmacy, History and other Applied Social Sciences) the differential was reduced. In these four fields, however, females do not earn more than in other areas, the reduced differential results from the fact that in these fields men tend to earn less than average salaries. Overall, the field factor increases the salary differential by about \$90.

-----As a result of salary differential for sex and other factors, women academics also suffer disadvantage in terms of employment fringe benefits such as pension plans, and life and long-term disability insurance plans. For example, with a money purchase pension plan such as is in effect at many universities, taking the salary differential at age 35 with retirement at age 65 the annual value of the pension is estimated to be between \$656 and \$1,116 less. If the pension plan is a fixed formula one, it is estimated that per annum pension benefits would be between \$629 and \$839 less for a woman.

-----The report pointed out what it calls a "disturbing trend" in terms of academic salaries: over the years between 1956/7 to 1963/4, the sex differences in median salaries increased from \$1,232 to \$1,779. As a proportion of the median male salary, the median female salary diminished from 82 per cent to 80 per cent. Although the average male/female salaries used in the C.A.U.T.'s calculations are not directly comparable, since they are means rather than medians, it is significant that in 1965/6 the difference between male/female average salaries was \$2,262, and that the average female salary constituted only 78.8 per cent of the average male salary.

FOOTNOTES - CHAPTER 1

1. Experiments with the data indicated that the variables "year of birth", "year of first degree" and "year of highest degree" performed about equally well as measures of "experience", and that there is no significant advantage in using more than one of them. We therefore chose "age" as the measure of "experience" in our analysis, since it was available for more cases than the other two variables.
2. We should like to acknowledge the assistance of Mr. James Gossland and Mr. William Reimer, who undertook the statistical work for this study.
3. See: Gideon Rosenbluth, "The Structure of Academic Salaries in Canada", C.A.U.T. Bulletin, Vol. 15, No. 4, April 1967, pp. 19 - 27.
4. The influence of various factors is estimated by means of a model in which it is assumed that each individual's salary is the sum of a number of components. Thus

$$S - a + b + c + d + e + f + g + h + u$$

Here, S is the individual's salary

- a is an average component depending only on whether the individual is male or female
- b depends on whether the university is located in the Atlantic region, Quebec, Ontario or the West
- c depends on the size of the university in terms of student enrolment, five size classes being employed
- d depends on whether the university is provincial, church affiliated or private
- e depends on the individual's field, 18 classes being employed in the analysis
- f depends on the individual's rank
- g depends on his age
- h depends on his highest earned degree
- u represents the effect of other factors and "chance" on the individual's salary.

The four alternative values of b, for males, for example, sum to zero and the same is true of the values for females. Similarly, the alternative values of each of c, d, e, f, and h, sum to zero for both males and females. G is assumed to be a second order polynomial function of age.

The values of a, b, c, d, e, f, g, h are estimated simultaneously by the method of least squares, so that the value of u for each individual is calculated as a residual.

We should note here that the "fit" of the model is very good, as cross-section studies go. As measured by the squared correlation coefficient, Table I explains 84 per cent of the variation in individual salaries. This value, together with the fact that the number of observations is very high, suggest that our results are very reliable.

5. The multiple regression analysis provides estimates of the salaries of males and females in the academic profession, grouped in terms of various combinations of the seven remaining characteristics for which we had information. Because of the classification of each of these seven variables, there are 103,680 possible groups, within each of which males and females respectively possess the same combination of all seven variables. The 103,680 groups are made up as follows:

Region	Size of Univ.	Control	Highest Earned Degree	Age	Field	Rank							
4	x	5	x	3	x	4	x	4	x	18	x	6	= 103,680

Since our population comprised less than 10,000 males and about 1,400 females, the vast majority of the 103,680 possible groups had no occupants, i.e. none of the 11,156 professors included in our population possessed the particular combinations of characteristics of these groups. The "component effects" are estimates based on the salary data for those groups into which one or more of our population fitted, but do not take into account the numbers of persons in each group.

On the other hand, the average salaries of males and females are based on actual salaries received by the 11,156 professors for whom we obtained data who are, of course, differentially distributed over these 103,680 possible groups. The difference between the average

actual salaries of males and of females can therefore be seen to be the sum of all the "component effects" for the seven variables, each weighted by the appropriate difference in the actual distributions of men and women over those seven characteristics.

The following example illustrates the procedure: The component effect of the Atlantic region is \$166, i.e. it reduces the difference between male and female salaries by \$166; this amount is based on the figures in the 25,920 cells (103,680 ÷ 4 regions) that comprise all the possible combinations of the classes of the remaining six characteristics. As noted earlier, however, the figures for these cells are estimates, since our population did not include a sufficient number of persons with these particular combinations of characteristics.

The effect of this variable on the difference between the actual salaries of men and women will be determined by the distribution over the 25,920 cells, of the 956 men and 153 women who are in the Atlantic region.

Let us suppose that only 50 of the 25,920 cells have actual cases. Since the salaries of only those in these 50 cells will affect the difference between the average actual salaries of men and women (and not the estimated salaries or the "component effects" of those cells with no actual cases, which in our hypothetical example would be the remaining 25,870 cells) we must take the male and female "component effects" of the populated cells and weigh them by the respective numbers of men and women in each of those cells. Columns 4 and 7 of Table I provide the results of those calculations, viz: the average "component effect" weighted by the male and female distributions respectively, for each class of each of the seven variables. Column 9 gives for each class of each variable the net effect on the difference between male and female salaries.

6. In theory, the extent of salary discrimination can vary as much as \$7,049, from one situation in which a man and woman at the same type of university, in the same region, with the same rank, in the same field and with the same degree of competence will receive salaries which differ by as much as \$4,945 in favour of the man (viz. a dean, with a first professional degree, aged 60 or over, in the field of hygiene and nursing, at a state-controlled university, with an enrolment of over 500, in Ontario would typically earn \$18,761 if he were a man but only \$13,816 if she were

a woman), to another situation in which the average woman will be paid \$2,104 more than a comparable man (viz. an associate professor with an M.A. aged under 30 years, in the field of home economics, at a church-controlled university, in the Western Region with an enrolment between 500 and 999 would typically earn \$10,674 if she were a woman, but only \$8,570 if he were a man).

7. We realize, of course, that the term "discrimination" usually refers to illegitimate distinctions, and that it is still possible that the differences between male and female salaries may be the result of differences of which we would not take account, but which are justifiably used as a basis for differences in salaries. For example, our measures of "competence", viz: "age" and "highest earned degree" may not be good indices of the kinds of competences that universities think should be rewarded, and which may be regarded as legitimate.

8. We decided that the simplest means of testing the significance of the male/female differences was to find the male/female percentage with respect to the total numbers of Ph.D.'s, M.A.'s, first professional degrees, B.A.'s and None (93.4%/6.6%; 83.6%/16.4%; 89.3%/10.7% and 77.0%/23.0% respectively) and then, for each degree in turn, determine whether the deviations of male/female percentages in each rank were significant. Initially, we made an attempt to check the figures for each year of age, but the small expected frequencies made it difficult to apply a simple X² test. It was finally decided to test the aggregate numbers of males and females for each degree in each rank (figures in Table V) using the F test for proportions, as in the following example:

Ph.D.:

Deans: $H_0 : P = 0.934$ $n =$ total number of Ph.D. Deans
 $H_1 : P > 0.934$ $k =$ total number of males

$$\text{Then } \Phi_1 = 2(n - k + 1) = 2(123 - 120 + 1) = 8$$

$$\Phi_2 = 2k = 240$$

$$\text{and } F = \frac{\Phi_2(1 - P)}{\Phi_1 P} = \frac{240(0.066)}{8(0.934)} = \frac{15.8}{7.47} = 2.12$$

But $F_{240}^8 < 1.98$ at the 5 per cent level. The interpretation is that this proportion of male Ph.D.'s (120/123) could be selected as Deans less than five times in a hundred, if no discrimination exists in selecting males over females, and if the proportion of Ph.D.'s who are males is 93.4 per cent. Significance implies discrimination exists.

9. For data on male and female median salaries for the academic years 1958/9 to 1963/4 see: "Salaries and Qualifications of Teachers in Universities and Colleges", 1963-4, published by the Dominion Bureau of Statistics, Education Division, Higher Education Section, Queen's Printer, Ottawa, May 1964, p. 27. For similar data for the academic year 1957/8, see: Josie, Svanhuit, "Salaries and Qualifications of Women Teaching in Canadian Universities and Colleges". The Labour Gazette, November 30, 1959 (prepared for the Women's Bureau of the Department of Labour). Both sets of figures are reproduced in the C.A.U.T. Bulletin, Vol. 15, No. 1, October 1966, p. 31.

FOOTNOTES - CHAPTER 2

10. Lapointe, Mireille, Rapport partiel et préliminaire sur les régimes de caisse de retraite des universités au Canada, C.A.U.T. Bulletin, Vol. 14, No. 4, April 1966, pp. 64 - 71.
11. Lapointe, Mireille, Sommaire de l'étude des avantages sociaux offerts aux professeurs dans les universités du Canada: 1965 - 1966, C.A.U.T. Bulletin, Vol. 15, No. 1, October 1966, pp. 66 - 84.
12. Lapointe, Mireille, Etudes des avantages sociaux, 1968 - 1969, C.A.U.T. Bulletin, Vol. 17, No. 4, April 1969, pp. 65 - 140.
13. Institutions included in 1965-1966 survey: Acadia, Alberta, Bishop's, Brandon, British Columbia, Dalhousie, Guelph, Lakehead, Laurentian, Laval, Manitoba, McGill, McMaster, Mount Allison, New Brunswick, Ottawa, Queen's, Royal Military College, St. Francis Xavier, St. John's, Saskatchewan, Sherbrooke, Sir George Williams, Toronto, United (Winnipeg), Waterloo, Waterloo Lutheran, Western, Windsor, York.

Institutions included in the 1968-1969 survey: Acadia, Alberta, Bishop's, Brandon, British Columbia, Brock, Calgary, Carleton, Dalhousie, Guelph, Lakehead, Laurentian, Laval, Lethbridge, Loyola, Manitoba, McGill, McMaster, Memorial, Moncton, Montréal, Mount Allison, New Brunswick, Notre Dame of Nelson, Nova Scotia Technical College, Ottawa, Queen's, Royal Military College, St. Dunstan's, St. John's (integrated with Manitoba), St. Francis Xavier, St. Mary's, St. Paul's (integrated with Manitoba), Sherbrooke, Simon Fraser, Sir George Williams, Trent, Victoria, Waterloo, Waterloo Lutheran, Western, Windsor, Winnipeg (formerly United), York.
14. C.A.U.T. Bulletin: Vol. 14, No. 4, April 1966, pp. 70 - 71; Vol. 15, No. 1, October 1966, p. 67; Vol. 17, No. 4, April 1969, pp. 89 - 93.
15. Table from Teachers Insurance and Annuity Association of America (TIAA), annuity rates effective March 1, 1969, Teachers Insurance and Annuity Association-College Retirement Equity Fund (TIAA-CREF), New York, 1969.
16. C.A.U.T. Bulletin: Vol. 14, No. 4, April 1966, pp. 66 - 69; Vol. 15, No. 1, October 1966, pp. 68 - 69; Vol. 17, No. 4, April 1969, pp. 77 - 88.

17. Salary of participant is calculated within the period defined by each particular plan: e.g., average salary during years of contribution, average salary during the last x years of contribution, average salary during the last y consecutive years of contribution, average salary during the z best years of contribution, etc.
18. C.A.U.T. Bulletin: Vol. 15, No. 1, October 1966, pp. 70 - 72; Vol. 17, No. 4, April 1969, pp. 94 - 99; also non-published information from the 1965-1966 survey.
19. Ingraham, Mark H., Faculty Retirement Systems in Canadian Universities, A Report to Association of Universities and Colleges of Canada, Canadian Association of University Teachers, Canadian Association of University Business Officers, University of Toronto Press and Les Presses de l'université Laval, Toronto, 1966, p. 40.
20. Ibid., p. 44.
21. C.A.U.T. Bulletin: Vol. 15, No. 1, October 1966, pp. 74 - 77; Vol. 17, No. 4, April 1969, pp. 109 - 113.