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"SEMINAL WOMEN": WOMEN IN SCIENCE IN THE CANADIAN FEDERAL DEPARTMENT OF AGRICULTURE, 1884 TO 1921

by

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ABSTRACT

"SEMINAL WOMEN": WOMEN IN SCIENCE IN

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Amber Lloydlangston,
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Supervisor:
Professor Ruby Heap

As historian Marianne Ainley maintains in the introduction to *Despite the Odds: Essays on Canadian Women in Science*, the way in which science is practised and institutionalized has an impact upon the careers of men and women. The purpose of this thesis then is to determine the type of science, and the ways of practising it, employed within the Canadian federal Department of Agriculture. What conscious and subconscious factors influenced the scientific and methodological choices of the leaders of the Department? How did this, in turn, influence the opportunities of women to become involved in science in the years 1884 to 1921? The thesis argues that the professionalization and bureaucratization of science in the Department of Agriculture created distinct opportunities for such involvement, but it also confined them to specific jobs deemed appropriate for their sex.

Because the science that was first undertaken in the Department beginning in 1884 emerged from the natural history tradition, women first contributed as unpaid "amateur" observers, collectors, and correspondents. As science professionalized and bureaucratized in the late nineteenth and early twentieth centuries, however, the contributions of unpaid "amateurs" were no longer desired or needed. At this juncture, women were employed as

paid assistants and members of the support staff. As civil servants, women entered an organization that was undergoing a process of reform and bureaucratizing. As a result, women were subjected to hierarchical and lateral segregation. Women's employment in science in the federal Department of Agriculture followed this pattern. Employed to undertake technical work in seed analysis and scientific work in botany, chemistry, and librarianship in the Department, women were confined to 'women's work' in science. They performed tasks which were undervalued, underpaid, and offered little or no opportunity for advancement, and were, therefore, rejected by men. Over the almost forty year period covered in this thesis, in both peace and war, the work of women followed this pattern. Satisfying the demands generated by the professionalization and bureaucratization of science as well as the reform and bureaucratization of the federal civil service, women were a pivotal part of the scientific workforce of the Canadian federal Department of Agriculture from 1884 to 1921.

ACKNOWLEDGEMENTS

The subject of this thesis was first conceived in Professor Ruby Heap's feminist theory and women's history field in 1994 and it is to Professor Heap's subsequent insightful criticism that the thesis owes its strengths. From the beginning of the research and writing process, her constructive recommendations combined with her sympathy and decided interest in the subject that I chose to study has sustained me. In addition to the guidance that Professor Heap provided throughout the project, she also extended important opportunities for professional development. Her invitation to present some of my research findings at the Social Sciences and Humanities Research Council research group, "Women in the Professions," was greatly appreciated. The interest shown in my project and the advice that was offered were invaluable. The thought provoking discussions were wonderfully stimulating. Finally, on a more pragmatic but no less important note, I must sincerely thank Professor Heap for the continued financial support that she provided in the form of many interesting research contracts. As well as providing me with the financial wherewithal to continue my studies, these contracts also fostered both my research and my analytical skills.

My thanks must also be extended to a number of professors within the History Department of the University of Ottawa. For his continued friendship, support, and welcomed advice, my sincerest and warmest appreciation and affection are extended to Professor J. Keshen. I would also like to acknowledge the kindness of Professor P. Bischoff. Providing me with assistance in the form of a research contract at a critical juncture of my studies, Professor Bischoff also offered friendship that I greatly appreciated. Last, I would like to thank Professor J. Barbier for his advice and friendship.

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Relocating from Hamilton to Ottawa to begin the doctoral program, I left behind dear friends whose support throughout the years of producing this thesis has been treasured. Upon entering the program, however, I found new friends who have since become inexpressibly dear. Their stimulating conversation, brilliant minds, and penchant for fun have made the years of the doctoral program some of most memorable and enjoyable of my life. Too numerous to name in their entirety, I must single out several women, classmates whose friendship has been particularly precious. Indeed, without them, the doctoral program

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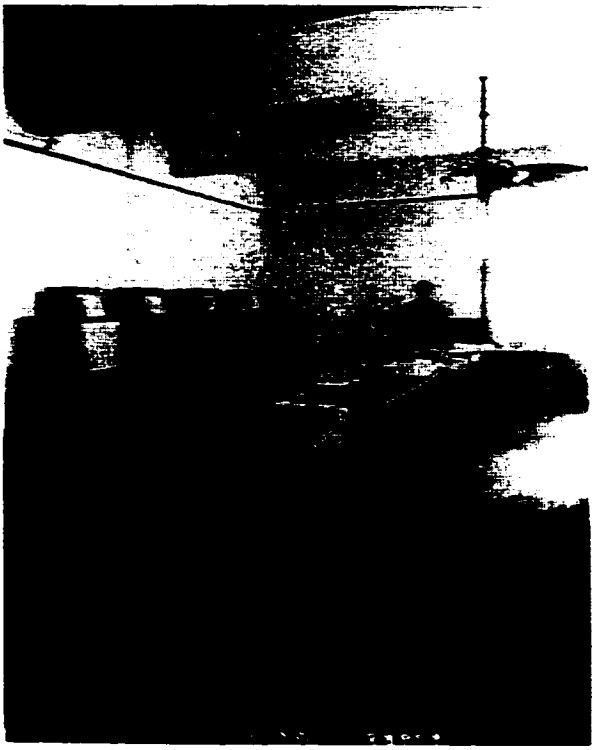
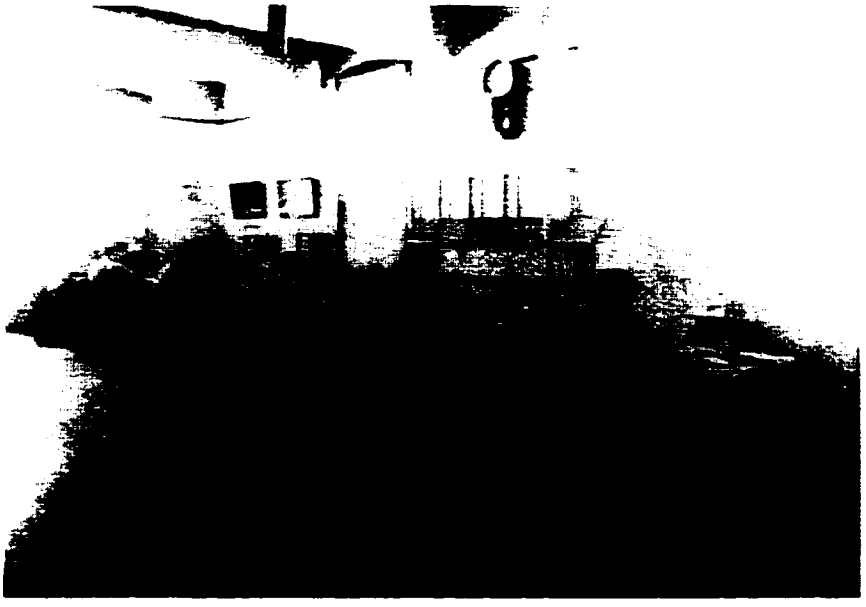


The germination section of the Ottawa Seed Laboratory, February 1907.
(William James Topley Collection, 1936-270/National Archives of Canada/PA-042586)



Conducting purity analyses at the Ottawa Seed Laboratory, February 1907.
(William James Topley Collection, 1936-270/National Archives of Canada/PA-042588)

Faith Fyles, Assistant Botanist
(William James Topley Collection, 1936-270/National Archives of Canada/PA-204727)

Faith Fyles, Assistant Botanist
(William James Topley Collection, 1936-270/National Archives of Canada/PA-204728)

VIKING

Water colour drawing by Faith Fyles. Colour plate from M. B. Davis. *The Raspberry and its Cultivation in Canada*, Ottawa: Department of Agriculture, 1934.

Chapter 1

Women in Science in the Canadian Federal Department of Agriculture, 1884 to 1921

1.1 Women in Science

Historians have recorded women's involvement in science for centuries. Following the encyclopaedic format, early histories collected the names and achievements of as many women scientists as possible. Subject to misogynistic criticism in the late nineteenth and early twentieth centuries, these studies were overwhelmed by analyses of great men scientists and their institutions.[1] Although never entirely disappearing, histories of women in science enjoyed a new popularity with the birth of Second-Wave feminism. Wishing to recapture the experiences of scientific foremothers, historians focused on discovering as many women scientists as possible.[2] As tools for feminist analyses developed, to these studies of 'great women' were added analyses that sought to appreciate women's role in science in comparison to that of men. Did women and men participate in science in similar ways? Did women and men enjoy equal access to the institutions of science? Because differences were abundantly apparent, these

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[1] Londa Schiebinger, *Has Feminism Changed Science?* Cambridge: Harvard University Press, 1999, 23.
[2] Schiebinger, "The History and Philosophy of Women in Science: A Review Essay," *Signs*, 12, 2(1987), 314.

analyses also endeavoured to investigate the structures of scientific work and its institutional base to determine what factors shaped the place and roles of women in science.

Along with their colleagues in other countries, Canadian historians have explored the position of women employed in science. They also noted that Canadian women began to enter the institutions of science as it professionalized and bureaucratized, acquiring the education necessary to find employment in universities[3] and government.[4] Interested in the experiences of women in science employed in the Canadian federal Department of Agriculture in particular, historians Ralph Estey and Edwinna von Baeyer have examined the life and career of mycologist Margaret Newton and horticulturist Isabella Preston, respectively. They began to unravel the key factors that shaped women's employment in science in the federal government, such as the rules and regulations of the federal civil service, the bureaucracy, and women's relationships with their male colleagues and superiors. Thus, Von Baeyer describes the lengthy hiring process that Preston endured at

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[3] Historian Alison Prentice has studied women at the University of Toronto, in general, and in the Physics Department, in particular. See, Prentice, "Bluestockings, Feminists or Women Workers? A Preliminary Look at Women's Early Employment at the University of Toronto," *Journal of the Canadian Historical Association*, 2(1991), 231-62; "The Early History of Women in University Physics: A Toronto Case Study," *Physics in Canada*, 52, 2(March/April 1996), 94-6; "Three Women in Physics," in *Challenging Professions: Historical and Contemporary Perspectives on Women's Professional Work*, Elizabeth Smyth, et al, eds., Toronto: University of Toronto Press, 1999, 119-40.

[4] Marianne Ainley has recaptured the names and experiences of women scientists in government, particularly in the National Research Council and the Geological Survey. See, Ainley and Catherine Millar, "A Select Few: Women and the National Research Council of Canada, 1916-1991," in *Building Canadian Science: The Role of the National Research Council*, Richard A. Jarrell and Yves Gingras, eds., special issue of *Scientia canadensis*, 15, 2(1991), 105-16; Ainley and Tina Crossfield, "Canadian Women's contributions to Chemistry, 1900-1970," *Canadian Chemical News*, (April 1994), 16-8;

the hands of a department "not exceptional in its hiring policies toward women," which only hired her because they could not get a similarly qualified man for the same money.[5] For his part, Estey discusses the insecurities that Newton felt as a woman scientist and the strategy of overperformance that she employed to overcome them.[6]

Recognizing that women faced particular difficulties in the Department of Agriculture because they were women, both authors introduce issues of particular interest to this thesis. These include discriminatory hiring practices, low salaries, prejudice, and women's responses to all of them. However, while Von Baeyer and Estey each focuses upon one woman and her unique experiences within the federal Department of Agriculture, this thesis adopts a different perspective. Starting with the Department of Agriculture itself rather than a particular woman scientist, it will explore how women came to be involved in the scientific activities of the Department. It will determine how science was practised in the Department of Agriculture and the different forces that reshaped it during the years 1884 to 1921. It will investigate how these same forces fashioned spaces for women in science. As well, it will consider the impact of the broader context of this employment, that is the federal civil service and its rules and regulations.

"Women's Work in Geology: A Historical Perspective on Gender Division in Canadian Science," *Geoscience Canada*, 21, 3(September 1994), 140-2.

[5] Von Baeyer, "Isabella Preston, 1881-1964: An explorer of the Horticultural Frontier," in *Despite the Odds: Essays on Women in Science in Canada*, Marianne G. Ainley, ed., Montreal: Véhicule Press, 1990, 220. See also, "The Horticultural Odyssey of Isabella Preston," *Canadian Horticultural History/Histoire de l'horticulture au Canada*, 1, 3(1987), 125-75.

[6] Estey, "Margaret Newton: Distinguished Canadian Scientist," in *Despite the Odds*, 244-5.

upon women's experiences in the Department.[7] In this way the thesis will uncover the main patterns of women's involvement in science in the federal Department of Agriculture in the formative years of science in the Department, 1884 to1921.

Along with historians such as Marianne Ainley and Margaret Rossiter, we define 'science' broadly; the thesis not only includes women involved in botany, entomology, and chemistry, but some also engaged in librarianship. Moreover, it investigates women who were undeniably scientists as well as those who served as technical and support staff.[8] Using a feminist analytical framework, we will argue that gender and the power relations between men and women were the key factors in shaping women's experiences in science in the Department of Agriculture. Socially constructed ideas of femininity and masculinity that dictated the nature of these power relations permeated the Department to create and perpetuate 'women's work' in science, that is, work that was considered appropriate for women. Despite the modernization of Canada at the end of the nineteenth and the beginning of the twentieth centuries and the impact of the first wave women's movement, we will see that women's relative position in science in the Department of Agriculture was not fundamentally altered between 1884 and 1921. This thesis will attempt to explain why.

The federal Department of Agriculture was selected as the institutional focus of this thesis because it was unique among the institutions that offered opportunities for

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[7] As Ainley has observed, the "way in which science is practiced and institutionalized always has important implications in all countries for the careers of men and women scientists." See, Ainley, "Introduction," in *Despite the Odds*, 19.

[8] Ainley, "Introduction," 17; Margaret Rossiter, *Women Scientists in America: Struggles and Strategies to 1940*, Baltimore and London: The Johns Hopkins University Press, 1982.

women to become involved in science in the late nineteenth and early twentieth centuries. Women found a comparatively welcoming environment in the Department, first in an unpaid and then in a paid capacity. This was a product of the timing of the incorporation of science among its responsibilities and because of the fields of inquiry that it pursued.

Indeed, the Department of Agriculture gained official responsibility for scientific agricultural improvement at a particularly fortuitous time in terms of incorporating women into its workforce. Because farming was of primary importance to the physical, economic, political, and social development of Canada, any threat to its stability and advancement was viewed with considerable alarm.[9] Between the mid- and late-nineteenth century, the pressures and difficulties experienced by Canadian agriculturists stimulated a new interest in agricultural improvement through science inside and outside the federal government. The government manifested its concern by first appointing an Honorary Entomologist in 1884 and then by passing the *Experimental Farms Act, 1886*. As science continued to professionalize and bureaucratize in the Department, support roles in science were created which needed to be staffed.

In the meantime, university-educated women, many of whom had been trained in science, entered the labour market just as the Department of Agriculture, which had expanded its responsibilities into the domain of science, required a new source of labour.[10] Unlike other government bodies and departments, such as the Geological

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[9] For more on this theme, see, Vernon Fowke, *Canadian Agricultural Policy: The Historical Pattern*, Toronto: University of Toronto Press, 1978.

[10] In her preliminary analysis of women's employment at the University of Toronto, Alison Prentice notes that women, having actively participated in science outside of the university, continued their involvement as "it came increasingly under the control of professional men in universities." See, Prentice, "Bluestockings, Feminists or Women

Survey, that had acquired a science mandate earlier in the century, the Department of Agriculture had not already developed an exclusive masculine work culture that barred women from its scientific activities. [11] Instead, it developed a gendered ethos that circumscribed women's scientific roles while providing them with a number of different opportunities. Equally important, the Department of Agriculture undertook work in scientific disciplines that were relatively more hospitable to women than those pursued in other departments. [12] As we shall see, the Seed Branch and the Divisions of Botany and Chemistry of the Experimental Farms Branch all employed women to a greater or lesser degree.

The period covered in this thesis is significant for many reasons. In1884 the responsibility for scientific investigations was first introduced into the Department of

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Workers?" 239. Margaret Gillett notes that the Donaldas, the first women to attend McGill, also tended to "eschew the Classics programme of studies in favour of the Scientific." See, Gillett, *We Walked Very Warily: A History of Women at McGill*, Montreal: Eden Press Women's Publications, 1981, 76.

[11] The Geological Survey, established in 1842 and employing only men from that date, was particularly unwilling to employ women. The experiences of Alice Wilson, hired in 1913 and the sole woman employed by the Survey in a scientific capacity for many years, indicate the extent to which such a masculine work culture could and did constrict women's opportunities. See, Barbara Meadowcroft, "Alice Wilson, 1881-1964, Explorer of the Earth Beneath Her Feet," in *Despite the Odds*, 204-219. See also, Morris Zaslow, *Reading the Rocks: The Story of the Geological Survey of Canada, 1842-1972*, Toronto: University of Toronto Press, 1975.

[12] In contrast, the Dominion Observatory, the Fisheries Research Board of the Department of Marine and Fisheries, and the Department of the Interior, within which was located the Geological Survey and the Mines Branch, undertook scientific investigations in fields such as astronomy, marine biology, surveying, and geology. These fields were less hospitable to women and, when combined with the attitudes of the civil service toward the employment of women, served to restrict women's opportunities in the departments responsible for these fields. In the case of astronomy, for example, Otto Klotz, Dominion Astronomer recorded in his diary in 1905 that there were no women on staff because of the lack of bathroom facilities. See, J. H. Hodgson, *The*

Agriculture with the appointment of James Fletcher to the position of Honorary Entomologist. 1921 was marked by the formalization of discriminatory employment practices against women in the federal civil service, with the adoption of the 1921 Order in Council stating that they must retire upon marriage.[13]

This period also witnessed significant changes in the lives of Canadian women, including middle-class women who are the most present in this study.[14] This change was driven by social, economic, and political transformations in Canada. A period of dramatic demographic change, not only did Canada's population grow exponentially, largely through immigration, but also the ratio of urban to rural population shifted. As Canada transformed from an agricultural into an industrial nation, more people lived in urban settings than in rural ones. Within these urban settings, moreover, there were more women than there were men since the former found employment predominantly in the cities.

Although working-class women continued to work in industry, middle-class women required employment more suitable to their station. Initially, such employment could be found in teaching and nursing. As the service sector developed, however, new opportunities arose. Employers sought a new pool of potential employees to work in their department stores and newly mechanized offices. Simultaneously, it was increasingly believed that it was appropriate for a young woman to work before marriage and, as a

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Heavens Above and the Earth Beneath: A History of the Dominion Observatories, Part I to 1946, Ottawa: Energy Mines and Resources Canada, 1989, 25.

[13] P.C. 517, 12 March 1921.

[14] Of the women's fathers that I was able to locate in the City Directories of Ottawa, Calgary, and Winnipeg, the majority worked as managers, clerks, and salesmen. Three held professional positions as ministers and several others were farmers or ranchers.

result, a new cohort of young women were seeking paying jobs before settling down to their "natural" work as wives and mothers. These educated young women were willing to accept low wages; they filled jobs that quickly became defined as "women's own."

Not all women, however, were content to fill such positions. The Women's Movement helped to open the doors of Canadian universities to a small group of women in the last quarter of the nineteenth century. Highly educated and with aspirations to establish careers similar to those of their fathers and brothers, these "New" women sought to enter medicine, law, and other male-dominated areas. This included science, a field that was undergoing a process of professionalization in Canada in the late nineteenth and early twentieth centuries. Included also was the civil service, an organization that, through legislation and reorganization, was undergoing changes in its attempt to improve its image in the eyes of the Canadian public and to become a more attractive site of employment.

The First World War dominates the closing years of the period under study. As will be shown, the War did not generate significant changes in women's employment in the civil service, in general, and in science in the Department of Agriculture, in particular. While women outside of government entered non-traditional work to replace the men who had joined the Canadian Expeditionary Force (CEF), bringing in crops, working in munitions factories, and in many other previously all-male occupations, the civil service did not alter its employment policies toward women to any great degree. In fact, the First World War simply accelerated the process of bureaucratization that had already begun in the late nineteenth century.

Within the Department of Agriculture, the war played a limited role in altering opportunities for women in science. While new job opportunities for women did arise, the work quickly became defined as 'women's work', with the ensuing consequences with regards to salaries, promotion, and status. Although women employed in non-traditional areas outside of the civil service were expected to vacate their positions once the hostilities ceased, women working in the civil service and, more especially, in the Department of Agriculture, were largely exempt from this pressure because they had not undertaken non-traditional work during the war.

1.2 The Department of Agriculture, the Professionalization of Science, and Amateurs

In order to discuss the development of the federal Department of Agriculture, of the federal civil service, and of women's experiences in science within the Department, a wide body of historical and sociological literature was consulted. The federal Department of Agriculture has not been the subject of many historical analyses. Largely produced internally, existing studies are predominantly narratives that highlight key structural developments in the Department and its science branches. As such, these works list dates and recount the activities of influential male staff members.[15] The authors of these studies

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[15] See, for example, Publications Branch, Department of Agriculture, *The Department of Agriculture: Its History, Organization and Work*, Ottawa: Publications Branch, Department of Agriculture, 1933; Canada Department of Agriculture, *Canada Agriculture: The First One Hundred Years*, Historical Series No. 1, Ottawa: Canada Department of Agriculture, 1967; William J. Cody, Douglas B. O. Savile, and Michael J. Sarazin, *Systematics in Agriculture Canada at Ottawa, 1886-1986*, Historical Series No. 28, Ottawa: Biosystematics Research Centre Agriculture Canada, 1986. Biographies are also not plentiful. See, for example, Elsie Pomeroy, *William Saunders and His Five Sons*, Toronto: Ryerson, 1956; Ralph Estey, "James Fletcher (1852-1908) and the Genesis of

viewed science as a "manly profession."[16] Not expecting women to be employed in science in the Department of Agriculture and holding the belief that any activity undertaken by women could not be science, the majority have neither noticed them nor actively sought them out. A more recent study by T. H. Anstey, a staff member of the Research Branch of the Department of Agriculture, explores significant scientific achievements by Department of Agriculture staff, including several women. It also details the types of scientific work undertaken in the Department from 1886 to 1986. But the study considers only minimally the time period studied in this thesis and it does not analyze the impact of the professionalization and bureaucratization of science in shaping this scientific work.[17]

This thesis argues that the adoption of science in the federal Department of Agriculture and the methodological changes introduced in the nineteenth and early twentieth centuries were, in part, the product of the professionalization of science. In her doctoral thesis Cynthia Nelles O'Donnell argues that this professionalization "implies paid positions for full-time pursuit of scientific work within institutional structures rather than at the vagaries of patronage, as well as formal certification of professional competence through recognized educational institutions or licensing bodies."[18] The

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Plant Pathology in Canada," *Canadian Journal of Plant Pathology*, 5, 2(June 1983), 120-4. This list of institutional and individual biographies does not include the histories of the various branch and illustration farms, entomological laboratories, and other facilities of the Department of Agriculture, a large body of literature on its own but which shares the characteristics of the above-mentioned literature.

[16] Rossiter, *Women Scientists in America*, 74.

[17] T. H. Anstey, *One Hundred Harvests: Research Branch Agriculture Canada 1886-1986*, Historical Series No. 27, Ottawa: Research Branch Agriculture Canada, 1986.

[18] Cynthia Nelles O'Donnell, "Alberta Women in the Field: Geoscientists in the Resource Industry, Government Research, and Academia, 1914-1999," unpublished Ph.D. thesis,

creation of paid positions for full-time work in science is indeed significant in the professionalization of science. The founding of institutions that confer, acknowledge, and require professional competence is equally important. An examination of the source and development of these conditions allows us to understand the professionalization of science. As well, it leads to a more nuanced interpretation of the way the process evolved in the Department of Agriculture, and of its impact upon the role of women in science within it.

Most sociologists of the professionalization of science agree that a key factor was the adoption of an esoteric body of knowledge that was unavailable to the general public. Thus, Beer and Lewis discuss the importance of the maturation of scientific disciplines, which process involved the development and adoption of this esoteric body of knowledge.[19] Similarly, George Daniels considers the adoption of this esoteric body of knowledge to be the first step in the process.[20] Thomas Haskell also stresses the role of experts who differentiated themselves from those they considered incompetent.[21] Like O'Donnell, many sociologists also emphasize the importance of institutional structures, such as societies, universities, and government facilities. In science, however, these institutions did not

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University of Toronto, 2000, 26-7. Pnina G. Abir-Am and Dorinda Outram provide a similar definition. See, Abir-Am and Outram, "Introduction," in *Uneasy Careers and Intimate Lives: Women in Science, 1789-1979*, Pnina G. Abir-Am and Dorinda Outram, eds., New Brunswick and London: Rutgers University Press, 1989, 2.

[19] John J. Beer and W. David Lewis, "Aspects of the Professionalization of Science," in *The Professions in America*, Kenneth S. Lynn, ed., Boston: Houghton Mifflin Company, 1965, 110-130.

[20] George H. Daniels, "The Process of Professionalization in American Science: The Emergent Period, 1820-1860," *Isis*, 58(1967), 152.

[21] Thomas L. Haskell, *The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth Century Crisis of Authority*, Urbana: University of Illinois Press, 1977, 66.

initially provide large-scale paid employment. Instead, as Daniels notes, their function was to create "insiders" and "outsiders" and this carried over into those institutions that later provided paid employment.[22]

This notion of "insider" and "outsider" is fundamental to Haskell's discussion of professions and professionalization. Defining a profession as a community of experts who, regardless of divergent opinions, nonetheless identify each other as intellectual peers because of shared assumptions about the problems to be solved and the methodology and knowledge to employ. Haskell argues that this community of experts is created through boundary work. To identify members of the community, institutions are formed access to which denoted professional status. Haskell argues that in science, professionalization witnessed spectacular success.[23] Leading scientific figures early voiced the need to recognize a community of the competent, organized in an institutional framework that would function to discredit so-called charlatans and deny those practitioners they considered incompetent an authoritative place in the public eye.[24]

However, the new scientific elite did not sever all relations with those to whom they had denied access. Because there was a continuity of activity amongst "amateurs"[25]

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[22] Daniels, "The Process of Professionalization in American Science," 156-60.
[23] Haskell, *The Emergence of Professional Social Science*, 66.
[24] Haskell, 66-7. See also, Charles Rosenberg, "Science and American Social Thought," in *Science and Society in the United States*, David D. Van Tassel and Michael G. Hall, eds., Homewood, Illinois: The Dorsey Press, 1966, 154-6.
[25] Recognizing that the observational sciences were too little in demand, too new, or too underdeveloped to be pursued as livelihoods, historians and sociologists conclude that all practitioners were initially amateurs. Amateurs were simply people who, trained in some unrelated field, pursued science studies as an outlet for intellectual curiosity, or to express aesthetic and/or religious appreciation. The label did not imply a negative evaluation of their efforts. As we shall see, such negative evaluations developed as the relationship between amateurs and the new professionals, who began to dominate the scientific world

and, to use Nathan Reingold's typology, the more highly trained practitioners and researchers,[26] the boundary dividing these two groups was fluid; they enjoyed a fruitful relationship.[27] At this stage in the development of scientific disciplines, occurring at different times in different disciplines,[28] amateurs were regarded as valued scientific contributors.[29] In such fields as astronomy, botany, entomology, and ornithology amateurs participated as equals with professionals.[30] In fact, their amateur status sometimes granted them a freedom unavailable to the professionals.[31]

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in the late nineteenth century, broke down in the face of the growth of esoteric knowledge and the institutionalization of science. See, Robert A. Stebbins, *Amateurs, Professionals and Serious Leisure*, Montreal & Kingston: McGill-Queen's Press, 1992, 9.

[26] Reingold, "Definitions and Speculations: The Professionalization of Science in America in the Early Nineteenth Century," in *The Pursuit of Knowledge in the Early American Republic: American Scientific and Learned Societies from Colonial Times to the Civil War*, Alexandra Oleson and Sandborn C. Brown, eds., Baltimore and London: The Johns Hopkins University Press, 1976, 33-69.

[27] Barbara T. Gates, "Ordering Nature: Revisioning Victorian Science Culture," in *Victorian Science in Context*, Bernard Lightman, ed., Chicago: University of Chicago Press, 1997, 181.

[28] While different disciplines underwent professionalization at different times, the life sciences began to professionalize in the early nineteenth century, particularly in Germany. This scientific professionalism spread to Great Britain and the United States in the mid-nineteenth century and to Canada in the last third of the nineteenth century.

[29] Canadian historian Ann B. Shteir has studied the role of women in botanical 'family firms' in mid-eighteenth to mid-nineteenth century England. Discovering that the "(h)ome [was] the geographical locus for learning and for botanical activity," Shteir quips: "Scratch a male botanist in the early nineteenth century and one can expect to find (...) botanical relatives," both male and female. As illustrators and keepers of herbaria, women were crucial to the success of the botanical family firm. See, Shteir, "Botany in the Breakfast Room: Women and Early Nineteenth-Century British Plant Study," in *Uneasy Careers and Intimate Lives*, 36. See also, *Cultivating Women Cultivating Science: Flora's Daughters and Botany in England 1760-1860*, Baltimore and London: Johns Hopkins University Press, 1996.

[30] W. Kaye Lamb and Thomas W. M. Cameron, "Biologists and Biological Research Since 1864," *Pioneers of Canadian Science*, G. F. G. Stanley, ed., Toronto: University of Toronto Press, 1966, 37.

[31] Historian John Lankford discusses the case of astrophyiscs, where, because the amateur was not connected with professional research establishments, he (sic) was at liberty to

By the end of the nineteenth century, though, the professionalization and institutionalization of science restricted the acquisition by amateurs of sufficient intellectual or financial resources. As science professionalized within research institutions, amateurs found that they lacked the credentials to participate as equals. As well, they did not have sufficient capital to acquire the expensive instruments employed in institutional settings.[32] At this point the relationship between amateurs and professionals began to be redefined. Not entirely excluded, amateur involvement was restricted instead as professionals harnessed their efforts to satisfy professional research needs. Amateur researchers, professionals realized, if properly stimulated and guided, could gather large amounts of needed data without placing undue stress on the resources of the major research facilities.[33]

As the process of professionalization continued, problems arose between amateurs and professionals. An inevitable result of the greater intellectual resources of professionals when compared to amateurs was the inability of the two groups to communicate. Increasingly resentful of the esoteric nature of professional science, amateurs found that

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take up "any subject he please(d), pursuing it so long as he believe(d) in the possibility of success, without fear of responsibility of charges of wasted time and wasted means." Provided they had the requisite intellectual and financial resources, amateurs could pursue research projects on the frontiers of astronomy. See, Lankford, "Amateurs and Astrophysics: A Neglected Aspect in the Development of a Scientific Speciality," *Social Studies of Science*, 11, 3(August 1981), 277.

[32] Lankford, "Amateurs and Astrophysics," 289. See also, Lankford, "Amateurs versus Professionals: The Controversy over Telescope Size in Late Victorian Science," *Isis*, 72, 261(March 1981), 11-28.

[33] In the case of astronomy, for example, amateurs represented a cost-efficient way of doing science because they supplied professional astronomers with tremendous amounts of data at a tiny fraction of the cost of professional staff. See, Mark Rothenberg, "Organization and Control: Professionals and Amateurs in American Astronomy, 1899-1918," *Social Studies of Science*, 11, 3(August 1981), 316. Marianne Ainley presents a similar discussion of the role of the amateur but for the science of ornithology. See, Ainley, "The Contribution of the Amateur to North American Ornithology: A Historical Perspective," *The Living Bird*,

even their limited role in the prosecution of professional research projects had ceased to exist. The initial agreement between the two groups, rooted in shared attitudes about both the sciences performed and the ideas of a scientific life style, devolved into discord as their respective attitudes diverged.[34] Debates over scientific territory became increasingly bitter as professionals and amateurs fought to control qualifications, entrance into disciplines, and appropriate scientific practice. Anxious to protect and maintain their recently acquired status, the new professionals began to define themselves as both separate from, and superior to, "amateurs."[35]

In Canada, the federal Department of Agriculture witnessed this pattern of development. Its first science staff members were "amateurs" who transferred to paid employment in science. Sharing their attitudes about science and how to undertake it, Entomologist and Botanist James Fletcher, for example, depended upon the assistance of amateurs, both women and men. As science professionalized and amateurs ceased to be a valued source of assistance, trained and amateur women entered the paid labour force of the federal Department of Agriculture where they proceeded to undertake 'women's work' in science.

18(1979-80), 162, 174.

[34] Reingold, "Definitions and Speculations," 51.

[35] Stebbins, *Amateurs, Professionals, and Serious Leisure*, 10; Ainley, "The Contribution of the Amateur to North American Ornithology," 161. See also, Mary P. Winsor, *Reshaping the Science of Nature: Comparative Zoology and the Agassiz Museum*, Chicago and London: University of Chicago Press, 1991.

1.3 The Professionalization, Masculinization, and Bureaucratization of Science and the Creation of 'Women's Work' in Science

The professionalization of science was strongly gendered. Although sociologist Thomas Haskell identifies race, religion, and class as attributes that determine "insider" and "outsider" status, gender was particularly critical. Resorting to the neo-Weberian theory of occupational formation, sociologist Anne Witz, studying several health care professions, argues that the criteria that determine inclusion and exclusion are often based on gender: men are included in certain occupations because they are men while women are excluded from the same occupations because they are women. [36]

Professionalization was accompanied by masculinization. Masculinization does not mean women had no role to play in science. A more complex term, masculinization refers to the primacy enjoyed by men in the field. Women were still involved in science but their presence becomes increasingly difficult to detect because masculinization ensured that equally or more qualified women were refused membership to professional societies and denied professional appointments in universities and government. As historians Shteir and Rossiter demonstrate, women remained instead on the sidelines of science where they produced important work for little or no recognition.[37]

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[36] Anne Witz, *Professions and Patriarchy*, London and New York: Routledge, 1992. Although Witz discusses the role of gender in shaping the relations between different health care professionals, the concepts that she introduces are applicable to this thesis. Like the men who controlled the mechanisms of inclusion, exclusion, demarcation, and dual closure in medicine and radiography, that granted or denied access to these professions, we will see that male civil servants controlled similar mechanisms that served to restrict women's opportunities in the Canadian federal civil service.

[37] Rossiter, "A Manly Profession," Chapter four in *Women Scientists in America*, 73-99. Tracing the impact of professionalization, Shteir indicates that as the study and practice of botany moved from the private to the public sphere, it became increasingly difficult for

By tracing the development of the professionalization and masculinization of science, Margaret Rossiter depicts an important shift in the "culture and conduct of science." This shift is also examined in detail by Canadian historian Alison Prentice in her re-evaluation of both women's position in physics and of physics, itself. Rejecting the notion that women have not traditionally studied physics, Prentice investigates why it "came to be seen as "traditionally" not a women's subject." She concludes that the development of physics after the Second World War was pivotal. While women had been welcomed as students and assistants when the discipline was in its infancy in Canada, they were either pushed out or overwhelmed by the more numerous men as it became more attractive to the latter.[38] Women were subsequently marginalized, rendered invisible, and relegated to 'women's work' in most, if not all, scientific disciplines, including physics.[39]

The creation of 'women's work' in science was also the product of its bureaucratization, which itself stemmed, in part, from the professionalization of science.[40] According to Rossiter, bureaucratization refers to the "growth of 'big science' or large budgets, which could support staffs of assistants at a few research centres." The growth and restructuring of work processes inherent to these two conditions resulted in

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women to participate and for their contributions to be acknowledged in the newly constituted profession. See, Shteir, "Botany in the Breakfast Room," 41-3.

[38] Prentice, "The Early History of Women in University Physics," 95.

[39] See also, Rossiter who traces the masculinization of anthropology, botany, and other branches of natural history. Rossiter, "A Manly Profession," Chapter four in *Women Scientists in America*, 73-99. See also, Shteir, "Botany in the Breakfast Room," 41-3.

[40] Rossiter, "'Women's Work' in Science," Chapter three in *Women Scientists in America*, 51-72. See also, "'Women's Work' in Science, 1880-1910," *Isis*, 71(1980), 381-398.

the creation of low paying, undervalued, routine jobs that were unattractive to men.[41] Describing the bureaucratization of office tasks, historian Graham Lowe refers to another critical component of bureaucratization: tasks, as he explains, "became more fragmented, mechanized and routinized."[42] As we will see, in the Canadian federal Department of Agriculture the need for assistants fostered by the professionalization of science and its bureaucratization through the passage of legislation, established new forms of 'women's work' in science that were indeed fragmented and routinized, although not mechanized.

'Women's work' in science did not refer to any one particular task but rather to conditions of employment marked by hierarchical and territorial segregation; women worked in sex-segregated areas of science and were confined to the lowest occupational ranks of the institutions where they were employed.[43] Because women had the necessary knowledge and were actively seeking appropriate feminine employment, they gravitated to these new positions; positions found in universities, private institutions, and government.

Discussing the particular shape that 'women's work' took in the federal government in the United States, Rossiter examines the prevailing sex-segregation in the Bureau of Plant Industry of the United States Department of Agriculture (USDA). Hired despite the negative attitudes of the federal government towards the employment of women, several factors led to this practice. First, there were economic motives. Because women were barred from taking entry exams for the position of "junior botanist" or

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[41] Rossiter, *Women Scientists in America*, 53.
[42] Lowe, *Women in the Administrative Revolution: The Feminization of Clerical Work*, Toronto: University of Toronto Press, 1987, 2.
[43] Rossiter, *Women Scientists in America*, 51.

"junior plant pathologist" and had instead to take the exam for the lower position of "scientific assistant," their starting salaries were lower than those paid to men. Furthermore, since they could not be promoted to administrative positions and were not likely to leave for employment in universities or experiment stations, any training given to these women was not lost to the laboratory. Finally, Rossiter suggests a psychological matter. The male supervisors may have enjoyed their "harem" of competent female subordinates, who were less threatening than an equal number of bright young men.[44] This sex-segregation resulted in the creation of the category of 'women's work' in science.

As we shall see, the professionalization and bureaucratization of science that transpired in the Canadian federal Department of Agriculture in the years 1884 to 1921 also generated 'women's work' in science. We will observe these processes at work in the Seed Branch, the Botany Division, the Chemistry Division, and the Publications Branch of the Department.

1.4 The Canadian Federal Civil Service, a Masculine Organizational Culture

The development of 'women's work' in science was the product of the lateral segregation of women within disciplines and of their hierarchical segregation within institutions in which science was undertaken. The institution in question in this thesis is the Canadian federal civil service, which has been the subject of a number of historical analyses. The position of women has been considered to a greater or lesser degree in all of them. While in 1929, Robert MacGregor Dawson argues in *The Civil Service of Canada* that

[44] Ibid, 61-3.

women and men are suited to different forms of employment and that the "complete interchangeability of women for men in the public service will doubtless never be realized," more recent feminist analyses probe the reasons for such an opinion as well as its impact upon women's employment opportunities.[45] The most influential is Kathleen Archibald's *Sex and the Public Service*, first published in 1970, and, more especially, her rough draft and notes which have been deposited in the National Archives of Canada.[46] Although more recent works have been produced, the findings that they contain are drawn from the Archibald study.[47]

Studying the contemporary and historical experiences of women in the public service, Archibald discusses the structures and attitudes that ensured discrimination against

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[45] Dawson argues that such a situation was undesirable because of the different physical and mental abilities of men and women and because of the greater commitment of men to their work than women evinced. He concludes: "The difficulty seems inherent in the woman question, and can be met in only one way: by excluding women, except in exceptional circumstances, from many of the highest posts and those from which the highest posts are filled." See, Robert MacGregor Dawson, *The Civil Service of Canada*, London: Oxford University Press, 1929, 193-4. In 1968, Stanislaw Judek presented arguments similar to those of Dawson. While recognizing the role of prejudice in shaping women's work experiences in the federal civil service, Judek suggested that this situation "may also be due to the women themselves, with their somewhat lower career expectations or aspirations compared to those of men. The latter is a mere recognition of what has been the reality of women's situation." See, Judek, *Women in the Public Service*, Ottawa: Roger Duhamel, 1968, 34.

[46] Archibald, *Sex and the Public Service*, Ottawa: Information Canada, 1973. See also, National Archives of Canada (NAC), RG 32, v. 854, "Sex and the Public Service," the Archibald Report, 1965-1972.

[47] See, for example, J. E. Hodgetts, William McCloskey, Reginald Whitaker, and V. Seymour Wilson, *The Biography of an Institution: The Civil Service Commission of Canada, 1908-1967*, Montreal and London: McGill-Queen's University Press, 1972; Lowe, *Women in the Administrative Revolution*, 71-4; Carolle Simard, *L'administration contre les femmes: la reproduction des différences sexuelles dans la fonction publique canadienne*, Montreal: Boréal Express, 1983; Nicole Morgan, *The Equality Game: Women in the Federal Public Service (1908-1987)*, Ottawa: Canadian Advisory Council on the Status of Women, 1988.

women. Characterizing their position as "Womanpower in a Manpower system," Archibald found that women were employed in an institution that was uncomfortable with their presence. Indeed, referring specifically to the Civil Service Commission, she states that its objectives were to restrict the numbers of women in the civil service and the opportunities of those women who had been employed.[48] The structure of the "Manpower system" served to constrain women's opportunities. They experienced occupational segregation and foreshortened careers ladders in 'female' fields. As well, the overall organization of work around the concept of continuous full-time employee was detrimental to women's opportunities.

While Archibald employs the term "Manpower System," we prefer the concept of "masculine organizational culture."[49] This culture is one that supports the male work-role model according to which men work throughout their lives and, by so doing, gain personal satisfaction and earn sufficiently high salaries to support dependents. A masculine organizational culture is constructed. It is the product of jobs that are organized into hierarchies, jobs that are designed with a man in mind. When women enter an organization dominated by a masculine organizational culture, they are confronted by gender exclusion. The result is the segregation of employees by sex, that is, a sexual division of labour.

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[48] In a much quoted passage, Archibald states: "The Commission perceived its problem not as one of keeping women down – that was taken for granted – but as one of keeping down the *number* of women in the civil service." See, Archibald, *Sex and the Public Service*, 14.

[49] See, E. D. Nelson and Barrie W. Robinson, *Gender in Canada*, Scarborough: Prentice Hall Allyn and Bacon, 1999; Rosemary Crompton, "Gender, Status and Professionalism," *Sociology*, 21, 3(August 1987), 413-28; Joan Acker, "Hierarchies, Jobs, Bodies: A Theory of Gendered Organizations," *Gender and Society*, 4, 2(June 1990), 139-58.

Long an obvious feature of the labour market, sociologists tracing the development of theorizing about the sexual division of labour have noted that it was initially explained as the logical result of the inborn, distinct attributes and abilities of men and women. Not considered problematic, the division, as neoclassical economists theorized it, was simply the result of the rational choices of equally positioned men and women in the labour market.[50] Discounting the idea that the division was "natural," cultural theorists argued in the 1970s and 1980s that women's position in the labour market was determined by their position in the family and by their socialization.[51] As such, responsible for the care of sick family members and the teaching of children in the family, upon entering the labour market women became nurses and elementary school teachers.[52] As feminist sociologists and historians have since determined, both explanations are too simplistic. Instead, we argue with them, that the root of the sexual division of labour in both the labour market and the family is found mainly in the differential access to, and exercise of, power by men and women.

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[50] See, for example, Samuel Cohn, *The Process of Occupational Sex-Typing: The Feminization of Clerical Labour in Great Britain*, Philadelphia: Temple University Press, 1985, 5-7; Harriet Bradley, *Men's Work, Women's Work: A Sociological History of the Sexual Division of Labour in Employment*, Cambridge: Polity Press, 1989, 23; Pat Armstrong and Hugh Armstrong, *Theorizing Women's Work*, Toronto: Garamond Press, 1990, 58.

[51] See, for example, Esther Greenglass, "The Psychology of Women; Or, the High Cost of Achievement," in *Women in Canada*, Marylee Stephenson, ed., Toronto: New Press, 1973; *A World of Difference: Gender Roles in Perspective*, Toronto: John Wiley and Sons, 1982. In their analysis of cultural theories of the sexual division of labour, Armstrong and Armstrong state that the argument was used in the 1970 Report of the Royal Commission on the Status of Women. See, *Theorizing Women's Work*, 38.

[52] See, for example, Cohn, *The Process of Occupational Sex-Typing*, 13; Bradley, *Men's Work, Women's Work*, 25.

Marxist labour process theory provides the analytical tools to understand these power relations, particularly in its discussions of the social construction of inequality.[53] Harry Braverman's formulation of this theory explains how employers altered labour processes to deskill workers so that they could gain control of these processes and reduce the number of paid employees. However, developed to explain the way in which power relations between men of different classes structured the labour market, the theory did not initially include the concept of gender. When Braverman discussed the position of female workers, his arguments were unconvincing. In a case study of women in clerical work, he argued that because the work was mechanized, routinized, subjected to outside control, and poorly paid, women were employed.[54] Similar processes occurred in other occupations, however, without leading to the employment of women.

In their analyses of the labour process, feminists begin by noting that it is inherently gendered because jobs themselves are gendered.[55] Gender ideologies influence all jobs at the design stage to make them appropriate for either men or women, but never for both. Moreover, in the post-design stage the manipulation of job content can serve to either masculinize or feminize these jobs. In this manipulation, feminists see the exercise of agency by male employees, an idea that was introduced by non-feminist critics of

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[53] Lourdes Beneria, "Gender and the Dynamics of Subcontracting in Mexico City, " in *Gender and the Workplace*, Clair Brown and Joseph A. Penchman, eds., Washington: The Brookings Institute, 1987, 163.

[54] Harry Braverman, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*, New York and London: Monthly Review Press, 1974.

[55] See, for example, Valerie Kincade Oppenheimer, "The Sex-Labelling of Jobs," *Industrial Relations*, 7, 3(May 1968), 219-34; Oswald Hall, "Gender and the Division of Labour," in *Report of a Round-Table Conference on the Implications of Traditional Divisions Between Men's Work and Women's Work in our Society*, March 12, 1964, 26-32; Bradley, 68; Acker, "Hierarchies, Jobs, Bodies," 139-158.

Braverman's labour process theory.[56] While these critics faulted Braverman for ignoring employee agency in resisting the process of deskilling, feminists highlight the fact that their agency was often directed to the restriction of women's opportunities. Furthermore, in these efforts to restrict women to 'women's work', solidarity was often achieved between male employers and their male employees. Although employers sometimes wanted to hire women for reasons of economy, their interest in maintaining the patriarchal social order largely prompted them to acquiesce to the demands of their male employees to restrict women to segregated, unskilled work.[57]

In designing jobs and manipulating their content to make them either masculine or feminine, employers and employees defined "skill," a concept fundamental to labour process theory and to the way in which women experienced the labour process. Initially treated as an "objective, agreed upon category," skill and women's supposed lack of it has served to explain women's position in the labour market.[58] Reconceptualizing the concept of skill, feminist sociologists, beginning with Anne Philips and Barbara Taylor, argued that judgements about skill are not value free.[59] Instead, the category skill is "a

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[56] See, for example, D. M. Gordon, "Capitalist efficiency and Socialist Efficiency," *Monthly Review*, 28(1976), 24; and Roger Penn, "Skilled Manual Workers in the Labour Process, 1856-1964," in *The Degradation of Work? Skill, Deskilling and the Labour Process*, Stephen Wood, ed., London: Hutchinson Press, 1983, 107.

[57] Judy Wajcman, "Patriarchy, Technology, and Conceptions of Skill," *Work and Occupations*, 18, 1(February 1991), 38.

[58] Armstrong and Armstrong, 89.

[59] Anne Philips and Barbara Taylor, "Sex and Skill: Notes Towards a Feminist Economics," *Feminist Review*, 6(1980), 79-88. See also, Ronnie J. Steinberg, "Social Construction of Skill: Gender, Power and Comparable Worth," *Work and Occupations*, 17, 4(November 1990), 476; Jane Gaskell, "What Counts as Skill? Reflections on Pay Equity," in *Just Wages: A Feminist Reassessment of Pay Equity*, Judy Fudge and Patricia McDermott, eds., Toronto: University of Toronto Press, 1991, 142.

socially constructed one determined by power relations."[60] Women are often refused the label "skilled" simply because they are women. Equally problematic, when stereotypically feminine characteristics such as docility, patience, and an affinity for detailed and routine work have been translated into skills, they have generally fostered discriminatory practices against women.[61] Indeed, they have generated the category of 'women's work'.

Labour process theory helps us to understand the position of women in the federal civil service and, by extension, in science in the Department of Agriculture. It highlights the fact that male power dictated the extent of women's access to work in science and the nature of the rewards that they would receive in exchange for performing it. Determining that women, as women, only held certain "feminine" skills, men restricted them to certain types of work in science, and to the lowest ranks in the civil service.

1.5 Discovering Women in Science in the Canadia Federal Department of Agriculture

This thesis is based on a variety of primary sources, of which the pivotal ones are, of course, the records of the Department of Agriculture. To flesh out the story, however, other collections of primary source material were also consulted, including the records of the Civil Service Commission (RG 32), Privy Council Records (RG 2), the Traill Family Papers (MG 29 D81), and the Records of the Chemical Institute of Canada (MG 28

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[60] Armstrong and Armstrong, 89.
[61] Gail Fawcett, "Gender, Skill and Earnings Inequality," unpublished Ph.D. thesis, Carleton University, 1994, 11-20.

[294).[62] Finally, a number of significant published sources also played a crucial role in constructing the argument of this thesis. Together, these sources helped to establish the presence and to explain the experiences of women in science in the Department of Agriculture.

To use the records of the Department of Agriculture to reconstruct partly the history of Canadian women's employment in science generated many challenges. The collected information was concealed within volumes of papers discussing innumerable other subjects. Another challenge is the way by which the Department generated its records. These are divided into two broad chronological periods, namely, the period from 1852 to 1920 and that from 1900 onward.[63] Within the first chronological period, the material is organized according to the major responsibilities assigned to the Department after 1867: Arts and Agriculture, Immigration, Census and Statistics, and Quarantine and Public Health. In addition, this section included the records of the Minister, the Deputy Minister, and the Secretary of the Department as well as the records of the Office of the Food Controller. Our search for women in science led us to the records of the Arts and Agriculture Branch and those of the Minister, Deputy Minister, and Secretary of the Department.

Much of this material consists of letters that had been organized according to the docket and letterbook system. In this system, incoming mail was entered chronologically into a register and outgoing mail was entered in a similar manner in a letterbook. Both

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[62] These records are held at the National Archives of Canada (NAC) and the references indicate NAC organization of the material.

[63] A third period, from 1959 to 1974 and corresponding to the establishment of Agriculture Canada is beyond the time frame of this thesis and, thus, is not considered.

were indexed nominally. For the historian searching for women in general rather than for particular individuals, the sole option is to leaf through the appropriate letterbooks. Moreover, because women did not always write their own letters and because male authors sometimes discussed women, the nominal indexes are not entirely reliable. To be sure that no women were missed, every letter within the applicable time period was reviewed in the letterbooks produced by the Deputy Minister, the Secretary, the Dominion Chemist, the Dominion Entomologist and Botanist, and the Commissioner of the Agricultural Institute and Chief of the Publications Branch.

The information concealed in the letterbooks, however, made it well worth this effort. Indeed, such significant information was discovered in the letterbooks of the Dominion Entomologist and Botanist that it led to a change in the time frame of the thesis. Initially envisioning a study of the years 1900 to 1920, preliminary research in the letterbooks of James Fletcher, spanning the years 1884 to 1908, revealed the presence of a coterie of unpaid women scientific contributors, which led us to push the opening date back to 1884.

The records of the Department of Agriculture for the post 1900 period are organized according to the departmental reorganization instituted after 1918, when the various non-agricultural-related responsibilities of the Department were removed. As a result, the records of the Production and Marketing Branch, the Economics Branch, the Personnel Administration Branch, the Food Production and Inspection Branch, the Research Branch, and the records of the Minister and Deputy Minister are organized separately. The parameters of the thesis dictated that the Research Branch would be the central focus of research because this was the Branch in which the science activities of

the Department were centralized. After 1893, the Department of Agriculture, while still using the docket and letterbook system described above, also organized material according to subject. However, because the material was organized according to subjects defined by the Department of Agriculture, the process of retrieving women and their experiences was equally laborious but also equally fruitful.

However, RG 17 provides nonetheless an incomplete picture of important aspects of women's experiences as federal civil servants. The search for material that would further contextualize the employment experiences of women in science in the Department of Agriculture necessitated a search in the records of the Civil Service Commission (RG 32). Unfortunately, RG 32 proved to be a disappointment because the personnel records of low-ranking civil servants have not been preserved. Since only the files of high-ranking or famous civil servants remain, those pertaining to women constitute a minute fraction of the records preserved. As well, a large portion of the material records the institutional history of the Commission rather than its direct dealings with civil servants and the fashioning of civil service employment policy.

To gain insight into those factors that determined women's experiences as civil servants, two other sources were consulted: the Annual Reports of the Civil Service Commission and the reports and transcripts of the Royal Commissions established to investigate the operation of the civil service in 1882, 1892, and 1907. The Civil Service Commission Annual Reports record both the attitudes of the Commissioners and the names of the people who wrote civil service exams and who were appointed to different positions in the service. The reports and transcripts of the Royal Commissions clearly reveal those views and opinions of the male Ministers and Department Heads of the

federal government that dictated the nature of women's experiences as employees of the federal government both during the years when women were first introduced into the civil service and those when their numbers grew.

RG 17 records the attitudes and voices of men. To discover the voice of women, we consulted the Traill Family Papers (MG 29 D81). Although initially disappointed to discover that Catharine Parr Traill, with whom Dominion Entomologist and Botanist James Fletcher had a healthy correspondence, saved the letters that she received rather than those that she sent, we soon found important letters; letters that do not appear in his letterbooks. They not only increase the importance of their correspondence, but also add further to our understanding of the views of James Fletcher, which shaped his choice of scientific methodology.

Our continuing quest for women's voice led to *The Civilian*, a source used extensively by *Slaves of the Lamp* author, Bill Doherty.[64] This journal of the Civil Service Association of Ottawa records the views of the average male civil servant. However, from its first appearance in 1908 and increasingly so in the 1910s, the journal also records the views of women, first in letters and then in a woman's column produced by women starting in 1913. In this source, one of the major concerns of male civil servants, the employment of women, was aired. As well, the major pieces of legislation dictating the rules and regulations of civil service employment passed by the federal government were discussed. Women increasingly contributed to these discussions and provided their own opinions about the factors that shaped their employment experiences.

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[64] Doherty, *Slaves of the Lamp: A History of the Federal Civil Service Organizations, 1865-1924*, Victoria: Orca Book Publishing, 1991.

While no women employed by the Department of Agriculture were active contributors to the magazine, it can nonetheless be assumed that its woman's column represented the opinion of a large number of female employees.

Both personal information and career histories of the women themselves are difficult to locate in RG 17. To fill the lacunae, we reviewed a number of other sources beginning with the finding aid of the Privy Council records. Its alphabetically organized index facilitated the search for dates of first appointment and resignation as well as other practical information such as the granting of incremental salary increases, and sick and vacation leaves. The annual Civil Service Lists also helped to establish the work histories of women in science in the Department of Agriculture. In addition to listing job title, classification, salary, and date of first permanent appointment, the Civil Service lists also provided information such as date of birth. This limited biographical history was, in most cases, the only such material available.

Research in the Ottawa, Calgary, and Winnipeg City Directories uncovered only some of the women employed in technical and scientific work. As well, because many were boarders, the entries do not always provide details about family background. In other instances, as in the example of Annie Louise Shaw, family names were so common that without knowing the name of the father, it was impossible to isolate the family. Despite these difficulties, however, it has been possible to reach some tentative conclusions about the women studied in this thesis. The entries suggest that the women employed in the technical work of seed analysis were largely from lower-middle and

middle class families.[65] Among the occupations held by the fathers of these women were labourer, driver, warehouseman, farmer, government and business clerk, commercial traveller, carpenter, and insurance and real estate agent. The majority of the siblings of these women were employed as clerks although there were also teachers, stenographers, salespeople, as well as one telephone operator. We suggest that, with their siblings, the women employed in technical work demonstrate a slightly upwardly mobile movement in their class position. Among the women employed in scientific work, only the family of Faith Fyles was located. A professional gentleman, her father was an Anglican minister. In a separate effort to uncover biographical and career information about the two women chemists, we examined the records of the Chemical Institute of Canada (MG 28 I294). However, although the Institute did admit women, neither Stella Hamilton nor Bertha Hedley sought membership.

Despite these set backs, we have nonetheless been able to isolate a significant group of women who worked in science in the Department of Agriculture; these women have not yet been the subject of historical analysis. Indeed, except for Faith Fyles, first woman Assistant Botanist in the Department, the existence of these women has not been acknowledged nor have their experiences been studied.[66] Yet their numbers are considerable. Forty-five women acted as observers, collectors, and correspondents of James Fletcher. A significant group of women were employed in technical work in seed

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[65] There are exceptions. For example, Alice Winifred Anderson, a seed analyst, was the daughter of a minister.

[66] Both Marianne Ainley and Margaret Gillett note that Faith Fyles was the first woman appointed to the position of Assistant Botanist in the Department of Agriculture. See, Ainley, "Last in the Field?," 41; Gillett, "Carrie Derrick (1862-1941) and the Chair of Botany at McGill," in *Despite the Odds*, 86.

analysis: 53 in the Ottawa Seed Laboratory, 56 in the Calgary Seed Laboratory, and 18 in the Winnipeg Seed Laboratory. Finally, an additional five women were employed in scientific work: two as botanists, two as chemists, and one as a librarian.

After this introduction, the thesis is divided chronologically and thematically into five chapters. Discussing the manner in which the professionalization and bureaucratization of science occurred in the Department of Agriculture, chapter two will consider how the processes dictated the type of scientific problems that the departmental heads considered important to study. Continuing with an examination of the experiences of the first generation of women who undertook unpaid work in science in the department, chapter three will trace the important role they played as correspondents, observers, and collectors of botanical and entomological specimens. By furthering the scientific objectives of James Fletcher, Dominion Entomologist and Botanist, these women, predominantly "amateurs," helped him reach the goals set up by the Department of Agriculture. By 1902, women began to find paid employment in science in the federal Department of Agriculture. Because this paid work transformed women into civil servants, the thesis must investigate the rules and regulations of the civil service that shaped women's employment experiences. The chronological organization of the thesis suggests that chapter four explore the attitudes about, and expectations of, women and their paid employment held by their civil service employers. As well, it will discuss the strategies employed by these women to promote their own opportunities within the service. Chapter five will trace the development of a new type of women's work in science in the Department of Agriculture from 1902 to 1920: seed analysis. An examination of the gendered processes of lateral and hierarchical segregation will

demonstrate the way in which a new form of 'women's work' in science in the Department of Agriculture was created. The sixth chapter will consider the experiences of a group of women who, in contrast to the seed analysts, were potentially disruptive of the professionalization and masculinization of science in the Department of Agriculture. It discusses how, by manipulating rank, title, salary, and job description, both the Canadian Department of Agriculture and the Canadian federal civil service were able to contain the aspirations of these women.

Chapter 2

Science in the Canadian Federal Department of Agriculture, 1884 to 1921: Creating Spaces for Women

2.1 Incorporating Science into the Canadian Federal Department of Agriculture

Established on May 1st, 1868, the Canadian federal Department of Agriculture did not initially undertake scientific work but instead was responsible for immigration and colonization, those aspects of agriculture that had an impact upon trade and commerce. Indeed, a science mandate was considered unnecessary because those scientific activities that promoted immigration and colonization, namely the collection, description, cataloguing, and displaying of the floral, faunal, mineral, and agricultural wealth of Canada, were already undertaken by the Geological Survey.[1] Moreover, since, according to the *British North America Act, 1867*, education was a provincial responsibility, the Federal Department of Agriculture could not undertake agricultural education.

However, agricultural crises in the 1870s and 1880s that directly threatened both immigration and colonization spurred the federal government to reconsider its role. To respond to the encroachment of epizootic diseases and the growing problem of insect pests, plant

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[1] Botanist John Macoun was responsible for this work upon his appointment in 1882. For a detailed discussion of Macoun, the Geological Survey, and his role in promoting agricultural opportunities in the West, see W. A. Waiser, *The Field Naturalist: John Macoun, the Geological Survey, and Natural Science*, Toronto: University of Toronto Press, 1989.

diseases, and soil exhaustion, problems that plagued farmers in eastern and western Canada, politicians and farmers supported the assignment of a science mandate to the federal Department of Agriculture.[2] From the first stages of the inclusion of science among the responsibilities of the Department of Agriculture, women found opportunities to become involved. The nature of this involvement did not remain constant, however. Rather, it changed as the Department and its scientific responsibilities evolved. In accordance with the professionalization and the bureaucratization of science and with the reform and bureaucratization of the federal civil service, women were welcomed first as amateur, unpaid assistants; they were then were gradually appointed to several types of paid employment, both technical and scientific.

While the chapters that follow will consider the precise contours of women's experiences in science in the federal Department of Agriculture, the purpose of this chapter is to chart the larger stages of the development of science in the Department in order to highlight their particular significance for women's participation. The chapter will begin with a discussion of the type of science that was first introduced in 1884. It will determine why observation and extrapolation from one situation to another, a method that stemmed from the natural history tradition, was chosen. What impact did this methodological choice have upon women's

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[2] Ministers of Agriculture had, from 1871, been stressing that agricultural issues were of the greatest importance to Canada. For example, Conservative J. H. Pope (1871-1873, 1878-1885) felt that it was the responsibility of the Department of Agriculture to increase agricultural production and arrest rates of rural depopulation. Similarly, Liberal L. Letellier (1873-1876) advocated agricultural instruction through Agronomic Institutes and the periodical publication of studies and researches undertaken by specialists. See, Canada. "Report of the Minister of Agriculture of the Dominion of Canada for the Calendar Year 1871." *Sessional Papers*, 1872, no. 2a; Canada. "Report of the Minister of Agriculture of the Dominion of Canada for the Calendar Year 1873." *Sessional Papers*, 1874, no. 26.

involvement? Considering next the nature of the changes that began to occur in 1899 with the appointment of G. H. Clark as assistant to Agriculturist James Robertson, the chapter will explore the accommodation between "professional" and "amateur" science spurred by his appointment. How did this accommodation create spaces for women? The professionalization and bureaucratization of science in the Department of Agriculture continued apace in 1908. That year, upon the death of Dominion Entomologist and Botanist James Fletcher, two university-educated men, one armed with a doctorate as the new badge of the truly "professional" scientist, were appointed to replace him. The chapter will investigate their appointment and the methodology that they favoured. It will also explore other forces that promoted the bureaucratization of science in the Department, including its formalized international responsibilities within the International Agricultural Institute as well as the outbreak of the First World War. Again, how did these events create new opportunities for women? Through this analysis, the chapter will show that the professionalization and bureaucratization of science played a crucial role in creating spaces for women in science in the federal Department of Agriculture.

2.2 James Fletcher and Natural History in the Canadian Federal Department of Agriculture, 1884 to 1908

When a science mandate was first assigned to the Department of Agriculture in 1884, the latter had to satisfy the interests of politicians and, more particularly, of the farmers that they represented. Confident of their own abilities but lacking in time, these farmers were of the opinion that the science staff of the Department should simply undertake the experiments that

time constraints did permit them to perform.[3] Also, they had total faith in the productive potential of Canadian soil. Farmers, and more particularly, the politicians whom they represented valued science to the extent that it furthered the economic growth of Canada.[4] By solving existing and anticipating future problems, scientists would provide the information that would allow the farmers to achieve this objective. Mistrusting pure or theoretical science,[5] farmers expected them to do this "by applying principles learned through observation and extrapolation from one set of circumstances to another set elsewhere."[6] The farmers advocated economic botany and entomology, two applied sciences that had emerged from the natural history tradition.

Undertaken in response to the perceived neglect of Canadian interests by the English and American naturalists for whom Canadian naturalists had collected extensively,[7] economic

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[3] Charles Rosenberg, *No Other Gods: On Science and American Social Thought*, Baltimore and London: The Johns Hopkins University Press, 1976, 154.

[4] Waiser, *The Field Naturalist*, 55; Trevor Levere, "What is Canadian About Science in Canadian History," in *Science, Technology and Canadian History*, R. A. Jarrell and N. R. Ball, eds., First Conference on the Study of the History of Canadian Science and Technology, Kingston, Ontario, Waterloo: Wilfrid Laurier University, Press, 1978, 20.

[5] This was one of the reasons why the government did not accept the Royal Society as its scientific adviser, the self-appointed role of the Society. See, Jarrell, "The Social Functions of the Scientific Society in Nineteenth-Century Canada," in *Critical Issues in the History of Canadian Science, Technology and Medicine*, Second Conference on the History of Canadian Science, Technology and Medicine, Kingston, Ontario, 1981, Jarrell and Arnold E. Roos, eds., Thornhill & Ottawa: HSTC Publications, 1981, 31-44; Vittorio M. G. de Vecchi, "Science and Scientists in Government, 1878-1896—Part I," *Scientia canadensis*, v. 8, 2(December 1984), 112.

[6] Patricia Bowley, "Ontario Agriculture in the 1910s: The Move Toward Regional Specialization in Crop Production," *Scientia canadensis*, 20, 49(1996), 101.

[7] A number of historians discuss the relationship between the collectors on the periphery and those for whom they collected in the metropolitan centres. See, for example, Suzanne Zeller, *Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation*, Toronto: University of Toronto Press, 1987, 183-268; Thomas R. Dunlap, *Nature and the English Diaspora: Environment and History in the United States, Canada, Australia, and*

botanists and entomologists focused their attention on acquiring a greater and more practical knowledge of the flora and fauna of Canada,[8] particularly those species of agricultural importance.[9] While economic botany incorporated aspects of scientific botany, including the study of the structure, physiology, geography, and systematic nomenclature of plants, it also required knowledge of appropriate cultivation methods. Further, it involved the importation and testing of foreign and native plants in different regions of the country to assist in the introduction of new crop varieties. Dependent upon the exchange of plants and ideas, economic botany, like scientific botany, also necessitated considerable correspondence.[10] While economic botany would eventually encompass plant pathology, this subject was initially included with economic entomology since it was so difficult to differentiate between damage inflicted by insects and that caused by disease.[11]

New Zealand, Cambridge: Cambridge University Press, 1999, 32; Sally Gregory Kohlstedt, "In from the Periphery: American Women in Science, 1830-1880," in *History of Women in the United States, Professional and White-Collar Employment*, Part I, Nancy F. Cott, ed., Munich: K. G. Saur, 1993, 17-32.

[8] Donald Fleming, "Science in Australia, Canada, and the United States: Some Comparative Remarks," *Actes du Dixième Congrès International d'Histoire des Sciences*, Paris: Herman, 1962, 183. Suzanne Zeller notes that the practical focus of natural history studies, while the most dominant, was not the only one. Not only agricultural arguments were presented for a botanical survey, but also intellectual and botanical ones. The intellectual argument advocated the inventory as preparation for increased immigration. The botanical argument presented the involvement of Canadians in the advancement of botanical knowledge in Europe and the United States as justification for more botanical activity in Canada. See, Zeller, *Inventing Canada*, 193-7, 206.

[9] Zeller, chapters 10 to 12, 183-239; See also Margaret Rossiter, "The Organization of Agricultural Improvement in the United States, 1785-1865," in *The Pursuit of Knowledge in the Early American Republic: American Scientific and Learned Societies from Colonial Times to the Civil War*, Alexandra Oleson and Sandborn C. Brown, eds., Baltimore & London: The Johns Hopkins University Press, 1976, 280.

[10] J. T. H. Connor, "To Promote the Cause of Science: George Lawson and the Botanical Society of Canada, 1860-1863," *HSTC Bulletin*, 10, 1(Spring/Summer 1986), 7.

[11] Ralph Estey, "Entomologists and the Genesis of Plant Pathology in Canada," in *Essays on*

Crop losses caused by the ravages of devastating insect infestations hastened the creation of the applied science of economic entomology.[12] Entomologists' response to insect pests was conditioned by their views about the economy of nature. While believing that man was at the pinnacle of God's creation and that all else had been placed on earth for his use, economic entomologists also accepted that, because of man's activities, the economy of nature could only be maintained with their active intervention.[13] Basing their activities on the concept of the "balance of nature," entomologists believed that insects in a state of nature were regulated by natural checks. However, because large-scale agriculture upset this natural balance, the penalty for this interference was increasing loss due to destructive insects.

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the Early History of Plant Pathology and Mycology in Canada, Montreal & Kingston: McGill-Queen's Press, 1994, 6-20. As well, plant pathology, a discipline that emerged from physiology, was not introduced until the methodology of laboratory-based biology superseded that of natural history. See, Richard A. Overfield, "Charles E. Bessey: The Impact of the 'New' Botany on American Agriculture, 1880-1910", *Technology and Culture*, 16, 2(April 1975), 170-2.

[12] J. T. H. Connor, "Of Butterfly Nets and Beetle Bottles: The Entomological Society of Canada, 1863-1960," *HSTC Bulletin*, no. 22, vi, 3(September 1982), 154; Robert Glen, "Entomology in Canada up to 1956, A Review of Developments and Accomplishments," *Canadian Entomologist*, 88, 7(July 1956), 291; Glenn B. Wiggins, *Centennial of Entomology in Canada, 1863-1963: A Tribute to Edmund H. Walker*, Toronto: University of Toronto Press, 1966, 4. The involvement of entomologists in economic entomology was officially encouraged. The Entomological Society of Canada became the Entomological Society of Ontario after it accepted the conditions attached to a $400 grant from the Ontario government. In exchange for these funds, the members of the Society investigated and published their findings about economic entomology, information about insects that were both injurious and beneficial to agriculture. See, Connor, "Of Butterflies and Beetle Bottles." Resulting from such support and from the necessity imposed by farming practices of Canada and the United States, economic entomology emerged as primarily a North American occupation. Although Europeans also studied it, North Americans dominated the field in terms of numbers of people employed, the number of publications, and the range of investigations and successful applications. See, W. Connor Sorensen, "The Rise of Government Sponsored Applied Entomology, 1840-1870," *Agricultural History*, 62, 2(Spring 1988), 98.

[13] Donald Worster, *Nature's Economy: A History of Ecological Ideas*, Cambridge: Cambridge University Press, 1977, 141-2.

Economic entomologists simply had to reinstate the necessary equilibrium.[14] Knowledge of insect morphology, life cycles, and geographical distribution permitted economic entomologists to determine the most effective control mechanisms, whether chemical, biological, or those based on cultivation methods, to reinstate the equilibrium.[15]

One of the most eminent and well-known practitioners of economic botany and entomology in Canada in the late nineteenth century was James Fletcher. Born in 1852 in Ashe, Kent, England, Fletcher was a self-taught amateur naturalist. Upon his emigration to Canada in 1874, in the employ of the Bank of British North America, he transplanted his interests to the Canadian environment.[16] Having begun his studies of insects out of scientific curiosity, Fletcher's membership and active participation in the Entomological Society of Ontario, led him to concern himself with those species of plants and insects of agricultural importance.[17]

His proficiency widely recognized, Fletcher found ample opportunity to share his growing knowledge with those who sought his expertise. While employed as an accountant with the Library of Parliament, he offered, on a purely voluntary basis, advice to Ministers of Parliament about the best methods for combating the insect pests that plagued the farms of their constituents. This function was made official with his appointment as Honorary

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[14] Sorensen, "The Rise of Government Sponsored Applied Entomology, 1840-1870," 105. See also, Worster, *Nature's Economy*, 262-9.
[15] Sorensen, 102.
[16] Writing about Victorian naturalists, historian David Elliston Allen notes that many were bankers: "There was something about the counting house mentality, with its punctilious sense of order and its skill in executing business with complete correctness and despatch, that made it well suited to the ceaseless roster of minor, yet demanding and sometimes backbreaking tasks in the intellectual housekeeping that forms so large a part of natural history." See, Allen, *The Naturalist in Britain: A Social History*, Princeton: Princeton University Press, 1994, 71.
[17] Canada. "Report of the Gigault Committee." *Appendices to the Journals of the House of Commons*, 1884, no. 6, 152-3.

Entomologist in 1884.[18] On July 1st, 1887, he achieved the paid position of Entomologist and Botanist of the Experimental Farms System.

Fletcher's was a fortuitous appointment because he was closely attuned to the attitudes and interests of the farming community. In 1886, he voiced approval at his own unpaid status: "At the beginning, at any rate, this kind of work should be carried on by a specialist—one who takes up, and labours at it, for its own sake, without thought of any reward, further than that the results arrived at may be of benefit to the world." Because he was unpaid, farmers, agriculturists, and orchardists throughout the country had "gone to considerable trouble to assist [him] in [his] studies, which might not have been the case, to such a large extent, had [his] been a remunerative political appointment."[19] Moreover, he decried the fact that "(i)n all sciences there is a great deal too much theory." Fletcher maintained that what was required were practical results. Describing his own work in economic entomology, he averred that "(e)ver since I have concerned myself with the study of Injurious Insects I have always kept before my eyes a short motto, which is also a warning, and according as I can follow out its admonitions, by so much, I believe, will the work I have undertaken be successful. That motto

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[18] The Gigault Committee recommendations were important in establishing a need for such a position. An equally strong spur to action occurred in 1883 when yet another specific entomological threat arose in Canada. A collection of seeds returned from the Philadelphia Exhibition in an infested state necessitated action to ensure that such infestations did not endanger Canadian agriculture. See, T. H. Anstey, *One Hundred Harvests: Research Branch Agriculture Canada 1886-1986*, Historical Series No. 27, Ottawa: Research Branch Agriculture Canada, 1986, 4.

[19] James Fletcher, "Insects Injurious to Fruit Trees (An Address delivered before the Fruit Growers' Association of Nova Scotia at their Annual Meeting held at Kentville, Nova Scotia," in Canada. "Report of the Minister of Agriculture for the Calendar Year 1885." *Sessional Papers*, 1886, no. 10, 396. Notably, Fletcher was himself not without political connections in Ottawa. He was the son-in-law of Collingwood Schreiber, the man who succeeded Sanford Fleming as chief engineer of the CPR in 1880. See, de Vecchi, "Science and Scientists in

is, "Be Practical."[20]

Motivated by this attitude, and lacking funds and staff to do otherwise, even after his permanent paid appointment to the Experimental Farms Branch in 1887, Fletcher continued to employ a tool developed in the amateur natural history tradition. He gained much of his information from "practical men, actually engaged in the cultivation of the soil."[21] Also, he was in constant contact with an extensive group of amateur and professional collectors, observers, and correspondents from Canada and around the world. Indeed, he needed the assistance of this national and international network of individuals to actually perform the duties of a *Dominion* Entomologist and Botanist. As chapter three will reveal, women, who were already active and avid participants in Canadian natural history, constituted an important part of Fletcher's network. His appointment to the position of Entomologist and Botanist in the Department of Agriculture provided them, in effect, with a new opportunity to extend their interests.

Although the way in which Fletcher undertook his investigations was clearly rooted in the amateur natural history tradition, he also responded to the scientific demands of his discipline and to his own professional aspirations. Thus Fletcher maintained that scientific knowledge was advancing beyond the grasp of amateurs. Speaking of crop losses due to insect infestations, Fletcher stated: "Now the loss to crops is caused, not by large and conspicuous insects, but by insects so small that they are not noticed." Farmers who before had been able to identify their insect foes and apply appropriate remedies were now helpless in the face of insect

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Government, 1878-1896 – Part I." 135.
[20] Fletcher, "Insects Injurious to Fruit Trees," 396.
[21] Fletcher, 396.

depredations.[22] Only an expert entomologist, an authority in the subject, could provide these farmers with the necessary information.

When asked to suggest such an expert entomologist for appointment to the Department of Agriculture, Fletcher recommended three candidates: William Saunders, the Reverend C. J. S. Bethune[23], and the Deputy Minister of Agriculture, Dr. Taché, an author of a work about the Colorado Potato Beetle.[24] While the exclusion of women from the positions might be attributed to the fact that Canadian women apparently did not study entomology in great numbers, it can also be argued that his recommendations were based on the belief that they were inappropriate for women. Barred from influential paid administrative and scientific positions, women would act more appropriately as assistants. Furthermore, as science continued to professionalize and bureaucratize in the Department of Agriculture, the assistance of unpaid amateurs, male and female alike, became unnecessary, nor was it desired. As a result, women's involvement in science in the Department was transformed. The field of seed analysis is particularly revealing in this respect.

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[22] "Report of the Gigault Committee," 152.

[23] Both men were founding members of the Entomological Society of Ontario. Saunders eventually became the Director of the Experimental Farms System and Bethune became a professor of economic entomology at the Ontario Agricultural College. See, for example, G. J. Spencer, "A Century of Entomology in Canada," *Canadian Entomologist*, 96(January-February 1964).

[24] "Report of the Gigault Committee," 156-7.

2.3 Seed Analysis: The Intersection of the Amateur and Professional Traditions, 1899 to 1905

Because crop returns are determined, in part, by the purity and vitality of agricultural seed, seed analysis, encompassing tests to ascertain both, was undertaken in Europe and North America from the early nineteenth century. The limited historiography on the subject indicates that it became even more important during the mid- to late-nineteenth century because good quality agricultural seed was increasingly difficult to procure. Seedsmen not only inadvertently sold seed that was damaged by outside agents such as frost, disease, or insect pests, but they also sometimes purposely sold contaminated seed.[25] To respond to this problem, the British government passed the *Adulterated Seeds Act, 1869*. That same year, the first seed testing station was established at Tharand, in Saxony, Germany.[26]

American farmers faced the same problem of poor quality agricultural seed as that experienced by their British and German counterparts. While individual farmers undoubtedly conducted the necessary tests, such sporadic efforts were insufficient. Following the accepted practice of travelling to Germany for advanced, professional training in science, including agricultural science[27], at least one American, chemist E. H. Jenkins, travelled to Germany to study at the German seed laboratory under the direction of its head, Friedrich Nobbe. Returning from his sojourn in Germany, Jenkins was armed with the most current knowledge

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[25] "Some European seedsmen screened and stained sand to the size and colour of clover seeds, with which they mixed it. Expensive seeds, such as cauliflower, were adulterated with less expensive kinds that could not be distinguished by seed characteristics. Factories existed in England in which the adulterants were devitalized to avoid detection." See, Oren L. Justice, "The Science of Seed Testing," in *Seeds: The Year Book of Agriculture 1961*, Washington, D.C.: The United States Department of Agriculture, 407.

[26] Justice, "The Science of Seed Testing," 407-8.

[27] Margaret Rossiter, *The Emergence of American Agricultural Science: Justus Liebig and*

of seed testing practices. He was given the responsibility of operating the first American seed laboratory at the Connecticut Agricultural Experiment Station in 1876.[28] The opening of the Connecticut laboratory, however, did not trigger a countrywide establishment of seed testing facilities in the United States.

While the testing of other agricultural materials such as feed, fertilizers, dairy products, and soils was pursued because of client demand, the amount of seed testing undertaken was determined by worker interest. The interest of the male scientists in this work did not always correspond to the benefits that accrued from seed analysis.[29] Indeed, according to American historian Charles Rosenberg, men did not enjoy the work of seed analysis, an observation with definite implications for the involvement of women, as we shall see.[30] But seed testing programmes were established with the passage of the Hatch Act in 1887, which provided federal support to the states for the provision of agricultural research.

This trend was intensified as the federal and state governments passed laws to control the seed trade and as the seed growing industry called for comparisons of American and imported seed.[31] By 1897, rules for seed testing had been established and reliable apparatus had

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the Americans, 1840-1880, New Haven and London: Yale University Press, 1975.

[28] Justice, 407-8.

[29] Elizabeth McSwain, "Early Seed Testing in the Experiment Stations of North America," *History of Agriculture*, 1, 4(November 1974), 40.

[30] Rosenberg describes the agricultural experiment station scientist who found himself "passing days that were filled with the endless detail of regulatory work—not only fertilizer testing but the testing of seeds, horticultural varieties, and the like." See, Rosenberg, "Science, Technology, and Economic Growth: The Case of the Agricultural Experiment Station Scientist, 1875-1914," in *Nineteenth-Century American Science: A Reappraisal*, George H. Daniels, ed., Evanston: Northwestern University Press, 1972, 187.

[31] By 1897, thirty-five states had undertaken seed testing work, although eleven had not performed any tests in over a year. In 1930, forty-four states, in addition to the federal

been developed for germination tests. As well, farmers, through bulletins and Farmers' Institutes, were repeatedly told of the importance of planting good quality agricultural seed and of using seed testing facilities to determine the quality of their seed. Moreover, practical instruction in seed testing and investigation work began to be offered at agricultural colleges.[32] Weeds were an equally powerful stimulus in the United States. The Russian thistle, for example, is considered to be to seed testing in the 1890s what the sputnik was to physics in the 1960s.[33]

While Canadian farmers faced the same difficulties in securing good quality agricultural seed as their European, British, and American counterparts,[34] the development of seed analysis followed a unique trajectory, one that created work opportunities for women. First officially undertaken by the staff of the Central Experimental Farm from 1886,[35] seed analysis was performed as part of crop experiments and was offered as a service to farmers.[36] In the late

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government, operated seed testing laboratories. See McSwain, "Early Seed Testing in the Experiment Stations of North America," 40-1; Justice, 408.

[32] McSwain, 47-8.

[33] Ibid, 46.

[34] Speaking before the American Pharmaceutical Association in 1870, future Director of the Experimental Farms Branch, William Saunders, stated that to secure good quality seed for his farm, he often wrote away to New York, Boston, and Paris. See, Elsie Pomeroy, *William Saunders and his Five Sons: The Story of the Marquis Wheat Family*, Toronto: The Ryerson Press, 11.

[35] William Saunders, *Testing the Vitality of Seeds, Bulletin No. 2*, Central Experimental Farm, Department of Agriculture, Ottawa, December 15, 1887, 1-11; "Appendix 54—A, Report on Agricultural Colleges and Experimental Stations, with Suggestions Relating to Experimental Agriculture in Canada." in Canada. "Report of the Minister of Agriculture for the Calendar Year 1885." *Sessional Papers*, 1885, no. 10, 289-90.

[36] Saunders wrote that "(n)o grain-grower or seedsman will undertake to purify seeds by picking out the individual kernels, it will take probably a week of an expert's time to separate a sample large enough for one of our experimental plots." See, Saunders, "Progress of Agriculture in Canada," in Canada. "Select Standing Committee on Agriculture and Colonization." *Appendices to the Journals of the House of Commons*, 1906-07, no. 4,

1890s. however, the activity began to attract greater attention through the efforts of Agriculturist James Robertson. In this incarnation, seed analysis constituted a transitional activity shaped both by the amateur tradition of James Fletcher and by the professional tradition that began to develop in the federal Department of Agriculture after 1899. As such, it created particular opportunities for women.

First appointed to the Experimental Farms Branch in 1891, James Robertson's activities were a product of his acceptance of the Agrarian Myth.[37] He believed that farmers, freed from the baser elements of society found chiefly in urban settings and living the ideal agrarian life, served as a force of cultural and moral uplift.[38] Prosperous farmers were necessary to Canada's wellbeing because they would promote industrial prosperity with their wealth. Their money would purchase those "manufactured articles, the making of which give employment to the denizens of our cities." Even more important, the beneficial effect of this increased purchasing power upon the intellectual life and activities of farmers would radiate

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[37] This social philosophy was the product of two organizations: the Dominion Grange of the Patrons of Husbandry, established in Ontario in 1874 and the Grand Association of the Patrons of Industry, established in Ontario in 1889. A response to the problems of urbanization, immigration, and rural depopulation that were increasingly attracting attention as the economy stagnated in the late 1880s and 1890s, these clubs attracted many members but were nonetheless short lived. See, for example, S. E. D. Shortt, "Social Change and Political Crisis in Rural Ontario: The Patrons of Industry, 1889-1896," in *Oliver Mowat's Ontario*, Donald Swainson, ed., Toronto: Macmillan of Canada, 1972, 212; Russell Hann, *Farmers Confront Industrialism: Some Historical Perspectives on Ontario Agrarian Movements*, Toronto: New Hogtown Press, 1975.

[38] Roy V. Scott, *The Reluctant Farmer: The Rise of Agricultural Extension to 1914*, Urbana: University of Illinois Press, 1970, 62; Hann, *Farmers Confront Industrialism*, 10; Kerry Badgely, "The Social and Political Thought of the Farmers' Institutes of Ontario, 1880-1917: Manifestations of Agrarian Discontent," unpublished M. A. thesis, Carleton University, 1988, 11-2.

throughout Canadian society.[39]

Initially devoting his time to adults, especially in his emphasis upon dairying, Robertson also recognized the importance of reaching Canada's future farmers and farmers' wives. To this end, he targeted Canadian youth through the Nature Study Movement. This Movement endeavoured to prepare farm boys and girls for complete living on the farm by teaching them better production methods that, in turn, fostered a better appreciation of the value of their work. Ultimately, it would prevent their enticement away from the farms to the cities and, by extension, foster improved social life.[40] Nature Study courses, including investigations of birds, trees, and soils, also incorporated studies of seeds. In these courses, children were taught to recognize the main crop and weed seeds and they were instructed in the methods of conducting both purity and germination tests.[41] A prerequisite for the instruction of children in seed

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[39] Robertson, "The Relation of Agriculture to Progress in the Development of Canadian Life," in Canada. "Second Annual Report of the Dairy Commissioner of the Dominion of Canada for 1891-1892." *Sessional Papers*, 1892, no. 7g, 115.

[40] O. J. Stevenson and Sidney Silcox, *Modern Nature Study*, Toronto: Morang Educational Company, Ltd., 1908, 5; Ontario Teachers' Manuals, *Nature Study*, Toronto: The Ryerson Press, 1915, 13; James Mills, "Nature Study," in *Nature Study or Stories in Agriculture*, Bulletin 124, Ontario Agricultural College, Toronto: L. K. Cameron, King's Printer, 1902, 3-4; W. H. Muldrew and S. B. McCready, *Hints on Making Nature Collections in Public and High Schools*, Bulletin 134, Guelph: Macdonald Institute, Ontario Agricultural College, 1906; Wilbur S. Jackman, "Nature-Study and Morals," Chapter IV in *Nature Study*, The Third Yearbook of the National Society for the Scientific Study of Education, Part II, Chicago: The University of Chicago, 1904, 73-81. Nature study was also considered to be a necessary component of the education of urban youngsters. The power of nature study to uplift and Canadianize was viewed as the remedy for problems related to increasing industrialization and immigration. City-bred children would acquire the moral and mental fibre that was inherent in pursuits that focused on country life, that is, nature study programs. See, Tom Nesmith, "The Philosophy of Agriculture: The Promise of the Intellect in Ontario Farming, 1835-1914," unpublished Ph. D. thesis, Carleton University, 1988, 170; S. B. McCready, *Gardening for Schools*, Bulletin 152, Ontario Department of Agriculture, 1906, 3.

[41] Elizabeth B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America*,

analysis was the training of teachers. Universities and agricultural colleges thus offered summer Nature Study courses for elementary school teachers, the majority of whom were women.[42]

To demonstrate the importance of this training, James Robertson launched, in 1899, a seed competition, the Robertson Seed Grain Competition.[43] It began as a small affair with prizes mounting to one hundred dollars. Favourably impressed, William MacDonald, a wealthy Montreal businessman, offered ten thousand dollars to continue the competition for another three years.[44] Busy with his duties as Commissioner of Dairying, Robertson hired G. H. Clark as an assistant to help him with the administration of the renamed Macdonald-Robertson Seed Grain Competition.[45] Among the first university graduates employed in the Department of Agriculture, Clark graduated with a B.S.A. from the University of Toronto in 1898. Employed for two years in the Field Husbandry Division of the Ontario Agricultural College, he was then appointed as Robertson's assistant in 1900. He brought with him decided views about the problems facing Canadian farmers and the best way to solve them.

The most serious problem that Clark perceived was that of weeds, particularly the

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Chapel Hill & London: The University of North Carolina Press, 1992, 139.

[42] Estey, *Essays on the Early History of Plant Pathology and Mycology in Canada*, 186, 216.

[43] Holding the popular belief that parents are positively influenced by the activities of their children, agricultural improvers in Canada and the United States invited children to participate in a variety of agricultural competitions. They anticipated that by observing the results of their children's labour, farmers would be led to accept the validity of experimental findings that revealed better production methods. See, Scott, *The Reluctant Farmer*, 122-3; G. Elmore Reaman, *A History of Agriculture in Ontario*, Volume 2, Don Mills, Ont.: Saunders of Toronto, 1970, 90.

[44] Canada. "Report of the Select Standing Committee on Agriculture and Colonization." James W. Robertson's testimony, "The MacDonald Movement for Rural Education." *Appendices to the Journals of the House of Commons*, 1907, no. 4, 191-2.

[45] Robertson had resigned his position as Agriculturalist with the Central Experimental Farm in 1896.

contamination of agricultural seed with the seeds of these pests.[46] Not only did weed seeds reduce immediate crop returns, but because they destroyed soil fertility, they also reduced long-term productivity. Historian Clint Evans argues that the recognition of the problem of weeds coincided with the specialization and professionalization of disciplines in science in general, and in botany, in particular, leading to the development of a new breed of agricultural specialist,[47] of which G. H. Clark was one.[48]

Upon his appointment to the Department of Agriculture, Clark began to investigate the state of the Canadian seed trade to determine the most prevalent noxious weed contaminants that were destroying farms and reducing crop yields. He surmised that because legislation in other countries controlled the quality of their seed imports, Canadian seed traders exported their best quality seed to these countries. To compound the problem, foreign exporters of agricultural seed used Canada as a dumping ground for poor quality seed. Lacking legislative

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[46] National Archives of Canada (NAC), RG 17, Acc. 83/64, file 5-5-A-1, "Geo. H. Clark-Outline of his Services to Agriculture While Dominion Seed Commissioner," *History of Seed Branch Work*, 1935; RG 17, Acc. 83/64, file 5-5-A-2, "A Short History of Seed Testing in Canada," *History of Seed Laboratories by W. H. Wright and A. Hope, 1900-1939*, 1.

[47] Evans, "The 1865 *Canada Thistle Act* of Upper Canada as an Expression of a Common Culture of Weeds in Canada and the Northern United States," in *Canadian Papers in Rural History*, v. X, Donald H. Akenson, ed., Gananoque, Ont.: Langdale Press, 1996, 142-3.

[48] In the British tradition, weeds were regarded as undesirable but inevitable and the responsibility of farmers to eradicate. In the North American context, however, weeds were regarded as an evil to be completely eradicated because many of them were imports from Europe that were enormously successful in the North American climate. Not only did the soil contain the necessary nutrients but also the pests that naturally controlled them in their native habitat were absent. Also, the labour force necessary for weed control did not exist. As land ceased to be readily and cheaply available the dominance of weeds became an increasingly pressing problem and this encouraged an active and aggressive stance to encourage their eradication. See, Evans, "The 1865 *Canada Thistle Act* of Upper Canada as an Expression of a Common Culture of Weeds in Canada and the Northern United States," 139-142.

protection. Canadian farmers were left with the worst quality seed. In 1902, Clark convinced the Minister of Agriculture, Sydney Fisher, of the need to substantiate this claim. A Seed Division was then formed, with Clark as its Chief. The magnitude of the problem revealed by his investigations prompted the federal government to pass regulatory legislation controlling both the quality of seed imports and exports and all seed offered for sale in Canada. In 1905, the *Seed Control Act* was passed; the Seed Division then became a Branch in its own right, under the direction of George H. Clark, who became Seed Commissioner. Now laboratory-based, seed analysis was to be conducted by a coterie of female laboratory assistants under the direction of a laboratory head.

Indeed, the passage of the 1905 legislation generated an enormous volume of work in seed analysis. Seed growers and salesmen were obliged to send seed in for analysis and grading. To ensure compliance with the regulations drafted to implement the legislation, the seed inspectors, all men, took random samples of seeds offered for sale, which were then sent to the laboratory for analysis. As well, farmers were still invited to send seed samples to the laboratory for analysis. The increasing amount of work to be performed necessitated first the employment of more personnel at the Ottawa laboratory and then, the opening of the Calgary laboratory in 1907, and of another one in Winnipeg in 1918.

In all these cases, only women, sometimes called clerks but usually called seed analysts, were hired to perform the routine work of seed analysis. As an activity emerging, in part, from the amateur Nature Study Movement, seed analysis was not considered a difficult task. Indeed, women had learned how to conduct the tests in teacher training courses and through their own amateur scientific pursuits. Also emerging from the developing professional tradition, a

situation reflected in the organization of the seed laboratories,[49] women were considered to be acceptable because they worked as assistants. The bureaucratization of science spurred, in 1905, by the passage of the *Seed Control Act, 1905* fostered the employment of women as it led to a large volume of routine work that was identified as 'women's work'. Women were, in effect, employed as laboratory technicians. They assisted the male scientists who took on the superior positions.

2.4 The Professionalization and Bureaucratization of Agricultural Science, 1908 to 1921

As G. H. Clark began to practice science as a professional in the federal Department of Agriculture in 1902, the forces that prompted his appointment grew more powerful. Laboratory-based biology, a professional science that required extended university study largely superseded natural history, which had emerged from the amateur tradition. Meanwhile, civil service reform began to place new emphasis upon measurable credentials reflected in university degrees, thus discouraging the appointment of self-taught amateurs. Finally, a growing international presence both in peace and in war prompted the adoption of new responsibilities by the Department.

In the early twentieth century, the scientific professionalism of the life sciences, evidenced in laboratory-based biology, focused on theory. This invalidated the type of basic

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[49] Historian David Elliston Allen argues that the organization of laboratories with a laboratory head responsible for directing the work of a collection of assistants was a product of the German academic tradition and reflective of a new professionalism. It was well suited to the development of the new biology of which seed analysis was a part. See, Allen, *The Naturalist in Britain*, 163.

observation employed in natural history.[50] Studying the different forms and phenomena of life, the conditions and laws under which they occur, and the causes whereby they are brought into being, biology focused on the internal processes of organisms using chemical and physical methods. Instead of observing in the field as in natural history, biologists observed organisms at the microscopic level.[51]

Laboratory-based biology offered the potential of solving the problems facing farmers. In botany, for example, an expanded view of plants arose which encompassed them as living things that need food, grow, have feelings, reproduce, are affected by their total environment, move, are affected by that movement, and suffer from injuries and disease. Also, this 'new' botany encouraged the study of the entire plant kingdom, cryptogams, or algae, fungi, mosses, and primitive vascular plants, as well as phanerogam, or seed plants.[52] The study of cryptogams contributed to an understanding and the control of the diseases of crop plants.[53] In zoology, and more specifically, entomology, biology was equally important. The biological control of

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[50] Barbara T. Gates, "Ordering Nature: Revisioning Victorian Science Culture," in *Victorian Science in Context*, Bernard Lightman, ed., Chicago: University of Chicago Press, 1997, 182. For more information about the development of biology, see, William Coleman, *Biology in the Nineteenth Century: Problems of Form, Function and Transformation*, Cambridge: Cambridge University Press, 1977; Frederick B. Churchill, "In Search of the New Biology: An Epilogue," *Journal of the History of Biology*, 14, 1(Spring 1981), 177-91.

[51] Coleman, *Biology in the Nineteenth Century*, 2; Dunlap, *Nature and the English Diaspora*, 94.

[52] Eugene Cittadino argues that this new interest in cryptogams was due to the influence of Darwin's *Origin of the Species* and the work of Louis Pasteur, which directed the attention of biologists to the simpler forms of life. See, Cittadino, "Ecology and the Professionalization of Botany in America, 1890-1905," in *Studies in History of Biology*, William Coleman and Camille Limoges, eds., Baltimore and London: The Johns Hopkins University Press, 1980, 176. See also, Reynold M. Wik, "Science and American Agriculture," in *Science and Society in the United States*, David D. Van Tassel and Michael G. Hall, eds., Homewood, Illinois: The Dorsey Press, 1966, 99.

[53] Cittadino, "Ecology and the Professionalization of Botany in America, 1890-1905," 178. See

insects became an increasingly important area of study necessitating the investigation of the lives and habit of insects and of their physiology.[54]

James Fletcher appreciated the value of the new biology to offer new solutions to pressing agricultural problems. Lacking the training and the facilities to undertake the work himself, he acted instead as a clearinghouse of information, which he disseminated to those seeking assistance. Upon the death of Fletcher in 1908, however, the Department decided to appoint men with the necessary training to undertake original investigations. In addition to the ability of the new biology to solve important agricultural problems, this decision was also taken to satisfy the dictates of civil service reform. Wishing to improve the image of the federal civil service in the late nineteenth and early twentieth centuries, highly placed civil servants condemned patronage with increasing stridency.[55] Advocating merit-based appointments, reformers wished to "introduce an element of expert authority into what was basically a democratic [and] majoritarian system."[56] Civil service legislation passed in 1908 introduced the merit principle. It also provided a loop-hole that permitted Ministers of departments to circumvent its provisions for those positions which were considered to be "scientific, technical, or in any other way special."[57] Minister of Agriculture Sydney Fisher who had approved the

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also, Overfield, "Charles E. Bessey," 170.

[54] Stéphane Castonguay, "La dynamique du changement scientifique en contexte gouvernemental, l'entomologie économique au Canada, 1909-1959," unpublished Ph. D. thesis, Université de Québec à Montréal, 1999, 363.

[55] The impact of this reforming zeal upon women's employment in the civil service, in general, will be the subject of analysis of chapter four.

[56] Thomas A. Haskell, *The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth Century Crisis of Authority*, Urbana: University of Illinois Press, 1977, 119-20.

[57] Chapter 21 of the legislation stated that a technical, professional, or scientific appointment could be filled by an individual recommended by the Deputy Minister without competitive

funding for Clark's work in seed analysis, thus supported the appointment of two university trained specialists to the positions of Dominion Botanist and Dominion Entomologist while the Director of the Experimental Farms Branch, William Saunders, recommended two amateurs.[58]

These combined forces resulted in the appointment of Hans Gussow[59] to the position of Dominion Botanist and Dr. C. Gordon Hewitt[60] to that of Dominion Entomologist, both in 1909.[61] As university trained biologists, these men undertook research work in their respective field. A plant pathologist, Gussow paid special attention to investigations on diseases of plants due to micro-organisms such as bacteria and fungi. Indeed, he envisioned that the CEF laboratory would serve as "a centre for the investigation of the diseases of plants which

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examination "provided the said person obtain(ed) from the Commission a certificate, to be given with or without examination, as is determined by the regulations of the Commission, that he possesses the requisite knowledge and ability and is duly qualified as to health, character and habits." See, Canada. "*Civil Service Amendment Act, 1908*, Appendix 4, The Civil Service List of Canada 1908." *Sessional Papers*, 1909, no. 30, 292.

[58] Saunders recommended the appointment of Arthur Gibson, a self-taught amateur entomologist and Fletcher's former assistant, to the post of Dominion Entomologist. He recommended another amateur, W. T. Macoun, Dominion Horticulturist, to the post of Dominion Botanist. See, Castonguay, "La dynamique du changement scientifique en contexte gouvernemental," fn 20, 56.

[59] Having studied applied botany, with particular focus on diseases caused by microscopic fungi and bacteria, at the German universities of Breslau, Liepsizg, and Berlin, Gussow went to England in 1901 where, in 1903, he was appointed assistant to Dr. William Carruthers, consulting botanist to the Royal Agricultural Society. See, William Saunders, "Additions to the Staff of the Experimental Farms," in Canada. "Appendix to the Report of the Minister of Agriculture Experimental Farms Report." *Sessional Papers*, 1910, no. 16, 9-10.

[60] Hewitt attended Manchester University, and, after studying and teaching economic zoology with special emphasis on entomology, he was awarded first a Master of Science degree in 1907 and, in 1909, a Doctor of Science degree. See, William Saunders, "Additions to the Staff of the Experimental Farms," 9-10.

[61] The appointment of a university graduate was not a new experiment. Dominion Chemist Frank T. Shutt, hired in 1886 when the Experimental Farms System was established, was a graduate of the University of Toronto. However, Charles Rosenberg states that "only with respect to chemistry did the 'intelligent farmer' assume that special training might be a prerequisite for an experiment station staff member." See, Rosenberg, *No Other Gods*, 155.

annually cause enormous losses to the growers of fruit and farm crops in Canada."[62] As a biologist, Gussow was less interested in classification and description, than process and function using the laboratory and the experimental method.[63]

Similarly focused on research,[64] Hewitt began to redirect the work and organization of his Division, a process that resulted in its establishment as a separate Branch in 1914. With the passage of the *Destructive Insect and Pest Act, 1910*, the appointment of an inspection staff was required.[65] Arguing that farmers would not trust inspectors without post-secondary education, Hewitt hired a staff of men whose education was then used to justify their year-round employment.[66] While inspection and the destruction of insect pests was undertaken between October and May, during the off-season the staff studied insect pests within the

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[62] Hans Gussow, "Report of the Dominion Botanist," in Canada. "Appendix to the Report of the Minister of Agriculture Experimental Farms Reports for the year ending March 31, 1910." *Sessional Papers*, 1910, no. 16, 251.

[63] Coleman, 2, 162; Cittadino, "Ecology and the Professionalization of Botany in America, 1890-1905," 174. Allen explains the revolt from morphology as the result of the fact that young workers found the morphological tradition stifling. They did not like the fact that morphological work was directed toward proving Darwinian evolution. As well, they revolted against the speculative nature of the subject. New methods of experimentation and rigorous analysis promised much. See, Allen, 3-19.

[64] C. Gordon Hewitt, "Report of the Entomologist," in Canada. "Appendix to the Report of the Minister of Agriculture Experimental Farms Reports for the year ending March 31, 1910." *Sessional Papers*, 1910, no. 16, 223.

[65] To properly administer the *Act*, it was necessary, by 1914, to separate the Entomological Division from the Experimental Farms Branch and make it into a Branch in its own right. By allowing Hewitt to communicate directly with the Deputy Minister, this separation was intended to simplify the operation of the legislation. While the separation did facilitate direct communication, it also allowed Hewitt, now controlling his own budget, to consolidate the scientific activities of his organization. He hired inspectors as well as technical assistants for the laboratory research work. He also established more laboratories and re-established several temporary laboratories as permanent facilities. See, Castonguay, 71.

[66] As such, four entomologists held doctorates, three held a masters degree, and eleven had earned their B. A. Moreover, the majority of those hired had already been employed as inspectors, either with a provincial government or with the federal government. See,

context of particular regions to understand what led to infestations in the first place.[67]

While their own professional interests dictated Gussow and Hewitt's research activities, both also had to respond to the demands of their economically oriented constituents, the farmers, since they were also government employees.[68] If, as scientists, they had to adopt professional standards and scientific methodology to win the acceptance of the larger scientific community, they also had, at the same time, to convince farmers to accept the validity of their claims for science and for themselves as professional scientists.[69] Women found spaces in science in the federal Department of Agriculture by assisting the scientists to balance these demands. As we shall see, they undertook scientific work to meet the needs of farmers and of the other clients of the federal Department of Agriculture. However, like those women involved in seed analysis, they played only a support role. While seed analysts performed technical 'women's work', these women performed scientific 'women's work'.

If the professionalization of science and civil service reform fostered the bureaucratization of science within the federal Department of Agriculture, this latter process was also a product of the growing international presence of the Department, a presence that subsequently necessitated the establishment of a central library in the Department.[70]

Castonguay, 60

[67] Ibid, 67-8.

[68] Rosenberg, *No Other Gods*, 150.

[69] Because the experimental farms were dependent upon their client-base for their existence and the scientists for their jobs, attracting and maintaining the support of farmers was important. See, Overfield, 179.

[70] Science libraries also took on a new significance as a result of laboratory science such as that undertaken by Hewitt and Gussow in the late nineteenth and early twentieth centuries. As the laboratory became an increasingly important site of scientific research, vast amounts of original research had to be made available to other researchers. The library ceased to be regarded as a depository for old works and became instead the corollary of the laboratory. The repository of

In 1910 Canada joined the International Agricultural Institute, an organization formed in 1905 to foster the "collection, collation, and publication of technical, economic, and statistical information of interest to agriculturists."[71] The work involved in being a member country of the Institute first necessitated the creation of the Publications Branch, and then the establishment of a library within it. The library, acquiring "all the Canadian publications relating to the objects of the Institute, whether federal, provincial, official or private," also obtained similar material from the United States, the United Kingdom, "Australia, India, France, Italy, Denmark, Belgium, Norway, Sweden, Argentina, Newfoundland, Jamaica, South Africa, Paraguay, New Zealand, Russia, and Austria-Hungary."[72] In addition to the considerable work involved in organizing the collections, the library grew to be a well-used reference facility. Researchers at all levels of government and in the private sector actively used the library to further their investigations.[73] As discussed in the sixth chapter, a woman managed the library from its inception.

The First World War also increased the international presence of the federal Department of Agriculture. Just as this war promoted the bureaucratization of the civil service in general, it fostered the bureaucratization of science in the Department of Agriculture in

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current scientific findings, the library was compared to the laboratory and also viewed as a place to undertake scientific research. See, Jennifer Connor, *Guardians of Medical Knowledge: The Genesis of the Medical Library Association*, Lanham, Maryland and London: The Medical Library Association and The Scarecrow Press, Inc., 2000, 19-20.

[71] "The Publications Branch of the Department of Agriculture," *The Civilian*, V, 14(November 1, 1912), 334.

[72] "The Publications Branch of the Department of Agriculture," 335-6.

[73] Publications Branch, Department of Agriculture, *The Department of Agriculture: Its History, Organization and Work*, Ottawa: Department of Agriculture, 1933, 8.

particular. Committed to supplying men and munitions, Canada also pledged foodstuffs.[74] This pledge became increasingly important as a world famine threatened.[75] Department staff focused their attention upon encouraging production and upon ensuring that those items produced were of the best quality. As we shall see, a limited number of spaces were created for women to assist in this work as men left the Department to enlist in the Canadian Expeditionary Force. In addition to intensifying existing functions, the Department of Agriculture also added new ones to respond to the demands generated by the War. Again, spaces were created for women in this work for reasons related to their availability, the location in which the work was conducted, and the nature of the work itself.

2.5 Conclusion: Science and Spaces for Women in the Canadian Federal Department of Agriculture, 1884 to 1921

Client demand, the professionalization and bureaucratization of science, civil service reform, and growing international commitments all shaped the scientific activities conducted by the Canadian federal Department of Agriculture. As these forces came together in different combinations, different spaces were created for women. When science was first introduced to the Department of Agriculture, its accommodation to the demands of farmers resulted in the appointment of a self-taught amateur entomologist and botanist, James Fletcher. His continued use of a network of observers, collectors, and collaborators created the first spaces for women.

Toward the close of the nineteenth century and at the beginning of the twentieth

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[74] Canada, Department of Agriculture, *Production and Thrift, Agricultural War Book 1916*, Ottawa, 1916, 193.

[75] The fear of world famine was widespread toward the end of the First World War. See, for example, John S. Ewart, *The World Famine and the Duty of Canada*, 1917;

century, the new professional tradition began to supplant the amateur one. This led to the first paid jobs for women in science in the Department of Agriculture. Establishing seed laboratories and drafting legislation to regulate the Canadian seed trade, G. H. Clark needed assistants to undertake the resulting routine work. His efforts promoted the bureaucratization of science, which, in turn, generated technical work in seed analysis to be performed by women.

Lastly, the professionalization of science, combined with civil service reform and the growing international presence of the Department, furthered the professionalization and bureaucratization of science in the Department of Agriculture. New spaces for women in science were then created as a result. Thus, the appointment of two university-trained biologists who focused upon work in the prestigious new branches of plant pathology and bionomics necessitated the employment of women to ensure that the less prestigious work of the Department was performed. At the same time, the growing international responsibilities of the Department, both in peace and in war, created a demand for still more scientific support staff, a demand to be filled by women. It is to the experiences of these various groups of women that this thesis will now turn.

Chapter 3

The First Generation of Women in the Canadian Federal Department of Agriculture: James Fletcher's Botanical and Entomological Collectors, Observers, and Advisors, 1884 to 1908

> "There seems, however, to be a prevalent opinion that much time and study is necessary for the acquisition of sufficient knowledge to bear practical results, and many of my correspondents, who give me the most useful information concerning the lives of insects, begin their letters by saying that because they know little of entomology, therefore their information will probably be of little value."[1]
>
> James Fletcher, *Annual Report*, 1886

3.1 Women and Amateur Natural History

Restricted to the periphery of the nineteenth century scientific community because of the constraints of Victorian femininity, Canadian women still formed an important part of this community. During the nineteenth century, identified as the "period of the great lady collectors," women constituted a crucial link in the chain of natural history exchanges and earned considerable praise from the men for whom they collected.[2] In

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[1] James Fletcher, "Report of the Honorary Entomologist," in Canada. "Report of the Minister of Agriculture for the Calendar Year 1886." *Sessional Papers*, 1886, no. 10, 394-5.

[2] Lynn Barber, *The Heyday of Natural History, 1820-1870*, London: Jonathan Cape, 1980, 126. Of Ellen Hutchins it was said that she "could find almost anything." Even more effusive, Mrs. A. W. Griffiths' male colleagues said that British marine botany owed almost its entire existence to her "masculine powers of research." See, David Elliston Allen, *The Naturalist in Britain: A Social History*, Princeton, New Jersey: Princeton University Press, 1994,112-3. See also, Susan Drain, "Marine Botany in the Nineteenth Century: Margaret Gatty, the Lady Amateurs and the Professionals," *Victorian Studies Association Newsletter*, (Spring, 1994), 6-11.

addition to this collecting work, women were also valued as natural history illustrators and popularizers.[3] Despite the recognition that these women received from certain of their male correspondents, the historical record has neglected them. And while women like Anne Mary Perceval and Lady Dalhousie[4] have been recognized for their inestimable role in the development of Canadian natural history, the contributions of less illustrious women have only just begun to be appreciated.[5] The present chapter, which explores the nature of women's contributions to the work of James Fletcher, contributes to this new appreciation.

Two explanations have been put forward to account for the neglect of women's contributions to botany. First, the men who published botanical works did not always mention their collectors by name. Second, the new professional scientists of the late nineteenth and early twentieth centuries often ignored the role of women collectors in the

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[3] Ann B. Shteir, "Botany in the Breakfast Room: Women and Early Nineteenth Century British Plant Study," in *Uneasy Careers and Intimate Lives: Women in Science, 1789-1979*, Pnina G. Abir-Am and Dorinda Outram, eds., New Brunswick: Rutgers University Press, 1989, 31-43.

[4] James S. Pringle, "Anne Mary Perceval (1790-1876), An Early Botanical Collector in Lower Canada," *Canadian Horticultural History*, 1, 1(1985), 7.

[5] Although no large-scale attempt has been made to determine the extent of Canadian women's participation in botany, this does not mean that the names of women have not been discovered. Indeed, as more historians investigate a variety of different sources and ask new questions of more traditional sources, more names appear. See, for example, Marianne G. Ainley, "Last in the Field? Canadian Women Natural Scientists, 1815-1965," in *Despite the Odds: Essays on Canadian Women in Science*, Marianne G. Ainley, ed., Montreal: Véhicule Press, 1990, 27-9; Lorraine C. Smith, "Canadian Women Natural Scientists—Why Not?" *The Canadian Field-Naturalist*, 90, 1(January-March 1976), 1-4; Pringle, "Anne Mary Perceval (1790-1876)," 7-13; Ralph Estey, "The Early Teaching of Plant Pathology in Canada," in *Essays in the Early History of Plant Pathology and Mycology in Canada*, Montreal & Kingston: McGill-Queen's University Press, 1994; J. T. H. Connor, "To Promote the Cause of Science: George Lawson and the Botanical Society of Canada, 1860-1863," *HSTC Bulletin*, 10, 1, (Spring/Summer 1986), 3-33.

advancement of Canadian botany.[6] This attitude has been attributed to the fact that women did not publish. But even those who did publish were subject to male neglect. For example, in 1897 David Penhallow, the Chair of botany at McGill, failed to include Catharine Parr Traill in his list of important Canadian botanists.[7] Women's contributions in entomology, ornithology, and other observational sciences are no better known.[8]

The historiography of Canadian entomology, which focuses upon its development as a profession and upon the institutions in which it was located, has not considered the involvement of any individuals apart from the prominent entomologists who were instrumental in its professionalization and institutionalization.[9] Equally important, the belief that all women detest insects has encouraged the misconception that women did

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[6] Shteir, "Botany in the Breakfast Room," 33.

[7] He did include Maria Morris, an early nineteenth century Nova Scotian botanist. See, D. P. Penhallow, "A Review of Canadian Botany from 1800 to 1895," *Proceedings and Transactions of the Royal Society*, 2nd Series, v. 3, 1897, 12. A professor of botany and chemistry at the Imperial College of Agriculture, Japan, from 1876 to 1880 and in charge of the scientific work of a private experiment station in New York, Houghton Farm Experiment Station from 1880 before becoming the Chair of Botany at McGill in 1883, Penhallow was concerned with the professionalization of the science of botany in Canada. Canada, "The Report of the Gigault Committee," *Appendices to the Journals of the House of Commons*, 1884, no. 6, 159.

[8] Allen, *The Naturalist in Britain*, 24; Shteir, "Botany in the Breakfast Room," 38; Barber, *The Heyday of Natural History*, 125-38.

[9] See, for example, H. L. Seamans, "Entomology in the Experimental Farms Branch, 1883-1913," *Entomology Newsletter*, 37, 4(April 1, 1959), 1-3; "The Entomological Branch, 1914-1936," *Entomology Newsletter*, 37, 5(May 1, 1959), 1-6; Arthur Gibson, *Entomology in Canada*, unpublished manuscript; G. J. Spencer, "A Century of Entomology in Canada," *Canadian Entomologist*, 96, (January-February 1964), 33-58; J. T. H. Connor, "Of Butterfly Nets and Beetle Bottles: The Entomological Society of Canada, 1863-1960," *HSTC Bulletin*, 6, 3(September 1982), 151-171;William J. Cody, B. O. Savile, and Michael J. Sarazin, *Systematics in Agriculture Canada at Ottawa*, Ottawa: Biosystematics Research Centre Agriculture Canada, Historical Series No. 28, 1986; Ralph Estey, "Entomologists and the Genesis of Plant Pathology in Canada," *Essays on the Early History of Plant Pathology and Mycology in Canada*, 6-20; Paolo Palladino,

not pursue entomological studies. English and American studies which depict important women entomologists, and explore the variety of professional appointments available to women entomologists in the last third of the nineteenth century in fieldwork, laboratory studies, teaching, and writing, have debunked this idea.[10]

An examination of the annual reports of the Entomological Society of Ontario[11] and of the *Canadian Entomologist*[12] reveal that while professional appointments came later for women in Canada than in the United States, they nonetheless participated in entomology, as they did in botany, as amateurs. The incorporation of a science mandate in the Department of Agriculture, and the appointment of James Fletcher to the position of Honorary Entomologist in 1884 and to the paid position of Dominion Entomologist and Botanist to the Department in 1887, created a new focus for the efforts of these

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Entomology, Ecology and Agriculture: The Making of Scientific Careers in North America, 1885-1985, Amsterdam: Harwood Academic Publishers, 1996.

[10] Marcia Myers Bonta, "Part IV, The Entomologists," *Women in the Field: America's Pioneering Women Naturalists*, College Station: Texas A & M University Press, 1994,145.

[11] Annual reports reveal the presence and participation of women in the affairs of the Entomological Society of Ontario. They made collections, prepared papers, and participated in the governance of the various branches of the Society, but particularly in the Montreal and Quebec branches. See, Entomological Society of Ontario, *Annual Report*, 1870-1910.

[12] The first Canadian woman mentioned in the journal was Miss E. R. C. of Amherstburg, Ontario, who took out a subscription in 1868. See, *Canadian Entomologist*, 1, 5(15 December 1868), 44. Miss Caroline Heustis contributed a number of entomological observations. See, *Canadian Entomologist*, 10, 8(August 1878), 141-2; 11, 2(February 1879), 39; 11, 5(May, 1879), 100; 11, 12(December 1879), 239-40; 13, 7(July 1881) 143-4; 15, 5(May 1883), 57-8. Elsie Blackmore, Secretary of the Toronto Branch of the Entomological Society of Ontario, contributed two articles detailing the activities of the Branch. See, Blackmore, 38, 4(April 1906), 127, and 38, 6(June 1906), 210. Mrs. A. G. H. White submitted "Notes on a Cecropia Caterpillar," 50, 9(September 1918), 289-90.

women amateurs.[13] Responsible for solving the various entomological and botanical problems facing Canadian farmers, Fletcher employed a tool that had long been successful in the natural history tradition; it consisted in a network of collectors, observers and collaborators, national and international in scope and including both self-taught amateurs and university-educated professionals.[14]

By continuing to employ that methodology, Fletcher signalled that amateurs were valued as credible scientists, fostering a particularly inclusive relationship amongst Department staff and all members of the wider scientific community. This approach, along with the respect accorded the contributions of amateurs, created an environment conducive to women's active participation, at different levels, in the science work of the Department of Agriculture. While historians have noted the existence of Fletcher's network of correspondents, their focus on his life, on institutional histories of scientific societies and educational facilities, or on internal histories of botany and entomology, has distracted them from the particular contributions of the members of this network. Negative conceptions of amateurs, a product of the professionalization of science, have also encouraged this neglect. As a result, women's contributions have not been discussed; this has created a falsely masculine image of science in late nineteenth and early

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[13] The descriptor "Dominion" was not employed until 1908, shortly before Fletcher's death. It is used throughout this chapter to avoid confusion.

[14] Allen, 59, 98; Richard A. Overfield, "Charles E. Bessey: The Impact of the 'New' Botany on American Agriculture, 1880-1910," *Technology and Culture*, 16, 2(April 1975), 175.

twentieth century Canada, in general, and of science in the federal Department of Agriculture, in particular.[15]

The dictionary defines an "amateur" in two ways. Reflecting the etymological root of the word, the first definition designates a person who engages in a study, sport, or other activity for pleasure rather than for financial benefit or professional reasons. The second describes a superficial or unskilful worker or dabbler, in opposition to another, professional practitioner.[16] Motivated by their own professional bias, historians have unquestioningly applied the second definition to amateurs in the past and, presuming that anything amateur is bad. Whig historians have analysed particular scientific disciplines and institutions to stress their progression from an amateur to a professional status. In the same vein, certain biographical studies have recategorized expert amateurs not simply to suggest their superiority to less proficient amateurs, but to argue also that the term itself, because of their subjects' considerable scientific accomplishments, was a misnomer to begin with.[17] By taking at face value the negative statements of new "professional"

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[15] T. H. Anstey, *One Hundred Harvests: Research Branch Agriculture Canada 1886-1986*, Historical Series No. 27, Ottawa: Research Branch Agriculture Canada, 1986; Ralph Estey, "James Fletcher (1852-1908), and the Genesis of Plant Pathology in Canada," *Canadian Journal of Plant Pathology*, 5, 2(June 1983), 120-4; Cody et al, *Systematics in Agriculture Canada at Ottawa, 1886-1986*, 45; Seamans, "Entomology in the Experimental Farms Branch, 1883-1913," 1.

[16] See, for example, Jess Stein, editor in chief, *The Random House Dictionary of the English Language*, New York: Random House, 1967, 45.

[17] For example, historian J. T. H. Connor calls William Saunders and Rev. C. J. S. Bethune 'proto- professionals'. See, Connor, "Of Butterfly Nets and Beetle Bottles," 160. This is not to say, however, that all amateurs were equally adept or devoted. Sociologist Robert Stebbins created a typology to express the hierarchy amongst amateurs. He classes amateurs as apprentices, journeymen, and masters. See, Stebbins, "Avocational Science: The Amateur Routine in Archaeology and Astronomy," *International Journal of Comparative Sociology*, 21, 1-2(June 1980), 35-7. See also, Stebbins, "The Amateur:

scientists about the skills and role of "amateurs," historians have failed to recognize the professional project underlying these statements.

That such a project distorted past historical assessment of those designated as "amateurs" has been argued by recent studies on women amateurs. They have demonstrated that women amateurs have been particularly hard hit by this negative bias because it was often compounded by a negative gender bias. Indicative of the masculinization that accompanies professionalization, the contributions of women have not only been discounted and devalued but also, in many instances, erased. Historians now recognize that women amateurs have been doubly marginalized: both by male professionals and by male amateurs.[18] By positioning women as the 'other', both groups curtailed their involvement and helped erase it from the historical record.

Well into the twentieth century, most major scientific societies barred women's entry, feeling that the subjects discussed were either beyond their comprehension or inappropriate to their delicate sensibilities. In a colourful but evocative description, historian David Elliston Allen characterizes the scientific societies and natural history clubs as a "kind of intellectual stag-party where a male rattled his antlers."[19] For example, when women were granted the right to join the Boston Society of Natural History, they

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Two Sociological Definitions," *Pacific Sociological Review*, 20, 4(October 1977), 582-606.

[18] See, Sally Gregory Kohlstedt, "The Nineteenth-Century Amateur Tradition: The Case of the Boston Society of Natural History," in *Science and its Public*, G. Holton and W. A. Blanpied, eds., Dordrecht-Holland: D. Reidel Publishing Company, 1976, 174-5. See, also, Margaret Rossiter, *Women Scientists in America: Struggles and Strategies to 1940*, especially Chapter 4, Baltimore and London: The Johns Hopkins University Press, 1982, 51-72. Chapter five will consider in greater detail the relation between masculinity and the professions.

[19] Allen, 150.

were not given equal status with the male amateurs. Rather, they were permitted entry at a lower level; this thus created a gendered hierarchy of amateurs within the society. Concerned about their own status in the face of the growing numbers of professionals, the male members ranked themselves above women. Women, because they were women, were therefore identified as more "amateur-like."[20]

Gender stereotypes also curtailed women's opportunities to undertake observational sciences. Ascribed mental and physical weaknesses combined with women's so-called tender sensibilities often channelled their efforts in directions different from those of men. For example, they collected the material classified by men, and they illustrated scientific works written by men. Women who contributed to the work of men often found their efforts subsumed. Those who left no publications have been mostly overlooked.[21] Other women, published and therefore more visible, have been ignored or criticized because their work was not considered to be of the same scientific calibre as that of men. Fortunately, recent historical studies have assessed women's work in science on its own merits, and within the context of the scientific culture of the nineteenth century, thus emphasizing the value of their contributions.[22]

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[20] Kohlstedt, "The Nineteenth-Century Amateur Tradition," 186.

[21] Allen notes that men who did not publish have also disappeared from the historical record because of the dominance of the "bibliophiles and book-listers" in compiling histories of natural history. See, Allen, 11.

[22] Ann B. Shteir, *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760-1860*, Baltimore: Johns Hopkins University Press, 1996; Bonta, *Women in the Field*; Ainley, "Last in the Field?" 25-62; Nancy G. Slack, "Nineteenth Century American Women Botanists: Wives, Widows, and Work," in *Uneasy Careers, Intimate Lives*, 77-103. The evolution of analyses of the work of Catharine Parr Traill are particularly illustrative of the process of devaluation and reclamation. First ignored in 1895 by David Penhallow, a botanist with a professional project, then in historical analyses called a 'splendid anachronism' and a 'struggling amateur,' only recently has

As this chapter is predominantly concerned with women amateurs in the Department of Agriculture, establishing the validity of their work is important. Fletcher relied on a number of these women as colleagues while harnessing at the same time the efforts of others to further his research. As we shall see, James Fletcher's correspondence with women in the years 1884 to 1908 demonstrates that the influence and interests of one man, as well as his particular approach to science, generated opportunities for women, both as self-taught amateurs and as university-trained professionals outside of the Department of Agriculture, to participate as his valued assistants. As well, the chapter will demonstrate that this early stage of the professionalization of science in the Department impacted upon women amateurs in unique ways. Not leading to their exclusion, the introduction of science created, rather, new opportunities for women to participate.

3.2 James Fletcher and his Women Correspondents

James Fletcher's success as Dominion Entomologist and Botanist was determined by the fact that he harnessed and expanded a network of correspondents, a network he

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the work of Traill been analyzed in the context of nineteenth century natural sciences. Recognizing the 'androcentric perspective of well-known male scholars,' feminist historian Marianne Ainley has demonstrated that Traill, far from being isolated and uninformed, was in fact aware of the major scientific works and trends of her time. See, Carl Berger, *Science, God and Nature in Victorian Canada*, Toronto: University of Toronto Press, 1983, 35; Michael A. Peterman, "'Splendid Anachronism': The Record of Catharine Parr Traill's Struggle as an Amateur Botanist in Nineteenth-Century Canada," in *Rediscovering Our Foremothers: Nineteenth-Century Canadian Women Writers*, Lorrain McMullen, ed., Ottawa: University of Ottawa Press, 1990, 173-85; Ainley, "Science in Canada's Backwoods: Catharine Parr Traill," in *Natural Eloquence: Women Reinscribe Science*, Barbara T. Gates and Ann B. Shteir, eds., Madison: University of Wisconsin Press, 1997, 79-97.

had initiated long before his paid appointment. Succeeding beyond his most sanguine expectations, he reported in 1885, "upwards of 400 observers, (...) promised to take notes under [his] instructions, and report periodically upon noxious insects and remedies suggested to keep them in check."[23] Although Fletcher described the members of his network of four hundred correspondents as gentlemen, his annual reports and letterbooks reveal that he corresponded with both men and women.[24] While women may not have been part of the original four hundred, they soon became regular correspondents. Like their male counterparts, women correspondents from across Canada as well as women in England and the United States wrote to Fletcher. Indeed, because insects and plants are not restricted by national boundaries, such international co-operation was necessary.

James Fletcher's female correspondents wrote to him from three different social, scientific, and intellectual locations. They were farmers. Those with knowledge equal to that of Fletcher, both university-educated professionals and self-taught amateurs.

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[23] Fletcher, "Preliminary Report of the Entomologist," in Canada. "Report of the Minister of Agriculture for the Dominion of Canada for the calendar year 1884." *Sessional Papers*, 1885, no. 8, 245.

[24] The methodological implications of James Fletcher's letterbooks are interesting. While the numbers of letters received by James Fletcher are recorded in his annual reports, the letters themselves have not been preserved. As such, the subjects of analysis in this chapter are the letters written by James Fletcher. Assumptions about the content, style, and tone of the letters that he received are based on the content, style, and tone of the letters that Fletcher sent in response. The one exception is the case of Eleanor Ormerod, a world-renowned economic entomologist, who preserved her own correspondence. After her death Ormerod's enormous correspondence, including that with James Fletcher, was published in her autobiography. In attempting to pair up the letters, however, another methodological issue arose. Gaps between letters show that not all the letters written by Fletcher have been preserved. This suggests that other letters to other individuals shared the same fate. As such, while this analysis is as complete as possible, some women correspondents may have disappeared from the record. See, Eleanor Ormerod, *Eleanor Ormerod, LL.D. Economic Entomologist, Auto-Biography and Correspondence*, Robert Wallace, ed., London: John Murray, 1904.

Amateur natural history enthusiasts constituted the third group. These different locations shaped Fletcher's approach to these women; at the same time, the information that they exchanged reflects the different stages in the relationship between amateurs and professionals. Thus, the women farmers who sought advice on the control of pests and who participated in cultivation experiments were enlisted as assistants who aided in the conduct of larger experiments. In contrast, the relationship with those women as knowledgeable as Fletcher, both professionals and amateurs, alike, was entirely collegial in that information was both sought and shared between them. Finally, the correspondence between Fletcher and the amateur natural history enthusiasts, in addition to displaying a relationship similar to the one he enjoyed with the women farmers, also illustrates the emerging divergence of opinion between amateurs and professionals. Each of these groups of women will now be analyzed in turn.

James Fletcher's Correspondence with Women Farmers:

According to Fletcher, economic entomology was that branch of practical agriculture which applied the findings of the scientific entomologist, whose task it was undertake "accurate scientific work, and carry out the tedious experiments which are necessary." Serving as both practical agriculturist and scientific entomologist, Fletcher performed a variety of different activities in his efforts to gather and disseminate "facts concerning the injuries committed by insects and the most suitable remedies."[25] A close

[25] Fletcher, "Insects Injurious to Fruit Trees (An Address delivered before the Fruit Growers' Association of Nova Scotia at their Annual Meeting held at Kentville, Nova Scotia," in Canada. "Report of the Minister of Agriculture for the Dominion of Canada for the calendar year 1885." *Sessional Papers*, 1886, no. 10, 395.

analysis of his annual reports and letterbooks reveals the role of women farmers in the successful performance of these activities.

Fletcher's network of observers, he stated, was made up of practical farmers. Women, too, were involved in farming, both independently and as farmers' wives. In this double capacity, they sent in their observations of insect pests as well as the methods that had been employed to combat them.[26] Fletcher published notices of particularly important infestations or particularly effective remedies in his annual reports to which many women had contributed. As such, these women provided information that Fletcher used to investigate larger entomological questions. They informed him about the distribution of species, cycles of destruction, and life histories of injurious insects. With this kind of support, Fletcher was able to undertake some research that would otherwise have been difficult, if not impossible, to conduct.

The example of Miss H. Raymond of New Brunswick is particularly illustrative of this point. Through an intermediary, Mr. George Raymond of Bloomsfield, New Brunswick, Miss Raymond contributed information about "a worm," a larva of the sawfly that had attacked her raspberries. She noted that they had been very destructive and that the only way she had been able to combat them was by removing the affected leaves. Under Fletcher's direction, she sent in specimens of larvae to Ottawa, where they were reared to maturity in order to provide Fletcher with the opportunity to trace their life

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[26] A compilation put together by the National Council of Women of Canada noted that in 1881, there were 6, 716 women farmers. That number had risen to 11, 590 by 1891. Other women were involved in horticulture. See, National Council of Women, *Women of Canada: Their Life and Work*, 1900, 86.

history.[27] After the adults emerged in Ottawa in mid-June, specimens were sent to Miss Raymond. Informing Fletcher that she had often seen these flies upon the raspberry leaves about the middle of June, she noted that it had been six years since the insect had appeared in troublesome numbers. However, their numbers had increased again during the preceding four years.[28] With the observations and information supplied by Miss Raymond, Fletcher was able to add to his knowledge of the life history, effects, methods of control, and distribution of this insect.

In a slightly different way, women farmers were able to assist James Fletcher in his experiments in economic botany. Thus, in 1889, Fletcher stated that "particular attention will be paid to the examination and cultivation of our native grasses."[29] The value of this work was of decided economic importance to Canadian farmers: "Few agricultural products are of more importance to farmers than the various grasses which provide food for their live stock" and that "there are few branches of their business concerning which the generality know so little." Although there were many naturalized and foreign grasses that were suitable to the Canadian climate, there were many varieties

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[27] National Archives of Canada (NAC), RG 17, A II 7, v. 2347, "Letter from Fletcher to Miss Raymond, 12 July 1899 and 20 July 1899." Fletcher encouraged Miss Raymond to continue to send specimens of the sawfly to him. There is no record of a letter thanking her for specimens sent so it could be that she was not interested. See, NAC, RG 17, A II 7, v. 2350, "Letter from Fletcher to Miss Raymond,18 June 1900."

[28] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1899." *Sessional Papers*, 1900, no. 8a, 180-1.

[29] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1889." *Sessional Papers*, 1890, no. 6c, 59.

that were unsuited to most parts of Canada. Those that were available on the market had not been tested in Canada, but were sold on the basis of their European reputations.[30]

Fletcher organized experiments at the Central Experimental Farm. He also arranged for the distribution of seed to the Branch farms and to correspondents. Those in receipt of the seed were responsible for growing it and recording their results. With this information at hand, Fletcher felt he would be able to inform farmers of the best varieties to sow; a quality not necessarily reflected in high prices.[31] Farmers were anxious to participate in this program; amongst the letters sent in by women, there were those asking to receive samples. Thus, for example, to Mrs Pepplewell of Glen Robertson, Ontario, Fletcher wrote, "I have much pleasure in sending you herewith a sample of the new fodder grass *Bromus (illegible)*, which has given splendid results and, I believe, will give you satisfaction. I shall be obliged if you will report to me your opinion of this grass at the end of the season."[32] Similar to the contributions of women farmers in entomology, these women undertook the fieldwork that Fletcher could not undertake himself. Fletcher, the scientist, then placed their observations within a scientific context.

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[30] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1890." *Sessional Papers*, 1891, no. 6c, 178-9.

[31] Fletcher, "Report of the Entomologist and Botanist," 178. Through his work with grass seed Fletcher became aware of the problem of the purity and vitality of seed and he began to test seed as a service to farmers.

[32] NAC, RG 17, A II 7, v. 2337, "Letter from Fletcher to Mrs. Pepplewell, 25 May 1893."

James Fletcher's Correspondence with Self-taught Amateur and University-educated Professional Women:

As the only employee in the division of Entomology and Botany until 1895, Fletcher was unable to conduct intensive original research to solve the entomological and botanical problems facing Canadian farmers.[33] He depended upon the literature from the United States, Europe, and England. As well, he exchanged letters with women entomologists and botanists, both self-taught and self-supporting amateurs and university-educated and employed professionals, from these countries. These women were particularly valued as colleagues by James Fletcher. Their collegial relationship, indicative of shared attitudes and values about science and methodology, is apparent in his correspondence with them.

From Fletcher's first appointment as honorary Dominion Entomologist in 1884 until her death in 1901, Eleanor Ormerod, the self-taught Consulting Entomologist of the Royal Agricultural Society of England until 1892, was one of Fletcher's most regular correspondents.[34] Both his references to her in his annual reports and the letters that they exchanged provide evidence of a collegial relationship. While Fletcher's annual reports

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[33] Stéphane Castonguay, "La dynamique du changement scientifique en contexte gouvernemental, l'entomologie économique au Canada, 1909-1959," unpublished PhD thesis, Université de Québec à Montréal, January 1999, 51-2. In 1895, J. A. Guignuard was appointed and took over the herbarium and much of the French extension work. An assistant in entomology, Arthur Gibson, was appointed in 1899. See, Anstey, *One Hundred Harvests*, 20-1.

[34] To begin her studies in entomology, Ormerod bought a pamphlet about British beetles and with the aid of the largest beetle that she could find she proceeded to learn its anatomy. In assisting her brother to prepare botanical specimens for examination, Ormerod learned how to use a microscope, an important skill in entomology. See, Marilyn Ogilvie Bailey, *Women in Science, Antiquity through the Nineteenth Century: A Biographical Dictionary with Annotated Bibliography*, Cambridge and London: The MIT Press, 1991, 142.

rarely failed to mention the importance of the work of Ormerod in economic entomology and of her unfailing assistance to him in his efforts to be of use to Canadians, the letters that they exchanged are even more illustrative of the nature of their relationship. Because Ormerod saved her own correspondence, we are able to assess how James Fletcher responded to his female correspondents.[35] They regularly exchanged information, specimens, and publications. Both also acknowledged often the contributions of the other in their respective publications. They both consistently and modestly maintained that this recognition was unnecessary and even inappropriate because it detracted from the achievement of the other. Thus Ormerod wrote to Fletcher about their work in encouraging the introduction of the insecticide Paris Green into England: "(B)ut indeed I shall be quite hurt and annoyed!—and your report will not give a right view!—unless you say that we applied to you, and that our work was in colleagueship."[36] In response, Fletcher argued,

> you had given me far more credit than I deserved and when I found that I could not print the whole report as I intended at first I left out your kind words to myself because I want you to get the full credit...To you belongs the whole credit of this important step which I believe fully is going to begin a new era in fruit growing in England and those who profit take advantage of the backing of science will reap the greater rewards.[37]

Fletcher did not hesitate to ask for Ormerod's assistance on a variety of subjects, including insect life histories, identifications, and control methods. For example, in his

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[35] We are fortunate that, of Eleanor Ormerod's correspondence, that with Fletcher is the most complete. Like Fletcher not all of her correspondence survived. See editorial note in *Eleanor Ormerod, LL. D.Economic Entomologist*, 195.

[36] "Letter from Ormerod to Fletcher, 23 December 1890," in *Eleanor Ormerod, LL.D*, 206.

[37] NAC, RG 17, A II 7, v. 2332, "Letter from Fletcher to Ormerod, 19 February 1891."

efforts to determine the life history of a particular beetle, Fletcher wrote: "One point I would particularly like to get your English experience upon and that is the time the beetles appear in the spring."[38] A lively exchange of specimens also occurred between Fletcher and Ormerod. Reading her report about the outbreak of *Xyleborus dispar*, he noted that it was the same as *X. pyri*. Sending her some Nova Scotia specimens, Fletcher asked her to forward some English specimens.[39]

When Ormerod was fighting to encourage the acceptance, in England, of the spraying of orchards with the insecticide Paris Green, she resorted to James Fletcher's expertise to help her win her point. Referring to her use of his name, she stated "your information is invaluable, not only in itself but because whatever may be advanced I can say Mr. Fletcher advised it, or more often, reported its success in Canada, and I feel secure."[40]

In addition to providing intellectual and professional support to each other, Ormerod and Fletcher also supported each other emotionally. Fletcher expressed to her his frustration over his difficulties in fulfilling his responsibilities because of a lack of proper assistance:

> I am much overworked. Mr. Saunders will give me no assistance of any kind and it is very distressing. Doing one's best only is very wearing when you cannot get even reasonable assistance. I can't imagine what his object is after all I have done for him. I suppose I must acknowledge my own incapacity because people that are overcome by obstacles are the failures in this world

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[38] NAC, RG 17, A II 7, v. 2331, "Letter from Fletcher to Ormerod, 29 November 1889."
[39] NAC, RG 17, A II 7, v. 2331, "Letter from Fletcher to Ormerod, 25 November 1889."
[40] "Letter from Ormerod to Fletcher, 24 March 1890," 202. See also, "Letter from Ormerod to Fletcher, 6 October 1890," 204. While reference to Fletcher is indicative of his knowledge and reputation, it also clearly suggests the difficulties that Ormerod faced as a woman. Her gender undoubtedly raised questions about the validity of her findings no matter the extent of the scientific knowledge that underpinned them.

and those that overcome the obstacles are the measures.[41]

Fletcher, in turn, buttressed Ormerod's flagging spirits when her work was being credited to others:

> My dear Good Friend,
> (...) It is indeed too bad that you should have to do so much work and others get the credit of it. However, this is not altogether the case, for your work has a stamp about it which shows through no matter whose name may appear under it. With us here your name is first on the rolls of Economic Entomology and we all appreciate the originality and courage which led you to take up this important subject (...) when you had to stand alone and be sneered at as 'pecu--liar' because you were telling farmers how they might save themselves thousands and the country millions.[42]

The correspondence between James Fletcher and Eleanor Ormerod is particularly interesting because it reveals certain similarities in their career path. Both self-taught, they had acquired extensive entomological knowledge through considerable personal effort. It also shows the relationship between an amateur who gained a paid position, and another who remained unpaid for her work but who shared the same attitudes about the science of entomology and appropriate methodology; as such, they operated as equal partners. However, while Fletcher was sought for a paid position in the federal Department of Agriculture, such an opportunity was denied to Ormerod.[43] In this field, like in so many others, professionalization and masculinization thus went hand in hand.[44]

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[41] NAC, RG 17, A II 7, v. 2335, "Letter from Fletcher to Ormerod, 4 February 1892."
[42] NAC, RG 17, A II 7, v. 2332, "Letter from Fletcher to Ormerod, 16 September 1890."
[43] While recognized as the foremost expert in economic entomology in England, Ormerod was passed over for government and teaching positions because she was a woman. The most that was granted as an acknowledgement was an honorary doctorate from the University of Edinburgh in 1900. See, Ormerod, 193, 287.
[44] In contrast to Ormerod, another of Fletcher's self-taught female correspondents, American Mary E. Murfeldt, did secure paid employment. She served as assistant to Missouri State Entomologist C. V. Riley from 1876 to 1878 and then as acting state entomologist from 1888 to 1896. She identified *Tortricidae* for Fletcher and received

Joining with entomologists in Europe, Asia, and Africa, Fletcher began, in 1905, to correspond with Edith Patch. University-educated in English and in entomology and armed with a doctorate in entomology from Cornell in 1912, Patch was a professional entomologist. Employed since 1904 at the Agricultural Experiment Station at Orono, Maine, she was a specialist in aphids. She considered herself to be both a scientist and a naturalist.[45] In addition to discovering new species of aphid, Patch was always willing to help other entomologists in their identifications. While some of Fletcher's correspondence with Patch revolved around aphids, it did not stop there.[46] In October 1905, he wrote to ask her about the occurrence of Apple Maggot in Maine.[47] In 1906, Fletcher sent her moth larvae and discussed the sawfly.[48] As he had done with Eleanor Ormerod, Fletcher also exchanged annual reports and other publications with Edith Patch.[49]

But the James Fletcher and Edith Patch correspondence illustrates the existence of a different kind of relationship. Fletcher wrote to Patch as he would a professional. His

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specimens from him. See, NAC, RG 17, A II 7, v. 2332, "Letter from Fletcher to Murfeldt, 23 December 1890"; v. 2343, "Letter from Fletcher to Murfeldt, 8 October 1897." See also, Bonta, 151-2; "Mary Esther Murfeldt," *Journal of Economic Entomology*, 6(1913), 288-9; Ogilvie, *Women in Science, Antiquity through the Nineteenth Century*, 139-40.

[45] Bonta, "Edith Patch: Entomological Naturalist," in *Women in the Field*, 174-80; Herbert Osborn, *Fragments of Entomological History: Including Some Personal Recollections of Men and Events*, Columbus, Ohio: Published by the author, 1937, 68.

[46] In 1906, Fletcher promised to look at aphids on potatoes and to send her his findings. See, NAC, RG 17, A II 7, v. 2365, "Letter from Fletcher to Patch, 6 September 1906."

[47] NAC, RG 17, A II 7, v. 2363, "Letter from Fletcher to Patch, 2 October 1905"; "Letter from Fletcher to Patch, 10 October 1905."

[48] NAC, RG 17, A II 7, v. 2364, "Letter from Fletcher to Patch, 1 June 1906"; v. 2365, "Letter from Fletcher to Patch, 8 November 1906."

[49] NAC, RG 17, A II 7, v. 2364, "Letter from Fletcher to Patch, 2 May 1906 and 1 June 1906"; v. 2367, "Letter from Fletcher to Patch, 13 December 1907."

letters were considerably more impersonal, not including the personal information, grievances, and concerns that figure so markedly in his correspondence with Ormerod. Fletcher sought information about aphids and Patch, the expert in this area, was the person to contact. It is interesting to note that after the death of James Fletcher in 1908, the Department of Agriculture staff maintained a significant correspondence with Patch well into the early 1930s. As a professional and as the unrivalled expert in the study of aphids, officers of the Department regularly sought her expertise.[50]

To fulfil his responsibilities as an economic entomologist in the Department of Agriculture, James Fletcher had to communicate the information he amassed through his correspondence and research to the clients of the Department: the farmers and other agricultural interests of Canada, including the agricultural colleges and societies in receipt of departmental publications. Appreciating the value of pictures in assisting farmers in the identification of the most common pests, Fletcher employed some photographs but predominantly drawings in his publications. As well, Fletcher published original drawings, not only his own but also many executed by women.

Thus, both Eleanor Ormerod and her sister Georgiana gave Fletcher permission to use their drawings in his publications.[51] In 1898, Miss L. Sullivan of the Division of Entomology, United States Department of Agriculture (USDA), at the request of Dr. Leland Howard, Chief Entomologist, drew *Xylocrius agassizii* for Fletcher. To thank her, he wrote:

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[50] Raymond H. Folger Library, Special Collections, University of Maine, Orono. Edith Patch Papers, Box, 408, folder 65.

[51] NAC, RG 17, A II 7, v. 2334, "Letter from Fletcher to Miss Georgiana Ormerod, 11 September 1891"; v. 2337, "Letter from Fletcher to Ormerod, 4 January 1894."

> I am quite aware that this was official work, but at the same time I am also aware that, as far as my judgement goes, no one can draw insects so naturally as Miss L. Sullivan, of Washington. Therefore, any figure from your pencil is sure to be as good as art can make it. Will you please accept the accompanying little silver spoon, showing the Canadian Arms, as a very trifling memento from a Canadian admirer?[52]

Even more interesting, however, Fletcher directly commissioned drawings from Mrs. Mary Peart of Philadelphia. The letters that he sent her reveal that Fletcher relied also upon her considerable entomological knowledge. Mary Peart was employed as a scientific illustrator for Bowen and Company, a lithographic establishment in Philadelphia that supplied the Smithsonian and other science-oriented organizations with illustrations for their publications.[53] Her work for Fletcher suggests that she also pursued entomological studies independently and did freelance work. In the first letter, Fletcher noted that he had sent an accompanying larva that she was to draw, of which he commented, "(i)f you have a description of the young larva, I should like very much to see it to compare it with my own which does not satisfy me."[54] Outlining the life history of this particular insect and drawing it at its various stages of development, Peart had asked Fletcher to send her different specimens.[55] In 1899, Fletcher wrote to Peart asking her to draw a new species of Thecla:

> I have a rather broken specimen of what appears to be decidedly a new species of Thecla and I should like to get a coloured drawing made of it. (...) The reason of having it redrawn is that some of the little chips which are missing from the wings might be filled in in the drawing, and thus the

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[52] NAC, RG 17, A II 7, v. 2346, "Letter from Fletcher to Miss L. Sullivan, Artist, Division of Entomology, USDA, no date, 1898."
[53] Bonta, 24.
[54] NAC, RG 17, A II 7, v. 2340, "Letter from Fletcher to Peart, 7 November 1895."
[55] NAC, RG 17, A II 7, v. 2341, "Letter from Fletcher to Peart, 12 August 1896"; v. 2343, "Letter from Fletcher to Peart, 11 May 1897, 16 May 1897."

insect appear perfect.[56]

Mary Peart fulfilled an important function for Fletcher, both as an artist and as an entomologist. In addition to supplying entomological information to him, Peart helped to make Fletcher's publications more accessible to Canadian farmers.

Fletcher relied also on the assistance of professionals and of knowledgeable amateurs in his work in economic botany. Until 1890, at which point the work was transferred to the Horticultural Branch, Fletcher undertook investigations in plant pathology, a task that earned him the title of 'father of plant pathology' in Canada.[57] Continuing after 1890 to serve as a broker of information about plant diseases and their remedies, Fletcher satisfied the needs of many growers by providing a plant disease answering service for the whole country.[58] Lacking the proper facilities, books and instruments, Fletcher relied upon the assistance of expert correspondents, both professional and amateur, to provide him with the information that he subsequently circulated to the Canadian farming community.

For example, Eleanor Ormerod and Fletcher discussed in their letters the value of various remedies for different plant diseases. Writing to Ormerod about the destruction of the onion crop by a fungal disease, Fletcher noted that he advised farmers to treat their

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[56] NAC, RG 17, A II 7, v. 2348, "Letter from Fletcher to Peart, 18 December 1899."
[57] Estey, "Entomologists and the Genesis of Plant Pathology in Canada," in *Essays on the Early History of Plant Pathology and Mycology in Canada*, 10; "James Fletcher (1852-1908) and the Genesis of Plant Pathology in Canada," 121.
[58] Estey, "James Fletcher (1852-1908) and the Genesis of Plant Pathology in Canada," 123.

land "with a liberal dose of Gas Lime."[59] Cautioning Fletcher about the possible ill effects of the product, Ormerod noted that it had a favourable reputation with farmers.[60]

Even when he was no longer involved with plant pathological work, Fletcher still continued to receive material that was affected by fungus diseases. This was especially the case for specimens that were doubly afflicted by both insects and disease. Such was the case with a Nova Scotia correspondent who had sent in an apple twig. Fletcher, in turn, sent it to the USDA where Assistant Pathologist Flora Patterson examined it.[61] Having identified the problem, Patterson asked Fletcher to acquire a specimen for her. Willing to comply, Fletcher was nonetheless experiencing difficulty. He informed Patterson, "I have written him (his correspondent) twice and he has only sent me little chips each time, and even then many of these did not show the fungus." He insisted that he would try again to acquire a good specimen, in recognition of the many favours he had received from the USDA, and from Patterson personally.[62]

To satisfactorily undertake the tasks of economic entomologist and botanist, Fletcher realized the importance of establishing a representative collection of the

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[59] NAC, RG 17, A II 7, v. 2330, "Letter from Fletcher to Ormerod, 20 November 1885."
[60] "Letter from Ormerod to Fletcher, 4 February 1886," 195-6.
[61] The reason behind Flora Patterson's appointment in the USDA is interesting. Because of the "glamor of field work in phytopathology, dealing with plant diseases, the field of mycology was pushed into the background." Needing someone to take charge of the mycological herbarium, the USDA wanted someone who would stick with the work. Flora Patterson was recruited from the Gray Herbarium by the head of the Division of Vegetable Pathology, Beverly T. Galloway. Although she did not score among the top three in the civil service exam, after the top man refused the position, Galloway convinced the Civil Service Commission of Patterson's eminent suitability for the position. He stressed that she would be more loyal to the collection. This particular conjunction of circumstances will be discussed again in chapter six. See, Gladys L. Baker, "Women in the U. S. Department of Agriculture," *Agricultural History*, 50, 1(January 1976), 193-4.

injurious and beneficial insects at all their stages of development, and of creating an arboretum, a botanical garden, and a herbarium to illustrate the variety of native and acclimatized flora in Canada. Beginning the herbarium by donating his own collection of three thousand specimens, Fletcher began to collect locally and in the different regions of Canada as time and lecture tours permitted.[63] Moreover, the Department benefited from the generosity of international institutions such as the Royal Gardens at Kew, the USDA, the Arnold Arboretum, Boston, the Imperial Gardens, Tokyo, and Dr. Regel of St. Petersburg, Russia. But to acquire a truly representative collection, Fletcher was also dependent upon the donations of his correspondents. Women played a significant role in this activity in a number of ways.

In addition to sending specimens to Fletcher because they knew that the department was building its collections, women with expertise in particular areas or in particular species were sometimes specifically asked to locate and collect specimens. Thus Fletcher wrote to Caroline G. Soule of Brookline, Massachusetts, to inform her that he had "read with much pleasure many of [her] papers on the results of [her] breeding," and to ask her to collect moth eggs for him.[64] Acknowledgements to Soule indicate that she did collect specimens for Fletcher. To return the favour, he offered her specimens of plants and insects. Fletcher also sent her a paper that he had written and asked her about its usefulness.[65]

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[62] NAC, RG 17, A II 7, v. 2347, "Letter from Fletcher to Patterson, 27 April 1899."
[63] Anstey, 21.
[64] NAC, RG 17, A II 7, v. 2355, "Letter from Fletcher to Soule, 22 April 1902."
[65] NAC, RG 17, A II 7, v. 2355, "Letter from Fletcher to Soule, 21 June 1902, 2 July 1902, and 19 July 1902"; v. 2356, "Letter from Fletcher to Soule, 19 August 1902"; v.

A particularly generous and regular donor of specimens was Catharine Parr Traill. Fletcher expressed his gratitude: "Please accept my sincerest thanks for the grand specimens of Sphaeria Robertsiana. I have never before seen these parasitic fungi although I have often read of them, and I can assure you I appreciate most highly this addition to my collection. The mosses too are most welcome."[66] On another occasion, Fletcher wrote to acknowledge Traill's "kindness in sending the beautiful collection of grasses from Minnie-wa-wa and the Rice Lake Islands. (...) There is one grass in the collection, Aira Flexnora which I was particularly glad to get from an Ontario locality."[67]

The Fletcher-Traill correspondence resembles in many ways the one exchanged between Fletcher and Eleanor Ormerod. It reveals, even more explicitly, the shared attitudes that allowed their collegial relationship to flourish. Thus, seeing in nature evidence of God's love, Fletcher deplored the "irreverent materialistic philosophy" of many modern naturalists. Praising a book by Traill which he had edited, Fletcher wrote: "It is very charming to me to see such love for our beneficent Creator and reverence for His perfect works." Her work corresponded with his own effort to "draw attention to the marvellous and beautiful adaptations of all objects presented to us in the study of nature,

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2357, "Letter from Fletcher to Soule, 5 March 1903"; v. 2358, "Letter from Fletcher to Soule, 28 July 1903."

[66] NAC, MG 29 D 81, v. 1, Traill Family Papers, "Letter from Fletcher to Traill, 25 March 1891." For other donations to the herbarium see, "Letter form Fletcher to Traill, 11 August 1891"; NAC, RG 17, A II 7, v. 2335, "Letter from Fletcher to Traill, 10 May 1892"; NAC, MG 29 D 81, v. 1, "Letter from Fletcher to Traill, 25 July 1892"; "Letter from Fletcher to Traill, 29 July 1894"; "Letter from Fletcher to Traill, 5 November 1894." For a donation to the insect collections, see MG 29 D 81, v. 1, "Letter from Fletcher to Traill, 19 June 1893."

[67] NAC, MG 29 D 81, Traill Family Papers, v. 1, "Letter from Fletcher to Traill, 20 January 1894."

to their required ends and to show us how much we have in this lovely world to make us happy."[68] Indeed, to Fletcher, Traill was an exemplary botanist:

> I wish that a fraction of one percent of the students of plants who call themselves botanists, could use their eyes half as well as you have done. I think indeed your work of describing all the wild plants in your book so accurately that each one could have the name applied to it without doubt, is one of the greatest botanical triumphs which anyone could achieve, and one which I have frequently spoken of to illustrate how one can develop their powers of observation.[69]

Traill's reticence in accepting the designation of botanist, implied by the tone of Fletcher's letter, suggests that she was aware that the science of botany was changing and that the process of professionalization, which was transforming botany into a laboratory science dependent upon experimentation rather than observation, was well underway.

James Fletcher's Correspondence with Natural History Enthusiasts:

To demonstrate the value of his work to the farming community, Fletcher not only published articles and pamphlets but also undertook extensive annual public speaking tours. To generate even more support for the Department of Agriculture and his own work, Fletcher expanded the clientele that could benefit from the science services of the department. An avid naturalist who was firmly convinced of the improving effect of natural history studies, Fletcher became a prominent supporter of the early twentieth century Nature Study Movement. Indeed, he felt that "Nature Study [was] the commonsense of education, whatever may be the chosen vocation of any school boy or

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[68] NAC, MG 29 D 81, Traill Family Papers, v. 1, "Letter from Fletcher to Traill, 22 March 1883."
[69] NAC, MG 29 D 81, Traill Family Papers, v. 1, "Letter from Fletcher to Traill, 29 July 1894."

girl, and this more particularly true of farmers, for their work has to deal directly with objects, a knowledge of which comes within the limits of natural history."[70] As an educational movement, its success was dependent upon reaching the teachers, the majority of whom were women. Joining in the push to educate teachers, Fletcher gave lectures such as "Nature Study, What is It?" before the Toronto Teachers' Association in March of 1903, and "The True Place of Nature Study in Education," before the students of the Macdonald Institute in Guelph, in June of 1905.[71]

Nature study encompassed a particularly ecological focus. As such, it encouraged its adherents to study nature in the field rather than the laboratory and it did not require extensive advanced education to understand. Unlike developments in the life sciences that required specialization, nature study encouraged the study of all aspects of nature through observation. Nature study enthusiasts recorded information about the weather, birds, plants, and insects. The living plant, insect, or animal rather than the dead specimen excited the interest. While certainly not restricted to women, nature study provided the latter with an arena for popular involvement in the sciences of botany and entomology. This was important at a time when women were still only attending universities in limited numbers. Most were not receiving advanced education in the life

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[70] Fletcher "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1901." *Sessional Papers*, 1902, no. 16, 207.

[71] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1903." *Sessional Papers*, 1904, no. 16, 165; Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year1905," *Sessional Papers*, 1906, no. 16 160.

sciences, and most continued to be self-taught amateur participants in the nature study movement.

Emboldened by the public relations work of James Fletcher, amateur female natural history enthusiasts submitted specimens to him. They sent in specimens simply because they knew that the Department of Agriculture was seeking to build up its collections. Thus, for example, Miss Alice Williams of Victoria, British Columbia, donated a collection of seeds of wild flowers of Vancouver Island in 1888. In 1889, with Miss Woods, she donated a collection of bulbs and seeds from the interior of British Columbia. In 1907 and 1909, Mrs. D. W. Stewart of Renfrew, Ontario, donated specimens of *Medicago faleata*.[72] Submitting specimens for identification, other women collectors often instructed Fletcher to keep material that he found interesting. Moreover, these women were also willing to search out extra specimens if Fletcher found a specimen of interest in a collection that he had been asked to return.[73]

Even those collections that included specimens already fully represented in the Department contained valued information. As a naturalist, Fletcher was interested in

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[72] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1888." *Sessional Papers*, 1889, no. 5b, 47; "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1889." *Sessional Papers*, 1890, no. 6c, 60; "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1907." *Sessional Papers*, 1908, no. 16, 202; Hans Gussow, "Report of the Dominion Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1908." *Sessional Papers*, 1909, no. 16, 64. Following the format for annual reports established by James Fletcher, Dominion Botanist Hans Gussow recorded the receipt of donations. He did not do this after this first report.

[73] NAC, RG 17, A II 7, v. 2343, "Letter from Fletcher to Mrs. A. S. Hurd, 27 March 1897"; v. 2349, "Letter from Fletcher to Mrs. S. A. Ridley, n.d."; v. 2345, "Letter from Fletcher to Miss B. Hargrave, 14 June 1898."

biogeography. Those individuals who sent in properly labelled specimens, recording date and location of collection, were dispensing information which, through his scientific knowledge, became scientifically relevant. Fletcher wrote in his annual report: "Through these collections valuable additional information is acquired as to the known distribution of our native insects and plants, lists of the names, localities and dates of all specimens received being carefully kept."[74] Writing of the correspondence received, Fletcher noted that the valuable data contained in the letters, "although not used now are carefully preserved, and will be made use of, when the various subjects to which they refer, are treated of in full."[75]

This final group of women enjoyed a distinct relationship with Fletcher, one in which he provided information solicited by them. Deferential in manner, they repeatedly assured Fletcher of their desire to assist him in any way that he might suggest. These natural history enthusiasts did not seem to realize that in submitting specimens they were playing an important role in helping Fletcher undertake his duties. Thus, Fletcher explained to Miss Edythe Copp: "I hope you will make every possible use of my offer to name plants for you next spring remembering that the obligation is by no means one-sided. I keep records of the localities and dates of all plants sent and in this way get much information of value to me."[76]

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[74] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1896." *Sessional Papers*, 1897, no. 8c, 223.

[75] Fletcher, "Report of the Entomologist and Botanist," in Canada. "Report of the Experimental Farms Branch for the calendar year 1894." *Sessional Papers*, 1895, no. 8c, 183.

[76] NAC, RG 17, A II 7, v. 2342, "Letter from Fletcher to Copp, 22 October 1896."

The deferential tone of the letters written by these women can be attributed to the fact that, overall, women of this period were deferential to men.[77] Also, these women may have doubted their own ability. Finally, these women, as "botanizers," a term coined by historian Elizabeth B. Keeney, probably felt removed from the professional scientific community.[78] Perhaps viewing themselves as "amateurs," these women did not expect their efforts to have value in the eyes of professionals. Despite Fletcher's repeated validation of their efforts, they continually doubted their reception.

3.3 Conclusion: Women in Science during the Early Stages of the Professionalization of Science in the Canadian Federal Department of Agriculture, 1884 to 1908

The incorporation of natural history into the Department of Agriculture was a step in the professionalization of the life sciences in the federal government and Canada. In this instance, professionalization did not lead to the immediate exclusion of women.[79] Because the natural history practised within the Department of Agriculture maintained

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[77] Sally Gregory Kohlstedt, in her analysis of letters sent to botanists Asa Gray, John Torrey and William Darlington in the 1840s and 1850s, and Susan Drain, in her analysis of letters exchanged between marine botanist Margaret Gatty and Dr. W. H. Harvey, note the same trends. See, Kohlstedt, "In from the Periphery: American Women in Science, 1830-1880," in *History of Women in the United States, Professional and White-Collar Employment, Part I*, Nancy F. Cott, ed., Munich: K. G. Saur, 1993, 19-22, and Drain, "Marine Botany in the Nineteenth Century," 6-11.

[78] Elizabeth B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America*, Chapel Hill & London: The University of North Carolina Press, 1992, 1.

[79] Science is not the only discipline in which this trend has been traced. A similar process has affected history. See, for example, Alison Prentice and Beverly Boutilier, "Introduction," in *Creating Historical Memory: English Canadian Women and the Work of History*, Beverly Boutilier and Alison Prentice, eds., Vancouver: University of British Columbia Press, 1997, 4. See also, Donald Wright, "Gender and the Professionalization of History in English Canada before 1960," *Canadian Historical Review*, 81, 1(March 2000), 31-3.

many of the characteristics of an amateur science, women who had enjoyed a long history of participation in the natural history tradition found that their unpaid contributions were valued, even solicited at that time.

In addition to recognizing the contributions of this important group of amateur women scientists, this analysis also promotes a more nuanced understanding of the changes in science that occurred upon its institutionalization in the federal Department of Agriculture. For example, while sociologist Robert A. Stebbins states that mission-oriented science, such as that practised in government and industry, creates a divide between amateurs and formally trained scientists, this chapter suggests a somewhat different scenario.[80] Unquestionably mission-oriented, Dominion Entomologist and Botanist James Fletcher accepted the assistance of professionals and amateurs outside of the Department of Agriculture because he was himself an amateur. Formally trained scientists eventually broke with amateurs for different reasons, closely linked to their view of themselves as professionals practising professional science. As we shall see, in this environment new, paid occupations were conceived for women in science in the federal Department of Agriculture. As paid employees, these women were subject, at the same time, to the rules and regulations of the federal civil service.

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[80] Stebbins, *Amateurs, Professionals, and Serious Leisure*, 85.

Chapter 4

Third Class Citizens? Women in the Canadian Federal Civil Service, 1907 to 1921

We're in the same Department of Stagnation,
And at our mutual desk our seats are near.
We draw a mutual stipend of starvation,
Since it has been the same for many a year.
We reach our "maximum", and then, sans luck,
Sans looks, sans pull, sans all save sense—we stuck.
Virginia Gray—"At 'Thirty Love' Retire"[1]

4.1 The Canadian Federal Civil Service: A Masculine Organizational Culture

The Canadian federal Department of Agriculture employed women in science to undertake a number of different tasks in a number of different disciplines. Despite their different responsibilities, these women nonetheless shared one important characteristic: they were all employees of the federal civil service. This kind of employment was pivotal in shaping their experiences in science in the Department. Just as factors internal to science determined the type of work in science that women could perform, factors internal to the civil service determined the recognition that they received in terms of salary, rank, and advancement opportunities. One factor above all in the civil service determined the conditions of women's employment in science in the Department of Agriculture: its masculine organizational culture. This culture, we

[1] Virginia Gray, "At 'Thirty Love' Retire, fourth stanza," *The Civilian*, 6, 21(6 February 1914), 513.

will argue, grew in strength as the drive to reform the civil service intensified in the first decade of the twentieth century.

A masculine organizational culture promotes the male work-role model. According to this model, men are socialized to expect to work all their lives, to gain personal satisfaction and rewards from, and to support dependants with this work.[2] The resulting organizational framework consists of a hierarchy that permits the long-term male employee to satisfy the expectations generated by his socialization. Beginning at the bottom of the hierarchy, he gradually moves up, achieving greater personal and financial rewards as he progresses. Because men are not socialized to work with women and women are not socialized to fit this model, women are considered problematic when they enter organizations with a masculine culture. The attitudes upon which such a culture is based construct women, as a group, as ineligible to function within it. These attitudes, in turn, shape the structure of the organization, a structure that strives to restrict women's opportunities within it.[3]

While the masculine organizational culture of the federal civil service predated 1907, it was never so clearly expressed before this date because women had not entered the service in sufficiently large numbers. The Royal Commissions of 1881 and 1892, established to investigate the federal civil service, did acknowledge the presence of women and state that their

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[2] See, E. D. Nelson and Barrie W. Robinson, *Gender in Canada*, Scarborough: Prentice Hall Allyn and Bacon, 1999, 236-9; Patricia Kosinar, "Socialization and Self-Esteem: Women in Management," in *Outsiders on the Inside: Women and Organizations*, Barbara L. Forisha and Barbara L. Goldman, eds., Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1981, 34-6; Joyce Antler, *The Educated Woman and Professionalization: The Struggle for a New Female Identity 1890-1920*, New York and London: Garland Publishing, Inc., 1987, 408.

[3] Rosemary Crompton, "Gender, Status and Professionalism," *Sociology*, 21, 3(August 1987), 423.

numbers had to be carefully controlled and restricted. In 1881, Commissioners suggested that this objective could be achieved by employing only limited numbers of women, and by confining those who were hired to sex-segregated work in a sex-segregated division.[4] The Royal Commission of 1892 recognized that the numbers of women had continued to grow. Because hierarchical segregation had been successfully implemented, however, the Commissioners and their witnesses did not consider the presence of women problematic. Indeed, the majority of the men felt that women were excellent clerks who could be employed throughout their departments.[5]

By 1907, the numbers of women in the civil service had reached a critical mass that threatened the integrity of the prevailing masculine organizational culture by jeopardizing the maintenance of the hierarchical segregation of women. Since the civil service was increasingly bureaucratizating in the late nineteenth and early twentieth centuries, these numbers were expected to grow. Bureaucratization led to the creation of poorly paid positions in which the work was routine and which offered little or no opportunity for advancement. It thus created spaces that were believed to be suited to women. As well, the civil service was reforming in an attempt to improve its public image. Although patronage had long been considered the bane of the civil service, the rising numbers of women soon rivalled it as a serious threat to the prestige of the civil service. The strategies employed to reconcile the need to hire women and the desire to restrict them, begun in 1907 and culminating in 1921, clearly reveal the strength of the

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[4] Canada. "First Report of the Civil Service Commission, with Appendices." *Sessional Papers*, 1881, no. 113, 29, 319.

[5] Only Antoine Gobeil, Deputy Minister of Public Works, espoused a preference for men because of problems involved in the discipline of women. See, Canada. "Report of the Royal Commissioners Appointed to Enquire into Certain Matters Relating to the Civil

masculine organizational culture of the federal civil service.

Beginning with the report of the Royal Commission of 1907, the chapter will explore the clearly enunciated attitudes of senior civil servants about women and their work. How were women perceived? Is any indication given that women were employed to undertake a variety of different tasks? The chapter will then analyze the content and the implementation of legislation enacted to formalize the conditions of employment in the federal civil service. How did the *Civil Service Amendment Act, 1908* restrict women's employment and advancement? How was existing and new legislation employed during the First World War to maximize the use of women while minimizing their opportunities for advancement? In what way did post-war legislation attempt to maintain these conditions? Equally important, how did women throughout this period react to the legislation and to their prescribed position in the federal civil service?

As we shall see, the federal civil service viewed women, regardless of task and responsibility, as a monolithic group. Because of their tenacious commitment to the dominant masculine organizational culture, leading federal civil servants wanted to maintain a strict hierarchical segregation of the sexes. Women were to be restricted to the lowest division of the service, the third division; a gender-based group of third class citizens was thus created.

Service of Canada, 1892." *Sessional Papers*, 1892, no. 16c, 467

4.2 The Royal Commission of 1907: The Prevailing Attitudes of a Masculine Organizational Culture

The Laurier government established the 1907 Royal Commission in response to charges levelled by the Borden-led opposition of serious inefficiency and wrong doing in the civil service. The Commissioners were instructed to investigate the general operation of the *Civil Service Act*, the classification of the service, promotions, temporary employment, salaries, discipline, and "any other matter relative to the service which in the opinion of the Commissioners requires consideration."[6] Not only investigating a civil service in which patronage was the personnel management policy of choice, the Commissioners were also examining a service in which the numbers of women had grown to significant proportions. They ended up conflating these two problematic situations.

Arguing that patronage led to the employment of women, the Commissioners maintained that women were hired to fill poorly paid positions that had been created to complete work left unfinished by incompetent patronage appointees. Accepting annual salaries of $500, more than they could earn in the private sector[7] but less than starting salaries for men, women instead of men entered the lower ranks of the service.[8] This, in turn,

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[6] P.C. 1109/1907, 8 May 1907. For more information about the establishment of this Royal Commission see, Robert MacGregor Dawson, *The Civil Service of Canada*, London: Oxford University Press, 1929, 74; Bill Doherty, *Slaves of the Lamp: A History of the Federal Civil Service Organizations, 1865-1924*, Victoria: Orca Book Publishing, 1991, 31-4; J. E. Hodgetts, *The Biography of an Institution: The Civil Service Commission of Canada, 1908-1967*, Montreal and London: McGill-Queen's University Press, 1972, 19.

[7] Evidence of W.J. Gerald, Deputy Minister of Inland Revenue, in Canada. "Report of the Royal Commission on the Civil Service." *Sessional Papers*, 1908, no. 29a, 293.

[8] "Report of the Royal Commission on the Civil Service," 14.

undermined the male work-role model because women could not be incorporated into it. Arguing that women, as a whole, lacked discipline and dedication and were, for this and other reasons, ineligible for promotion, the Commissioners and their witnesses provide a particularly clear enunciation of the attitudes prevalent in a strongly masculine organizational culture.

Not simply a punitive term, discipline also refers to the whole gamut of social interactions and reactions centred on self-control, orderliness and efficiency within the workplace. Bureaucratic standards implicitly stated that employees had to be methodical, prudent, reliable, conforming, and impersonal. Men were accustomed to these particular forms of behaviour in the federal civil service. In contrast, not having been socialized to understand this work norm, women, according to men, transgressed it.[9] They brought a level of emotion to the bureaucratic organization that was foreign to men in their work experiences.[10] The men felt that this feminine behaviour created considerable challenges for them, both as employers and as colleagues, as the following exchange illustrates:

> By Mr. Fyshe:
> Q. Do they (women) agree with each other? Are their relations harmonious?
> —A. They agree in a way, but not in the way men do. Their differences are very petty. There are little frictions. There are small things that I suppose appear large to them but that you would never find causing trouble among men or that you would not possibly put up with in men.
> By the Chairman:

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[9] See, Barbara L. Forisha, "The Inside and the Outsider: Women in Organizations," in *Outsiders on the Inside*, 13; Kosinar, "Socialization and Self-Esteem," 34-5; Carolle Simard, *L'adminstration contre les femmes: la reproduction des différences sexuelles dans la fonction publique canadienne*, Montréal: Boréal, 1983, 41, 57-8; Andrew Macphail, "On Certain Aspects of Feminism," *University Magazine*, xiii (February 1914), 79-91, reproduced in *The Proper Sphere: Woman's Place in Canadian Society*, Ramsay Cook and Wendy Mitchinson, eds., Toronto: Oxford University Press, 1976, 309.

[10] See, National Archives of Canada (NAC), RG 32, v. 854, Archibald Report, Ch. 1, Sex Roles and Work Roles, Rough Draft and Footnotes, pp. 4-5; Forisha, "The Inside and the Outsider," 13.

> Q. Such as a peg to hang their hats on? or things of that kind?
> —A. There are little things that are very annoying sometimes, but you cannot treat ladies in the same way that you treat men when these things occur.[11]

Unable to ignore women, male supervisors also felt that they were unable to reprimand them. To complicate matters further, the Commissioners and their witnesses insisted that women claimed not only the rights of men but also the privileges of their own sex.[12] They believed that women wanted to be treated the same as men—only more so.[13]

Women were also a liability because of their perceived lack of dedication to their work and to the service. While men increasingly viewed employment in the service as a prestigious life-long career, the Commissioners and their witnesses maintained that women entered the service for a few years before marriage upon which event, it was commonly understood, they resigned.[14] Moreover, this focus upon marriage affected the work performed by women, even before the banns were read:

> When girls enter first at the age of seventeen or eighteen, or it may be from eighteen to twenty-three or twenty-four, they are inspired with the idea either of getting married or of something happening that they can get out of the service. They do not usually take the same interest in their duties that a man does who feels that it is his life's work and he is going to remain at it.[15]

High turnover of staff hindered the efforts to improve the image of the federal civil service.

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[11] Evidence of John Fraser, Auditor General in "Report of the Royal Commission on the Civil Service," 1286.
[12] Evidence of Joseph Pope, Under Secretary of State in "Report of the Royal Commission on the Civil Service," 42.
[13] "Treat women the same as men--only more so," is a slogan suggested by C. W. Chasins for male managers of female employees. See, Chasins, "Advice for the Man who Supervises Women," *Supervisory Management*, (June 1968), 7.
[14] Pope, in "Report of the Royal Commission on the Civil Service," 42. See also NAC, RG 17, v. 1328, file 265052, "Letter from Secretary of State to T. A. Crerar, Minister of Agriculture, 11 December 1918."
[15] W. W. Cory, Deputy Minister of the Interior, in "Report of the Royal Commission on the

Women were guilty not only because they left their jobs, but also because they held positions that prevented men from beginning long-term careers in the service. Although, in exceptional cases, women did regard employment in the civil service as their life work, this did not remove the problem. Women were considered to be ineligible for promotion. In effect, the promotion of women to positions of authority and responsibility was inconceivable to both the Commissioners and their witnesses for several reasons. First, they argued that women were incapable of managing men:

> By Mr. Fyshe:
> Q. And they are not accustomed to the idea of ruling?
> --A. No, they cannot take charge. I have, I think, 30 on the staff of my office and only one or two could do so.
> Q. They would not develop the critical faculty half as fast as men?
> --A. No, and they will never be competent to take charge of men.[16]

No reference is made to the fact that men were unwilling to work under the 'rule' of a woman, yet this is pivotal. Women were capable of making decisions, but this was meaningless if men would not act upon them.[17]

Second, the Commissioners and their witnesses maintained that after a period of ten or fifteen years of employment, a woman, "in the majority of cases, while she may do the work assigned to her carefully and well, she does so to a certain extent in a perfunctory manner."[18] No connection was made between this perfunctory performance of work and the boredom caused by the repetition of the same task over such a long period.

Third, as a consequence of the first and second factors, women were just not worth as

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Civil Service," 455.
[16] John Fraser, Auditor General, in "Report of the Royal Commission on the Civil Service," 1285.
[17] NAC, RG 32, v. 854, Archibald Report, "Sex and the Public Service," III-20.

much as men. Since skill level was equated with wages, women were less valuable than men and they were not 'promotable'[19]:

> --A. As far as our service is concerned, I am quite satisfied that $1000 is all that any woman can earn.
> Q. There are some very able women?
> --A. There are some very able women, but by the time a woman passes through the third-class and has reached the top of the second class, she has arrived at the place in our service where, in my opinion, she is performing as useful duties as are usually assigned to women, and is, therefore, drawing as much salary as she earns.[20]

The Commissioners finally concluded: "it can hardly be admitted yet that the work devolving on the departments can be carried on with a staff composed entirely of women."[21]

In its discussion, the Royal Commission of 1907 treats women as a monolithic group that was not only potentially disruptive of the service, but that was currently causing untold damage. As a result, some of its recommendations were aimed at reducing the "redundance of women in the lower ranks of the service." First, the Commissioners suggested that the minimum salary for entry positions to the service be raised to $700 per annum.[22] Second, they recommended the replacement of patronage with the merit principle.

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[18] Cory, in "Report of the Royal Commission on the Civil Service," 455.
[19] Similar thinking structured women's experiences in other forms of white-collar employment. See, for example, Shirley Tillotson, "'We May All Soon be First-Class Men': Gender and Skill in Canada's Early Twentieth Century Urban Telegraph Industry," in *Gender and History in Canada*, Joy Parr and Mark Rosenfeld, eds., Toronto: Copp Clark Ltd., 1996, 238.
[20] Cory, 455. In this statement, we see how confusion about the motives for promotion can arise. Is promotion granted as a matter of course, because of merit, or simply to grant higher salaries? This confusion continued to plague the civil service throughout the period under study.
[21] "Report of the Royal Commission on the Civil Service," 14.
[22] Ibid, 17.

The implementation of these recommendations was expected to encourage young men to enter the civil service. This, in turn, would strengthen the masculine organizational culture of the civil service. However, these recommendations did not take into account the bureaucratization of the civil service that created employment seemingly suitable for women. How could bureaucratization be reconciled with efforts toward enhancing the status of male civil servants? As we shall see, the legislation that was enacted in the years following the release of the 1907 report safeguarded, in the federal civil service, the hierarchical sexual division of labour which responded to both of these concerns and which had been promoted since 1881.

4.3 Civil Service Legislation and Its Implementation: 1908 to 1921

Drafted in response to the Royal Commission of 1907, the *Civil Service Amendment Act, 1908*, introduced the merit principle to the Inside Service.[23] Despite this improvement, however, the legislation was nonetheless met with subdued optimism.[24] Discontent was expressed not simply because salaries had not been improved, but also because the growing

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[23] *Civil Service Amendment Act, 1908*, in Canada. "Civil Service List. Appendix No. 4." *Sessional Papers*, 1909, no. 30. That the merit principle applied only to the Inside Service was perceived as a weakness. That it did only cover the Inside Service, essentially, that part of the federal civil service based in Ottawa, however, accounts for the fact that the majority of women in the government employ worked in Ottawa. Not only were women needed but also the merit principle gave them greater access to low-level appointments in the Inside Service than to those in the Outside Service. See, Archibald, *Sex in the Public Service*, 14-6.

[24] Douglas Owram, *The Government Generation: Canadian Intellectuals and the State 1900-45*, Toronto: University of Toronto Press, 1986, 68-9.

presence of women had not been addressed.[25] Suggesting that this omission was due to a lack of courage on the part of the legislators,[26] male opinion about the employment of women was reiterated. Common sense dictated that "women must be content to remain in the minor ranks until such time as they (were) prepared to renounce all ambitions as to filling other stations in life, and to fit themselves for the occupancy of executive positions."[27] Because the legislation did not enshrine this dictum, men feared that women would gain access to all positions in the federal civil service. The fears of men, however, were unfounded.

Underestimated by the male civil servants was the power of silence in not only maintaining the status quo but also in strengthening the position of men.[28] Omitting explicit discriminatory attitudes towards women disarmed criticism.[29] As well, to clearly define and prescribe women's position in the service would have restricted the possibility of manoeuvring the provisions of the legislation to suit different situations.[30] In sum, the legislation was

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[25] Women were equally piqued by the absence of specific mention of their employment in the legislation. While some thought that this meant that they were to receive equal treatment under the law, the more discerning, as we shall see, recognized that, in actual fact, the position of women was weakened.

[26] Anonymous, "The New Era: A Review With Comments of the New Civil Service Measure," *The Civilian*, 1, 3(5 June 1908), 41.

[27] "The New Era," 41.

[28] Marlene Kadar writes that the "way we define sexual harassment is indicative of the kind of battle that we intend to wage against it." Lack of definition can indicate a more subtle battle, especially where explicit definition is more harmful than not. See, Kadar, "Sexual Harassment as a Form of Social Control," in *Gender and Society: Creating a Canadian Women's Sociology*, Arlene Tigar McLaren, ed., Toronto: Copp Clark Pitman, Ltd., 1988, 338.

[29] Marjorie Peacock, "Sex Disqualification," *Library World*, 22(February 1920), 344, reprinted in *The Role of Women in Librarianship 1876-1976: The Entry, Advancement, and Struggle for Equalization in One Profession*, Kathleen Weibel, Kathleen M. Heim, and Dianne J. Ellsworth, eds, Oryx Press, 1979, 81.

[30] To prohibit women's employment in the civil service was impractical because women were needed and had proven themselves competent. Similarly, the legislation could not

implemented in such a way as to create and perpetuate a hierarchical sexual division of labour. This was ensured by the way in which merit was measured in the federal civil service and by the fact that responsibility for the implementation of the *Civil Service Amendment Act, 1908* was placed in the hands of a male-run body, the Civil Service Commission (CSC).

As dictated by the 1908 legislation, merit was measured in two distinct ways in the federal civil service. First, examinations evaluated merit to determine appointments to the civil service and promotions from the third division to the second division. In contrast, promotions within the second and to the first divisions were dependent upon the evaluation of superior officers. Experience of the merit principle was a function of an individual's placement in the federal civil service. While seemingly straightforward, even male civil servants and department heads did not share a common interpretation of what constituted "merit," nor to whom it would apply.[31] Women's experience of the merit principle was particularly problematic.

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prohibit their promotion because the illusion of neutrality and equality was important to maintaining the morale of the women. Indeed, such an illusion induced women to blame themselves for their failure to progress in the service. Joyce Antler makes this observation in her analysis of women's professional employment. See, Antler, *The Educated Woman and Professionalization*, 380.

[31] Striving for careers in the civil service, the men of the civil service felt that length of service was a key indicator of merit. See, *Memorial of the Civil Service Association of Ottawa, 1907*, 3; S. Encel, *Equality and Authority: A Study of Class, Status and Power in Australia*, Melbourne: F. W. Cheshire Ltd., 1970, 245, 249; François Gazier, *La fonction publique dans le monde*, Bibliotheque de l'institut international d'administration publique, Cher: Editions Cujas, 1992, 141; Robert T. Golembiewski, and Michael Cohen, eds., *People in Public Service: A Reader in Public Personnel Administration*, 2nd ed., Itasca, Il: F. E. Peacock Publisher, Inc., 1976, 11; R. H. Pear, "United States," in *Specialists and Generalists: A Comparative Study of the Professional Civil Servant at Home and Abroad*, F. F. Ridley, ed., London: George Allen and Unwin, 1968, 175-176. Their employers, however, felt that seniority and merit did not go hand in hand. Long service would actually dull civil servants and so they preferred lateral recruitment, recruitment from outside the service. See, Charles W. Eliot, "The Theory and Practice of Promotion," *The Civilian*, 3, 23(March 10, 1911), 601.

Because the CSC determined initial placement in the federal civil service as well as subsequent advancement, the position of women was dependent upon the Commissioner's attitudes about the employment of women.

Like the majority of the men in the service, the Commissioners, Dr. Adam Shortt and Dr. Michel G. LaRochelle, as well as their secretary, William Foran, all appointed in 1908, did not envision change in the role of women in the civil service.[32] If there was some confusion about their attitudes toward women, it was quickly eradicated by the "First Annual Report of the Civil Service Commission of Canada." Arguing that the promotion of women to the Second Division was "insuperable," the Commissioners also maintained that women were unsuited to many positions in the Third Division. The weight of large registers, women's inability to travel long distances from Ottawa, and the "many special features connected with work or location of individual offices (rendered) the employment of women, to a large extent, impracticable."[33] These attitudes were reflected in the way in which the CSC directed the

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[32] Adam Shortt, for example, was concerned with the quality of women hired by the civil service. Knowing that he gave unflinching moral support to his future wife, Elizabeth Smith, during the most difficult time of her medical training in 1882-83, and that she worked after their marriage in 1886, we surmise that Shortt subscribed to the 'great woman' school of thought. Only superior women could progress in the service and he felt that "only about one in a thousand" of such women existed. He recommended that the government raise standards to restrict the entry of purely average women into the service, but not to stop the employment of women altogether. See, Veronica Strong-Boag, ed., *A Woman with a Purpose: The Diaries of Elizabeth Smith 1872-1884*, Toronto: University of Toronto Press, 1980, xxix; Adam Shortt, "Address of Professor Shortt on the Civil Service at Victoria, B.C.," *The Civilian*, 2, 8 (31 August 1909), 225; "Address by Commissioner Shortt. Explanation and Defence of Civil Service Commission," *The Civilian*, 7, 24(19 March 1915), 692; S. E. D. Shortt, "Adam Shortt: The Emergence of the Social Scientist," Chapter 6 in *The Search for an Ideal: Six Canadian Intellectuals and their Convictions in an Age of Transition*, Toronto: University of Toronto Press, 1976, 95-116; Owram, *The Government Generation*, 69-73.

[33] Canada. "First Annual Report of the Civil Service Commission of Canada, September 1,

reorganization of the federal civil service.[34]

This reorganization led to the creation of three divisions. In the first division, divided into sub-divisions A and B, were placed those individuals doing work equivalent to that of deputy heads of departments, as well as administrative, technical, and executive officers. Those individuals undertaking work of a similar character but of less importance and responsibility were placed in the second division, also divided into sub-divisions A and B. Last, the act specified that the "Third Division shall consist of the other clerks in the Service whose duties are copying and routine work, under direct supervision, and of less importance than that of the second division."[35] The legislation was gender-neutral. As well, it did not state that the work undertaken in any one division was more meritorious than that performed in any other division.

However, the directives of the CSC contained in the "*MEMORANDUM for the guidance of Deputy Heads in the Organization of Departments under Section 8 of the Civil Service Amendment Act, 1908*" fostered gender bias. This is particularly evident in the instructions for determining the placement of staff in category A of the third division, or in the next highest rank, category B of the second division. Both of these categories were intended for staff performing work under direct supervision and which required no initiative.[36] Two

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1908 to August 31, 1909." *Sessional Papers*, 1910, no. 31, 17.

[34] As sociologist Barbara Reskin comments, "(d)ominant groups remain privileged because they write the rules, and the rules they write 'enable them to continue to write the rules.'" See, Barbara F. Reskin, "Bringing the Men Back In: Sex Differentiation and the Devaluation of Women's Work," *Gender and Society*, 2, 1(March 1988), 60.

[35] Canada. "Civil Service List, Appendix No. 4, *Civil Service Amendment Act, 1908*." *Sessional Papers*, 1909, no. 30, 288.

[36] NAC, RG 17, v. 2761, file 199279, "MEMORANDUM for the guidance of Deputy Heads in the Organization of Departments under Section 8 of the Civil Service Amendment Act, 1908," n.d. From its position in the file, we suggest that this document was released in September of 1908. Although no author is given, this document thus

significant factors differentiated 3A from 2B. First, those placed in 3A were supposed to be performing routine work. Second, those placed in 2B, unlike those in 3A, were supposed to be undertaking work that would prepare them for promotion to the next highest rank.

Both of these factors ensured that women would be placed in the third division. Because women were considered to be ideally suited to the performance of routine work, any work that they did was perceived as routine.[37] Those high-ranking men who wished to sustain the masculine organizational culture of the civil service placed men in B of the second division. By extension, they placed those individuals that they did not wish to promote, that is women, in the third division.

The CSC actively promoted this practice. Although the legislation gave all persons the right to attend the examinations for promotion from the third to the second divisions, the CSC devised three ways to restrict women's access to the second division. First, in 1909, it specified that in their requests for staff, department heads could specify the sex of the successful applicant if it had a bearing on the performance of the work.[38] Second, the Commissioners claimed to consider both the theoretical and practical qualifications demanded by positions; the

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appears to be one of the first edicts issued by the CSC, appointed in September 1908. For a brief discussion of the development of this impenetrable division between the lower and upper ranks see, Dawson, *The Civil service of Canada*, 156-8.

[37] Shirley Dex, *The Sexual Division of Work: Conceptual Revolutions in the Social Sciences*, New York: St. Martin's Press, 1985, 99-104; Jane Lewis, *Women in England 1870-1950: Sexual Divisions and Social Change*, Bloomington: Indiana University Press, 1984, 171; Joy Parr, *Disaggregating the Sexual Division of Labour: A Transatlantic Study*, Queen's Papers in Industrial Relations, 1985-7, Kingston: Industrial Relations Centre, 1987, 29; Anne Phillips and Barbara Taylor, "Sex and Skill: Notes Towards a Feminist Economics," *Feminist Review*, 6(1980), 79-80.

[38] "First Annual Report of the Civil Service Commission of Canada," 17.

obscure meaning of the former condition permitted discrimination against women.[39] Third, women who successfully completed the promotion exam were retained in category B of the third division until such time as positions came open in the second division.[40] All three tactics effectively ensured that women would, in most instances, not be sought for positions in the second division.

The third division was conceived as a place for an unskilled or semi-skilled army of clerks.[41] Because it was routine, the work within it was described in such a manner as to negate the existence of merit.[42] Women's experience of the merit principle elicited comment from both men and women. "Frea Cannaiad", the male author of the "Woman's Column" of *The Civilian*, suggested that merit ought to be measured differently for women because of the nature of their work:

> Those whose work is varied in nature rarely take time to consider just what it means to a woman to perform the same act, in the same way, every minute of every hour, of every day—nothing but a wearing, ceaseless monotony, year after year. And yet, in many cases, it is work which has to be done, and can only be given to people who are thoroughly reliable. If a high standard of education is not involved, a high standard of character is.[43]

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[39] Canada. "Second Annual Report of the Civil Service Commission of Canada for the period from September 1, 1909, to August 31, 1910." *Sessional Papers*, 1910, no. 32, 16.

[40] "The inclusion of a few women in the list of candidates for the Second Division examination when none were advertised for, is explained by the fact that the law permits of those who have passed the Second Division examination being employed in the Third Division if vacancies are available." See, Canada. "Fourth Annual Report of the Civil Service Commission of Canada for the period from September 1, 1911 to August 31, 1912." *Sessional Papers*, 1912, no. 32, xi.

[41] John Porter, *The Vertical Mosaic: An Analysis of Social Class and Power in Canada*, Toronto: University of Toronto Press, 1966, 51.

[42] See, Simard, *L'administation contre les femmes*, 35-9; Tillotson, "'We May All Soon be First-Class Men'," 236; "From a Woman's Standpoint," *The Civilian*, 2, 16(19 November 1909), 132.

[43] "From a Woman's Standpoint," *The Civilian*, 2, 16(19 November 1909), 132. Until the

Although a man wrote the "Woman's Column" from 1908 to 1913, women submitted letters to the editor of *The Civilian* that reveal that they were conscious of the obstacles that they faced in the federal civil service. They recognized that men in charge of implementing the legislation had constructed a measurement tool that did not deal with women in the same way as it did with men. The result was the maintenance of a hierarchy that had negative implications for women. One astute woman remarked:

> Gentlemen, you hold the trump cards at present, and your will is paramount. You may exclude women entirely, thus demonstrating your superiority and incidentally adding to the public expense; or you may go on as you have been very generally doing, throwing women, efficient and inefficient alike, into a hode-podge class – a sort of limbo for lost souls.[44]

Another woman, stating that she had hoped that it was "intellect and the application of it that [was] being paid for, and not sex," sadly concluded that she knew that it was not true.[45]

By 1911, only 17 women out of the 650 employed in Ottawa, that is 2.6 percent, had received a promotion to B of the Second Division, with a maximum salary of $1,600.[46] One woman had been promoted to 2A with a maximum salary of $2,100.[47] If the men of the service, particularly those who found themselves in the third division, were concerned that some women had been promoted to 2B, they were aghast that a woman had been promoted to

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formation of the Women's Branch in 1913, a man wrote the so-called 'Woman's Column'.

[44] Certain Ladies of the Service, "Every Shield has Two Sides," *The Civilian*, 1, 4(19 June 1908), 57.

[45] Business Girl, "Word From the Women. To the Editors of *The Civilian*," *The Civilian*, 4, 18(29 December 1911), 471.

[46] The identity of these seventeen women is not revealed but Bill Doherty credits their promotion to the pleas of senior officials who managed to convince the CSC that advancement was warranted because of special private secretarial duties. See, Doherty, *Slaves of the Lamp*, 91.

[47] "The Commission and the Service," *The Civilian*, 4, 16(December 1911), 417. In 1911, women constituted 8.1 percent of the total civil service staff, Inside and Outside Services.

2A. This one woman may have been worthy, as the presence of an exceptional woman was always a possibility, but the male civil servants felt that the CSC had changed the unwritten rules of the service. The consequences were clear: "Now, however, every lady in the service would seem to have a divine right to aspire at least to Div. 2A. and the Commissioners can hardly refuse to sign a certificate for such aspirants, seeing that they themselves have established the precedent."[48] This was never the case, nor would it ever be, despite the best efforts of women to bring just such a change.

Unhappy about the obstacles they faced in the civil service, women began to actively seek to improve their position by becoming, in 1909, elected members of departmental committees to the executive of the Civil Service Association (CSA). Unfortunately, little information exists about the work they performed. As there were only four of them out of approximately forty, their influence was probably minimal.[49] Moreover, once permitted election to special advisory committees, they were relegated to those committees that were easily understood to be specifically of women's concern. For example, they became responsible for much of the legwork involved with the investigations of the sanitation committee.

While issues of health were important, considering the dangerous typhoid epidemics that struck Ottawa yearly, women were equally concerned with issues of salaries, promotions, superannuation, and other conditions of employment in the civil service. But women's input

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See, Archibald, 15.

[48] Anonymous, "The Commission and the Service," *The Civilian*, 4, 16(December 1911), 417.

[49] Misses M. Leyden and M. Broden served on an advisory committee of eight from the Department of Agriculture, Miss L.M. Whitton was one of six committee members from Indian Affairs and Miss E. Snelling was elected to serve with four men on the labour committee. See, Doherty, 61-2.

into discussions of these issues was severely curtailed by their absence from committees convened to investigate them. Finally, these women were acting individually rather than collectively. Until they acted as representatives of all women, they lacked the force of numbers.

With these problems in mind, the idea of a Women's Branch of the CSA was conceived in 1913. Recognizing that their "'confrères' (had) their hands full attending to the many wants of the service in general, and (that) women (could) not expect them to attend to (theirs') in particular," Malvina Tremblay of the Department of the Interior called a meeting of women for November 28, 1913, to devise alternative plans.[50] After discussing insurance, promotion, and superannuation, issues that were to be dealt with in the proposed 1914 legislation, the women resolved to form a Women's Branch. Designed as an affiliate of the CSA, in which they would hold two seats, the Women's Branch established on February 3, 1914, aimed to determine and articulate women workers' opinions about working conditions, salaries, superannuation, and other important concerns.[51]

To assuage the fears of some women that they would be labelled as 'suffragettes', and of some men that women were becoming too aggressive, the executive of the new Branch explained that theirs' was not a "'militant' organization." Rather, their "sole aim" was to "work with the men of the C. S. Association for the good of the whole, but more

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[50] Malvina Tremblay, "Of Special Interest to the Ladies in the Civil Service," Women's Column, *The Civilian*, 6, 16(28 November 1913), 392.

[51] Women in the English civil service had already organized, an action that was watched attentively by the women and men of the Canadian civil service. In fact, the English civil service was the model for much of what happened in Canada. See, for example, M.G. LaRochelle, "A Review of the Civil Service Situation," *The Civilian*, 8, 19(7 January 1916), 477-479; Hodgetts, *The Biography of an Institution*, 25-27.

especially in the interests of the women of the service." Certainly not advocating "open defiance of law and order" nor wishing to "show how much better [women] can do things than men," the women wanted to demonstrate "how infinitely better everything can be done when the two sexes are working together in harmony."[52]

While interested in issues relevant to all civil servants, the principal concern of the executive of the Branch was improving the conditions for women in the civil service. To gain access to the hallowed ranks of the second division the Women's Branch advocated and employed strategies that they had learned by observing or participating in the suffrage campaign and in other women's organizations. Taking over the production of the 'Woman's Column' in 1913 following the establishment of the Women's Branch, women began to clarify and explain, for both men and women, the general issues and operations of the civil service as the women, themselves, understood them.[53] They also used the "Women's Column," which soon filled more than a page, to unmask and discuss the inequalities experienced by women in such a manner as to attempt to manipulate and mould male opinion.[54] Thus Dorothy Day, a pseudonym adopted by one woman or a group of them, wrote:

> I am sure that every fair-minded man is ready to give women an equal chance with him in the race of life. No right sort of man is afraid of the competition of woman, but willing to compete and surrender willingly to

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[52] Anonymous, "Editors of *The Civilian*," *The Civilian*, 6, 21(February 6, 1914), 534.
[53] See, Ethel M. Colson Brazelton, *Writing and Editing for Women*, New York: Funk and Wagnalls, 1927, 3-5; Barbara Freeman, *Kit's Kingdom: The Journalism of Kathleen Blake Coleman*, Ottawa: Carleton University Press, 1989, 52-3; Sunera Thobani, *Sharing Our Experiences*, Ottawa: Canadian Advisory Council on the Status of Women, 1993, 169.
[54] Women used similar tactics in their discussions of issues of self-support. See, for example, Francis Marion Beynon, "Women Don't Want to be Supported, Thank You," *The Grain Growers' Guide*, 10(17 December 1913), 1326, reproduced in *The Proper Sphere: Woman's Place in Canadian Society*, Ramsay Cook and Wendy Mitchinson, eds., Toronto: Oxford University Press, 1976, 110.

> her when she fairly wins. The majority of men are big, brave, generous and fair-minded to women, but they have the inherent prejudices of centuries of brute superiority behind them. In most cases, however, they need only to pause and consider the question calmly in order to make them fair and just to women.[55]

If she tried to flatter men into accepting women on an equal footing, Dorothy Day also assured them that most women preferred the traditional role of wife and mother. The only women they would be competing against were women who were forced into the role of breadwinner. These women, however, felt that "(w)hen we are obliged by fate to strike out for ourselves and conquer life it is our duty to go in to win."[56]

If women were to 'win', as Dorothy Day argued, changes had to occur in salary levels and in the granting of promotions. Women rejected the idea that men should receive a higher salary simply because of family responsibilities. They pointed out that many women also supported families but that they did not wish to earn higher salaries than those unencumbered by these responsibilities. Such a practice was pure charity. In the name of justice, both women and men should be paid for the work done, irrespective of other considerations. They thus advocated equal pay for equal work for men and women. Women also protested the fact that they were ineligible to receive promotions to the Second Division. They noted that many women did the same work as men in the Second Division, but were classified in the Third Division where they received half the salary.[57]

The justification given by men for inequalities in salaries and promotions was their view that women could, and should, either be supported by a father or a husband. This was not

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[55] Dorothy Day, "Women's Column," *The Civilian*, 7, 5(26 June 1914), 169.
[56] Day, "Women's Column," 169.
[57] "Women's Column," *The Civilian*, 7, 2(15 May 1914), 46-7. They might also have

acceptable to the women of the service. "Why should a girl live on at home, a drag on her father, after she is educated and fitted to support herself?" they asked. Why should a girl be obliged to sell herself, under the guise of a wedding ring? Far more honourable and happy is the girl who "supports herself wholly and so leaves herself free to marry through choice when she feels that she has met the man with whom she desires to spend her life, for love of whom she is ready and glad to make many sacrifices, if necessary."[58] To ensure justice, women wished to see three general principles governing their employment: "an adequate initial salary, equal pay for equal work, and the appointment and promotion of women to such of the higher positions as they are qualified to fill with the salary that justly pertains to that position." Two ways of achieving these principles were envisioned: through "organization, which will educate public opinion to take a fair and just view of the matter, and by increasing the efficiency of the individual."[59]

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mentioned that they were denied promotions.

[58] Dorothy Day, "Women's Column," *The Civilian*, 7, 5(26 June 1914), 169. This argument was women's way of dealing with the challenge that the fact of their working offered to the male work-role model. Rather than suggesting that men should not support dependents, women suggest that it was pure selfishness to siphon money from the rest of the family needing a father's support if they could help to provide for themselves. This was a valid argument in a fluctuating economy that often placed families in perilous financial situations. See, Cindy S. Aron, "'To Barter Their Souls for Gold': Female Clerks in Federal Government Offices, 1862-1890," in *Professional and White Collar Employment*, Part I, Nancy F. Cott, ed., Munich: K. G. Saur, 1993, 47-65.

[59] "Women's Column," *The Civilian*, 7, 2(15 May 1914), 46-7. For more information about the strategies employed by other white-collar and professional women in their attempts to succeed in a male world see, Margaret Rossiter, *Women Scientists in America: Struggles and Strategies to 1940*, Baltimore: Johns Hopkins University Press, 1982; Penina Migdal Glazer and Miriam Slater, *Unequal Colleagues*, 14, 213-219; Epstein, "Women and Elites," 11-2; Antler, *The Educated Woman and Professionalization*, 379-80, 414; Mary Kinnear, *In Subordination: Professional Women, 1870-1970*, Montreal & Kingston: McGill-Queen's Press, 1995, 22.; Ramsay Cook and Wendy Mitchinson, eds., *The Proper Sphere*, 200.

Having found their voice, women were convinced that their demands for equality could not much longer be ignored. Indeed, promising new civil service legislation was prepared for the fourth parliamentary session of 1914. In the debates about this proposed new legislation, men, including MP Alfred E. Fripp (Ottawa), argued that "it makes no difference whether it is female or male help in the Civil Service, there should be equal pay for equal work."[60] Although this opinion met with some resistance[61], it appeared that the majority felt that any contention to the contrary was obsolete. This was no small victory. Women felt sure that one of their major objectives was finally going to have the force of law.[62]

When war was declared on August 4, 1914, however, the fourth session of parliament became the War Session. Any legislation unrelated to the war was then shelved. Furthermore, as the government focused its attention on the pursuit of the war effort, it did not always choose to respect existing legislation. The *Civil Service Amendment Act, 1908* was increasingly disregarded. As Robert Borden later stated, because the primary goal of government was to "throw the full power of the (...) nation into the conflict (...) a meticulous adherence to Civil

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[60] Mr. Alfred E. Fripp, Ottawa, in Canada. "Civil Service Acts Amendment," *Official Report of the Debates of the House of Commons*, Third Session, Twelfth Parliament, 29 May 1914, 4444.

[61] M. Proulx, Prescott, maintained that paying women salaries anywhere from $1,000 to $1,600 placed an embargo on marriage. Women would simply refuse to marry unless their prospective husband could keep them in a manner to which they had become accustomed. Moreover, paying too high salaries to women civil servants, the majority of whom had previously been teachers, had created a serious shortage of qualified candidates in the teaching profession. Mr. A. K. Maclean, Halifax, stated that these opinions were obsolete. See, "Civil Service Acts Amendment" 4445, 4447.

[62] The men of the service had equally high hopes for the 1914 proposed legislation. It provided for a yet more complex classification system which allowed greater chance for promotion within divisions. Moreover, starting salaries were raised as was the maximum salary of each division. See, "Civil Service Acts Amendment," 4438.

Service enactments and regulations was not the main purpose of the administration."[63] Civil servants, male and female, wisely recognized that in the "peculiar conditions brought about by the war, (...) it would be to the interests of the Service for the Executive not to take any initiative in urging the Government to proceed with" the legislation.[64]

Equally concerned with winning the War, and winning it quickly, men and women civil servants accepted any legislation passed to facilitate the war effort, the effects of which resulted in the complete circumvention of many of the provisions of the *Civil Service Amendment Act, 1908*. The *War Measures Act, 1914*, the *Appropriation Act, 1914* and the *War Appropriation Act, 1914* authorized departments to employ staff without reference to the old legislation. Moreover, salaries could be determined by departments, under the authority of the Governor General, rather than according to those schedules set out in the 1908 enactment.

Despite the all-encompassing nature of the war-related legislation, employment in the civil service was not greatly affected in the first year of the war. Although men were leaving their work, safe in the knowledge that they were to continue to receive their civil service pay and that their jobs would be waiting for them upon their return,[65] there were still enough men and women to meet the needs of the growing bureaucracy. Stagnation of the economy in the

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[63] Sir Robert Borden, "Problem of an Efficient Civil Service," Canadian Historical Association, *Report of the Annual Meeting*, 1931, 15.

[64] Civil Service Association of Ottawa, "Civil Service Association of Ottawa, Annual Report of the Executive," *The Civilian*, 8, 16(26 November 1915), 415.

[65] According to Commissioner Shortt, no order in council was passed to deprive men of their positions and so they were on leave of absence. He said, "They are still members of the Civil Service and their pay is still continued." See, Adam Shortt, "Commissioner Shortt's Evidence," *The Civilian*, 10, 1(27 April 1917), 20. P.C. 579 and P.C. 665 of March 1915 detailed that substitutes, by virtue of the *War Measures Act, 1914* and paid from the War Appropriations vote, could be appointed to replace men serving with the Canadian Expeditionary Force.

months before and after the beginning of the war had actually created a surplus of labour.[66] By 1915, however, two new contingencies had arisen that created a staffing crisis. First, Canada's commitment to what had become a war of attrition necessitated the enlistment of ever-greater numbers of young men, thus depleting the ranks of potential new employees. This problem was exacerbated by the second. As Canada's war industries gathered momentum, their greater remuneration drained the pool of candidates even further. Another source of labour had to be tapped. The most logical group of individuals to hire, of course, were those who not only had recent experience with the service, but whose commitment to winning the war, irrespective of personal sacrifice, was unflinching. Thus, women, whose resignation from the service upon marriage had taken effect three months before the outbreak of hostilities, and whose husbands had joined the Canadian Expeditionary Force (CEF) for military duty overseas, were now invited to return to the service.[67]

Entering the service under this order, a woman was to be employed in any capacity similar to her previous employment "during the period of her husband's military service (...) at such salary, not exceeding that formerly paid to her, as may be fixed by the Governor General in Council." A money-conscious government and a civil service driven by a masculine organizational culture largely interpreted this provision to mean that women came in at 3B and at the lowest salary scale, regardless of their rank and pay before resignation. Still short-staffed, age restrictions were relaxed to allow persons older than thirty-five and not younger than

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[66] Canada was experiencing an economic recession in 1914 and early 1915 caused, in part, by economic upheavals from the disruptions of war. See, Ceta Ramkhalawansingh, "Women During the Great War," in *Women at Work: Ontario 1850-1930*, Janice Acton, et al. eds., Toronto: Canadian Women's Educational Press, 1974, 271.
[67] P.C. 1874, 7 August 1915.

sixteen to be engaged in the service.[68] As well, individuals, predominantly women, appointed to temporary positions saw the limit of six months removed as their appointments were extended indefinitely. This was not altogether positive because their salaries were low and for some time leave was not authorized. In this manner, the government staffed the bureaucracy that would help win the war.

Although prepared to tolerate certain difficulties due to the war as part of "doing their bit," some women refused to accept flagrant injustice. Indeed, in 1918 ten 'girls' staged the first Inside Service strike. Transferred as temporary stenographers to the War Trade Board and promised extra pay in return for working longer hours, the women struck when the longer hours but not the higher pay materialized. "They didn't go "out," but they sat at their desks, refusing to tap a key of their typewriters or draw a "pot-hook" in their note-books. The officials of the Board quickly succumbed, promised the extra pay, and work was promptly resumed."[69] This event was reported upon favourably by the "Woman's Column. However, this "strike" did not herald large-scale action on the part of women for equal treatment in the civil service. Attitudes about women's work, their role, and their abilities did not change during the war.[70]

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[68] P.C. 759, 4 August 1916 and P.C. 2170 respectively. The last mentioned order in council also included provisions the intent of which was to safeguard opportunities for returned men while ensuring that men eligible for military service would not find employment. As well, it permitted honourably discharged soldiers to sit entrance and promotion exams free of charge.

[69] "The Women's Column, The First "Inside" Strike," *The Civilian*, 10, 24(24 March 1918), 511.

[70] A quick glimpse at the 'Women's Column' during the war years will give a clear idea of the activities of the women civil servants. They sewed, knit, created a 'Victory Garden', formed a City Relief Committee to help young unemployed women, and raised money for a variety of different causes including the Emergency Fund and Clivedon Hospital. The

Women themselves did not all share the same views about women's work in the civil service during the War. While some women believed that women should be able to do the work that they wanted to do and receive pay equal to that of a man, others argued that not all women had a right to work in the civil service. First and foremost, returned soldiers deserved civil service appointments.[71] Women reminded each other that those "who are occupying some of these positions with the mistaken idea of doing their bit, do their bit in reality by giving up the positions to returned men."[72] If positions still remained available at this point, then young women in financial need were next in line. Girls in the leisure class were informed that they could better occupy the daylight hours in work for the Red Cross, rather than taking civil service jobs in the mistaken belief that in doing so, they were doing their bit.[73]

In fact, preference was given to returned men, regardless of their standing in competitive examinations. As well, women who elected to serve overseas as nurses or as members of the St. John Ambulance Voluntary Aid Detachment did not receive the same consideration as men enlisting in the CEF. Unless their department heads permitted it, women

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subscription for the last named so exceeded the need that the women were also able to purchase an ambulance for France. They cared for several children who had lost their homes because of the war. In the summer of 1918, women also went to the fields to help farmers with their crops. See also, The Women's Branch, Civil Service Association of Ottawa, *Two Years of War as Viewed from Ottawa: A Special Issue of 'The Civilian' Giving Some Account of the War Work of the Civil Service of Canada, 1914-1916*, Ottawa: The Civilian, 1916, 87; Doherty, 129-30, 189.

[71] In saying this, women were echoing government policy. Feeling honour-bound to protect the rights of returned men, even if they had not previously been civil servants, the government specified that preference in appointments be given to returned soldiers, "especially those who through disability occasioned by active military service [were] unable to fill their previous occupations." See, P. C. 2758, 27 November 1915.

[72] "Women's Column; Placing Returned Men," *The Civilian*, 9, 22(16 February 1917), 535.

[73] "Women's Column, Doing Her Bit?" *The Civilian*, 9, 22(16 February 1917), 534.

lost their positions and, if a leave of absence was granted, it was certainly without pay.[74] The Women's Branch tried, unsuccessfully, to have military leave granted to women under the same conditions as for enlisting men.[75]

Still more damaging, however, was the fact that attitudes about the employment of women remained the same. Describing the work of departments during the first two years of the war, a special issue of *The Civilian* thus stated:

> In cases where the normal numerical strength was maintained or exceeded there was inevitable loss of capacity, for the newly appointed clerks have been women or untrained men, while those who joined the army were all men and nearly always men of length of service and adaptation to their special duties which made their absence more severely felt.[76]

The men of the service obviously still felt that women, even trained women, were unable to replace trained men on active service.

These unchanged attitudes were also evident in the discussions of war bonuses and the manner in which they were granted. Civil servants had been complaining about low salaries before the First World War, but under war conditions the cost of living increased exponentially. Civil servants of the Inside and Outside Service were experiencing a severe financial crisis.[77]

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[74] Anne H. McNichol of the Money Order Branch of the Post Office went overseas as a nurse in April 1915 and Catherine Lyons, a clerk in the District Engineer's Branch in Chase, B.C., followed soon after, joining the Red Cross. See, Doherty, 130.

[75] The Women's Branch, Civil Service Association of Ottawa, *Two Years of War as Viewed from Ottawa*, 87.

[76] The article does continue with recognition of the capacity and devotion of the men and women who so competently handled so much routine and special work. See, The Civilian, *Two Years of War as Viewed from Ottawa*, 33.

[77] The Department of Labour released statistics stating that in the period 1914-17, living expenses had increased by fifty percent and in the period 1909-17, they had risen over one hundred percent. See, "Memorandum on Behalf of the Outside Civil Service Regarding Adequate Salary Increases to Meet the Increased Cost of Living," *The Civilian*, 11, 2(10 May 1918), 25.

Petitions on behalf of all civil servants in Ottawa were submitted to the government by the CSA. When action was finally taken, civil servants in Ottawa were horrified to discover that the Provisional Allowance was to apply only to those employed in the Outside Service.[78] Malvina Tremblay, President of the Women's Branch, remarked that,

> (i)t has been said that when the bonus was granted to the Outside Service in the summer, the same would have been granted to the Inside Service, had it not been that there are so many women in the Inside Service. That is rather hard on us. Women have always proven their loyalty and devotion, their ability and good-will in doing the work entrusted to them. After four years of war Canada would hardly be in her present position but for the great army of women behind our fighting men.[79]

Tremblay continued by pointing out that women also had dependants to support. Finally, since women were among the lowest paid in the civil service, they suffered greater privations.[80]

Considered inadequate by 1914, the provisions of the *Civil Service Amendment Act, 1908*, suffered repeated violations throughout the First World War. Because of war-related legislation, patronage again pervaded the Inside Service, just as it did in the Outside Service.[81] In the eyes of Canadians, patronage was equated with inefficiency, while only efficiency would help Canada to win the war. Playing upon these beliefs to ensure the election of his Union

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[78] NAC, RG 17, v. 2803, file 262664, "Memorandum to the Heads of Branches from the Acting Deputy Minister of Agriculture re the Provisional Allowance," 21 June 1918.
[79] "The War Bonus," *The Civilian*, 11, 12(November 1918), 330.
[80] "The War Bonus," 330. In this discussion, Tremblay mentions the fact that the excuse for excluding women stemmed from the belief that women spent the money on dress; a terrible waste in times of war. Rather than denying this, she said, "Well, it is a woman's duty to look as pretty as she can." While maintaining that women can look pretty for very little money and listing the numerous war-related organizations into which women poured time and money, she still weakened her argument with this statement. See also, "What Our Women are Doing, Cost of Living for a Young Woman—A Wage Earner," *The Civilian*, 11, 12(November 1918), 345.
[81] Dawson, 88-9.

Government, Borden promised to eradicate patronage.[82] The Union Government was elected in 1917. Forced to fulfil his promise, Borden presented a Bill that was passed on May 24, 1918.

The men of the civil service met the new Civil Service Act, 1918 with enthusiasm. Under this new act, merit became the sole factor controlling appointments and promotions in the entire civil service. Once again women hoped that the new legislation heralded better days for them. Indeed, much had been said to them to foster this hope. The concept of equal pay for equal work, irrespective of sex, had been bandied about in discussions of the 1914 legislation. It resurfaced when legislation again became a hot topic in 1917. In March of 1918, the Hon. Frank B. Carvell, Minister of Public Works, addressed the members of the Women's Branch. Commenting favourably on his lack of condescension, the report of the meeting recorded that he spoke to the women about the "complete abolition of the patronage evil, promotion for merit only, equal pay for equal work and the placing of the Civil Service on a strictly business basis."[83]

The new legislation, however, did not measure up to women's hopes. Indeed, women soon realized that exceptions to the merit principle were built into the body of the act itself. It gave precedence to veterans in appointments and promotions regardless of their standing on merit lists. This did include women who had served as nurses overseas as well as widows of

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[82] By this time, civil servants were embittered and distrusted the Borden government. His repeated assertions of civil service reform appeared to be mere posturing to gain votes. See, Doherty, 157; "Merit System for Outside Service," *The Civilian*, 10, 14(26 October 1917), 274; "Marching Towards Freedom," *The Civilian*, 10, 15(9 November 1917), 299-300; "Is It Millenium," *The Civilian*, 10, 16(23 November 1917), 311-2.

[83] "Women's Column, Hon. F. B. Carvell Addressed the Women," *The Civilian*, 10, 26(12 April 1918), 561.

soldiers. The overall effect of the provision, however, was to restrict women's opportunities in the civil service. Again, male commissioners and department heads applied and measured merit in ways that, just as subtly as before, worked against women.[84]

One provision of the 1918 legislation effectively curtailed women's opportunities in the civil service. In discussing criteria of eligibility for examinations, the Act specified that they were

> open to all persons who may be lawfully appointed to any position within the class for which the examination is held, with such limitations as to age, sex, health, habits, residence, moral character and other qualifications that are in the judgement of the Civil Service Commission requisite to the performance of the duties of such positions.[85]

The word 'sex' in this list of criteria is a euphemism for 'women'. Obviously men would not apply for poorly paid and low-status jobs. As always, the goal was the exclusion of women from higher ranking positions and their demarcation in the lowest ranks of the service. In this one provision, the men were provided with the legislative guarantee that they had so anxiously worked for since 1907.

Equally important is what remained unsaid in the Act. First, as with the 1908 legislation, the employment of women is never specifically mentioned. Second, the principle of

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[84] The women did perceive the danger in an all-male Civil Service Commission. An article that originally appeared in one of the July issues of the *Canadian Railroader* met with the approval of those unnamed women who produced the section entitled "What Our Women Are Doing." It was reprinted under the caption "Why Not?" The article suggested that the CSC be expanded to have five members and that one of the new commissioners should be a returned soldier and the other a woman. It seemed only natural considering the "large burden of patriotic work that has been borne by women, both in and out of the Civil Service, during the war." See, "What Our Women are Doing, A Woman Commissioner," *The Civilian*, 12, 9(August 1919), 366.

[85] "An Act Respecting the Civil Service of Canada," in Kenneth V. Johnston, "The Civil Service of the Dominion of Canada," in *The Civil Service in the Modern State*, Leonard D.

equal pay for equal work was not enshrined in the legislation. After its passage, women were left with the vain hope that because the government expected war industries to follow the principle, it would, too. Women, however, recognized that it was "almost impossible (for men) to disassociate themselves from the ages of old prejudice against women." In spite of this, they still believed that the CSC would grant equal pay for equal work simply because it was illogical to expect industry to follow the principle if the government did not.[86]

The reclassification and reorganization of the civil service was an important component of the responsibilities of the CSC under the *Civil Service Act, 1918*. The general aim of the classification was to apply to positions with similar tasks and responsibilities and requiring similar qualifications, the same rank, salary, title, and lines of promotion. After retaining the services of the American firm, Arthur Young & Co., the huge process of classifying the service was begun. From its inception, the reclassification was fated to disappoint women because of the purely subjective manner in which positions were evaluated.

The reclassification of the federal civil service was a three-step process. First, employees were asked to fill in a card providing details such as name, salary, the nature of the work performed, the number of people for whom they were responsible, and the aggregate salaries of these subordinates. Second, department and branch heads reviewed the cards to certify to the accuracy of the information provided and to furnish further information about the

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White, ed., Chicago: University of Chicago Press, 1930, 90.

[86] "What Our Women are Doing, Equal Pay for Equal Work," *The Civilian*, 11, 10(September 1918), 253. It is notable that in this issue the format of the women's page changed. They changed the name of their page to "What Our Women are Doing." The Women's Branch very clearly stated its goals by placing on either side of the title the slogans, "Equal Pay for Equal Work" and "In Honour Preferring One Another."

necessary qualifications and temperament for each position.[87] The value judgements inherent in responses to these questions provided endless opportunities to describe work in a manner disadvantageous to women.[88] In the third and final stage, the classifiers evaluated the information and produced the new classification schedule. The final product of this process was a book entitled *The Classification of the Civil Service of Canada*.

This schedule was destined to disappoint women for one major reason. The process of classifying the positions was dependent upon grouping similar tasks and responsibilities. The classifiers, the department and branch heads, and male civil servants, however, would not have identified similarities in the work of men and women.[89] Occupational sex-typing and sex-segregation were far too entrenched. Organizing women into separate occupational groupings in which salaries were low and career ladders foreshortened, the new schedule perpetuated this sex-typing and sex-segregation. Quickly dubbed the "Joke Book" and "The Best Book of Short Stories in the English Language" by the men of the service because of their displeasure with it, the classification schedule could aptly have been called "Hard Times" by women.[90]

The 1919 classification schedule strengthened thus effectively separated the men from

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[87] "Re-classification of the Civil Service of Canada," *The Civilian*, 11, 9(16 August 1918), 209-213; "The Civil Service Explains: A public meeting to hear the Board's Experts on the current work of reclassification," *The Civilian*, 11, 11(October 1918), 278, 295-302.

[88] Coxon and Jones discuss the problem of occupational egoism in which individuals evaluate their own occupations more highly than those outside of them. If women had practised this form of egoism it certainly would not have got beyond their branch heads. See, Anthony P. M. Coxon and Charles L. Jones, *The Images of Occupational Prestige*, London: The MacMillan Press, Ltd., 1978, 53. See also, Pat Armstrong, "Pay Equity: Not Just a Matter of Money," 134-6.

[89] Coxon and Jones, *The Images of Occupational Prestige*, 63.

[90] Ramkhalawansingh, "Women During the Great War," 301.

the women.[91] Two Orders in Council further separated the sexes. They represent the culmination of the efforts of senior civil servants to restrict both the numbers of women in the service as well as their opportunities for advancement. Thus, P.C. 1393, promulgated June 18, 1920, stated that no married woman whose husband was living and able to support her could be eligible for appointment. P.C. 517, approved on March 12, 1921, formalized what had previously been customary by dictating that a woman must resign from the civil service upon marriage.[92]

In the context of the immediate post-war years, these Orders in Council constitute another method of safeguarding the preferential treatment of veterans, a requirement written into the 1918 legislation. Indeed, P. C. 517 refers to the complaints of veterans about the employment of married women whose husbands were able to support them. Kathleen Archibald concedes that these two measures attempted to ensure that "two-worker families" did not result in the existence of "no-worker families." Because of strongly entrenched beliefs about the "natural" division of family responsibilities, women were treated as an expendable resource.[93]

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[91] P.C. 2357, dated December 3, 1919, authorized the application to the Civil Service generally of the new classification schedules prepared under the *Civil Service Act, 1918*, to take effect as of April 1, 1919.

[92] The Secretary of State stated in 1918: "My understanding of the matter is that there has always been a sort of unwritten law, or at all events a custom, that any woman in the Service who got married would thereupon leave the service." See, NAC, RG 17, v. 1328, file 265052, "Letter from Secretary of State to T. .A. Crerar, Minister of Agriculture, 11 December 1918."

[93] NAC, RG 32, v. 854, Archibald Report, Ch. 1, Sex Roles and Work Roles, Rough Draft and Footnotes, 12-4. While both P. C. 1393 and P. C. 517 barred the employment of married women in the civil service, they also contained exceptions. Both accepted the employment of married women if their husband was unable to support them. Both also suggested that on occasion it might be necessary to employ a husband and wife together.

The contributors to the section "What Our Women Are Doing" remained strangely silent after the promulgation of these two Orders in Council. While in 1921, this silence can be attributed to the fact that *The Civilian* ceased publication in May 1921, the absence of any criticism in 1920 is more difficult to explain. In fact, after the war, the Women's Branch focused less on lobbying for better treatment for women in the service and more upon its second objective, the creation of links between women in the service. To this end, a variety of recreational activities were organized and the Halcyon Club was founded, which provided comfortable rooms in which women could socialize.[94] A second reason is that a consensus could not be achieved about how to lobby for change.[95] As a result, the masculine organizational culture of the civil service remained basically intact.

4.4 Conclusion: Women in a Masculine Organizational Culture

This chapter argues that the source of the attitudes about women and the subsequent treatment that they received within the civil service can be found in the prevailing masculine organizational culture within the civil service. As we saw, senior civil servants mobilized to restrict the opportunities of women. The restriction of women in the service became an even

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More interesting because of the potential for discrimination against women was the clause contained in P. C. 517 which reads: "Provided that, when the Commission reports that the supply of experienced help for any particular kind of work is not sufficient to meet the demands of the Public Service, a married woman may be certified for temporary employment." As historian J. E. Hodgetts interprets this clause, women who married had to resign after which point they might be rehired in a temporary capacity and paid only the minimum rate of their occupational category. In sum, the Orders in Council were designed to create a flexible and cheap pool of labour that could be tapped in times of need and removed at will. See, Hodgetts, 486.

[94] Doherty, 178.

[95] Ibid. 439.

more important issue in the post-war years. As a consequence, the marriage bar was erected.

Although gradually finding a voice in the civil service, women were unable to alter this masculine organizational culture. As a result, the experiences of those women who undertook civil service employment in a scientific capacity were all shaped by it. The remainder of this thesis will consider the ways in which those women employed in science in the federal Department of Agriculture experienced this culture.

Chapter 5

Technical 'Women's Work' in Science: Seed Analysis in the Canadian Federal Department of Agriculture, 1902 to 1921

> "Men do not take to the detail work of seed testing. It is very fine and close work, very trying on the patience. It is essentially women's work"[1]
> *George H. Clark, Seed Commissioner, 1919*

5.1 The Sexual Division of Labour in Science

Features internal to science determined the type of work that women were permitted to undertake in this field in the federal Department of Agriculture in the late nineteenth and early twentieth centuries. At the same time, features internal to the federal civil service determined the rewards and recognition that women received for this work. These two conditions were not mutually exclusive. On the contrary, as science professionalized and the civil service sought to improve its public image, both scientists and senior male civil servants aspired to restrict women's opportunities. Since both science and the civil service were bureaucratizing, at the same time and, as a result, becoming increasingly dependent upon the labour of women, scientists and senior male civil servants resolved to create distinct and "appropriate" spaces for women. As this chapter demonstrates, they were markedly successful in seed analysis.

The sexual division of labour in scientific fields has been studied at length by historians

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[1] National Archives of Canada (NAC), RG 17, v. 2796, file 251115, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Deputy Minister of Agriculture, 28 April 1919."

Margaret Rossiter and Marianne Ainley. Beginning with the obvious but important precondition that women and men must first be employed in science, Rossiter and Ainley both explain why women gained entry into what had been the purely masculine domain of paid scientific employment in the late nineteenth and early twentieth centuries. They note that as scientific disciplines developed during this period, space for the participation of women was created in both new and established disciplines.

For example, in those new disciplines of economic importance, such as mycology and petroleum geology, women gained entry because these disciplines did not attract sufficient men.[2] Providing insufficient inducements in the form of financial and psychological rewards, men rejected them in favour of the more established disciplines. However, women also found opportunities in the more established disciplines. During periods of expansion of a field, such as that which occurred in astronomy in the United States in the 1880s, women were employed to fill the vacancies that once more resulted from insufficient numbers of men.[3]

While factors internal to science led to the creation of spaces for women's paid employment, equally as important were those factors external to science. First, a cohort of appropriately trained women had to exist. Both Rossiter and Ainley note that women had gained access to universities where they earned the degrees that entitled them to scientific

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[2] Margaret W. Rossiter, "Sexual Segregation in the Sciences: Some Data and a Model," *Signs*, 4(1978), 146; Marianne Gosztonyi Ainley, "Last in the Field? Canadian Women Natural Scientists, 1815-1965," in *Despite the Odds: Essays on Canadian Women in Science*, Ainley, ed., Montreal: Véhicule Press, 1990, 31.

[3] Rossiter, *Women Scientists in America: Struggles and Strategies to 1940*, Baltimore and London: Johns Hopkins University Press, 1982, 55-6; Pamela E. Mack, "Straying from Their Orbits: Women in Astronomy in America," in *Women of Science: Righting the Record*, G. Kass-Simon and Patricia Farnes, eds., Bloomington & Indianapolis: Indiana University Press, 1990, 74-5, 86-9, 91-105.

employment. Second, institutions had to be prepared to hire them. Rossiter thus presents the case of the United States Department of Agriculture (USDA), which manifested in the late nineteenth century the necessary conjunction of attitudes and need that permitted the employment of women in plant pathology.[4] First, there was a shortage of available men. Because job descriptions could be masculinized or feminized by adding or subtracting rewards and responsibilities, a crucial second condition was an acceptance, on the part of the employer, of women as staff members.[5] Third, women had to be aware that such positions in science were appropriate for them as well as available. To this end, women already in the field often themselves resorted to gender stereotypes to justify their positions and to attract female colleagues.[6]

These preconditions met, women began to join men in the scientific labour market. However, this labour market was clearly divided according to sex. Jobs were segregated and sex-typed in two ways: through lateral or territorial segregation and through hierarchical segregation. In the first case, men and women were channelled into different fields of science or into different branches of the same field. For example, in American astronomy in the 1880s, while men found new openings in observational astronomy upon the establishment of new observatories, women found employment in the developing area of photographic astrophysics.[7]

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[4] Rossiter, *Women Scientists in America*, 60.

[5] This attitude was clearly revealed in the civil service because legislation required employers to state the preferred sex of each incumbent. As such, the appointment of a woman was rarely accidental but rather a reflection of employer preference, prompted by either economic incentives or strong feelings of support for women. Interestingly, women sometimes escaped revealing their sex by using their initials only and, by so doing, were hired in positions that otherwise would have been inaccessible.

[6] Rossiter, 55-6, 60-1, 219.

[7] Ibid, 55-6; Mack, "Straying from Their Orbits," 74-5, 86-9, 91-105. Illustrating the

Through hierarchical segregation, men and women received different recognition and rewards within the same fields and branches of scientific work. The effect of both lateral and hierarchical segregation was to channel men and women into separate and decidedly unequal forms of employment, and to restrict women to undervalued and underpaid work and positions.[8]

Indeed, 'women's work' in science became that work which men did not want to do because it was poorly paid or because the work was, or was perceived to be, routine, repetitive, boring, and insufficiently scientific or prestigious.[9] Because women's entry into the labour market was believed to be a temporary diversion before marriage,[10] it was accepted that they should undertake those jobs that neither required much training nor were disrupted by high turnover of staff. They were also deemed acceptable for those jobs that were so poorly paid and low ranking that they failed to attract competent men.[11] To rationalize this division as "natural," stereotyped conceptions of women's skills, abilities, and characteristics which held that women were docile, patient, dextrous, and had an affinity for repetitive and routine work,

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variable and socially determined nature of the gender designation of jobs, in England the work of computing was defined as 'men's work', and was assigned to young men who had just finished school. See, Peggy Aldrich Kidwell, "Women Astronomers in Britian, 1780-1930," *Isis*, 75, 278(September 1984), 537.

[8] Marianne Gosztonyi Ainley, "Women's Work in Geology," *Geoscience Canada*, 21, 3(September 1994), 140; "'Women's Work' in Canadian Chemistry," *Canadian Woman Studies Les cahiers de la femme*, 13, 2(Winter 1993), 43; Rossiter, *Women Scientists in America*, 51.

[9] 'Women's work' in science was sometimes undervalued because women performed it, despite its importance. In other instances, tasks which became 'women's work' were given to women because these tasks were intrinsically uninteresting and, as such, were undervalued. Thanks are extended to Dr. Beatrice Craig for suggesting nuance in this discussion of 'women's work' in science.

[10] Ainley, "Women's Work' in Canadian Chemistry," 43.

[11] Rossiter, *Women Scientists in America*, 53.

were accepted. However, because these supposedly female qualities were devalued,[12] discriminatory practices against women were fostered.

The analytical framework elaborated by Rossiter and Ainley to understand the sexual division of labour in science is applicable to the Seed Branch of the federal Department of Agriculture. As we saw in chapter one, numerous events generated the preconditions for women's entrance into this work in the federal Department of Agriculture. Upon the appointment of George H. Clark in 1899, seed analysis, an activity that had been included among the responsibilities of the Experimental Farms Branch from 1886, was given a new professional focus. The passage of seed legislation in 1905 then resulted in a large volume of routine regulatory work. Through this professionalization and bureaucratization, the work of seed analysis thus grew significantly, requiring the efforts of assistants; an occupation was created out of what had been one task among many for the men of the Experimental Farms Branch. As these changes were occurring, women with the requisite knowledge to undertake such work also became available. By 1905, women had been gaining scientific knowledge and training from two sources, formally in universities[13] and informally through the Nature Study Movement. Because nature study had become an important part of the elementary school curriculum, women acquired some training both as students and as teachers.[14] The knowledge gained through this training proved to be of primary importance in permitting women's employment in seed analysis.

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[12] Rossiter, 51.

[13] See, for example, Alison Prentice, "Bluestockings, Feminists or Women Workers? A Preliminary Look at Women's Early Employment at the University of Toronto," *Journal of the Canadian Historical Association*, 2(1991), 231-62.

[14] Ralph Estey, *Essays in the Early History of Plant Pathology and Mycology in Canada*,

Thus women were prepared to work in seed analysis just as the federal Department of Agriculture needed their services. However, throughout this period of change and after, men also continued to be employed in seed analysis. Because it was unacceptable that men and women should do the same type of work, both lateral and hierarchical segregation occurred, which resulted in the creation of a sex-typed and sex-segregated work place. How were these strategies implemented? For example, how 'scientific' was the work of seed analysis and was this characterization assigned differentially to the work performed by women and men to create lateral segregation? In what terms did the Department and the Seed Branch justify hierarchical divisions in seed analysis? By answering these questions, this chapter will highlight the way in which the goals of science and those of the civil service intersected to create spaces for women that supported the professionalization and bureaucratization of both.

5.2 Lateral or Territorial Segregation in Seed Analysis: 'Women's Work' and 'Men's Work', 1902 to 1921

Lateral segregation was a fundamental component of the sexual division of labour in seed analysis. The utilization of this strategy is evident in several ways, not least of which is the relocation of the work of seed analysis. This is an important factor because the spatial and social aspects of any activity are inseparable. As such, while seed analysis was conducted solely at the Central Experimental Farm (CEF) in the Seed Testing House and attached greenhouse, women were not introduced to the work because the Farm was, except for the wives of the staff who lived on site, a male preserve.

Montreal & Kingston: McGill-Queen's University Press, 1994, 186, 216.

However, when G. H. Clark, with the help of his female assistants, began his investigations of the seed trade in 1902, he joined his supervisor, James Robertson, in the Langevin Block in downtown Ottawa.[15] In the Seed Branch, seed analysis was conducted in an office environment; an environment that was, itself, spatially segregated by sex. The male laboratory supervisor worked in a room separate from the women, who worked in the purity and germination laboratories. This spatial separation was crucial to the process of sex-segregating seed analysis because a change in spatial arrangements could generate new gender-related meanings in the work.[16]

Other factors helped to strengthen and maintain this lateral segregation of the sexes in seed analysis. The key one was definitional: the work that men did in seed analysis was defined as 'science' whereas that done by women was 'technical'. This was evident not only in the Seed Branch, itself, but also at the CEF which, although it no longer provided seed analyses as a service to farmers, continued to conduct the tests. Indeed, the testing of seed for experimental purposes continued and even intensified as the Experimental Farms Branch grew. Purity tests, with an experimental focus, were conducted to select the best quality seed produced in trial plots while germination tests evaluated the strength of the resulting seedlings. Seed analysis with this experimental focus had a decided scientific quality to it. It was undertaken as a crucial step in the development of new strains of seed. Largely performed by William Ellis, this 'scientific work' in seed analysis remained the sole province of men.[17]

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[15] *Ottawa City Directory*, 1903, 17.

[16] For a discussion on this theme, see, Daphne Spain, *Gendered Spaces*, Chapel Hill and London: The University of North Carolina Press, 1992, 5-7.

[17] Dominion Cerealist Charles Saunders, with the assistance of William Ellis, conducted seed analyses as part of the experimental process in the development of new cereal crop

In the Seed Branch, a similar process was at work. The passage of legislation in 1905 and the introduction of Canada to the international seed testing community fostered the continued development of the science of seed analysis in Canada. For example, because the United States and Canada shared a robust seed trade, it was necessary that their seed legislation incorporate many of the same regulations. These regulatory measures, especially those related to the vitality of agricultural seed, required the support of scientific experimentation. To be effective, experiments had to be both national and international in scope. Through the Association of Official Seed Analysts of North America, established in 1908, international co-operation in experimentation was organized.[18] Continual attention had to be paid to the contaminants appearing in seed to formulate effective schedules to protect national and international agriculture. The same held true for germination tests of the vitality of agricultural seed. Initially, seed was considered to have adequate vitality if it germinated. The experimentation undertaken in these areas resulted in the adoption of international standards of seed testing. Equally important, equipment employed in the germination laboratories was continually improved.[19]

The improvements and developments in the science of seed analysis were credited to the men employed in the Seed Branch. These men, the "scientists," corresponded with each

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varieties. See, for example, Canada. "Tests of the Vitality of Seed Grain and Other Seeds, *Appendix to the Report of the Minister of Agriculture, Experimental Farms, 1906.*" *Sessional Papers*, 1907, no. 16, 32.

[18] Now the Association of Official Seed Analysts, it was joined by the International Seed Testing Association in 1924. Both organizations still exist. They publish standard rules for seed testing, training manuals for seed analysts, and newsletters to keep member laboratories abreast of the latest developments in the science of seed analysis.

[19] NAC, RG 17, Acc. 83-64, file 5-5-A-2, "A Short History of Seed Testing in Canada," *History of Seed Laboratories by W. H. Wright and A. Hope, 1900-1939*, 3, 5.

other to co-ordinate experiments and they attended conferences to share research results. While their positions within the Seed Branch required that they undertake some work in seed analysis as researchers and as supervisors, men largely played a co-ordinating role in the laboratory. Since the supervisors/ scientists, the men, had ultimate control over the experiments, their work was accorded a great deal more status than the routine work of the women.

Equally important in maintaining the men in their status as "scientists," the majority of seed analyses undertaken at the Seed Branch and performed by women were not part of scientific experiments. Initially, beginning in 1902, the analyses were conducted to formulate schedules of the weeds most troublesome to Canadian farmers. Clark and his male assistants, L. Newman, B.S.A., J. C. Coté, and F. W. Broderick, B.S.A., collected and organized the samples of seed and soil upon which the seed analysts, the Misses Bruce, Hartley and Langford, under the direction of James Murray, B.S.A., conducted purity and germination tests.[20] Starting in 1905, seed analyses in the Seed Branch were conducted to enforce the regulatory measures of the *Seed Control Act, 1905* and as a public service to advise farmers about the purity and vitality of their seed. In this incarnation, seed analysis was not science but merely 'technical work': it thus properly belonged to women.

The method employed to conduct purity and germination tests provide ample evidence of why the technical work of seed analysis quickly became identified as 'women's work'. The repetitive and exact nature of the work required women's "natural" skills and abilities. In "Technical Work in the Seed Laboratory," Clark wrote:

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[20] NAC, RG 17, Acc. 83/64, file 5-5-A-2, "A Short History of Seed Testing in Canada,"

> for a purity test a definite quantity is weighed out from a mixed sample – the weight of the sample varies with different kinds of seed...The weighed sample is then separated with the use of brass sieves and by hand into three component parts,
> 1st, Pure seed, seed of the kind being examined.
> 2nd, Inert matter, broken seeds, dirt, sand, sticks and chaff.
> 3rd, Foreign seed,–
> (a) Seeds of useful or harmless plants.
> (b) Weed seeds.
> The percentage by weight of pure seeds, inert matter and foreign seeds is then calculated. Finally the kinds and proportion by number or by weight of foreign seeds are then determined.[21]

Clark also stressed the exactness of purity analyses:

> The average purity examination involves looking through from 18,000 to 40,000 seeds twice to find impurities. The seeds are from 1/16 to 1/24 of an inch in diameter, and some of the impurities are so similar to the cultivated seeds that very close scrutiny is necessary to distinguish them.[22]

Moreover, to perform a thorough purity analysis it was often necessary to go through the sample several times.[23] As repetitive, routine, and fine work, purity tests necessitated the patience, tolerance of boredom, docility, and manual dexterity supposedly "natural" to women.

Germination tests involved, for their part, a "determination of (the) percentage of seeds capable of germinating under favourable conditions, and the vital energy of the seed that germinates."[24] Two general methods could be employed in the conduct of germination tests, although different types of seed required particular variations. In the first method, a sample of one hundred seeds was planted in soil. The number and strength of the seedlings determined

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History of Seed Laboratories by W. H. Wright and A. Hope, 1900-1939, 1-2.
[21] George H. Clark, Branch of the Commissioner of Agriculture and Dairying, *Report of the Chief of the Seed Division, 1904*, Ottawa, December 31, 1904, 17.
[22] NAC, RG 17, v. 2887, file 14-19, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Deputy Minister of Agriculture, 7 April 1920."
[23] Clark, *Report of the Seed Commissioner for the period from March 1911, to August 31, 1913*, Ottawa, December 31, 1913, 18.
[24] Clark, 15.

the vitality. In the second method, a similar sized sample was employed but it was placed between blotters in a standard germinator where the temperature and moisture was maintained at the optimal level for the variety being tested. As with soil tests, the number and strength of the seedlings determined the vitality of the seed. These two methods were used together so soil tests could confirm the results of tests in germinators.[25]

While men had to be conversant in the method of conducting seed analyses to train women in the work and to verify test results, they were largely involved in duties that kept them away from the technical work of seed analysis. Indeed, had they conducted seed analyses, it would have been considered a misuse of their talents and ability for these men were university graduates.[26] Education was thus another means of ensuring lateral segregation in seed analysis. Because of their real and perceived greater knowledge and skill in comparison to women, men controlled the seed laboratories. Appointed to positions such as Supervising Seed Analyst or Official Botanist, men were responsible for the management of the work of seed analysis. Moreover, the men served as a reference for the women analysts in cases of hard to identify seeds.[27] One can argue that women attained a similar level of knowledge and skill after spending years at the work of seed analysis.[28] However, the knowledge and skill accumulated by women through experience was not accorded the same recognition because, with a high

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[25] Ibid, 19.
[26] NAC, RG 17, v. 2786, file 239409, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 28 May 1915."
[27] "The Seed Branch: A Hardworking and Efficient Organization and How it Helps the Public," *The Civilian*, 4, 13(October 20, 1911), 344.
[28] Jane Gaskell notes that "lots of different kinds of training will do to prepare people for their jobs. No single version is 'necessary'." See, Gaskell, "What Counts as Skill? Reflections on Pay Equity," in *Just Wages: A Feminist Assessment of Pay Equity*, Judy Fudge and Patricia McDermott, eds., Toronto: University of Toronto Press, 1991, 149.

school education, they did not have the same academic credentials as the men had.[29] Although three women held Bachelors of Arts, they remained seed analysts; education did not permit them to transcend lateral segregation in the Seed Branch.[30]

Seed analysts were required to have little formal training in science and seed analysis. In his discussions of seed analysis, G. H. Clark maintained, that this kind of work, especially purity tests, was not difficult: it was "quite within the power of any observant person to become acquainted with the common weed seeds that are prevalent everywhere."[31] Women were, therefore, not expected to have a vast store of botanical knowledge about seeds because training in seed analysis as undertaken by the Seed Branch was only acquired through the Seed Branch.[32] Thus, while laboratory experience was considered an asset, it was not absolutely necessary.[33] Instead, women were expected to have good scholastic ability, a good working knowledge of the metric system of weights and measures, and a good training in mathematics.

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[29] Discussing the different value assigned to 'knowledge' and 'experience', philosopher Lorraine Code argues that the latter, attributed to women, lacks credibility whereas the former, attributed to men, is authoritative. See, Code, *What Can She Know? Feminist Theory and the Construction of Knowledge*, Ithaca and London: Cornell University Press, 1991, 222-3.

[30] Appointed in 1910, Faith Fyles held a B. A., but transferred to the CEF to work that better reflected her education. Olive M. Boyd also held a B. A. and stayed with the Seed Branch from 1914 to 1918. Alice Winifred Anderson, B. A., was hired in 1919 as a Seed Analyst. She was a Senior Seed Analyst by 1921. She, eventually became research assistant to Seed Scientist, C. W. Leggatt. In a 1942 article, Leggatt acknowledged Anderson's "painstaking care in planting and counting the tests..." See, Leggatt, "Germination of Seeds of Three Species of *Agrostis*," *Canadian Journal of Research*, 24, series C(1946), 20.

[31] George H. Clark, Branch of the Commissioner of Agriculture and Dairying, *Report of the Chief of the Seed Division, 1904*, Ottawa, December 31, 1904, 22.

[32] NAC, RG 17, v. 2799, file 257897, "Letter from J. H. Grisdale, Deputy Minister of Agriculture, to W. Foran, Secretary, Civil Service Commission, 15 November 1919."

[33] NAC, RG 17, v. 2781, file 232176, "Memo from G. F. O'Halloran, Deputy Minister of Agriculture, to Martin Burrell, Minister of Agriculture, 3 March 1914."

Junior matriculation was considered a necessity for women employed in germination laboratories, and senior matriculation, for those in purity laboratories. With this level of education, women were considered able to provide the required level of accuracy.[34] By 1920, however, some university training was considered desirable, although a high school education was still regarded as sufficient.[35]

Much more important and desirable than advanced botanical knowledge in women was a certain set of social skills and attitudes. Women were carefully screened before being appointed to the Seed Branch to determine their attitude toward exacting, boring, and routine work, and to ascertain if they were mentally alert and likely to be obedient. Before the passage of the 1908 civil service legislation, this screening occurred first in the office of a Member of Parliament or of a Minister of a federal department who recommended women for particular appointments.[36] Upon recommendation, the screening continued with an interview in the Seed

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[34] NAC, RG 17, v. 2796, file 251115, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 15 October 1917."

[35] NAC, RG 17, v. 2808, file 269269, "Letter from Mr. Bland, Assistant Secretary, Civil Service Commission, to J. H. Grisdale, Deputy Minister of Agriculture, 3 March 1920." By 1929, senior seed analysts, positions to which some women won appointments, were required to have graduated from a university. See, NAC, RG 17, v. 2378, file 2-1(2), "Letter from E. D. Eddy, Acting Seed Commissioner, to Mr. H. T. Stephens, Office of the Deputy Minister of Agriculture, 10 June 1929."

[36] This is the process that Jennie and Bernice Kilburn followed to gain their appointments with the Department of Agriculture. Together, they sent a letter, dated November 28, 1905, to Minister of Agriculture Sydney Fisher requesting appointments. With high school education, they felt that they could be useful in the Census or Archives Branches. Deputy Minister G. F. O'Halloran, writing on December 4, 1905, stated that one position, but without describing the nature of the position, was open. Jennie Kilburn accepted the unknown position on December 6, 1905 and started work in the Seed Branch on the 15th of the month. The 1907 *Ottawa City Directory* records that Bernice secured employment with the Patents Branch in 1906. See, NAC, RG 17, v. 1018, file 176444, "Letters from J. M. Kilburn, to Sydney Fisher, Minister of Agriculture, and from G. H. O'Halloran, Deputy Minister of Agriculture, and Jennie M. Kilburn, 28 November, and 4, 6, 11 December 1905."

Branch. With the passage of the *Civil Service Amendment Act, 1908*, the Civil Service Commission determined academic qualifications. But the Seed Branch continued to ascertain if women candidates had the desired mind-set.

While the questions asked of potential seed analysts from 1908 to 1921 have not been preserved, it seems likely that the list given to Supervising Analysts in 1936 parallels the ones distributed to their predecessors. In this list, only one question considered the candidate's knowledge of weed seeds. It conceded that "while the candidate is not expected to be very familiar with weed seeds," she should be shown "a collection of a few common ones to test her powers of observation."[37] Significantly, all of the other questions focused upon securing a young woman with the appropriate attitude and temperament for seed analysis:

> The "Simple" Question (e.g. how to wash glassware). Note the manner of reply. What is the candidate's attitude towards a simple subject? Is she likely to be careful of small details?
> Attitude to Work. What are her interests and hobbies? What reaction to skills requiring close attention to detail – painting, embroidery, etc., etc., to nature studies, gardening, and so on.
> Mental Alertness. The so-called "catch" question may be useful here. Questions which may involve simple mental arithmetic, power of following a line of reasoning, general powers of observation, and so forth.
> General Knowledge. A good deal of information as to a candidate's attitude to life and to her work can be derived from questions relating to general knowledge. Her knowledge of names, historical and contemporary, famous in any fields of endeavour; of present trends in national and international affairs; of the government of the country; of sport, art, science, etc., may be gauged and much more learned as to her attitude from replies and the manner in which she makes them.[38]

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[37] NAC, RG 17, v. 2385, file 64-6, *Minutes of the Supervising Analysts' Conference, November 1936*.

[38] NAC, RG 17, v. 2385, file 64-6, *Minutes of the Supervising Analysts' Conference, November 1936*. In her discussion of the work of women in the making of watches and clocks, Joan Sangster notes that the "explicit comparisons with knitting and embroidery, which were female hobbies, were often made, thus belittling the proficiency needed for the job." See, Sangster, *Earning Respect: The Lives of Working Women in "Small-Town*

The qualifications that women brought to the work of seed analysis and the level of responsibility required of them in the performance of their work were recognized and valued by the Seed Commissioner. Clark described the women in his employ as "eminently satisfactory," as "unusually willing, faithful and competent," as "entirely satisfactory in every way," and as "unusually bright, capable and enthusiastic."[39]

Lateral segregation in seed analysis was also the result of attitudes about women's involvement in fieldwork.[40] An important aid to the work of seed analysis, particularly purity tests, was the Seed Branch's weed seed herbarium. To maintain and add to the herbarium, as

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Ontario, 1920-1950. Toronto: University of Toronto Press, 1995, 58.

[39] NAC, RG 17, v. 2808, file 269269, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Deputy Minister of Agriculture, 25 July 1919." Notably, in 1917 and 1918, the Ottawa seed laboratory experienced difficulty with the attitude and behaviour of three seed analysts. In 1917, Miss Reardon's "attitude of uncompromising hostility (....) [had] seriously interfered with both the quality and quantity of the work performed in the laboratory." Her attitude was adopted by Miss Lafontaine. It would appear that both of these ladies mended their ways since Lafontaine resigned on 26 October 1920 (P.C. 1/2632) and Reardon retired (as a typist) on 30 May 1934 (P.C. 14/1162). In 1918, Louise Lachance, née Richard, having absented herself from work without leave, was dismissed for her insubordinate behaviour. It is interesting that Dymond did "not consider it a hardship toward this woman to advise her that her services were no longer required. She and her husband are keeping house, and I understand that his salary is sufficient to meet their requirements." See, NAC, RG 17, v. 2796, file 251115, "Memorandum for the Deputy Minister, from J. R. Dymond and H. B. Sifton, 3 December1917"; v. 2800, file 258500, "Letter from J. R. Dymond, Seed Analyst, to G.H. Clark, Seed Commissioner, 1 April 1918."

[40] Requirements of fieldwork have restricted women's opportunities in other scientific disciplines. Emphasizing the changeable nature of this form of discrimination, women were prevented from participating not only because of the rough conditions but also because of the presence of men. These men, and often their wives, did not want women to join. See, for example, Ainley, "Last in the Field?" 33; Barbara Meadowcroft, "Alice Wilson, 1881-1964: Explorer of the Earth Beneath Her feet," in *Despite the Odds: Essays on Canadian Women and Science*, Marianne G. Ainley, ed., Montreal: Véhicule Press, 1990, 205, 213; Michele L. Aldrich, "Women in Geology," in *Women of Science*, 53; Cynthia Irwin-Williams, "Women in the Field: The Role of Women in Archaeology before 1960," in *Women of Science*, 2.

well as to assemble the common weed seeds collections that were sold to farmers, agricultural organizations, and colleges, a considerable amount of fieldwork was undertaken by the Branch staff.[41] This fieldwork was the sole preserve of men, as Clark believed that it was an activity to which "a lady clerk might not be able to attend."[42]

Clark's choice of the word 'lady' is significant. While a woman might have been physically capable of undertaking field work in the Seed Branch, a 'lady' would not choose to do it because it did not represent a proper feminine activity, as he understood it.[43] Fieldwork in the Branch fitted masculine stereotypes as it involved walking over rough terrain in the heat of summer. Moreover, it was a solitary, independent activity beyond the range of supervisors. Annie Gray, who applied for the position of assistant botanist in the Seed Branch in 1912 and the only applicant with the requisite qualifications, was thus rejected for this reason.[44]

In conclusion, then, men and women performed different kinds of work in the seed laboratories. Indeed, the lateral segregation of seed analysis was so entrenched that by

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[41] Weed seed collections were educational tools sold to farmers, as well as agricultural organizations and colleges, so that they could identify common weed seeds in the soil and in seed offered for sale.

[42] NAC, RG 17, v. 2754, file 166496, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 29 August 1911."

[43] It is interesting to note women's participation, singly or in groups, in recreational botanizing expeditions was perfectly permissible. Essentially fieldwork, this activity was located within an acceptable leisure framework that effectively masked its content. See, for example, Elizabeth B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America*, Chapel Hill: The University of North Carolina Press, 1992.

[44] NAC, RG 17, v. 2771, file 220794, "Letter from G. H. Clark, Seed Commissioner, to W. Foran, Secretary, Civil Service Commission, 10 July 1912." Gray was also rejected because the position entailed supervisory responsibility. See below the section discussing the hierarchical segregation of women. A comparison of Annie Gray's case with that of Faith Fyles, hired as Assistant Botanist at the CEF in 1912, shows how necessity can overcome stereotypes. While primarily responsible for projects at the Farm, Fyles was sent alone on field trips when staff constraints made it necessary. See chapter six for a detailed

1919. Clark was able to declare: "Men do not take to the detail work of seed testing. It is very fine and close work, very trying on the patience. It is essentially women's work"[45]

5.3 Hierarchical Segregation in Seed Analysis: Rank and Compensation for 'Women's Work' and 'Men's Work', 1902 to 1921

Lateral segregation co-existed with, and was supported by, the hierarchical segregation of men and women in seed analysis. As the Seed Branch grew, a sexually segregated occupational hierarchy was indeed created. As the Seed Commissioner, George H. Clark answered to the Deputy Minister of Agriculture, and was the head of the Branch that had both a field inspection and laboratory division. E. D. Eddy was the assistant Commissioner who answered to Clark. Beneath these two men were district supervisors responsible for directing both seed inspection in the field and seed analysis in the laboratories. These men were ranked in the first and second divisions. At this point, the field and laboratory divisions were separated. Assistant botanists, sometimes called Official Seed Analysts or Chief Seed Analysts, answering to district supervisors, directed the work of seed analysis in the laboratories. Upon their first appointment, these men were ranked in the Second Division. Women appointed to the position of seed analyst performed the detail work of seed analysis in these laboratories. At the bottom of the hierarchy were a final group of men, the labourers and messengers.[46]

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discussion.

[45] NAC, RG 17, v. 2796, file 251115, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Deputy Minister of Agriculture, 28 April 1919."

[46] It is interesting to note that labourers were involved in some aspects of seed analysis. In 1916, two male labourers were employed to undertake germination tests of corn seed. Instead of using the germinators in the laboratory, however, these men performed germination tests in boxes of soil. Dirty and strenuous work was 'men's work'. See, NAC, RG 17, v. 2771, file 220686, "Letter from G. H. Clark, Seed Commissioner, to G. F.

Within this larger hierarchy, however, there existed another, exclusively feminine hierarchy, the complexity of which masked the fact that women's career ladder in the Seed Branch was short. Upon their first appointment, women were employed in a seasonal capacity for six months between October and April, the peak season for seed testing.[47] In the first year, seasonal seed analysts received a monthly salary of $60.00. After one season's experience women were titled senior seasonal seed analysts and paid a monthly salary of $75. If a seasonal analyst returned for a third season, she might receive $87.50 per month. This salary increase, however, was not guaranteed but was granted upon the recommendation of the Seed Commissioner. After having served efficiently and reliably for several years in a seasonal capacity, and having shown themselves to be highly skilled, with a facility in conducting research work, under the direction of the chief analyst or supervising analyst, women might be appointed permanently.[48] A whole new work hierarchy, located entirely within the third division and also composed entirely of women, then came into play.

Seed analysts were ranked in the third division but length of experience in a temporary or seasonal capacity determined the sub-division, A or B, into which they were placed. The ramifications of their placement in the third division, however, are important.

O'Halloran, Deputy Minister of Agriculture, 9 March 1916."

[47] Seasonal appointments were differentiated from temporary appointments by the fact that those holding seasonal appointments were immediately reappointed the following season without having to go through the application process.

[48] NAC, RG 17, file 77, "Letter from G. H. Clark, Seed Commissioner, to Dr. J. H. Grisdale, Deputy Minister of Agriculture, 5 March 1921." Each year, the Department of Agriculture was told the number of appointments that it could make to the First, Second, and Third Divisions. Unless the Department still had vacancies, no permanent appointments could be made, no matter how deserving the applicant. See, NAC, RG 17, v. 1969, p. 270, Reports to Privy Council, "Memorandum from Martin Burrell, Minister of Agriculture, to Governor General, 1/04/14."

According to the instructions provided by the Civil Service Commission for the organization of staff into the three divisions, the third division was intended for "clerkships, the duties of which are routine work under direct supervision, not ordinarily calculated to render the clerk performing them competent to perform the duties of a clerkship in the second division."[49] Once in the third division, there was little likelihood that women would be promoted out of it. Indeed, for a woman in 3B, even promotion to subdivision A of the third division was sometimes difficult to achieve. It took many years of service before it was granted.

If such a promotion was achieved, women might receive a raise. However, this was not obligatory. The pay scales in the civil service were organized so that the maximum salary range of each grade was the same as the minimum of the next highest grade. Civil service rules dictated that if a staff member was already in receipt of the maximum salary of the rank from which he or she was being promoted, then a raise would not accompany the promotion. Women promoted from 3B to 3A and already receiving $800 thus continued to earn $800. However, they were again eligible for fifty dollar yearly raises until they reached the maximum of 3A, $1200. While women were eligible under the civil service regulations to take the second division promotion exam, success did not translate into a promotion. Indeed, a second division promotion did not figure in the seed analyst career ladder because, as chapter four discussed, men held positions in the second division almost exclusively.[50]

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[49] NAC, RG 17, v. 2761, file 199279, *Memorandum for the guidance of Deputy Heads in the Organization of Departments under Section 8 of the Civil Service Amendment Act, 1908*, n.d., no author.

[50] We established this hierarchy by studying the experiences of several of the women who stayed with the work of seed analysis over at least a ten-year period. It took this long for

The example of Mary F. Hartley is a case in point. Employed temporarily beginning in 1902 at a salary of $500 per annum, Hartley received a permanent appointment in 1908 under the new civil service legislation, when the Seed Branch became part of the Inside Service. She was placed in the lowest grade, in sub-division B of the third division, although she earned $900 per annum, a salary considerably higher than the $500 minimum of that grade.[51] By 1918, Hartley was in sub-division A of the third division and she was earning an annual salary of $1300, one hundred dollars above the maximum of that grade. Although Hartley was receiving the salary of a clerk in the Second Division, she was not promoted to that grade.[52] Established as a male preserve, the second division was largely closed to women.

With his longstanding zeal for promoting Canadian agriculture through seed control, Clark had a particularly high opinion of the seed analysts that was not always shared by those with the power to determine the conditions of their work. In fact, he had to fight hard to ensure recognition of what he considered to be the exceptionally responsible nature of the work of seed analysis and high quality of seed analysts. The Civil Service Commission, for example, had a tendency to equate seed analysts with clerical labour while Clark argued that seed analysis

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this short career ladder to be scaled.

[51] Seed analysts were always paid two hundred dollars above the minimum of the 3B in recognition of the special nature of the work. Hartley was earning $700 a year by 1907 and by 1908 she was receiving more than this. With the reorganization of the civil service she was granted a salary that accorded with her experience. The justice and fairness of Hartley's treatment, at least in terms of her salary, was not a common feature of women's employment. Other women, as will be discussed further in this chapter, were treated less equitably.

[52] NAC, RG 17, v. 1034, file 185909, *Estimates, Session 1906-07, Memorandum to the Seed Commissioner, 26 April 1907*; v. 2761, file 199279, *Drafts, Copies, re organization of the Department of Agriculture under the Civil Service Amendment Act of 1908*, n.d.; v. 2803, file 262618, *Seed Branch Employees, July 1918*.

was work of considerably greater responsibility.[53] Moreover, strict adherence to civil service regulations sometimes created inequitable conditions for women. In several instances, when seasonal seed analysts of several years' experience became permanent, they experienced a cut in pay if they were brought in at the minimum salary paid to seed analysts in B of the third division. Without intervention, the Civil Service Commission made no attempt to align the salary that women had received as temporary seasonal workers with that of their permanent positions.

This problem was particularly acute in 1919 when, as we discussed in chapter four, the Civil Service Commission went through the process of reclassifying the entire civil service and reorganizing it under the *Civil Service Act, 1918*. The 1919 reclassification of the civil service created a hierarchy of titles to reflect the qualifications, length of experience, and responsibilities of seed analysts. The career ladder that it created, while seemingly gender neutral, extensive, and inclusive, in fact confined women to the lowest positions. An individual having limited experience in seed analysis was appointed to the position of seasonal Junior Seed Analyst. It required graduation from high school, including courses in botany, good eyesight, accuracy, patience, and industry. It paid a monthly salary of $65 to be increased by $5 a month over three years until a maximum of $75 a month was achieved. From a position as Junior Seed Analyst, the staff member advanced to the permanent position of Seed Analyst.[54]

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[53] NAC, RG 17, T 1835, file 14-19, *Department of Agriculture, Seed Branch, Recommended Definition of Class, Qualifications, Principal Lines of Promotion, and Compensation for the administrative and technical positions under the Seed Commissioner, with personnel of present incumbents and comments on the positions in relation to the Civil Service Classifcation, n.d., ca. 1919*, 26-7.

[54] Civil Service Commission, *The Classification of the Civil Service of Canada*, Ottawa: J. de Labroquerie Taché, King's Printer, 1919, 449.

The minimum qualification for the position of Seed Analyst was high school graduation, but a university education was preferred. Applicants were required to have knowledge of seeds, to know the methods of conducting purity tests, to have the ability to use fine balances, and to be able to calculate percentages. Like Junior Seed Analysts, Seed Analysts also needed to have good eyesight and patience. These Seed Analysts were in charge of monitoring the work of the Junior Seed Analysts. For this work, they were paid a yearly salary of $960, or $80 a month, raised by $60 annual increments until a maximum of $1380, or $115 a month, was achieved.[55] Women, rather than men, served as Junior Seed Analysts and Seed Analysts.[56]

According to the reclassification schedule, those who had served as Seed Analysts could then be promoted to the position of Senior Seed Analyst. This position entailed the control of a seed laboratory under the direction of the Botanist in Charge. As Senior Seed Analysts, incumbents were responsible for a number of tasks: the direction and supervision of the work of seed analysts, the conduct of investigations into improved methods of analysis and germination testing, the examination of samples to determine the accuracy of other tests and reports, and the maintenance of equipment in the seed laboratory. Appointment to this position required graduation from university with specialization in botany or at least two years' experience in a seed laboratory. Incumbents also needed to demonstrate supervisory ability.[57]

While women could achieve the position of Seed Analyst if they persisted with the

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[55] Civil Service Commission, *The Classification of the Civil Service of Canada*, 615.
[56] NAC, RG 17, v. 2799, file 257897, "Letter from E. S. Archibald, Director, Experimental Farms Branch, to J. H. Grisdale, Acting Deputy Minister of Agriculture, 8 April 1919."
[57] Civil Service Commission, 656.

work long enough, only a minute fraction became Senior Seed Analysts. Women hired with education sufficient to gain appointment to the position of Seed Analysts did not have the opportunity to get the university education necessary to progress to the next position. For those who did have the required academic qualifications, promotion was still not automatic. As the example of Lilyan Louise Cochrane demonstrates, incredible tenacity and longevity were the key to gaining such an appointment. Indeed, Cochrane, who was appointed to the Seed Branch in 1915, reached the position of Senior Seed Analyst only in 1953.[58]

From Senior Seed Analyst, incumbents supposedly were able to advance to the position of Chief Seed Analyst.[59] To become Chief Seed Analyst, candidates were required to have graduated from university with a specialization in botany, or to have had at least five years experience in a seed laboratory. Moreover, they needed to have administrative ability and a thorough knowledge of farm work.[60] Unsurprisingly, no women achieved the rank of Chief Seed Analyst. While women might have had the requisite academic qualifications, prevailing gender stereotypes undermined their administrative ability and knowledge of farm work.[61] Thus, the highest ranks of the occupational hierarchy that was established by the 1919

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[58] NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-1, "Memorandum from B. F. Forward, Ph.D., District Analyst, to A. C. Heise, Head, Laboratory Unit, October 4, 1957," *History of the Seed Branch-Plant Products Division, by Mr. Heise in 195?*.

[59] Civil Service Commission, 656.

[60] Ibid, 170-1. A university graduate may have acquired farming experience if he was the son of a farmer. Summer employment may also have provided opportunities to gain farming experience.

[61] As chapter four discussed, men did not believe that women had either the ability to manage men or the appropriate characteristics to succeed in the Canadian federal civil service. Popular advice literature directed to women suggested that they undertake farm work. However, these works suggested that women grow flowers, raise bees, or cultivate a kitchen garden rather than grow wheat or other grain crops. See, for example, Marjorie MacMurchy, *The Canadian Girl at Work: a Book of Vocational Guidance*, Toronto: A.

reclassification were inaccessible to women.

In Clark's opinion, women seed analysts were particularly hard hit by this reclassification. The classifiers categorized seed analysis with clerical work, a result of their gender bias and also, perhaps, of their inability to understand the occupation. By doing this, Clark argued that they failed to recognize the special nature of the work. Attempting to negotiate a more favourable deal for the women seed analysts, he stated that,

> Seed testing is more difficult and responsible and requires a definitely higher type of clerk, of more extended and specialized training than ordinary clerical work. Samples under test may represent lots of seed worth several thousands of dollars and the certificates under which the seed will be sold is dependent upon the accuracy of the test. A mistake may cause heavy loss to the owner of the seed at the time of sale and legal complications later. Careful and accurate work is absolutely essential and can only be secured from clerks possessing first class ability and a keen sense of responsibility.[62]

While unable to change the overall classification, Clark was able, however, through persistent letter writing, to negotiate more equitable treatment under the reclassification for particular women seed analysts.[63]

T. Wilgress, 1919.

[62] NAC, RG 17, T 1835, file 14-19, *Department of Agriculture, Seed Branch, Recommended Definition of Class, Qualifications, Principal Lines of Promotion, and Compensation for the administrative and technical positions under the Seed Commissioner, with personnel of present incumbents and comments on the positions in relation to the Civil Service Classifcation, n.d., ca. 1919*, 26-7.

[63] NAC, RG 17, v. 2808, file 269269, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Acting Deputy Minister of Agriculture, 24 January 1919; v. 2807, file 269014, "Letter from W. Foran, Secretary, Civil Service Commission, to J. H. Grisdale, Deputy Minister of Agriculture, 16 November 1919"; v. 2887, file 14-19, "Letter from J. H. Grisdale, Deputy Minister of Agriculture, to G. H. Clark, Seed Commissioner, 17 January 1920"; v. 2808, file 269269, "Memorandum for Seed Commissioner re salaries of the Clerks in the Seed Laboratory, by H. B. Sifton, Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Acting Deputy Minister of Agriculture, 24 January 1919"; v. 2808, file 269269, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Deputy Minister of Agriculture, 12 November 1919"; v. 2808, file 269269, "Letter from J. H.

While willing to help women employed as seed analysts, Clark, like other male heads in the Department of Agriculture, in particular, and the civil service, in general, was willing to go to great lengths to ensure that women did not rise above this position. He only wanted men to be hired for supervisory positions. In 1911, he sought an individual for the position of Assistant Botanist. Of the applicants, the Civil Service Commission identified only one individual who had the necessary academic qualifications as outlined by Clark: Miss Annie R. Gray. However, the position, in addition to entailing fieldwork, was also intended to groom the incumbent to undertake supervisory responsibility of a laboratory and its staff, which included men:

> In addition to the essential qualifications for technical work, however, it is desirable that the person who receives the appointment should be able, after say one year with us, in the absence of the chief officer in charge of the seed laboratory work, to stand in his place not only in the matter of technical work but also in directing it and the general discipline of the staff, which is quite large during our busiest season and composed partly of men. It is further contemplated that the person appointed, as soon as he has received a thorough training in seed testing, should be able to take charge of a branch seed testing station, of which we have thus far only the one at Calgary though others would now be established could we procure competent men to take charge of them.[64]

Miss Gray's application was consequently rejected but the position still had to be filled. [65]

When initially listed, the position was placed in subdivision B of the second division, to be paid at the rate of $1200 per annum. However, Clark noted that men did not apply because

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Grisdale, Deputy Minister of Agriculture, to W. Foran, Secretary, Civil Service Commission, 15 November1919"; v. 2808, file 269014, "Letter from G. H. Clark, Seed Commissioner, to J. H. Grisdale, Deputy Minister of Agriculture, 18 October 1919."

[64] NAC, RG 17, v. 2771, file 220794, "Letter from G. H. Clark, Seed Commissioner, to W. Foran, Secretary, Civil Service Commission, 10 July 1912."

[65] At the same time that Gray was refused the position of Assistant Botanist, Faith Fyles was transferred from the Seed Branch to the CEF to fill a position of Assistant Botanist. Did Fyles anticipate applying for the position of Assistant Botanist with the Seed Branch but changed her mind when she learned that her application would not be received favourably? The position at the CEF, while requiring some fieldwork, did not put her in

of the "initial salary and because the annual increases...are lower than they would be able to get elsewhere."[66] To attract the desired "really competent man," Clark and the Civil Service Commission had to sweeten the deal. Clark proposed that the position be placed in subdivision A of the second division.[67] The man finally appointed to the position, James R. Dymond, B.A., was convinced to apply and accept appointment in 2B because of the personal assurances of Clark that, "as soon as he had become well acquainted with the duties of office I shall be pleased, as a reward for efficient service, to recommend his promotion to subdivision A of the second division."[68]

Under the duress generated by the inability to keep men on staff, however, women were reluctantly granted some measure of control and authority:

> (I)t seems clear to me that we shall need to add an additional clerk to our staff for seed laboratory work. What we need at this time is a competent person who has had a university training in science and has a good general knowledge of biology and who would take and continue with the work in our germination laboratory. I need hardly say that I would prefer a man to a lady clerk, although our experience has been that there is, and is likely to be, so much demand for young men with good training, such as our work affords, that we can scarcely hope to retain them even at the salaries we have been paying. If therefore the Civil Service Commission can furnish the Seed Branch with a lady clerk of exceptional qualifications, including a complete university science course, who would be well worthy of commencing in grade 3 sub-division 2, your Seed Commissioner will be content to give her the three months trial, as provided under the new Civil Service Act. That grade would allow her to begin at $900 and to go $1200.[69]

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charge of other staff members. See chapter six for a discussion of Fyles and her work.

[66] NAC, RG 17, v. 2771, file 220794, "Letter from G. H. Clark, Seed Commissioenr, to W. Foran, Secretary, Civil Service Commission, 10 July 1912."

[67] NAC, RG 17, v. 2771, file 220794, "Letter from G. H. Clark, Seed Commissioner, to W. Foran, Secretary, Civil Service Commission, 10 July 1912."

[68] NAC, RG 17, v. 2771, file 220794, "Letter from G. H. Clark, Seed Commissioner, to W. Foran, Secretary, Civil Service Commission, 17 July 1912."

[69] NAC, RG 17, v. 2754, file 166496, "Letter from George H. Clark, to Deputy Minister of Agriculture, 20 October 1909."

It is notable that in this request, Clark sought an individual to take charge of one aspect of seed analysis: the work in the germination room. This person was not intended to be responsible for all aspects of seed laboratory work.

The only individual hired in the Seed Branch after the appearance of this announcement and who fitted its parameters was Faith Fyles, B.A. She was hired in March 1910 as an assistant seed analyst and placed in B of the third division at a starting salary of $800 a year. There is no indication, however, that Fyles assumed any responsibility for the supervision of the work of seed analysis in the germination room or in the purity room. In fact, for reasons speculated on in chapter six, Fyles only stayed with the Seed Branch for just over a year. She transferred to the CEF to fill the position of Assistant Botanist in B of the second division at a salary of $1200 per annum on August 1st, 1911.[70]

The first woman to assume any degree of responsibility for the control of laboratory work in the Seed Branch was Miss Mary Florence Hartley in 1909. As difficulties in securing male personnel in the Seed Branch began to jeopardize the efficient operation of the laboratories, Clark was willing to experiment:

> Miss M. F. Hartley, of our seed laboratory staff, has had seven years training and is quite competent in the details of both purity and germination work. I believe that under Mr. McKillican's direction our Calgary seed laboratory would be able to continue to render the usual efficient and prompt service to the farmers of Alberta, British Columbia and part of Saskatchewan with Miss Hartley in direct charge of the detail work.[71]

Miss Hartley's seven years 'training' under the Seed Commissioner is key.[72] Not only was

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[70] NAC, RG 17, v. 2768, file 212092, "Letter from G. H. Clark, Seed Commissioner, to Colonel A. L. Jarvis, Acting Deputy Minister of Agriculture, 24 July 1911."
[71] NAC, RG 17, v. 2754, file 166496, "Letter from G. H. Clark, Seed Commissioner, to the

Clark personally aware of her knowledge and skill but even more significant, he was cognisant of her correct attitudes toward her work and her superiors. In this position, Hartley supervised the work of other women seed analysts and served as an assistant and a helpmate to the male head of the laboratory, Mr. McKillican. Hartley's increased responsibility involved neither a promotion nor a corresponding increase in salary.[73]

Another male shortage, similar to the one that induced Clark to grant some supervisory responsibilities to Miss Hartely did not arise again in the Seed Branch until 1916, two years after the beginning of war. When war broke out in August of 1914, the Seed Branch, like many other organizations, at first experienced a decline in its workload. Much of the work of the Branch involved the testing of the purity and vitality of agricultural seed from the import and export trade. When this seed trade was interrupted by the disruption of shipping lines, the need for women seed analysts was reduced. In the 1915-16 season, no new seasonal appointments were made and, while two women received their promised permanent appointments, two others also expecting to be promoted in this way instead lost their positions. It was impossible to estimate the amount of work to be expected in the Branch in the following season.[74] At the

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Deputy Minister of Agriculture, 20 October 1909."

[72] We find the use of the word 'training' here interesting. The word 'experience' seems to be more correct to describe Miss Hartley's work record. However, 'training' does give greater agency to her male teacher.

[73] Hartley received, in addition to her transportation and meals on the train, a living allowance of $15.00 a month. NAC, RG 17, v. 2754, file 166496, *Memorandum for the Accountant, 10 November 1909.*

[74] The Misses Marie A. Hartney and Gertrude M. Weegar were made permanent while the services of the Misses Laura J. Mulvaugh and Elizabeth E. O'Gorman were dispensed with as of May 1st, 1915. See, NAC, RG 17, v. 2786, file 239409, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 15 March 1915." Men experienced the same brake to their careers in the Seed Branch because of the war. James Fryer and Harold B. Sifton, both promised promotions, were stalled in their

same time, the Seed Branch did not lose large numbers of men to the Canadian Expeditionary Force. In fact, only one member of the supervisory staff, Alfred E. Eastham, enlisted.[75]

In the 1916-17 season, however, the amount of work in the Seed Branch grew exponentially for three reasons. First, Canadian seed growers had compensated for the loss of overseas producers by stepping up production of home grown agricultural seed. Second, and even more important, a disastrous frost and an outbreak of smut in the west damaged huge quantities of seed wheat. The number of samples sent by farmers for vitality tests grew considerably. Not only did this lead to the establishment of the Winnipeg Seed Laboratory in 1918, but increased staff in the laboratories in Ottawa and Calgary was required, as well as the continuation of temporary appointments past the usual limit of six months. Third, employment opportunities in science were expanding across the country, with conditions more favourable than those offered in the Seed Branch.[76] As a result, it was increasingly difficult to secure staff, especially men, for the laboratories.

All of these factors conspired to force the Seed Commissioner to grant another

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pre-war positions. See, NAC RG 17, v. 2887, file 14-19, *Department of Agriculture, Seed Branch, Recommended Definition of Class, Qualifications, Principal Lines of Promotion, and Compensation for the administrative and technical positions under the Seed Commissioner, with personnel of present incumbents and comments on the positions in relation to the Civil Service Classification, n.d., ca. 1919.*

[75] NAC, RG 17, Acc. 83/64, file 5-5-A-2, *History of Seed Laboratories by W. H. Wright and A. Hope, 1900-1939*, 4.

[76] In 1917, men could get teaching positions in high schools paying $1500 to $1800 per year. These salaries were considerably higher than the $1200 offered by the Seed Branch for the position of Assistant Botanist; the position for which the Branch had the most difficulty in securing qualified men. In 1918, the Seed Commissioner recommended that the Branch offer a minimum salary of $1400 to attract qualified male staff. See, NAC, RG 17, v. 2796, file 251115, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 17 March 1917"; v. 2804, file 263825, "Letter from E. D. Eddy, for Seed Commissioner, to J. H. Grisdale, Acting Deputy Minister of Agriculture, 6

woman, Jean Ethel Mitchell, some measure of authority over the work of seed analysis in the Ottawa laboratory. In June of 1916, Seed Commissioner Clark asked the Civil Service Commission to secure a

> man clerk in subdivision B of the second division for this Branch, with initial salary at $1, 200 per annum; duties of office to include supervision of work in conducting tests of seeds for purity and germination. Candidates must be university graduates who have specialized in botany.[77]

The only qualified male candidate was a Mr. Hart who, mistrusting the opportunities for promotions and raises within the Department, withdrew his application.[78] After requesting that the search for a qualified man be pursued in June 1917, Clark proposed granting increased responsibility to a woman:

> Miss Jean Ethel Mitchell of our Ottawa staff has had training in the purity laboratory and is now probably the best qualified lady clerk in the germination section of our laboratory at Ottawa to take a part of the work that would have been expected of Mr. Hart. She is now gradually taking on this work and her responsibility will be gradually widening as the work increases for the season.[79]

Unlike the case of Miss Hartley, however, Clark recommended that Miss Mitchell be promoted from B to A of the third division. This recommendation was not acted upon.

August 1918."

[77] NAC, RG 17, v. 2793, file 247071, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 22 June 1916."

[78] James Fryer, M.A., official seed analyst in charge of the Calgary Seed Laboratory, although promised promotion to the rank of 2A upon the assumption of responsibility for the laboratory, had not received it. The same lack of prospects and recognition of the value of the work of the Seed Branch by the Civil Service Commission led to the resignation of H. B. Sifton in January of 1920. See, NAC, RG 17, v. 2796, file 250200, "Letter from G. H. Clark, Seed Commissioner, to G. F. O'Halloran, Deputy Minister of Agriculture, 19 October 1916"; v. 2807, file 269014, "Letter from H. B. Sifton, Seed Analyst, to G. H. Clark, Seed Commissioner, 12 January 1920."

[79] NAC, RG 17, v. 2796, file 250200, "Letter from G. H. Clark, Seed Commissioner, to G.

5.4 Conclusion: The Sex-Segregation and Sex-Typing of Seed Analysis

Both sex-segregated and sex-typed, seed analysis was compartmentalized into clearly differentiated 'men's work' and 'women's work.' Maintained through the combined efforts of scientists and senior male civil servants, the division was created using lateral and hierarchical segregation. Most evident in the divide between scientific 'men's work' and technical 'women's work', lateral segregation was also generated by barring women from fieldwork and from positions entailing supervisory responsibility. Co-existing with and, supported by, this lateral segregation, the hierarchical segregation of women saw them appointed to the lowest division of the civil service, promotion from which was largely impossible. Indeed, while women were sometimes given the responsibilities of 'men's work', they were never given the rewards that accrued to it. Both strategies were so successfully applied that, as in other areas of employment in the Department of Agriculture, it could be declared: "competent men, whether returned soldiers or not, are not anxious to accept positions usually filled by ladies, -for the reason that the positions do not appeal to them either on account of the nature of the work or the pay offered it."[80] Women, then, truly remained third class citizens.

F. O'Halloran, Deputy Minister of Agriculture, 19 October 1916."

[80] NAC, RG 17, v. 2799, file 257897, "Letter from E. S. Archibald, Director, Experimental Farms Branch, to J. H. Grisdale, Acting Deputy Minister of Agriculture, 8 April 1919."

Chapter 6

Women and Scientific Work in the Canadian Federal Department of Agriculture, 1910 to 1920

6.1 Professional 'Women's Work' in Science

This chapter will investigate the experiences of women employed in the federal Department of Agriculture in scientific work. Regrouping a librarian, two botanists, and two chemists, these women shared two important common features. They each held a university degree and they all performed "scientific" rather than "technical" work in science. This chapter will show how the processes of lateral and hierarchical segregation identified in the previous chapter shaped the patterns and conditions of employment of this second group of women. Just as in seed analysis, scientists and senior civil servants resolved to, and succeeded in, creating distinct spaces for them.

The analytical framework established by historians of women in the professions is the most useful to examine the experiences of this particular group of women. These historians have found that women regarded the emergence of the professions as a historical moment of incomparable opportunity.[1] Taking at face value the rhetoric that held that entrance to, and success within, the professions was based on merit alone,

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[1] Penina Midgal Glazer and Miriam Slater, *Unequal Colleagues: The Entrance of Women into the Professions, 1890-1940*, New Brunswick and London: Rutgers University Press, 1986, 4-5.

women acquired the credentials that ought to have given them equal access to them.[2] However, such equal access was not achieved. In fact, it is argued that professionalization was, in reality, a response to female incursions into what had been all-male preserves of paid employment.[3]

Considering the position of women in science, American historian Margaret Rossiter thus contends women professionals in science, especially the most qualified, "bore the brunt of the men's fight for professional status and prestige in the nineteenth century."[4] As such, women were barred from, or restricted to lower levels of membership in professional societies. Through the processes of lateral and hierarchical segregation, women found themselves confined to professional 'women's work' in science; work which was undervalued and underpaid and which had been rejected by men. For example, women were channelled into museums and libraries, as well as into particular disciplines, such as domestic science, because they seemed to require feminine skills. Women were also denied, or received far fewer, promotions than their male colleagues. Remaining at the same level, women were forced to make a career out of what should have been a stepping stone to greater opportunities. Rossiter concludes: "The coming of

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[2] Mary Kinnear, *In Subordination: Professional Women, 1870-1970*, Montreal & Kingston: McGill-Queen's University Press, 1995, 8-9.
[3] Glazer and Slater, *Unequal Colleagues*, 1; Elizabeth Smyth, et al, "Introduction," in *Challenging Professions: Historical and Contemporary Perspectives on Women's Professional Work*, Elizabeth Smyth, et al, eds., Toronto: University of Toronto Press, 1999, 5.
[4] Margaret Rossiter, *Women Scientists in America: Struggles and Strategies to 1940*, Baltimore and London: Johns Hopkins University Press, 1982, 74.

professionalism in the 1880s and 1890s had contained and circumscribed the women and restricted them to the fringes of science."[5]

Current Canadian scholarship indicates the existence of similar processes. Historian Marianne Ainley found that women employed in science in Canada experienced three different career patterns. While some women enjoyed successful careers in academia and government, others found obstacles in their way throughout their careers. Still other women gave up paid employment altogether; they then either served as voluntary assistants to a husband or some other man, or conducted independent studies.[6] Focusing on women's employment in university physics, historian Alison Prentice discovered instances of hierarchical segregation. Employed from the early twentieth century as assistants, lecturers, and demonstrators, women found that only extreme longevity and the exigencies of the Second World War allowed their promotion to the professorial ranks."[7]

Women were well aware of this discrimination. They tried to face it by resorting to different strategies. American historians Penina Glazer and Miriam Slater have identified four: innovation, superperformance, subordination, and segregation. Canadian women employed similar strategies, to a greater or lesser degree, although segregation was somewhat more difficult for them to adopt.[8] While Canada had single-sex high

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[5] Rossiter, *Women Scientists in America*, 53-6, 99.
[6] Marianne Gosztonyi Ainley, "Last in the Field? Canadian Women Natural Scientists, 1815-1965," in *Despite the Odds: Essays on Canadian Women and Science*, Marianne Gosztonyi Ainley, ed., Montreal: Véhicule Press, 1990, 31.
[7] Alison Prentice, "The Early History of Women in University Physics: A Toronto Case Study," *Physics in Canada*, 52, 2(March/April 1996), 94-5.
[8] Smyth et al, *Challenging Professions*, 11.

schools, it did not have women's colleges, institutions that offered considerable employment opportunities to women.[9] Other equally viable strategies employed by women were perseverance and acceptance. Although displeased with the discriminatory practices that they experienced, women dealt with the situation by gaining satisfaction through a job well done. If, as botanist Dorothy Forward maintained, women did science because it was what they wanted to do, they had to accept the low salaries and the slow advancement.[10]

The women studied in this chapter experienced work patterns that correspond to those outlined by historians of women in the professions. Endeavouring to launch careers similar to those of men, they found that similar opportunities were not available to them. We will begin by looking at the experiences of the departmental librarian, Annie Louise Shaw to discuss the impact of her employment in a 'woman's occupation' upon the conditions of her service. We will continue with an investigation of the women employed in what outwardly appear to be 'men's occupations,' botany and chemistry, to determine the extent to which lateral and hierarchical segregation worked against them and their professional aspirations.

6.2 A Librarian in the Federal Department of Agriculture: Annie Louise Shaw

Representing Canada in the Imperial Institute of Agriculture beginning in 1909, the federal Department of Agriculture established a library to house the publications

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[9] In fact, Canadian women did leave Canada for the United States to take up employment in the American women's colleges. See, for example, Prentice, "The Early History of Women in University Physics," 94.
[10] Ainley, "Last in the Field?" 38.

subsequently received from around the world. To facilitate their use, a librarian, Annie Louise Shaw, was appointed in 1910. As a librarian, Shaw was employed in a 'woman's occupation.' This was fundamental in shaping her experiences in the Department and the federal civil service. It encouraged both scientists and senior civil servant to undervalue her work. This, in turn, led to a conflict between the aspirations of Shaw and the limited opportunities offered in the Department of Agriculture; a conflict which reached a critical stage in 1920, and from which the Department emerged victorious.

Born on March 4th, 1876, Annie Louise Shaw received a B. A. from McGill University in 1898.[11] She began work in the Publications Branch library first as a temporary employee starting March 2nd, 1910, and then in a permanent capacity from October of the same year.[12] Upon her permanent appointment, Shaw was placed in B of the third division at an annual salary of $500. Although promoted to A of the third division in July of 1912, she was not satisfied.[13] Believing that she was performing work of sufficient responsibility to merit further promotion, Shaw asked to be advanced to B of the second division in September of 1912.[14] The Civil Service Commission refused

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[11] This biographical information was gleaned from several sources. Canada. "Civil Service List." *Sessional Papers*, 1912, no. 30; McGill University, *Directory of Graduates, corrected to July, 1913*, Montreal: Dodd-Simpson Press, 1913.

[12] National Archives of Canada (NAC), RG 17, v. 2290, "Letter from J. B. Spencer, Editor, to Deputy Minister, 6 June 1911."

[13] NAC, RG 17, v. 2771, file 220794, "MEMORANDUM FOR THE DAIRY & COLD STORAGE COMMISSIONER, 8 July 1912."

[14] Shaw was a spirited woman who recognized her own worth and attempted to ensure that others did as well. For example, in 1911, when her name first was included in the Civil Service List, it appeared "without the addition of the title of B. A." Bringing this omission to the attention of her superior, she requested that the mistake not be repeated. See, NAC, RG 17, v. 2292, "Letter from T. K. Doherty, Chief Officer, Publications Branch, to Lt.-Col. Jarvis, I. S. C., 25 April 1912."

Shaw's request.[15] While not explaining the reason for this rejection, the Commissioners most likely considered her work to be routine and without responsibility because she worked in a 'woman's occupation' and because she worked under the direction of a man. As a 'woman's occupation,' librarianship, like seed analysis, properly belonged in the third division.[16]

Further demonstrating the classification of librarianship as 'women's work' in the Department of Agriculture was the decision of the Civil Service Commission to reject a male candidate for the position of librarian, when it was opened to competition during the 1913 reorganization of the Publications Branch.[17] The official reasons for this decision were either not publicized or have not been preserved. Anticipating that he might become the new head of the library, J. B. Spencer, Chief Officer of the Publications Branch, recommended the appointment of Duncan Gow of the Seed Branch to the position of librarian. Noting that "it would be difficult to secure a suitable man in the regular channels of the Civil Service Commission without paying a fairly high salary," Spencer

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[15] NAC, RG 17, v. 1793, "Letter from G. F. O'Halloran, Deputy Minister of Agriculture to William Foran, Secretary of the Civil Service Commission, 23 September 1912," and "Letter from G. F. O'Halloran, Deputy Minister of Agriculture, to A. L. Shaw, Librarian, 25 September 1912."

[16] Librarianship became a 'woman's occupation' as more staff was needed but operating budgets did not increase. At the same time that this was occurring, well-educated women were increasingly entering the labour market. This conjunction of circumstances appeared in both the United States and Canada in the last quarter of the nineteenth century. See, Dee Garrison, *Apostles of Culture: The Public Librarian and American Society, 1876-1976*, New York: The Free Press, 1979; Kathleen Weibel and Kathleen M Heim with assistance from Dianne J. Ellsworth, *The Role of Women in Librarianship 1876-1976: The Entry, Advancement, and Struggle for Equalization in One Profession*, Phoenix: Oryx Press, 1979.

[17] Because the work generated by the International Agricultural Institute had grown to substantial proportions, the Publications Branch was divided into two organizations, a newly constituted Publications Branch and the Commission of the Agricultural Institute.

felt that Gow was "admirably suited for this position." He also felt that it would be possible to secure him "by increasing to some extent his present salary" of $850.[18]

Despite the presence of this male competitor, Shaw continued in the position of librarian. Shaw's own letter of application no doubt encouraged her appointment. In it she stated that she was accustomed to the work and that she hoped to enjoy a long career in the library in which she had "spent so many enthusiastic days." To further recommend herself, Shaw pointed out that she "could make [herself] valuable in connection with the French correspondence which Mr. Spencer generally entrust(ed) to [her]." She concluded her letter of application by stating: "Our present filing-system by means of cards has also been arranged by me. We never lose letters."[19] While the government may have been unwilling to provide the extra salary to appoint Gow, equally evocative in explaining Shaw's appointment, however, is the fact that the salary increases and promotions that she could realistically have expected were less than those that Gow could have expected. After all, Shaw had not received the promotion to the second division that she felt was her due. Shaw was reinstated as librarian because she fitted better in a hierarchical structure in which she would remain both subordinate and inexpensive.[20]

Shaw, on the other hand, did not view her position in the same way. She seems to have perceived her appointment over Gow as recognition of her superior ability. She may

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[18] NAC, RG 17, v. 2766, file 206295, "MEMORANDUM FOR THE DEPUTY MINISTER from J. B. Spencer—19 November 1913."
[19] NAC, RG 17, v. 2766, file 206295, "Letter from Miss. A. L. Shaw, International Agricultural Institute Office, to G. O'Halloran, Deputy Minister of Agriculture, 19 November 1913."
[20] On this issue, see, Anita Schiller, "Women in Librarianship," in *Advances in Librarianship*, V. 4, Melvin J. Voight, ed., New York: Academic Press, 1974, 103-47.

have considered her supervisory responsibility of a small staff of women to be a clear indication of significant responsibility.[21] Also, having exercised some measure of authority, Shaw either was unaware of, or was unwilling to accept the gender-based systemic discrimination that most women faced in librarianship and which determined her superiors' perception of her work. In this occupation, like others, circular reasoning determined women's positions. Stereotyped conceptions of women's skills and abilities were harnessed to justify their appointment to positions subordinate to men.[22] These same attitudes shaped perceptions of women's work, resulting in its devaluation, which, in turn, led to low pay and limited advancement opportunities. Such employment conditions

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[21] As the work of the library was increasing rapidly, Shaw acquired an assistant in 1912 to undertake stenographic work as well as responsibility for the file cards. By 1913, the "work of filing, keeping [the] correspondence, documents, books and index in order" was increasing at such a rate that Doherty, Chief Officer of the Publications Branch, recommended the appointment of a second assistant for Shaw. By the end of 1919, Shaw had supervised the work of several women including the Misses Morrison, Cole, and Weber. See, NAC, RG 17, v. 2291, "Letter from T. K. Doherty, Chief Officer, Publications Branch, to G. F. O'Halloran, Deputy Minister of Agriculture, 20 January 1912"; NAC, RG 17, v. 2766, file 206295, "Letter from T. K. Doherty, Chief Officer, Publications Branch, to G. F. O'Halloran, Deputy Minister of Agriculture, 23 July 1913." The 1919 reclassification of the federal civil service was supposed to class occupations together according to the duties performed rather than salary. Questions posed to employees, however, also focused on salaries, both that earned by the individual as well as those of any subordinates. The amount of money earned and the amount of money for which an individual was responsible was interpreted as a reflection of responsibility. In this environment, the supervision of women was not perceived to entail great responsibility because women did not earn large salaries. See, "Reclassification of the Civil Service of Canada," *The Civilian*, 11, 9(August 16, 1918), 209-13; "The Civil Service Commission Explains," *The Civilian*, 11, 11(October 1918), 278, 295-302.

[22] Dee Garrison, "Women in Librarianship," in *A Century of Service: Librarianship in the United States and Canada*, Chicago: American Library Association, 1976, 150. See also, Kathleen Weibel, Kathleen M. Heim, and Dianne J. Ellsworth, "Introduction," in *The Role of Women in Librarianship, 1876-1976: The Entry, Advancement, and Struggle for Equalization in One Profession*, Phoenix: Oryx Press, 1979, xiii-xiv; Justin Winsor, "Transactions and Proceedings of the Conference of Librarians Held in London, October 1877," in *The Role of Women in Librarianship 1876-1976*, 5.

were determined by the fact that women performed the jobs, not because of the level of responsibility that pertained to them.[23] Further, as Jennifer Connor discovered in her analysis of the relationship between doctors and medical librarians, the strong supervisory impetus of the doctors in the medical library movement affected their treatment of full-time library workers. Although courteous and respectful, the physicians on the job always regard librarians as subordinates.[24]

Shaw and Doherty were in a relationship similar to that described by Connor. Doherty, as well as Shaw's more distant supervisor, held similar attitudes about women librarians and their work. This led to a conflict over notepaper in 1920. On February 5th, 1920, Shaw submitted a request for personal notepaper. She enumerated several reasons to support her request. Commenting upon the difficulties she faced in performing her job properly due to the fact that Doherty signed all outgoing correspondence, Shaw noted that those to whom the letters were addressed responded to Doherty. Problems arose because these responses were not always forwarded to her before being filed. Suggesting that

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[23] To justify women's lower salaries, Melville Dewey, a noted American librarian, argued that they had four weaknesses: poor health, lack of training, a low career commitment, and, because of physical weakness, less versatility than men. He maintained that not only was a man able to lift heavy cases and climb ladders but he could also, "in case of accident or disorder, (...) act as fireman or do police duty [thus adding] something to his direct value." See, Dewey, "Women in Libraries: How They Are Handicapped, (1886)" in *The Role of Women in Librarianship 1876-1976*, 10-1. Remarking that "women rarely receive the same pay for the same work as men," in contrast to Dewey who blamed women, Mary S. Cutler suggested that "many other library trustees take advantage of a woman's willingness to work for less than she earns when she knows her work is useful." See, Cutler, "Proceedings of the Fourteenth American Library Association Conference: The Woman's Meeting, 1892," in *The Role of Women in Librarianship, 1876-1976*, 14-5.

[24] Jennifer Connor, *Guardians of Medical Knowledge: The Genesis of the Medical Library Association*, Lanham, Maryland and London: The Medical Library Association and the Scarecrow Press, Inc., 2000, 72.

Doherty likely found it "troublesome to sign so much "routine" correspondence." Shaw also maintained that he "should not sign it as he (let) mistakes made by inexperienced persons pass." Even more worrisome, Doherty used Shaw's name without permission to order "about $100 of new magazines." If this was not sufficiently irritating, he ordered titles such as *The Modern Languages Bulletin*, *The Journal of Philology*, and *The Bookman*, that Shaw considered inappropriate to the purposes of the Institute library. In her most evocative argument, however, Shaw stated "that it means a great deal to have someone constantly interfering." Because of this interference, Doherty had to be "watched to see what he [did] with letters, publications, etc. which should [have been] in the hands of the person who is at the head of the library."[25]

No doubt astounded by Shaw's complaints, Deputy Minister of Agriculture J. H. Grisdale responded on February 12th, 1920:

> Dear Madam:
>
> I am in receipt of your letter of the 5th instant in which you suggest that if you were allowed to have personal note paper printed it would facilitate your work for a number of reasons which you advance.
>
> Apart from the fact that I consider some of your arguments rather feeble, I am not disposed to authorise special letter for a sub-division of Mr. Doherty's Branch.[26]

This response indicates that if Shaw saw herself as responsible for the work of the library, both her supervisor and the Deputy Minister of Agriculture considered her as the librarian of the Commissioner of the Agricultural Institute and felt, therefore, that she was answerable to him in all instances.

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[25] NAC, RG 17, v. 2803, file 261666, "Letter from A. L. Shaw, Librarian, to J. H. Grisdale, Deputy Minister of Agriculture, 5 February 1920."
[26] NAC, RG 17, v. 2803, file 261666, "Letter from J. H. Grisdale, Deputy Minister of Agriculture, to A. L. Shaw, Librarian, 12 February 1920."

From her early employment in the Publications Branch of the federal Department of Agriculture, Annie Louise Shaw demonstrated that she was fully aware of her own worth. University-educated, she demanded that this education be recognized. Similarly, perceiving responsibility in her own work, she requested promotion from the third to the second division. However, while Shaw's superiors were willing to acknowledge Shaw's education, they did not believe that her position warranted placement in the second division. The 1920 altercation between Shaw and her superiors is indicative of the attitudes that determined these outcomes, thus structuring Shaw's employment experiences. Working in librarianship, a 'woman's occupation,' Shaw not only remained subordinate to her male superior, the Chief of the Publications Branch, but also did not escape the third division.

6.3 Women Botanists in the Federal Department of Agriculture: Faith Fyles and Lilian V. Baker

We now turn to the experiences of two women employed in a 'male occupation.' Since they performed scientific work in botany and were ranked in B of the second division, they could be seen as a threat to the masculine organizational culture of the federal civil service. By investigating the description of the work undertaken in B of the second division, and by analyzing job descriptions and the impact of work locations, we will suggest that these women did not, after all, jeopardize this culture.

In its memorandum that explained the way in which the reorganization of the civil service dictated by the 1908 legislation ought to be applied in the various departments of the government, the Civil Service Commission described in some detail the nature of the

work performed in each of the divisions. The first division was entirely reserved for those men who performed the work of Deputy Ministers but who did not officially have that rank, and for their immediate subordinates. The second division was also envisioned as a male preserve. The work undertaken in A of the second division was similar to that of the first division but considered to be of lesser responsibility. It prepared incumbents for promotion to the first division. The tasks undertaken in B of the second division entailed less responsibility than that performed by staff in 2A. Like that in 2A, the work done in 2B was considered to be adequate preparation for promotion to the next highest division.

A closer reading of the description of work in B of the second division, however, reveals distinct similarities with that undertaken in A of the third division. In both ranks, employees worked under direct supervision and were not expected to show initiative. The important difference between the two grades was the fact that placement in 2B, unlike the case of 3A, supposedly prepared incumbents for promotion to the higher ranks. With a strongly enunciated masculine organizational culture, the civil service was largely unwilling to grant such privileges to women. In exceptional cases, however, women were granted such rank. This practice did not adversely affect the masculine organizational culture because hierarchical segregation operated to prevent women's further advancement. As well, lateral segregation ensured that women were performing scientific 'women's work'. The careers of Faith Fyles and Lilian V. Baker provide ample evidence to this effect.

Faith Fyles, B. A., Assistant Botanist:

Botany was long considered to be a field eminently suited to feminine tastes and abilities. Indeed, this trend had become so marked that in 1887 it had been asked "Is Botany a Suitable Study for Young Men?"[27] Despite the concern suggested by this title, botany had become, by this time, as rigorous and scientific as "other seemingly more "masculine" fields of science and had "put forward the image of an almost totally masculine professional science."[28] While this did not stop women from gaining entry into the field, it has certainly made their presence more difficult to detect. This holds true for Faith Fyles, B. A., who was appointed to the position of Assistant Botanist in 1911.[29] Placed in B of the second division and in receipt of an annual salary of $1200, Fyles undeniably filled a position to which only men were supposed to aspire. Why did Fyles receive this appointment? Was it indicative of a certain acceptance of women as the equal of men in science in the Department of Agriculture? We will answer these questions by examining her qualifications as well as her job conditions.

The seventh of ten children and the third of four daughters born to the Reverend Thomas Fyles and his wife, Mary, Faith was born on September 30th, 1875, in

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[27] J. F. A. Adams, "Is Botany a Suitable Study for Young Men?" *Science*, 9(1887), 117-18.

[28] Rossiter, *Women Scientists in America*, 85-6.

[29] Marianne Ainley makes reference to Fyles' employment in the Department of Agriculture. See, Ainley, "Last in the Field?," 41. Margaret Gillett notes that Carrie Derrick, botany instructor at McGill, taught Fyles. See, Margaret Gillett, "Carrie Derrick (1862-1941) and the Chair of Botany at McGill," in *Despite the Odds*, 86. Finally, Fyles was also mentioned in a popular history of the Central Experimental Farm and in a history of systematics, the study of taxonomy, in the Department of Agriculture. See, Helen Smith, *Ottawa's Farm: A History of the Central Experimental Farm*, Burnstown, Ontario: General Store Publishing House, 1996, 59; and, William J. Cody, Douglas B. O.

Cowansville, Quebec.[30] Part of a large and loving family, her parents were deeply involved in their children's emotional and intellectual development.[31] Writing of his relationship with his own young daughter, Connie, James Fletcher, Dominion Entomologist and Botanist, stated in 1891 that she was "old enough now to help [him] considerably in [his] collecting" and that she was his "constant companion."[32] It is not difficult to imagine the Reverend Fyles, an amateur entomologist and botanist and a colleague of Fletcher's, expressing similar sentiments about his own children, especially the young Faith who seems early on to have shared her father's interests. The Reverend, who was an artist, no doubt encouraged also the early artistic endeavours of Faith, who later became a gifted botanical artist, toward botanical and entomological subjects.[33]

Savile, and Michael J. Sarazin, *Systematics in Agriculture Canada at Ottawa, 1886-1986*. Ottawa: Biosystematics Research Centre Agriculture Canada, 1986, 7, 11.

[30] Hoyes Lloyd, "Faith Fyles, Artist-Naturalist, 1875-1961," *The Canadian Field Naturalist*, 75, 4(October-December 1961), 220; NAC, C-13204, 1881 census records for Cowansville, Township of Dunham.

[31] The caring and fun personality of Reverend Fyles is revealed in his short history of the mission of Iron Hill and West Brome. He describes his young wife, the Sunday School teacher, in the most positive terms: "She was then 21 years of age, bright and active, and she had a particularly winning way with young people. She was well qualified for the work, having been educated at Mrs. Lay's school in Montreal, and having taught a class in St. George's Sunday School and conducted (gratuitously) Mrs. Fulford's free school for boys on Inspector Street." See, Rev. T. W. Fyles, "An Account of the Early Days of the Mission of Iron Hill and West Brome in the Diocese of Montreal," 1907, 8.

[32] NAC, MG 29, D 81, Traill Family Papers, v. 1, "Letter from James Fletcher to Catharine Parr Traill, 25 March 1891."

[33] We have only been able to find a small sample of letters from the Reverend Fyles and they do not mention any contributions from Faith. However, other histories of women in science have noted how daughters and wives joined the 'family firm' through their collecting activities and their illustrations of the work of fathers and husbands. See, for example, Ann B. Shteir, *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760-1860*, Baltimore and London: Johns Hopkins University Press, 1996; Marcia Myers Bonta, *Women in the Field: America's Pioneering Women Naturalists*, College Station: Texas A & M University Press, 1992.

Fyles' education and work history provided her with the qualifications necessary to undertake the position of Assistant Botanist. She began her schooling at King's Hall, in Compton, from which she graduated with honours, obtaining the medal and special prizes in botany and other subjects. Fyles entered college with a first class scholarship and graduated, in 1900, from McGill with a Bachelor of Arts degree.[34] During her time at McGill, Fyles studied botany with Professor Carrie Derrick, a woman who assuredly inspired Fyles with the idea that it was possible for a woman to gain satisfying employment in the science of botany.[35] Upon her graduation, Fyles returned home to Cowansville to pursue a yearlong study of the flora of that region with her father. At the same time, she took a drawing course from artists Robert Wickenden and Walter Griffin, then holding classes at the Quebec Studio Club, of which Fyles was a member. Entering the job market, she taught school for six years, first at Dunham Ladies College, Dunham, and then at Bishop Strachan College, Toronto. Giving up teaching, Fyles completed her education with a year of travel and study in Europe in 1909.[36]

While Fyles was, in terms of her education, eminently qualified for the position of Assistant Botanist, her application was also likely considered favourably because of her age and marital status. At the time of her appointment she was a single, mature woman of thirty-six. The likelihood of her leaving the position in favour of marriage and a family was not high. It seemed probable that Fyles, who had shown academic inclinations,

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[34] Canada. "Additions and Changes in Staff," in "Appendix to the Report of the Minister of Agriculture, for the year ending March 31, 1912." *Sessional Papers*, 1913, no. 16, 46; *McGill University Montreal, Directory of Graduates, Corrected to July 1913*, Montreal: Dodd-Simpson Press, 1913, 43, 235.
[35] Gillett, "Carrie Derrick (1862-1941) and the Chair of Botany at McGill," 86.
[36] Canada. "Additions and Changes in Staff," 46.

would choose a career over a family of her own. The extant evidence indicates that she was the main support of her parents as they aged.[37] But while her education, age, and family status helps to explain why Fyles was able to earn the position of Assistant Botanist, they do not tell the complete story. To understand the reasons for her appointment, we must consider a part of her employment history involving the federal Department of Agriculture as well as her connections with potentially influential individuals.

Fyles' received her first permanent appointment to the Department in 1910 as a seed analyst; a position she acquired despite her poor typing skills![38] In this position, Fyles was placed in B of the third division at an annual salary of $800, $300 above the minimum of the grade. Had she remained with the Seed Branch, Fyles might have been promoted, after many years service, to 3A and received a salary equal to that paid in 2B. She would have remained primarily involved in the technical work of the Seed Branch with limited supervisory responsibility for women her junior in terms of length of service, but who earned the same salary and were placed in the same rank. As Annie Gray discovered, women could not be appointed to the position of Assistant Botanist in the

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[37] It has been suggested that families selected certain daughters for professional careers and it is possible that this was the experience of Fyles. See, Patricia A. Palmieri, "Patterns of Achievement of Single Academic Women at Wellesley College, 1880-1920," *Frontiers*, 5(Spring 1980), 63-7.

[38] NAC, RG 17, v. 1773, "Letter from G. F. O'Halloran, Deputy Minister of Agriculture, to William Foran, Secretary, Civil Service Commission, 15 April 1910." In this letter O'Halloran asked Foran if Fyles could be made permanent despite her low score on the typing test. In 1910, the Civil Service Commission instituted rules that dictated that women applying for temporary positions must pass typing and stenography tests. This was part of an effort on the part of the CSC to segregate the sexes because typing and stenography were skills rare among men. See, Graham Lowe, *Women in the*

Seed Branch because it involved supervising men, undertaking field work, and taking charge of a Seed Laboratory.[39]

This career path does not seem to conform to a woman of Fyles' education and background. Did family responsibilities necessitate this move? Why abandon teaching for seed analysis? Was she made aware of greater opportunities in the Department of Agriculture? We cannot answer these questions with complete assurance, but we suggest that Fyles' appointment in the Seed Branch was intended as a stepping stone to a better-ranked and more lucrative position. Two connections possibly facilitated the transfer.

A possible connection between the Fyles family and that of the Deputy Minister of Agriculture, G. F. O'Halloran, is suggested by the 1891 census returns for Cowansville.[40] While we can only speculate upon the existence of this connection, if it did exist, efforts might have been made to obtain information about possible posts in the Department and the procedures to follow to obtain them. A more concrete connection is evident with Carrie M. Derick, who was one of the civil service examiners responsible for testing individuals who applied for positions in botany. As one of Fyles' former professors, it seems possible and indeed, likely, that Derick would have alerted a former pupil of the availability of positions in the Department of Agriculture.[41]

Administrative Revolution: The Feminization of Clerical Work, Toronto: University of Toronto Press, 1987, 73.

[39] NAC, RG 17, v. 2771, file 220794, "Letter from G. H. Clark, Seed Commissioner, to W. Foran, Secretary, Civil Service Commission, 10 July 1912."

[40] The Reverend Thomas Fyles was the Anglican minister in Cowansville at that time. Amongst the Anglicans in town were the O'Hallorans, one of whom would later become the Deputy Minister of Agriculture.

[41] Carrie M. Derick, McGill University, and Prof. Ramsay Wright, University of Toronto, were listed as examiners in biology. See, Canada, "Fourth Annual Report of the Civil

We must still ask why a woman was appointed to the position instead of a man. This must be asked because other women equally qualified for other sorts of positions applied but did not get them because they were considered unsuited to a "lady."[42] This naturally suggests two questions: What was it about the work of Assistant Botanist that made it suitable for a lady? To what extent did the factors that made the position appropriate for a lady in turn make it equally inappropriate for a man?

Although undertaking work of considerable value to the country, the salaries paid to the science staff of Experimental Farms Branch were low in comparison to those paid in the private sector. Retention of staff was a perpetual concern of the heads of the various divisions, because employees, with training and experience acquired through working in the Department, were desirable to employers in the private sector as teachers and researchers. These employers were able to offer considerably higher salaries than those offered by the government. Equally significant, not all the work to be done in the Department was on the cutting edge of science. While laboratory research in plant pathology and mycology was becoming increasingly important, long-standing responsibilities continued to exist. For example, the herbarium continued to be an

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Service Commission of Canada for the period from September 1, 1911 to August 31, 1912." *Sessional Papers*, 1912, no. 31, 158.

[42] Most informative is the case of an unnamed young woman who applied and was rejected for a position as Bacteriologist and Chemist in the Health of Animals Branch in November, 1908. Writing to reject her application, Deputy Minister of Agriculture G. F. O'Halloran stated that not only would the men be unwilling to work with a lady assistant but that the work of the Department would be "very disagreeable to a young lady." See, NAC, RG 17, v. 1763, "Letter from G. F. O'Halloran, Deputy Minister of Agriculture, to W. S. Fielding, Minister of Finance, 7 November 1908." Similarly, Rossiter found that women in the United States Department of Agriculture, while permitted to work in plant pathology, were not employed to study animal diseases. See, Rossiter, *Women Scientists in America*, 221.

important tool for the staff and the Canadian public, while the botanical garden also needed to be maintained. Finally, the science staff of the Department of Agriculture was not large and there was little chance of advancing within the hierarchy to a position of greater salary or prestige.

In this context, opportunities in the Department of Agriculture held little attraction to well-trained young men. This led to the trial of a new experiment: the employment of a woman in an indisputably scientific position. Thus, in 1911, "(t)he vacancy created by the resignation of Mr. Herbert Groh was filled by Miss Faith Fyles, B. A., who (had) charge of all the work connected with the Botanic Gardens, Herbarium, identification and collection of plants and such experiments as (came) within the scope of systematic botany."[43]

It can be argued that Fyles was undertaking work that was service oriented in that it supported the work of male professionals and individuals outside of the Department. Moreover, it was work that necessitated the stereotypically feminine skills of patience and attention to detail. Dominion Botanist Hans Gussow explained that as part of her responsibilities for the Botanical Garden, she began "labelling the plants with plainly printed large labels of a permanent character. This work entail(ed) considerable painstaking and careful research owing to the difficulty of the everchanging nomenclature of plants."[44] Fyles was also in charge of co-ordinating the exchange of seed

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[43] Canada. "Report of the Dominion Botanist, Appendix to the Report of the Minister of Agriculture, for the year ending March 31, 1912." *Sessional Papers*, 1912, no. 16, 191-2.
[44] Canada. "Botanic Gardens, Appendix to the Report of the Minister of Agriculture, for the year ending March 31, 1912." *Sessional Papers*, 1912, no. 16, 214.

and plant specimens for the herbarium.[45] While Gussow was involved in experimental science as well as legislative and administrative work, his Assistant, Fyles was involved in observational science.

In addition to her regular work, and suggestive of her willingness to assist the men to the best of her abilities, Fyles freely offered her services as an artist. Her pen and ink drawings and watercolour paintings significantly improved the utility of divisional reports because farmers were provided with a tool that helped them to identify plants and plant diseases. In praise of her work, Hans Gussow wrote that she had "shown herself to be an expert artist, and her skill in this connection has been much in requisition and has been found very useful in all phases of work of this division (...) The division is exceedingly fortunate in having a member on its staff whose skill in the work is so exceptional."[46]

Although Faith Fyles was doing the equivalent of professional 'women's work' in science, the position offered her opportunities for scientific employment that she would not have found elsewhere. As Assistant Botanist she was expected to publish the results of her investigations.[47] Further, her responsibilities occasionally necessitated fieldwork:

> On July 11, 1914, Miss Fyles left for a tour through the West in order to collect flowering specimens of the Western weeds as they are found in their natural surroundings. Treesbank, Brandon, Indian Head, Medicine Hat, Lethbridge,

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[45] Canada. "Systematic Botany, Appendix to the Report of the Minister of Agriculture, Experimental Farms, for the year ending March 31, 1913." *Sessional Papers*, 1913, no. 16, 493-6.

[46] Canada. "Report of the Botanist, Appendix to the Report of the Minister of Agriculture, for the year ending March 31, 1912." *Sessional Papers*, 1912, no. 16, 191-2, 215.

[47] Faith Fyles, *Do You Know Your Weeds?* Ottawa: Department of Agriculture, 1916; *Principal Poisonous Plants of Canada*, Ottawa: J. de L. Tache, 1920; *Wild Rice*, Ottawa: J. de L. Tache, 1920.

> Agassiz, Victoria, Lacombe and Rosthern were visited as collecting centres, from which trips were made through the neighbouring districts. Upwards of 800 perfect specimens of weeds representing 44 different species were collected, pressed, dried and shipped to Ottawa, during July and August. Many hundreds of botanical specimens other than weeds were also collected, as opportunity occurred, to be included in the herbarium.[48]

While women were often barred from scientific employment and advancement because of fieldwork, Fyles was required to do it because of staff shortages, because she apparently travelled alone, and because she was based at various branch farms.

On the other hand, despite her responsibilities and the recognition granted her, Fyles' superior had to fight in order for her to maintain her rank in B of the second division. Under the 1919 reclassification, and coinciding with her transfer to the Horticultural Division in 1920, Fyles suffered a demotion and significant pay cut. Assuming that she was 'simply an artist' and no longer a botanist, the Civil Service Commission classed her as "Artist, Botany" with a salary range of $1320 to $1620. E. S. Archibald, the Director of the Experimental Farms System, hastened to correct this misapprehension. Writing to the Deputy Minister of Agriculture, J. H. Grisdale, he noted

> As a matter of fact in the Horticultural Division it is proposed to avail ourselves just as full and perhaps more fully of her training as a Botanist and in addition thereto utilize her marked ability as an Artist which were not nearly as fully used in the Division of Botany except on one or two special things which she did, such as the Bulletin on Poisonous Plants. In the Horticultural Division, however, we expected to have constant use of her work as an Artist in addition to using her botanical knowledge in the fullest extent.[49]

Significantly, Archibald's initial recommendation for her classification did not

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[48] Canada. "Report of the Botanist, Appendix to the Report of the Minister of Agriculture, for the year ending March 31, 1915." *Sessional Papers*, 1915, no. 16, 964-5.
[49] NAC, RG 17, v. 2819, file 1-1-1, part 1, "Letter from E. S. Archibald, Director, Experimental Farms, to J. H. Grisdale, Deputy Minister of Agriculture, 1 October 1920."

adequately reflect her tasks and responsibilities. He recommended that, from her current position as Assistant Botanist, she be reclassed as a "Junior Technical Assistant."[50] In 1919, Fyles was in receipt of an annual salary of $1600. Although the ideal salary range suggested by Archibald for the new position went from $1600 to $2400, he consented to more realistic alternative of $1440-1800.[51] While Fyles' position was adjusted to match Archibald's recommendations, she still did not receive the recognition she deserved.[52] There is no evidence, however, that Fyles complained.[53] She stayed with the Department,

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[50] The difference of opinion over classification between Dr. Alice Wilson of the Geological Survey and her superiors is illuminating. She wished to be classed as an associate invertebrate paleontologist but her superiors planned to class her as an associate curator of paleontology. Wilson "recognized this stratgem for what it was, a grotesque attempt to keep her out of the higher echelons of the Survey, and to bar her from the field work that she so passionately enjoyed." See, Meadowcroft, "Alice Wilson, 1881-1964, Explorer of the Earth Beneath Her Feet," in *Despite the Odds*, 215-6.

[51] NAC, RG 17, v. 2886, file 14-17, part 1, July 1919, "Experimental Farms, Classification 1919-1951."

[52] Fyles was thus classed as a "Junior Technical Assistant" and continued to receive $1600 a year.

[53] Indeed, the sole time that we hear Fyles voice is in 1919 when she thought that her honesty was doubted. Responsible for the support of her elderly parents, Fyles qualified for a War Bonus. It was then argued that Anglican clergymen receive a pension, and that Fyles was falsely representing her financial obligations. After explaining that it was possible under certain circumstances for a clergyman to lose his pension, a situation that applied to her father, Fyles returned the cheque. Despite the fact that the Department accepted her explanation, Fyles was highly offended and flatly refused to accept the money. See, NAC, RG 17, v. 2803, file 262664, "Letter from E. S. Archibald, Acting Director, Experimental Farms, to Accountant, Department of Agriculture, 24 March 1919;" "Letter from J. H. Grisdale, Acting Deputy Minister of Agriculture, to E. S. Archibald, Acting Director, Experimental Farms, 28 March 1919;" "Letter from Faith Fyles, Assistant Botanist, to E. S. Archibald, Acting Director, Experimental Farms, 4 April 1919;" "Letter from E. S. Archibald, Acting Director, Experimental Farms, to J. H. Grisdale, Acting Deputy Minister of Agriculture, 8 April 1919;" "MEMORANDUM FOR THE ACTING DIRECTOR EXPERIMENTAL FARMS from J. H. Grisdale, Acting Deputy Minister of Agriculture, 15 April 1919;" "MEMORANDUM FOR THE ACCOUNTANT from the Deputy Minister of Agriculture, 20 June 1919."

retiring in 1931, after more than twenty years of service.[54]

Lilian V. Baker, M. A., Microscopic Analyst:

The professionalization of science in the Department of Agriculture helps to explain the appointment of Faith Fyles to the position of Assistant Botanist. She was hired because someone was needed to continue to undertake the more routine scientific work of the Department while Dominion Botanist, Hans Gussow, pursued his work in plant pathology and met his administrative responsibilities. The bureaucratization of science and of the civil service also created opportunities for women to undertake professional 'women's work' in science. Indeed, such a process resulted in the appointment of Lilian V. Baker to the position of Microscopic Analyst in the Seed Branch in 1919.

While it increased the amount of work to be done throughout the Department of Agriculture, the First World War also led to the introduction of a whole new type of scientific activity in the Seed Branch: microanalysis, that is the analysis by microscope of the contents of animal feed. Although the problem of weed contaminants in feed had been recognized since 1907, the disruption of European trade during the First World War exacerbated the problem.[55] Canadian producers responded by increasing their output.

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[54] PC 14/2756, F. Fyles, Artist, Botany Department, Superannuation, 6 November 1931.

[55] In 1911 the *Adulteration Act*, administered by the Department of Inland Revenue, was amended to require that bran, shorts, middlings, and chop feeds be free from the vital seeds of any of the noxious weeds defined by the Seed Regulations. The samples of feed collected by the Department of Inland Revenue were analyzed in the seed laboratories. In 1909 the *Commercial Feeding Stuffs Act* was passed. First administered by the Department of Inland Revenue and then the Department of Health, the purpose of this legislation was to require manufacturers of feed to list the percentage of fat, protein, and fibre in feeds. See, NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-1, "High Points in the Development of the Dominion Seed Branch, Now the Plant Products Division, February 28, 1957," *History of the Seed*

However, these producers were not always particular or scrupulous in the materials that they included in their feeds. Contaminants such as poisonous and vital weed seeds, those with germinating power, were included in the feed. In addition to adversely affecting the quality of agricultural land through animal waste, these contaminants also caused sometimes-fatal illnesses in livestock.

Although the *Feeding Stuffs Act* was not passed until 1920, analyses of feeds were undertaken to protect farmers.[56] While chemical analyses of feeds revealed some information about contaminants, to be thoroughly informed, microscopic analyses to ascertain the composition of ground feeds were required.[57] The Microanalysis Laboratory of the Seed Branch was established to take up this work.

In 1916, Jean Ethel Mitchell became the first woman to undertake the work of microanalysis. Self-trained in the work,[58] she was, like Faith Fyles, a former schoolteacher[59] who was first appointed to the Seed Branch in 1914. After her resignation in 1919, a new

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Branch-Plant Products Division, by Mr. Heise, 2-3; NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-1, "George H. Clark: Outline of his Services to Agriculture While Dominion Seed Commissioner," *History of Seed Branch Work, Written in 1935*, 2; NAC, RG 17, box 68, file 5-5-A-2, "Botanical Micro-Analysis," *History of the Feed Microscopy Lab, 1911-1961*.

[56] NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-1, "George H. Clark: Outline of his Services to Agriculture While Dominion Seed Commissioner," *History of Seed Branch Work, Written in 1935*, 2; NAC, RG 17, box 68, file 5-5-A-2 "Botanical Micro-Analysis," *History of the Feed Microscopy Lab, 1911-1961*.

[57] The Chemistry Branch of the CEF, under the direction of Frank T. Shutt, Dominion Chemist, performed the chemical analyses of feed after 1920 and until the foundation of the chemical division of the Seed Branch. See, for example, NAC, T-1092-3, RG 17, AII 2, Letterbooks of the Dominion Chemist, v. 2208-9, 25/2/1920-4/8/1920.

[58] NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-1, History of the Seed Branch-Plant Products Division, by Mr. Heise, in 1957, *High Points in the Development of the Dominion Seed Branch, Now the Plant Products Division, February 28, 1957*, 3.

[59] The *Ottawa City Directory* lists Mitchell as a teacher at Glashan School from 1910 to 1913.

person was sought to undertake the work. In seeking to fill this position, Clark concluded that either a man or a woman was equally suitable. A university degree with a specialization in botany was a necessity. The incumbent was also expected to have training in microscopic work, including the preparation of slides by cutting sections.[60] The position was ranked at 2B with a salary of $1400 per annum. A competitive examination in botany and microscopy set by the First Division Examiner of the Civil Service Commission, Prof. B. A. Bensley of the University of Toronto, was held to determine which applicant was best qualified for the position.[61]

Miss Lilian V. Baker earned the appointment. Baker had graduated in 1918 with a Master's Degree in Botany from the University of Toronto.[62] Under H.B. Sifton, the Botanist in charge of the Seed Laboratory in Ottawa, Miss Baker "(made) analysis of finely ground feeding stuffs by the use of a microscope to determine the constituents contained,

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[60] NAC, RG 17, v. 2887, file 14-19, *Department of Agriculture, Seed Branch, Recommended Definition of Class, Qualifications, Principal Lines of Promotion, and Compensation for the administrative and technical positions under the Seed Commissioner, with personnel of present incumbents and comments on the positions in relation to the Civil Service Classifcation, n.d., ca. 1919*, 15, 23. The position of Seed Microscopist is interesting because Clark and not the staff of A. Young & Co., who classified the Civil Service, drafted the description. We suggest that Clark's job description is closer to Lilian Baker's actual qualifications than those of the outside company.

[61] Baker competed against the Messrs Wright and Tomlinson, two unsuccessful candidates in the competition for officer in the Seed Branch. NAC, RG 17, v. 2804, file 263825, "Letter from W. Foran, Secretary, Civil Service Commission, to Dr. J. H. Grisdale, Deputy Minister of Agriculture, 9 November 1918."

[62] Mr. Heise considers Miss Baker, M. A., to have been self-trained. NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-1, "High Points in the Development of the Dominion Seed Branch, Now the Plant Products Division, February 28, 1957," *History of the Seed Branch-Plant Products Division, by Mr. Heise*, 2-3; NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-2, "Letter from Elizabeth M. Gordon, Senior Micro-analyst, to Miss L. Clement, Plant Products Division, 19 January 1961," *History of the the Feed Microscopy Laboratory, 1911-1961*; Dorothy F. Forward, *The History of Botany in the University of Toronto*, Toronto: University of Toronto Press, 1977, 98.

including cereal grains, flax seed, oil cake, cotton seed meal, screenings, mill sweepings, poisonous weed seeds or other deleterious or useless adulterants; (cut) sections for microscopic examination; and, (made) drawings of and (studied) the structure of seeds." She also conducted micro-chemical tests and was expected to perform original research work.[63] While it is significant that Lilian Baker gained the position of Microanalyst through merit, it must be borne in mind that this type of work had been introduced into a largely feminine environment, that is, the Seed Branch. As well, a woman had been conducting microanalysis under the supervision of a man since 1916. Finally, the nature of the work undertaken to draft the *Feeding Stuffs Act* closely paralleled the routine, regulatory work performed to meet the provisions of the *Seed Control Act, 1905*. In both instances, the work was perceived as technical rather than scientific work, and therefore was 'women's work'. The combination of location, gender precedence, and the creation of regulatory work through legislation ensured that microanalysis would be laterally segregated to become scientific 'women's work'.[64]

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[63] NAC, RG 17, v. 2887, file 14-19, *Department of Agriculture, Seed Branch—Recommended Definition of Class, Qualifications, Principal Lines of Promotion, and Compensation for the administrative and technical positions under the Seed Commissioner, with personnel of present incumbents and comments on the positions in relation to Civil Service Classification*, n.d., c.a. 1919.

[64] NAC, RG 17, Acc. 83/64, box 68, file 5-5-A-2, *History Of Feed Microscopy Laboratory, 1911-1961*, "Letter from Lucie Clement, Plant Products Division, to Miss E. M. Gordon, Senior Micro-Analyst, 31 January 1961." In this letter, Clement lists the dates of first appointment, promotion, transfer, and separation of staff members of the Feed Microscopy Laboratory. Spanning the years 1916 to 1959, the list includes twenty-six names, only two of which are men: H. B. Sifton, in charge of the laboratory until his resignation in 1920, and Wm. Tildesley, micro-analyst from 1935 until 1946.

6.4 Women Chemists in the Federal Department of Agriculture: Stella Hamilton and Bertha Hedley

In 1919, in response to a request for information about employment opportunities for women in chemistry in the Department of Agriculture, Frank T. Shutt, the Dominion Chemist, declared his willingness "at all times, as far as may be practicable, to assist the women graduates of the University (of Toronto) towards obtaining suitable positions."[65] While this ambivalent response can be accounted for by the uncertainties generated by the 1919 civil service reorganization and ongoing upheavals in his staff due to the First World War, it was also a product of his awareness of the limited opportunities that women had enjoyed in his Division.

At first the result of his own desire to employ men only, an attitude which Shutt gradually relinquished as the war progressed, the Civil Service Commission (CSC) further ensured women's limited opportunities in the Division. The Commissioners initially resisted the permanent appointment of two women, Stella Hamilton and Bertha Hedley, both of whom had served as temporary replacements of men on active service. Why were these two women eventually hired? What do the difficulties experienced by Shutt in achieving their permanent appointment suggest about the position of women in chemistry in the federal Department of Agriculture?

The First World War exacerbated the perennial staff shortages experienced by the Chemistry Division. Although men employed in crucial war work were exempt from

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[65] NAC, RG 17, AII 2, v. 2206, 17/11/1919-7/1/1920, "Letter from F. T. Shutt to E. MacPherson, Women Students' Administrative Council, University of Toronto, 4 December 1919."

military service, pressure to enlist was strong.[66] Thus, by September 9th, 1914, the division had already lost three men from its permanent staff.[67] In February 1915, Shutt remarked that his staff had changed "two or three times."[68] Making the losses of personnel more acutely felt was the fact that the work of the division increased with Canada's entry into the war, as Canada had to supply the allies with foodstuffs, as well as produce items such as food and chemicals for Canadian consumption that previously had been imported. Thus, more samples were received from the Meat Inspection Division and more chemical tests were performed upon samples of feeding stuffs to respond to the needs of farmers and to establish the schedules of the *Feeding Stuffs Act, 1920*.[69]

The increased work combined with staff shortages produced two responses from Shutt. First, he curtailed the involvement of the division in co-operative international investigations.[70] Second, and more importantly, he tried to find new men to replace those

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[66] As Morris Zaslow writes in relation to the Geological Survey, although the Canadian war-time role was perceived as a supplier of materials as well as men, there was no system of deferral or granting of special status to scientific or technical staff. Moreover, "(e)nlisting was the only socially acceptable course...and in Ottawa, as in English Canada in general, a man needed great strength of will to resist these pressures and continue in his regular work, no matter how important or necessary it was." See, Zaslow, *Reading the Rocks: The Story of the Geological Survey of Canada, 1842-1972*, Toronto: University of Toronto Press, 1975, 311.

[67] NAC, RG 17, AII 2, v. 2165, 15/7/1914-28/9/1914, "Letter from F. T. Shutt to Dr. S. Hadwen, Pathologist, Agassiz, B. C., 9 September 1914."

[68] NAC, RG 17, AII 2, v. 2168, 15/1/1915-22/3/1915, "Letter from F. T. Shutt to A. G. Spencer, Canadian Inspection and Testing Laboratories, 24 February 1915." The problem only intensified as the war continued and each year Shutt commented several times on the loss of men or their anticipated loss.

[69] NAC, RG 17, AII 2, v. 2169, 23/3/1915-26/4/1915, "Letter from F. T. Shutt to G. F. O'Halloran, Deputy Minister of Agriculture, 2 April 1915."

[70] In March 1915, Shutt declared his inability to participate in joint experiments with the American Organization of Analytical Chemists because of staff shortages. In April of the same year, he wrote to C. B. Williams, Chief Chemist, Experiment Station, West Raleigh, North Carolina, of his inability to participate in extra chemical work because of the

he had lost. In his first search for replacement staff in 1914, applications were received from at least two women, one of whom had previously applied for work in 1913.[71] Neither of the women received an appointment.[72]

Instead, two men were appointed. However, the latter also left to join the Canadian Expeditionary Force (CEF).[73] Undeterred, Shutt contacted his colleagues in the universities notifying them of the needs of the Chemistry Division and listing the qualifications, one of which was "if possible a gentleman."[74] Shutt's difficulties in finding qualified men for the vacancies in the laboratory only worsened. Men were

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European War. See, NAC, RG 17, AII 2, v. 2168, 15/1/1915-22/3/1915, "Letter from F. T. Shutt to T. D. Jarrell, Assistant Chemist, College Park, Maryland, 2 March 1915." NAC, RG 17, AII 2, v. 2169, 22/3/1915-16/4/1915, "Letter from F. T. Shutt to C. B. Williams, 12 April 1915."

[71] Miss Della M. Stewart and Miss Ida MacLachlan applied for the opening in 1914. MacLachlan had also submitted an application in 1913. NAC, RG 17, AII 2, v. 2166, 29/9/1914-26/11/1914, "Letter from F. T. Shutt to W. Foran, Secretary, Civil Service Commission, 20 November 1914 and 25 November 1914." NAC, RG 17, AII 2, v. 2160, 30/9/1913-1/12/1913, "Letter from F. T. Shutt to Miss Ida MacLachlan, 24 October 1913."

[72] This is unsurprising because prior to the outbreak of the First World War only one woman had been employed in the Chemistry Division. NAC, RG 17, AII 2, v. 2163, 23/3/1914-16/5/1914, "Letter from F. T. Shutt to Grisdale, 11 April 1914" and "Letter from F. T. Shutt to Annie Hamer, 7 April 1914." Annie Hamer, holding a Doctor of Science from Trinity College, Dublin, and a published specialist in biochemistry, was a teacher and researcher at the University of Toronto. Highly recommended by Dr. MacCallum of McGill, Dr. Hamer was appointed for the summer of 1914 at $100 a month to investigate the "coefficients of digestibility of more common foods" as well as to undertake digestion work with steers.

[73] Appointed on December 2nd, 1914, Kennedy was granted a leave of absence to take up his commission in the 39th Battalion on February 15th, 1915. Browne, appointed on the same day, was granted a leave of absence in August 1915. See, NAC RG 17, AII 2, v. 2167, 27/11/1914-28/01/1915, "Letter from F. T. Shutt to Dr. Shortt, Civil Service Commission, 2 December 1914," and "Letter from F. T. Shutt to G. F. O'Halloran, Deputy Minister of Agriculture, 15 February 1915." NAC, RG 17, AII 2, v. 2172, 21/7/1915-31/8/1915, "Letter from F. T. Shutt to G. F. O'Halloran, 23 August 1915."

[74] NAC, RG 17, AII 2, v. 2170, 26/4/1915-4/6/1915, "Letter from F. T. Shutt to Prof. R. F. Ruttan, 4 June 1915."

leaving the division to join the CEF while potential male candidates found more lucrative opportunities in the private sector, or found other positions while waiting for the Civil Service Commission to process their application.[75] While previous appointments had been to permanent positions, in October 1916, Shutt informed the Deputy Minister that three temporary positions were opened, to replace men in the CEF.[76]

On October 10th, Stella Hamilton applied for one of these positions.[77] Recommended by Dr. Clara Benson from the Department of Food Chemistry at the University of Toronto,[78] Hamilton was appointed under the *War Measures Act* at a salary of $100 a month[79] and began work on January 2nd, 1917.[80] The appointment of this woman did not alleviate staff shortages and the unceasing search for new staff continued. Perhaps reflecting his satisfaction with Hamilton as well as his recognition of the realities of the labour market, Shutt changed the phrasing of his requests for assistance from

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[75] NAC, RG 17, AII 2, v. 2184, 17/1/1917-20/2/1917, "Letter from F. T. Shutt to Professor J. Warren Smith, Division of Agricultural Bacteriology, Weather Bureau, Washington D. C., 26 January 1917." NAC, RG 17, AII 2, v. 2178, 29/3/1916-19/4/1916, "Letter from F. T. Shutt to W. Foran, Secretary, Civil Service Commission, 17 April 1916."

[76] NAC, RG 17, AII 2, v. 2182, 28/9/1916-19/11/1916, "Letter from F. T. Shutt to G. F. O'Halloran, Deputy Minister of Agriculture, 4 October 1916."

[77] NAC, RG 17, AII 2, v. 2182, 28/9/1916-19/11/1916, "Letter from F. T. Shutt to G. F. O'Halloran, Deputy Minister of Agriculture, 10 October 1916."

[78] NAC, RG 17, AII 2, v. 2182, 28/9/1916-19/11/1916, "Letter from F. T. Shutt to Miss (sic) Clara Benson, Department of Food Chemistry, University of Toronto, 26 October 1916."

[79] Under the provisions of the *War Measures Act*, men could take a leave of absence to enlist in the CEF. Upon demobilization they received their previous appointment. Under this scheme, it was thus necessary to find people who would accept the temporary work. Hamilton was filling the position of Lt. Douglas C. Cole. See, NAC, RG 17, AII 2, v. 2182, 28/9/1916-19/11/1916, "Letter from F. T. Shutt to G. F. O'Halloran, Deputy Minister of Agriculture, 15 November 1916."

[80] NAC, RG 17, AII 2, v. 2183, 18/11/1916-16/1/1917, "Letter from F. T. Shutt to Miss S. M. Hamilton, 8 December 1916."

professors in universities. In December 1917, Shutt wrote again to Professor Ruttan of McGill, but this time he did not state a preference for a "gentleman." Instead, he asked him if he knew of a chemist, either a man or a woman, who was not afraid of work and who would stay with the Division for the duration of the war at a salary of $100 a month. The job to be filled involved careful quantitative work.[81]

On February 23rd, 1918, Bertha Hedely, holding a B. A. from the University of Oxford, wrote to Shutt for information about the position that he was seeking to fill. She asked about the likelihood of permanent positions becoming available and of the chances of those with temporary appointments to secure them. Shutt replied that he believed temporary staff would stand a "good chance" of receiving such permanent appointments.[82] Hedley then applied for a position as a chemist in the Division; she was appointed as a War substitute and began work in April.[83] Shutt described her as "a well-trained chemist, a skilled analyst and a faithful, careful and most assiduous worker." He also stated that "she [had] done excellent work that (...) saved the Empire and the Allies many thousands of dollars in connection with our flour control."[84]

As replacement staff, both Hamilton and Hedley were scheduled to lose their positions upon the return of the male veterans. Beginning in June 1918, the veterans

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[81] NAC, RG 17, AII 2, v. 2192, 26/12/1917-5/2/1918, "Letter from F. T. Shutt to Prof. R. F. Ruttan, Department of Chemistry, McGill University, 27 December 1917, and to Prof. J. Watson Bain, Faculty of Applied Science, University of Toronto, 27 December 1917."
[82] NAC, RG 17, AII 2, v. 2193, 5/2/1918-12/3/1918, "Letter from F. T. Shutt to Bertha Hedley, B. A., 23 February 1918."
[83] NAC, RG 17, AII 2, v. 2194, 12/3/1918-20/4/1918, "Letter from F. T. Shutt to Bertha Hedley, B. A., March 1918."
[84] NAC, RG 17, AII 2, v. 2201, 22/3/1919-294/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 14 April 1919."

began to enquire about the manner of their reintegration into the Chemistry Division.[85] Writing of this situation to E. S. Archibald, Shutt stated that he wished to keep both Hamilton and Hedley on staff. They were both women of ability who possessed a sound training in chemistry, and who also had special training in technical and analytical work; they were also excellent workers. Equally important, they were both needed because of the "press of work." Shutt then asked that measures be taken to ensure their permanent appointment after their temporary employment under the *War Measures Act* ended.[86]

Writing again about Hamilton in January 1919, Shutt reminded Archibald of his earlier requests to retain her services permanently; he asked that, in the meantime, she be appointed to a temporary position.[87] The issue was still not resolved in July 1919. Shutt once more asked for her permanent appointment or, failing that, for her temporary appointment to be renewed.[88] In September 1919, with the anticipated return of Mr. Jansen, Hedley was in the same position as Hamilton.[89] By this time, however, the permanent appointment of both Hamilton and Hedley was becoming a greater issue due to the resignation of some of the returned men. Because of the poor prospects in the

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[85] NAC, RG 17, AII 2, v. 2195, 20/4/1918-14/6/1918, "Letter from F. T. Shutt to L. Aitchison Browne, B. Sc., 13 June 1918." RG 17, AII 2, v. 2198, 13/11/1918-26/12/1918, "Letter from F. T. Shutt to R. Dorrance, 18 November 1918." RG 17, AII 2, v. 2199, 27/12/1918-7/2/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 23 January 1919."

[86] NAC, RG 17, AII 2, v. 2199, 27/12/1918-7/2/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 23 January 1918."

[87] NAC, RG 17, AII 2, v. 2199, 27/12/1918-7/2/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 25 January 1918."

[88] NAC, RG 17, AII 2, v. 2203, 21/6/1919-21/9/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 24 July 1919."

[89] NAC, RG 17, AII 2, v. 2204, 20/8/1919-3/10/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 15 September 1919."

Chemistry Division and because the salaries paid did not reflect either the work or the "status of the position(s),"[90] these men left to take up more promising positions in the private sector.[91]

Such opportunities were probably unavailable to Hamilton and Hedley. It seems unlikely that either Hamilton or Hedley would have willingly continued in their uncertain positions if something similar or better existed outside of the civil service. With opportunities scarce, they stayed with the Chemistry Division and were, perhaps, comforted by the repeated efforts of Shutt to ensure their permanent appointment. Shutt himself was becoming increasingly angered by his inability to have Hamilton and Hedley appointed to permanent positions. Complaining bitterly of the incompetence of the Civil Service Commission, he wrote to Archibald of his frustration at not being permitted to select the appropriate people for positions in his Division.[92]

Part of the problem experienced by Shutt with the CSC was disagreement over the title, salary, and status to be applied to four vacancies in the Chemistry Division. This problem was complicated by the fact that Shutt wished to have Hamilton and Hedley appointed to two of these positions. Describing his staffing needs, Shutt requested one

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[90] NAC, RG 17, AII 2, v. 2204, 20/8/1919-3/10/1919, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 15 September 1919."

[91] For example, Assistant Chemist P. T. Moloney, M. A., left the Division to take up work as a Research Chemist at the Connaught Laboratories. See, NAC, RG, 17, AII 2, v. 2205, 3/10/1919-17/11/1919, "Letter from F. T. Shutt to E. S. Archibald, 16 October 1919." Other resignations included B. Leslie Emslie, L. A. Browne, and D. S. Cole. RG 17, v. 2799, file 257897A, "Letter from F. T. Shutt to J. H. Grisdale, Director, Experimental Farms, 21 October 1919."

[92] NAC, RG 17, AII 2, v. 2207, 5/1/1920-25/2/1920, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 19 February 1920."

"Soil Chemist" to undertake work with soils and fertilizers at a salary of $1800 a year, and three "Assistant Chemists," at $1350, $1500, and $1600 a year.[93]

Problems arose because, although Shutt provided identical job descriptions and requested identical qualifications for all three Assistant Chemist positions, he suggested three different salaries for them. This was contrary to the principle of equal pay for equal work. The CSC thus asked Shutt to demonstrate the differences in the job descriptions and in the qualifications of incumbents to justify these different salaries. In response, Shutt emphasized the fact that the appointments were to be made "in accordance with the qualifications and experience of the candidates." (underlined in original) The wording of the advertisements was changed to reflect this situation. The first Assistant Chemist, at $1440 a year, was to have one year of laboratory experience, the second, at $1560 a year, two years experience, and the third, at $1680 a year, three years laboratory experience.[94] Shutt made sure to phrase the specifications in such a way as to reflect the experience of Hamilton and Hedley, both of whom planned to apply for the vacancies as soon as the advertisements were posted.[95]

The second difficulty arose over the decision to rank the Soil Chemist as an Assistant rather than an Associate Chemist, the former designating according to Shutt, a non-professional and the latter a professional position. Shutt maintained that a

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[93] NAC, RG 17, v. 2799, file 257897A, "Letter from F. T. Shutt, Dominion Chemist, to J. H. Grisdale, Director, Experimental Farms, 21 October 1919."

[94] These salary scales appear to be arbitrarily set by Shutt because they do not correspond to the schedules set out in the new classification of the civil service. As a result, these figures do not appear again in the correspondence.

[95] NAC, RG 17, v. 2799, file 257897A, "Letter from F. T. Shutt, Dominion Chemist, to E. S. Archibald, Director, Experimental Farms, 15 November 1919."

professional chemist was not required to fill the position of "Supervisor of Investigational Work with Fertilizers." He acknowledged that while "there could be no objection to the appointment of a University graduate to the position, (...) to insert in the advertisement requirements and qualifications which are neither required or essential merely increases the difficulty of properly and promptly filling the position." For the position of Soil Chemist, Shutt wanted a person with "a certain knowledge of chemistry as relating to soils and fertilizers." He did not feel that such a person needed to have the background of a professional chemist, "that basic knowledge – theoretical and practical – covering the whole science of chemistry." These were the qualifications that would be "expected and demanded (...) in one applying for the post of Associate Chemist."[96]

While this situation is interesting in and of itself, it takes on a peculiar significance considering that Shutt anticipated and desired the appointment of both Stella Hamilton and Bertha Hedley to the position of Assistant Chemist, the non-professional position. Anticipating the successful outcome of the applications of both women, Shutt asked the Deputy Minister to ensure that the salaries of these two women be no less than what they received as temporary staff. He realized that the civil service legislation did not permit the appointment of people to more than the minimum of the position to be filled. Under this provision, as Assistant Chemists Hamilton and Hedley would have received an initial salary of $1320 a year, a salary that neither was willing to accept because, at that time, Hamilton was in receipt of $1500 and Hedley, $1300 a year.[97] Shutt stated that

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[96] NAC, RG 17, v. 2799, file 257897A, "Letter from F. T. Shutt, Dominion Chemist, to J. H. Grisdale, Deputy Minister of Agriculture, 4 December 1919."
[97] NAC, RG 17, v. 2799, file 257897A, "Letter from F. T. Shutt, Dominion Chemist, to J. H. Grisdale, Deputy Minister of Agriculture, 4 December 1919."

it was "essential that we secure the services of at least two assistants, having the qualifications and experience of Misses Hamilton and Hedley, who have been on our staff for several years in a temporary capacity and who have gained experience in the varied and specialized work of our laboratories. Such assistants cannot be obtained for $1320 per annum."[98] As such, he asked that two of the Assistant Chemist positions be changed to that of Associate Chemist, both to be paid at the rate of $1800 a year.[99]

Yet more delay ensued. The CSC proposed to fill the positions of Associate Chemist from the list of those individuals eligible for the position of Soil Fertility Specialist, the non-professional position ranked as an Assistant Chemist. Shutt reiterated the fact that the positions were not comparable and that the people who applied for the position of Soil Fertility Specialist "would not be found satisfactory candidates for the positions" of Associate Chemist.[100] Taking his request to the Deputy Minister in August of 1920, Shutt "heartily recommended" the permanent appointments of Hamilton and Hedley. He noted once more the valuable work of Hamilton in the analysis of feeding stuffs and of Hedley in water analyses, flour control work, and allied investigations. He reiterated that fact that

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[98] NAC, RG 17, v. 2799, file 257897A, "MEMORANDUM RE: VACANCIES ON THE STAFF OF THE DIVISION OF CHEMISTRY, EXPERIMENTAL FARMS, 30 December 1919."

[99] NAC, RG 17, v. 2799, file 257897A, "MEMORANDUM RE: VACANCIES ON THE STAFF OF THE DIVISION OF CHEMISTRY, EXPERIMENTAL FARMS, 30 December 1919." Shutt had apparently not envisioned placing women in professional positions until the question of salary forced him to consider the possibility. Because he knew and valued the work of Hamilton and Hedley, he accepted their placement in such positions.

[100] NAC, RG 17, v. 2799, file 257897A, "MEMORANDUM RE: VACANCIES ON STAFF OF DIVISION OF CHEMISTRY, EXPERIMENTAL FARMS. From Frank T. Shutt, Dominion Chemist—4 March 1920."

> (i)t would be quite impossible to obtain through advertisement any one under the classification of Assistant or Associate Chemist who would be able to at once carry on effectively and satisfactorily the lines of work now in the hands hands of these Assistants. Their application to the work and experience during the past three years would certainly make their permanent appointment, viewed simply on economic grounds, most desirable.[101]

Finally, both women obtained a permanent professional appointment as Associate Chemists on March 1st, 1921 almost three years after the first request had been made.[102]

Both Hamilton and Hedley remained with the Division for many years. Hamilton stayed until her death in 1938, after twenty-one years of service, still with the rank of Associate Chemist.[103] Bertha Hedley, who remained also an Associate Chemist, retired from the Division in October of 1943 because of ill health, after twenty-five years service. She was in receipt of an annuity of $1368.[104] Between 1921 and 1943, only two other women appear to have received an appointment as chemists in the Chemistry Division. Neither of them were in professional positions as described by Shutt; that is, they were both employed as Assistant rather than Associate Chemists.[105] Thus, a Miss Barnes was employed as a Temporary Assistant Chemist from August 10th, 1921 until

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[101] NAC, RG 17, AII 2, v. 2211, 4/8/1920-11/10/1920, "Letter from F. T. Shutt, to J. H. Grisdale, Deputy Minister of Agriculture, 11 August 1920."

[102] NAC, RG 17, AII 2, v. 2214, 19/1/1921-3/3/1921, "Letter from F. T. Shutt to E. S. Archibald, Director, Experimental Farms, 1 March 1921."

[103] We believe that Hamilton died because the last entry on her personnel card noted that the authorization of the Finance Department had been obtained to pay two months salary to her father, James Hamilton. This payment to family members only occurred upon the death of the civil servant. See, NAC, RG 17, Finding Aid 17-59, Personnel Records 1920-1947, card for Miss S. N. Hamilton."

[104] P. C. 1/4690, 8 June 1943. See, NAC, RG 17, Finding Aid 17-59, Personnel Records, 1920-1947, card for Miss B. Hedley.

[105] We are not positive that these were the only other women appointed to the Chemistry Division because the source, Finding Aid 17-59, Personnel Records 1920-1947, is not complete. For example, it does not hold a card for Faith Fyles, Assistant Botanist.

February 22nd, 1922 at an annual salary of $1320. On November 25th, 1921, a Miss J. V. Lane was made a permanent Assistant Chemist with an annual salary of $1320, a position she held until her resignation on June 26th, 1926.[106]

6.5 Conclusion: Scientific 'Women's Work' in the Federal Department of Agriculture, 1910 to 1921

This chapter has argued that hierarchical and lateral segregation confined women who performed scientific work in the Department of Agriculture to the equivalent of professional 'women's work' in science. The degree of hierarchical segregation was a function of women's employment in 'women's occupations' or 'men's occupations.' In effect, women who were employed in 'men's occupations' secured placement in the second division while the one librarian, employed in a 'woman's occupation,' remained in the third, despite her efforts to go beyond it. Those women who secured placement in B of the second division, however, found that they did not move from this position. A starting point for men, this rank was the apex of women's careers, as the experiences of the Assistant Botanist and Chemists demonstrated.

Lateral segregation in scientific work ensured that women were employed in areas distinct from men. Thus, in botany, women performed tasks that had been sex-typed as 'women's work,' as in the case of microscopic analysis in the Seed Branch. Women also undertook those tasks that, although long-standing and necessary to the successful functioning of the Division of Botany, were less prestigious and thus unattractive to men. Discussing the employment of women in chemistry, in particular, Alice Vincent Massey,

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[106] NAC, RG 17, Finding Aid 17-59, Personnel Records, 1920-1947, cards for Miss

in her book of vocational advice, warned women that they were in competition with men in a very limited field.[107] Circumventing this competition, women in botany as well as chemistry sought scientific employment in the federal government, an employer that experienced increasing difficulty in attracting competent men, where they accepted "'invisible' positions that did not match their qualifications."[108]

Barnes and Lane.

[107] Alice Vincent Massey, *Occupations for Trained Women in Canada*, London and Toronto: J. M. Dent & Sons, Ltd., 1920, 58.

[108] Marianne G. Ainley and Tina Crossfield, "Canadian Women's Contributions to Chemistry, 1900-1970," *Canadian Chemical News*, (April 1994), 16.

Chapter 7

Conclusion: Women in Science in the Canadian Federal Department of Agriculture, 1884 to 1921

This thesis has argued that the professionalization and bureaucratization of science and the federal civil service in Canada in the late nineteenth and early twentieth centuries determined women's opportunities to participate in science in the Federal Department of Agriculture between 1884 and 1921. In effect, these processes depended upon a pool of support personnel willing to perform routine, undervalued, and underpaid tasks, which were quickly labelled 'women's work.'

Initially responsible for those aspects of agriculture related to trade and commerce, namely immigration and colonization, the federal Department of Agriculture began to undertake scientific investigations when problems such as soil exhaustion and insect pests threatened Canadian farming. These changes, however, did not happen overnight. Unwilling to spend large sums of money to support theoretical science, politicians, with the support of the farming community, appointed amateur entomologist and botanist James Fletcher to an honorary, unpaid position in the Department to undertake work in the applied sciences of economic entomology and botany. To successfully meet his responsibilities, as we saw in chapter three, Fletcher utilized a tool that had long been popular in the amateur tradition; it consisted of a network of fellow amateur observers, collectors, and correspondents.

Among this community of amateurs was a significant number of women, not just Canadian but also English, and American. As farmers and farmers' wives they assisted Fletcher in the conduct of experiments in the West. As collectors and observers, ranging the gamut from curious botanizers to self-taught amateurs as knowledgeable as Fletcher to university-educated professionals, women sent specimens and observations about plant and insect distribution. Their contributions did not end with his transfer on July 1st, 1887, to a permanent paid position in the Experimental Farms Branch.

Fletcher's transfer to a paid position is indicative of the professionalization of science, a process often marked by masculinization. Indeed, in the Department of Agriculture of 1887, women were not considered as potential candidates for a position such as Fletcher's. At the same time, however,Fletcher maintained the network he had established when he was in an unpaid position. As such, contributions of unpaid women continued to be sought.

As observational science gave way to experimental, laboratory-based science, however, the assistance of amateurs was less and less solicited. While this shift ended one form of women's participation in science in the Department of Agriculture, it opened the door to another. Women now entered the paid workforce of the Department. At this point, they came under the jurisdiction of a reforming and bureaucratizing civil service, which resorted to various policies, unwritten and written, to preserve its masculine culture.

The civil service, as we saw in chapter four, was thus organized into a hierarchical structure intended to provide advancement opportunities to men while denying them to women. The bureaucratization of the civil service led to an attempt, which was largely successful, to restrict women to the lowest rank of the civil service, the third division. This

classification was justified by women's "natural" work habits. Male civil servants argued that women were not 'promotable' because of their lack of dedication and "inappropriate" behaviour. The civil service was also restructured to safeguard men's opportunities. For instance, although the merit principle was adopted in the Inside Service in 1908, women learned that it did not, in most cases, apply to them. In the post-war environment, the masculine organizational culture of the civil service was further strengthened through another seemingly gender-neutral law passed in 1918. As well, Orders-in-Council were passed in 1920 and 1921 to bar married women from the civil service and to force their resignation upon marriage.

The goals of the civil service were most easily met, as we discussed in chapter five, in seed analysis, a science whose structure in the federal Department of Agriculture was the product of both the professionalization and bureaucratization of science. First employed to implement the research agenda designed by George H. Clark, a professional scientist, women soon found even greater employment opportunities as seed analysis bureaucratized following the passage of the *Seed Control Act, 1905*. This *Act* created a need for support personnel that would undertake routine work: it was labelled as 'women's work.' In contrast, the work of men was considered to be scientific. As well, men performed fieldwork and managed seed laboratories, activities deemed to be inappropriate for a "lady." Finally, while men were required to have post-secondary education, women had to evince "correct" attitudes, such as a willingness to perform repetitive, detailed, and boring work requiring manual dexterity.

Higher education, however, allowed some women to escape from the third division. Holding university degrees, certain women, such as Assistant Botanist Faith Fyles,

Microscopic Analyst Lilian V. Baker, and Chemists Stella Hamilton and Bertha Hedley, all secured appointments in the second division of the civil service. Nonetheless, as we demonstrated in chapter six, they each experienced discrimination. Baker was hired because of her credentials, but also because microanalysis had already been sex-typed; a woman had performed the work from 1916 and it was undertaken in the Seed Branch laboratories. Faith Fyles, on the other hand, experienced lateral and hierarchical segregation as the assistant of Dominion Botanist Han Gussow. While Gussow undertook important investigations in plant pathology, Fyles performed the routine and less prestigious work involved with maintaining the herbarium and botanical garden. Like Fyles, the chemists experienced hierarchical segregation. Although they did work similar to that of male chemists, they did not obtain promotions or the raises that accompany them. Involved in botany and chemistry, these women were not employed in "female occupations." They fared better than their equally well-educated sisters employed in such occupations. Thus, librarian Annie Louise Shaw was refused entry to the second division.

In 1919, E. S. Archibald noted that competent men did not seek those positions filled by women either because of the nature of the work or because of the salary attached to them. This sex-segregated structure was not accidental. Rather, it was an essential dimension of the professionalization and bureaucratization of scientific work and of the civil service during the years covered in this thesis.

The history of women in science in Canada remains a relatively young field and the literature has only minimally broached the specifics of women's employment in science in the federal government. The Canadian federal Department of Agriculture is unique in terms of both the numbers of women employed and the early date of their employment, although

other federal departments and bodies have also employed women in science. Moreover, the range of occupations in which they participated is intriguingly diverse. This thesis has thus filled an important gap. But there is a great need for further investigation. The experiences of women employed in science in the period after 1921 need to be investigated. Did women's opportunities expand or contract in the Inter-war years? What happened during the Depression? What was the impact of the Technical and Professional Services Commission, known as the Beatty Commission, of 1928-31? Did the Second World War, unlike the First World War, create or expand opportunities for women in science in the Department of Agriculture? All of these questions, I hope, will be explored in future research projects.

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