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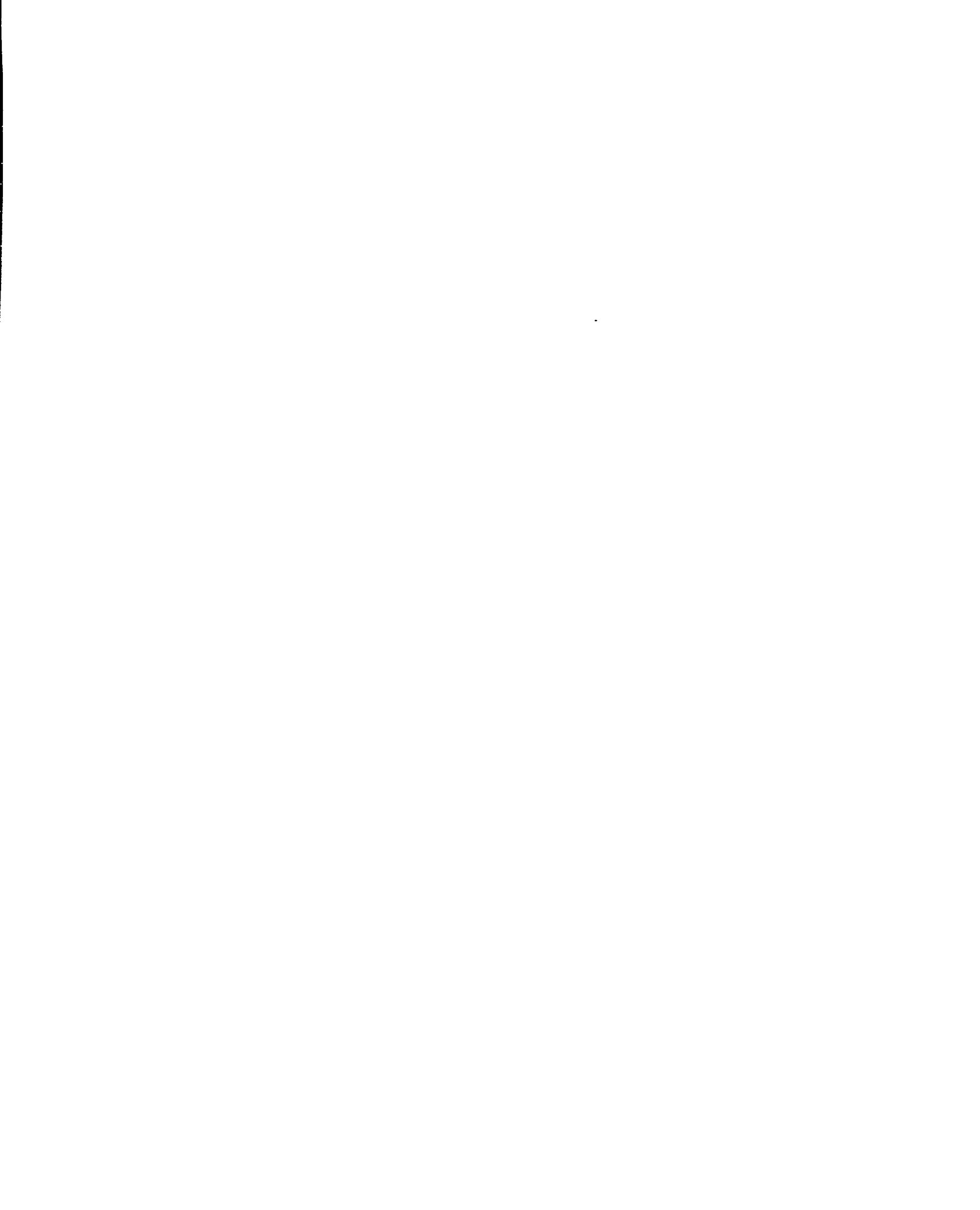
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**Organizing the Bench:
Medical Laboratory Workers in the Maritimes, 1900-1950**

By

Peter L. Twohig

**Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy**

at

**Dalhousie University
Halifax, Nova Scotia, Canada
August 1999**

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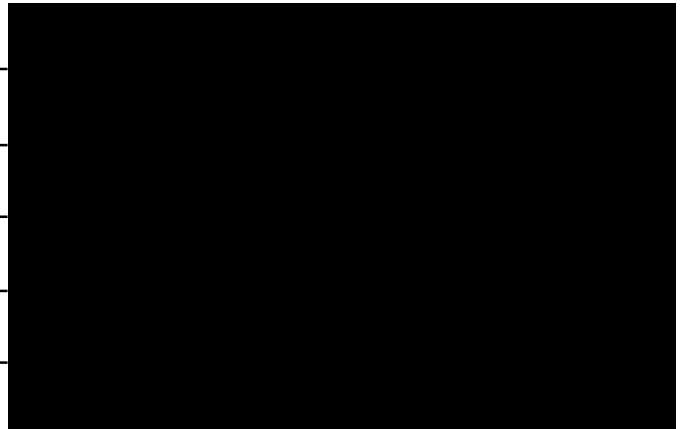
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by Peter Lawrence Twohig

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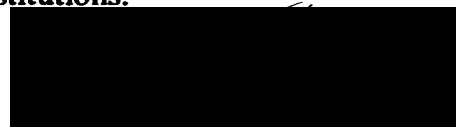
AUTHOR: Peter L. Twohig

**TITLE: Organizing the Bench: Medical Laboratory Workers
in the Maritimes, 1900-1950**

DEPARTMENT: History

DEGREE: Ph.D. CONVOCATION: Fall YEAR: 1999

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Abstract

Medical laboratory technology is the third largest health profession in Canada. Yet, these workers are largely invisible, both to the public and historiographically. Even recent studies of laboratory medicine make only fleeting reference to workers at the bench. This study examines the origins of the laboratory workforce at the Pathological Institute in Halifax in particular, and the Maritime provinces more generally. It utilizes hospital, university and archival records to demonstrate how this workforce was created as part of a "health care team" and the implications this had for the workers themselves. As Canadian hospitals grew in number and bed capacity over the opening decades of the twentieth century, they also grew in complexity. Hospitals added new services, including departments such as dietetics, x-ray and expanded laboratory facilities. As these services matured, the routine work passed from physicians working alone to specially trained workers. Yet, this process was not uniform and remained remarkably incomplete. In the first half of the twentieth century, laboratory workers did not share a common education, training experience, or labour process. Hospital workers in the Maritimes and elsewhere did not necessarily perform discrete tasks and many, notably nurses, assumed duties in the laboratory. The workers themselves had diverse educations and work experiences. Well into the 1950s, the "laboratory worker" was a diffuse concept. The demands of patients and physicians for enhanced services, the constraints of budgets, recruitment and retention problems, and the interests and desires of workers themselves combined to shape laboratory work. Viewed from the laboratory, the story of the twentieth century Canadian hospital is not one of ever-expanding specialization, but rather a complex milieu where the social relations of skill and gender found bold articulation.

Acknowledgements

"The value of an Historian was discussed and agreed upon. No appointment was made at this time."¹

The Canadian Society of Laboratory Technologists was wonderfully supportive of this work and Kurt Davis and Lynn Zehr in particular. The national society made files available to me and allowed me some office space while I was in Hamilton. I was also pleased to be able to present papers at the society's national congress in 1997 and also to the Nova Scotia Society of Medical Laboratory Technologists. I appreciate very much the interest and support of the current generation of laboratory workers. Special acknowledgement is due to Dorothy Bidgood, who took an early interest, but died before I could complete this work.

It was a privilege to be a student of Michael Cross during my time at Dalhousie and it saddens me to think I will be his last PhD student. He always challenged me to bring my work to another level. I am still trying and will get there through his inspiration. I am indeed fortunate to have a wonderful group of scholars to draw upon. David Sutherland, Shirley Tillotson, John Farley and T.J. (Jock) Murray all provided much appreciated intellectual stimulation of differing varieties and amounts. I am sure I owe them all significant intellectual debts. Colin Howell, of Saint Mary's University, reminds me through his work and friendship why I wanted to be a historian in the first place. Barbara Clow, who took up an office across the hall while a post-doctoral fellow at York University, has proved to be a terrific friend and offered helpful criticism of parts of the work. Deborah Stiles helped me through a difficult part of the process and I am most grateful.

My colleagues in the Department of Family Medicine were supportive of my "other life" as a PhD candidate. Over the past few years, they have encouraged me to continue writing and presenting papers and allowed me the time to do so. Many thanks to Sue Tatemichi, Stephanie Suter, Debby Cougle and Bob Tingley in Fredericton and Fred Burge and Wayne Putnam in Halifax.

The staff at the Public Archives of Nova Scotia are simply wonderful. I think one would be hard-pressed to find a more dedicated collection of individuals anywhere. Special thanks to John MacLeod, Barry Cahill, Lois Yorke and Rosemary Barbour. I also spent significant time in the Dalhousie University Archives, pestering Charles Armour. He always treated me with courtesy and took an interest in the work.

My wonderful wife Beverly has been a partner through this entire journey. She sustained me through comprehensive exams, the early research effort, the travel, a two-year absence and the writing process. She provided much support. OK, you can teach me to curl now.

I would like to dedicate the work to the memory of Dr. Richard Hadden, a sociologist at Saint Mary's University. He invited me to his classroom to discuss some of the ideas in this work. More importantly, he was a friend and I am going to miss him.

¹ CSLT Executive Meeting, March 29, 1953.

Introduction

Halifax in 1919 was a bustling place. It was still a military town -- a legacy of the British empire -- and, of course, there were the benefits of war enjoyed by port communities since time immemorial. Halifax was not only a port, but it was also a center of education and of health care. Walking west on Morris Street, one could pass by several hospital facilities before arriving at the campus of Dalhousie University. Here one could see the stately Forrest Building, Dalhousie's second home, while nearby, on the south side of Morris, stood the Pathological Institute. A few blocks away, on Cartaret Street, Margaret Low was hard at work. As one of the early pioneers who forged a place for women in medicine at Dalhousie, she was familiar with the complex of university and medical buildings clustered on these few blocks. Low attended the medical college from 1900 to 1902. But in 1919, working from her home, Low was not ministering to the sick and infirm of her south-end Halifax neighbourhood. Rather, beginning in May, she was patiently cutting histological sections with a microtome, mounting slides and taking them up to the medical school, where students would use them to unlock the mysteries of the hidden cellular world.¹

Margaret Low and countless other workers laboured in the university and, then as now, they were rarely acknowledged. Such workers are common in the university: the cleaners, carpenters, secretarial staff who are largely absent from university histories. The experience of Margaret Low speaks to the invisibility of certain kinds of workers in our historical remembering. Margaret Low, and all of the laboratory workers who pioneered in the hospital

and other laboratories, *exist* in the documentary record. An examination of the *Public Accounts* of New Brunswick for the years 1919-20 to 1944-45, yields no less than 121 different names, including workers performing laboratory tests, support staff such as cleaners, clerical relief and carpenters, and physicians working in the provincial Bureau of Laboratories in Saint John.² Their stories have, however, not been considered worthy of recounting.

In the late twentieth century laboratories have captured the attention of a wide range of commentators. Canada's tragic engagement with questions of the blood supply and the devastating consequences for victims who contracted HIV or hepatitis C, has thrust the laboratory into the national spotlight.³ In the 1980s, three million Canadians received blood transfusions and more than a thousand contracted these diseases. More generally, questions surrounding emerging infectious diseases, ebola being perhaps the most striking example in the 1990s, or drug-resistant strains of old nemeses, have given laboratories a public profile not enjoyed for many decades.⁴ And while laboratories vary greatly in terms of their composition or objectives, they share in common a variety of workers who toil anonymously, hidden from the headlines and historical accounts.

Although laboratories are widely recognized to be a significant development in the public health and scientific medicine that swept the western world in the wake of the great discoveries of bacteriology in the 1880s, we know very little about their internal workings or their staff, particularly in the North American context. Margaret Low is an example of the invisibility of laboratory workers in the early twentieth century, and perhaps even today. She was a pioneer in Halifax's Pathological Institute and her name can be found in

the *Public Accounts* and *Annual Reports* of the 1920s. But Margaret Low's contribution to the facility is largely unrecorded. To date, there have been a couple of brief treatments of the Pathology Laboratory. One, a thirty year old Masters thesis, focuses on education and makes no mention of any of the early staff.⁵ The other is a brief article published more than thirty years ago by D.J. MacKenzie, the long-time laboratory director for whom the building housing the laboratory service at the Victoria General Hospital site of the Queen Elizabeth II Health Sciences Center is named. MacKenzie, not surprisingly, focuses on the achievements and contributions of a select group of physicians and scientists, and hardly mentions other staff. He does note that Low provided "faithful and efficient service" until her retirement in 1947.⁶ During her thirty years service, Margaret Low was a dynamic presence among laboratory workers. In 1927, the Department of Public Health sent Low to the Michigan Board of Health laboratories in Lansing, where she studied under Dr. R.L. Kahn. And when MacKenzie was absent for most of 1927-28 because of ill health, running the laboratory fell to Margaret Low.⁷ She was often responsible for training other women in the laboratory and was remembered by her co-workers as the unquestioned authority in the day-to-day work in the lab.

Concurrently, Margaret Low exemplifies a great deal of what we know about women who worked and lived in Halifax. Low was very well educated. She had attended the Halifax County Academy before entering University, and pursued business courses at the Maritime Business College afterward. Margaret Low earned an honorarium for her work, which she had performed since 1915.⁸ University President A.S. MacKenzie noted that Dalhousie "could not put [compensation] on a really proper basis" but could "recognize that we

appreciated her services."⁹ While demonstrating, Low worked approximately four days a week, for two hours a day in addition to preparing her slides. She would obtain fresh tissues from a local butcher, while local pharmacist George Burbridge would supply alcohol. Professor D. Fraser Harris and President MacKenzie considered her highly competent and trusted Low to get the work done.

For her efforts, Low received a \$100 honorarium. This was considered sufficient until the late fall of 1919, when her brother died. Harris wrote that "[a]s long as her brother was alive she had an income from him, but at his death that ceased. She is a[t] present doing so much for my department ... that it is only fair she should get something more than an honorarium."¹⁰ So, in common with women everywhere, her pay was not intended to provide a living wage. Wage structures simply did not contemplate the independent woman, except for brief periods prior to marriage. Women were to eke out a living where they could find it. Laboratory work did, however, offer women needing and wanting work an avenue that removed them from tending to the needs of children, their family or patients (if one was fortunate enough to work exclusively in the laboratory). For educated women such as Margaret Low, this may very well have been a desirable occupation. They could acquire the necessary skills in fairly short order, often while being paid. If they had an undergraduate education in the sciences, laboratory work offered an opportunity to pursue their interest in science, although in a highly constrained manner. At a time when opportunities for women were few the chance, even for a short time, to use a degree that otherwise led to few career prospects was desirable.

It has been almost a decade since John Harley Warner emphasized that the so-called "new social history of medicine" marked a significant shift in the content of medicine's historiography. Surveying the historiography of science and medicine over the past 20 years, Warner suggests that many medical historians have displayed a reticence toward science.¹¹ The lack of concern with science invariably leaves laboratories outside many investigations. Indeed Andrew Cunningham and Percy Williams note that of the three medicines -- bedside, laboratory and hospital -- only the latter has received very much historical attention.¹² Accompanying the transformation wrought by the new social history of medicine, was a critique from within the medical community of "reductionist medicine." Medical ethicists and clinicians jointly criticized the reification of medical technology for dehumanizing modern medicine by obscuring the doctor-patient relationship. Concurrent with this critique, resentment was building within the medical profession toward the research laboratory, both because of the latter's material support and its super-ordinate position vis-à-vis clinical judgement.¹³

Cumulatively, these developments created a historiographic climate that leaves laboratories largely uninvestigated. Many studies identify the laboratory as a key feature of medical education,¹⁴ the location of medical authority¹⁵ and the site of medicine's most prominent discoveries, including the tubercle bacillus, diphtheria antitoxin, and others. A generation of scholars has pursued a program of research on the influence of laboratory teaching on medical education, the laboratory-based germ theory on the history of epidemiology and public health, and the increasing industrial role played by laboratories, especially (but not restricted to) the drug industry. But there have been few

examinations of the laboratory itself, despite the institutional focus of much of the history of science and the history of medicine. In many hospital histories, the development of a laboratory is mentioned only in passing, if at all.¹⁶

But it is more than omission. In his classic examination of Chicago, Thomas Bonner mentions the laboratory when detailing the "meagre" equipment of County Hospital in the early years. The lack of laboratory (and other) facilities is noted, presumably as an indication of the pre-modern and poor quality hospital.¹⁷ Occasionally, laboratories were mentioned in communication between hospital and government. The Hotel Dieu Hospital in Chatham, New Brunswick, noted in 1928 that together with other services, the laboratory was an "immense expense" that contributed to the hospital's operating deficit.¹⁸ In his opening remarks to the 1936 Annual Report the New Brunswick Minister of Health, William Warwick, stated that the "highly scientific and exacting nature of the work carried on by the staff of the laboratory ... is little appreciated by the laity."¹⁹ To many, laboratory workers remained hidden and this extended to historians. It is ironic, given the admirable effort to write history from the bottom-up, that social historians have not seized the laboratory in an effort to recover the narrative of these other workers and rethink many of the assumptions that endure about hospital work. Perhaps the answer lies in the fact that first, social historians have ignored the laboratory because they considered it "elitist" and, second, historians of science have ignored laboratory workers because they were unimportant.

Works that do delve into the laboratory invariably focus on the elite research scientist. Even a recent and thorough analysis such as Gerald Geison's study of Pasteur, fails to make anything but the briefest mention of workers

other than Pasteur. Geison describes the Pastorian camp as a "family affair," noting that the work environment emulated the family enterprises familiar in the French and Italian context. "Job security" characterized Pasteur's labs according to Geison, as members of the same family, extending into new generations, worked as "low-level technicians or custodial staff."²⁰ Despite Geison's tease, this is the only mention of these workers in the volume. In a similar fashion, Robert Bruce writes of anonymous "humbler workers" or "pyramids of pygmies," on whose shoulders the great scientists stood.²¹ Bonner refers to the "bottle-crammed laboratory with its silent *men* of research ..."²² The *New York Times* heralded the opening of the Rockefeller Institute in 1903 as a place of "scientific men, working in the scientific spirit."²³ This anonymity reveals as much about the historian as the history -- it is rooted in assumptions of class and gender. Considerations of the laboratory often do not move beyond examining elite scientists, usually men, even to consider other men in the lab.

Other works, most notably Steven Shapin's recent volume *A Social History of Truth*, have endeavoured to make technicians visible, to transform them from the "ghostly inferred hosts of unnamed actors who shifted instruments about and exerted their muscular labour in making them yield phenomena."²⁴ Shapin has commented that technicians are triply invisible. First, they are virtually absent from the literature.²⁵ Second, the contribution of technicians to scientific pursuit is rarely preserved in the documentary record. Finally, stemming from the absence of technicians from the documentary record, it is plausible to infer that their work was not considered significant by employers, including the scientific institutes, hospitals, universities and individual scientists.²⁶ While we may accept Shapin's invisibility schema for seventeenth

century European science, it is less tenable for the twentieth century clinical or public health laboratory. After all, the study of public health is a frequent one among urban historians, medical historians, labour historians, women's historians and others. Yet the same invisibility endures.

This thesis attempts to reveal something about laboratory work and workers in the Maritimes. The experience of other hospital workers, notably those in the x-ray service, is occasionally noted for illustrative purposes, but no systematic analysis of these workers was undertaken. The study does try to situate laboratories, one of the hallmarks of both public health and the modern hospital, within a larger social and cultural framework. It is not an attempt to write the history of the Victoria General or Saint John hospitals that housed the laboratories under consideration. There are as yet few sophisticated studies of the hospital in Canada²⁷ and this study does little to remedy that problem. Characteristically, commemorative hospital histories or works on health history in general place an emphasis on caring. This study departs from this tradition insofar as it tries to understand the laboratory as a place of work. Clearly, then, this is not a patient-centred study. What the various tests meant for patient outcomes or for the health of the province is not examined here. Much of the evidence presented is drawn from Halifax, while the Saint John facility was investigated only through published annual reports. The work is even less an attempt to treat the remarkable period of hospital development in the Maritimes in the early twentieth century. At its core, the thesis is rather an attempt to understand the hospital as a place of work and of laboratory work as a "service": women serving the public and the laboratory serving the interests of the hospital, the medical profession, and the state.

Hospitals have been, and continue to be, idiosyncratic institutions. There is no doubt a need to understand the development of laboratory workers across Canada. While largely focused on Halifax, the study has endeavoured to achieve some sort of balance. It focuses on the Morris Street laboratory, but looks elsewhere for confirmations and exceptions to reveal the tensions, trends and inconsistencies where appropriate. National journals and the records of the national society, the Canadian Society of Laboratory Technologists (CSLT), were examined systematically to supplement and inform the Halifax records. What are the things we need to understand about the emergence of laboratory work in the period before 1950? First are the institutional structures, the bricks and mortar that were one of the most obvious manifestations of a government's commitment to public health initiatives. Secondly, the thesis will describe the daily work of the laboratory. Third, the workers themselves will be examined, including who they were and how they were educated. Finally, the creation of a typical national organization characteristic of Canadian "health professions" will be described.

I -- INSTITUTION BUILDING AND THE BURDEN OF DISEASE

To understand laboratory work, it is necessary to understand the development of the institutional structures. Thus, there is a description of the development of the buildings, facilities and administrative structures in the early chapters. This is, after all, the context of work. It is intended to describe the working environment for the women and few men who laboured at the bench. Laboratories in the Maritimes were not innovators. Instead, they existed in a national and international climate that saw laboratories established

throughout the western world in the closing decades of the nineteenth century and the early twentieth century. The leading Maritime laboratories were the provincial laboratory in Nova Scotia, located in Halifax, and the Bureau of Laboratories in Saint John, established when that province created a Department of Health in 1918, the first in Canada. Laboratories in the Maritimes were not leaders in Canada; others were established in earlier decades. But the laboratories in Halifax and Saint John became important centers for aiding clinical diagnosis for physicians in the Maritimes, for public health and, in Halifax particularly, for medical education.

From about 1880 to 1920, municipal, provincial and federal governments established public health bureaucracies.²⁸ Of course, activities to defend health predated this period but these were usually sporadic, prompted by outbreaks of cholera, smallpox or other maladies. In the closing decades of the nineteenth century public health was transformed, according to Paul Bator, "from the status of a periodic preoccupation of a few doctors and lay volunteers into a permanent occupation for experts who daily monitored the health of communities."²⁹ Urban growth and the often-cited social consequences of industrialization prompted many provincial governments to take a serious interest in public health.³⁰

In Nova Scotia, the Board of Health was established in 1893. It joined those already in existence in New Brunswick, Ontario, Quebec, and Manitoba. The Nova Scotia Board was chaired by the Premier, W.S. Fielding and included the Attorney General and the Commissioner of Public Works and Mines. The medical profession was also well represented on the new board, including the superintendents of the Nova Scotia Hospital and the Victoria

General Hospital (VG). Four other physicians were also appointed. But the real work of the Board fell to Dr. Alexander P. Reid.³¹ Reid was a well-known figure in medical reform. He had also served as an examiner on the Medical Board, a faculty member at the Halifax Medical College and a superintendent at both the VG and the Nova Scotia Hospital, the two provincial institutions. What is apparent is that from the outset, public health in Nova Scotia would be characterized by the close co-operation between the medical profession and the state.

Laboratories were an overt and visible manifestation of governmental commitment to the public health effort. Ontario established its public health laboratory in 1890, eight years after creating the provincial Board of Health.³² In Montreal, Dr. Louis Laberge, the City's Medical Officer from 1885-1913, laid the foundations for a laboratory service. Bacteriologist Dr. J. Edouard Laberge examined milk and food supplies.³³ In laboratories such as these, discoveries relating to bacteriology, immunology and, increasingly biochemistry, were given practical application. Microbiology held great promise for the control of communicable diseases, and large municipalities and provinces were quick to recognize their utility. By 1899, the American Public Health Association had a section for bacteriology and chemistry, which was later re-named the laboratory section.³⁴ Looking back on fifty years of progress, the *Canadian Journal of Public Health* noted that the intention of the public health laboratory was "to make a study of communicable diseases and to assist in assuring a suitable public water supply. ... The diagnostic laboratory's reliable information on the date on which convalescent diphtheria patients could be released from quarantine, the introduction of a Widal test for typhoid,

and the introduction of the Wassermann test all consolidated the laboratory's position."³⁵ In the Maritimes, laboratories grew throughout the 1920s to achieve some stature within the medical community and public health bureaucracy.

Physicians welcomed this assistance. After Robert Koch discovered the tubercle bacillus in 1882, doctors the world over were quick to accept that the best confirmation of disease was the presence of bacteria, and tuberculosis was joined by other diseases, including cholera, typhoid and diphtheria.³⁶ Laboratory tests removed the uncertainty of diagnosis around serious contagious diseases such as diphtheria.³⁷ An early annual report noted that the laboratory would "be of special service to the profession and the public, for an early diagnosis in cases of diphtheria and tubercle, when the signs are indefinite. ... Few medical men have the apparatus, even if they have the skill, to make such examination in doubtful cases. In very many cases doubt has been dispelled, and in others a timely forewarning given which will save, or in any case, prolong life."³⁸ New York founded a diphtheria laboratory in 1893, and doctors were supplied with a free test tube filled with nutrient that nourished the growth of bacteria. Doctors took throat swabs in suspected cases, applied the swab to the culture media, and dropped the tube at any one of the countless drug stores across the city. Tubes were collected nightly, and physicians learned of the diagnosis the next day. Diphtheria's clinical presentation did not make diagnosis easy -- a sore throat was a common occurrence and the white membrane in the throat did not always appear. Doctors, moreover, may have been reluctant to make the diagnosis. Diphtheria was highly contagious, and a diagnosis meant quarantine. This meant not going

to work and a disruption in familial social relations. A missed diagnosis brought the scorn of public health authorities and even the community. In Halifax during the First World War, the Department of Public Health reported that many soldiers lacked the distinctive white membrane, and that a diphtheria diagnosis was made only through laboratory methods.³⁹ Diphtheria was clearly a good cause for establishing laboratories. In the first decade of the twentieth century, an even more dramatic disease, syphilis, joined it.

In 1905, German laboratory scientists Fritz Schaudinn and Erich Hoffmann identified the cause of syphilis, a spiral microorganism they dubbed *Spirochaeta pallida* (renamed *Treponema pallidum*). Again, the laboratory had made a significant discovery, but the following year, August Wassermann, together with Albert Neisser and Carl Bruck, published a paper detailing their success in developing a test for syphilis. The blood test used a complement-fixation reaction, based on recent developments in immunology. The third element was introduced within the next year, the dark-field microscope. On these instruments, the object being examined appears as a bright image on a dark background, which made identification of syphilis much easier, because it did not stain well and appeared only as a faint image on a standard bright-field microscope. The innovation made the visual detection of the organism much easier.⁴⁰ Syphilis joined other recognized venereal diseases. Neisser identified gonorrhea in 1879 and the Italian dermatologist Augusto Ducrey discovered chancroid a decade later. Unquestionably by 1906, the basis of diagnosis of venereal disease was the laboratory.

Public health, unlike the domain of the hospital or medical school, was terribly complex, subject to a variety of interests. Scientists offered advances in

chemistry and physics that made public health efforts viable, and engineers, who refined sewage systems and water supplies, joined them. In the twentieth century, nurses would play an increasingly prominent role in ensuring the health of the rural and urban population alike. Health care workers, moreover, stood alongside countless volunteers, while governments enacted the legal, administrative and financial structures required for public health reform. Public health enjoyed widespread appeal.

It is this complexity that makes the study of public health fruitful, for it reveals the broad impact of questions of health and reform, while allowing historians of medicine to expand their often narrow focus. Among other things, public health history reveals "the close relationship between government bureaucracy and public health care."⁴¹ In Canada, public health historiography has taken three approaches: first, those that document a story of progress and the glorification of results; second, the humanitarian argument, which views public health as the effort to save lives and improve health; and third, social control models, which posit that improvements were made as a means to maintain order by ameliorating the condition of the working class.

Chapter 1 will extend these efforts, exploring the complex relations among government, medicine and other interests through an examination of the development of laboratories in Halifax and Saint John. In Halifax, the presence of the Dalhousie Medical School, and the relationship between the laboratory and the University are significant. Planners also believed the laboratory would serve both the Victoria General Hospital and the province generally, which added to the complexity. In Saint John, the development of the laboratory accompanied government efforts in public health. The chapter details the

creation of the laboratories themselves, as one of the most obvious expressions of the provincial governments' commitment to public health.

The establishment of laboratories in the Maritimes did not take place in isolation. There was an international movement to establish lab facilities in virtually all industrialized countries, and reformers throughout the Maritimes paid close attention and participated in this movement. Doctors kept abreast of the latest laboratory tests and practices, and made critical assessments of how they would aid in clinical diagnosis or public health work. Journals were read and meetings attended. Tours were taken of facilities in other centers to view equipment and space. Thus, a study of laboratory workers in the Maritimes offers a chance to examine the processes of establishing laboratories generally.

In 1910, Halifax children listened earnestly to a lecture on hygiene at the Quinpool Road School, and the education supervisor Alexander McKay praised the efforts of the physician and health reformer who presented the talk.⁴² Maritime reformers, like their counterparts elsewhere, exhibited a growing interest in public health. Children were always of special interest to reformers of all kinds, and they were singled out for special instruction on hygiene. Doctors endorsed the effort, calling for general vaccination against smallpox, instruction in hygiene and physical education, and building better schools. Cleanliness was touted as the best defence against disease. It meant the reduction of dirt and disease, flies and rodents, but it also extended to people, water, milk and food.⁴³ As a result, public health blazed a trail into new markets for the extension of medical authority. This emphasis on prevention marked a shift for the medical community, and was informed by the remarkable discoveries -- accelerating by the end of the nineteenth century -- in

disease etiology (especially bacteriology) and in medical technology, with the widespread use of compound microscopes, thermometers and stethoscopes.

More than discovery, innovation, or the faces of young children, it was the horror of disease that drove the public health movement in these years. Typhoid in Winnipeg, cholera in Toronto, smallpox in Montreal or Milwaukee, these pathogens infected city dwellers with a desire for improvement. In 1904, before a typhoid epidemic, Winnipeg spent only \$36,000 on public health. The year following the epidemic, 1906, this figure approximated \$130,000. The number of public health employees more than doubled, from fourteen to thirty-four in the same time.⁴⁴ In the Maritimes, laboratories were founded in the early decades of the twentieth century to serve the public health of the general population and the clinical needs of the community hospitals. They responded to the changing needs as new tests emerged or as questions of social policy were framed. Most importantly, the work of the laboratory was shaped by the threats disease posed to the health of the population. It was this "burden of disease" that saw the addition of milk and water testing, the commitment of the federal government to venereal disease control and the involvement of philanthropic organizations in a range of endeavours that saw staff added to the laboratory.

These developments are discussed in the second chapter. The tests performed were dominated by examinations of milk and water, and investigations related to tuberculosis, typhoid fever, diphtheria and venereal diseases. In the first decades of the twentieth century, the number of analyses expanded from a few hundred tests per year initially to several thousand. Accompanying this expansion were additions to the staff and service.

Increasingly, the laboratory revealed hidden threats to health and, by the end of the 1920s, established itself as an integral part of clinical and public health work.

Doctors were intimately involved in many aspects of the nascent public health movement, and Meryn Stuart has suggested that after consolidating their control over hospitals, they attempted to dominate public health in a similar fashion. "The central theme in the history of late nineteenth- and early twentieth-century public health," Stuart writes, "was the hegemony of medicine and science over the voluntary religious reform movements which dominated earlier efforts."⁴⁵ Doctors in Canada did, however, build careful alliances with volunteers and philanthropists.⁴⁶ This contrasts sharply with the American experience, as recounted by several historians of public health. Barbara Melosh suggested American doctors were "scornful" of the aims of public health and were happy to give the duties over to the enthusiastic reformers.⁴⁷ Public health in Canada enjoyed the benefit of large national organizations and governments more willing to ameliorate the material conditions of its population. As a result, preventive medicine was not subordinated to curative medicine to the same extent in Canada. Different forces were at work and the two systems developed differently.

II -- LABORATORY WORKERS

Public health required a broad range of workers to ensure its success. In her examination of late-nineteenth century America, Barbara Rosenkrantz suggested that physicians, engineers and the public participated in a more or less happy partnership.⁴⁸ Andrew Young expressed this clearly enough when,

in 1891, he told the American Public Health Association that plumbers and physicians shared responsibility for public health. Young, in fine rhetorical style, stated that "Plumbing is no longer merely a trade. Its importance and value in relation to health, and its requirements regarding scientific knowledge, have elevated it to a profession."⁴⁹ Plumbers, not surprisingly, never garnered the rewards that accrued to physicians and others who were the public face of public health. The emphasis on professionalization is significant. The closing decades of the nineteenth century and the first ones of the twentieth saw participants in the public health movement define and redefine their relationship to public health, and one another. Sanitary science, science, or other appellations were characteristically inclusive in the early years of public health. With the increasing specialization, however, "science" began to refer to "specific disciplinary advantages which training, affiliation and accreditation conferred."⁵⁰ The meaning of science has been much debated in the historiography. John Harley Warner argues that historians use "science" in a haphazard, uncritical fashion. Indeed, he argues, all periods of the history of medicine were "scientific." Rosenkrantz suggests that it was reformers themselves who restricted the use of the term science. In other words, the confusion stems from more than simple slippage on the part of the historian.⁵¹

Public health was becoming increasingly specialized and medicalized. Following World War I, physicians in public health increasingly resented the leadership exhibited by organizations like the Canadian Tuberculosis Association or the National Council of Women in Canada. In 1925, at the Canadian Medical Association's (CMA) annual meeting, this resentment manifested itself. The CMA adopted a policy that explicitly subordinated lay

persons working in health to the authority of doctors. At the same meeting, public health nurses were singled out for special criticism. Preventive medicine, at least officially, was fully subordinated to medical authority.⁵² Those with an interest in sanitation were increasingly removed from power within the movement, as were those without medical qualifications. At the same time, the bacteriological advances that identified specific causative agents for disease broke down the alliances around notions of disease causation that allowed for the creation of a heterogeneous community.⁵³ Specialization and science displaced voluntarism, informed by the humanitarian impulse. In Canada, the best manifestation of this new reality was the founding of the University of Toronto's School of Hygiene in 1927. Located on College Street and funded by the Rockefeller Foundation, the School, under the guidance of Drs. John FitzGerald and Robert Defries, developed programs to address all aspects of public health.⁵⁴

Public health, accompanied by a new commitment to infrastructure, bolstered by the developments of science and the experience of a century, stood as an example that sickness and death were, at least in part, public policy issues.⁵⁵ Everywhere throughout North America, there was recognition of a need for adequate infrastructure and this included the development of facilities for laboratories. One historian noted that in the mid-nineteenth century, "the only laboratory of which the average European or American medical man would be likely to have a direct acquaintance was that of the pharmacist." By the turn of the century urban and education centres throughout North America and Europe had established laboratories -- physiological, pharmaceutical and pharmacological, microbiological, forensic and public health.⁵⁶ Stanley Reiser

explained the process of laboratory development "as a chain of links that began with the laboratory devoted to basic research; was followed by the clinical laboratory, which split its efforts between research and patient care; and ended with the ward laboratory, where the knowledge and methods perfected in other laboratories were most practically applied."⁵⁷ The acceptance of the laboratory ethic by physicians, however, was far from complete.⁵⁸

Laboratories were performing an expanding number of tests every year and the staffing needs were growing. Health care delivery was also becoming increasingly complex. The clinical judgement of a physician in making a diagnosis was supported by x-ray and laboratory services, while their efforts to manage infirmity benefitted from services such as physiotherapy or dietetics. A complete diagnosis for many diseases could now only occur with the participation of many services. Chapter 3 will explore the growth of the laboratory workforce as a case study of one of these services. It will pay particular attention to the education of the workforce, demonstrating that there were many routes to the laboratory bench before the Second World War.

Once laboratories became established, they needed to be adequately staffed. The first additions to the staff in Halifax, significantly, were funded by a philanthropic agency oriented toward public health in the wake of the 1917 disaster and a federal government seeking to combat the "venereal disease menace." Physicians also began to order increasing numbers of tests to aid their diagnosis and management of clinical cases. Thus, in Halifax and in Saint John, laboratories served both as provincial public health laboratories and clinical facilities. In the mid-1920s, many smaller hospitals established sparse laboratories to ensure they received accreditation. The result was a demand for

workers capable of taking charge of the laboratory work and performing a narrow range of tests.

In the larger facilities, these were most often dedicated employees. Conversely in the community hospitals dotting the Maritime landscape, work in the laboratory was simply added to the duties of other hospital workers. There were undoubtedly local factors that shaped how laboratories came to be staffed, but these serve as an important corrective on a view of hospital workers as having become increasingly specialized during the twentieth century. Evidence from the Maritimes, indeed nationally, suggests that hospitals were not necessarily staffed by workers with highly-defined and constrained duties. Rather, there is a need to understand how hospital work was interconnected across departments. More importantly, we need to grapple with the meaning of these linkages for workers.

In her conversation with a gnat, Alice discussed the importance of names. "What's the use of their having names," the Gnat said, "if they won't answer to them?" "No use to them," said Alice; "but it's useful to the people that name them, I suppose."⁵⁹ Laboratories have been described as the "organized workshops of science"⁶⁰ and workshops need workers. Invariably, attention is focused on the upper echelon of the workplace. 'Scientists,' 'investigators' or 'researchers' have all attracted more or less attention, depending upon the end result and the accompanying discovery myth. This is a study of the people, largely but not exclusively women, who worked in public health and hospital laboratories in the Maritimes in the early decades of the twentieth century. It is not easy to generalize just who was a laboratory worker in these years. This study deliberately chose the term "laboratory worker" for these women over the

alternatives, such as "technician" or "technologist," both of which obscure the diverse experience of those it labels. Defining these early workers as "techs" implies a degree of professional formation that had not yet been achieved.

When laboratories were young, workers often combined their work with other hospital duties. It was not uncommon, therefore, to find a nurse, dietitian, x-ray assistant, student or volunteer also carrying out lab tests. University-educated women, very young men, émigrés from England and elsewhere, medical students and high school graduates stood shoulder to shoulder at the bench. Laboratory work was equally diverse: public health work, clinical work, assisting in university laboratory courses and work in industry shared the terrain, although the boundaries between kinds of work were hardly rigid.

This complexity makes laboratory workers and their work difficult to place. Nursing, for example, immediately conjures up a powerful image of a woman in the Canadian mind, performing certain duties in a prescribed location. This image has found a place in academic writing and popular culture alike. "Laboratory worker" is much more ambiguous. These individuals were rarely in the public eye. They were often well-educated, some even holding graduate degrees by the 1940s, and paid a decent wage. Laboratory workers had a specialized knowledge and skill, and would certainly qualify as members of the 'new working class,' which included technicians, engineers, scientists, managerial and administrative workers, teachers and a range of others that rose to prominence in the twentieth century.⁶¹ Harry Braverman grappled with the definition of working class by occupational grouping over two decades ago. "In that group called 'managers, officials, proprietors,' for instance, there are considerable numbers of railroad conductors, union officials, and especially

'managers,' so called, of retail stores, eating and drinking places, gasoline service stations ... and the like." He had special comments on the professional and technical grouping to which laboratory workers would fall. Braverman suggested quite rightly that this categorization "conceals a genuinely working-class situation for those involved."⁶² Laboratory workers endured long hours, handled dangerous material, performed shift work and they were often on call. Through most of the period under consideration, the workers enjoyed geographical mobility. It was not unusual for a worker from the Maritimes to train elsewhere, change jobs to find better wages or more adventure. While there were significant opportunities for geographical mobility or the pursuit of more money, there were few chances for upward mobility. A physician usually held the position of director, the upper echelon of laboratory work. There was very little upward mobility beyond "senior tech," which did not remove the individual from the bench and the routine work. These workers were expected to be intelligent, conscientious and resourceful, but there were few opportunities for advancement.

Historians have laboured against a monolithic history of science in the Canadian context and argue instead for regional studies.⁶³ The Maritimes have been, generally, historiographically underserved in both public health history and the history of science, particularly in the twentieth century.⁶⁴ Not surprisingly, consideration of laboratories has been lacking. The disparate nature of laboratories in the early decades of the twentieth century suggests the need for local understanding. The tests performed in clinical hospital labs varied tremendously. Some hospitals performed little more than urinalysis tests, others a wider array. Many hospitals in smaller communities throughout

the Maritimes sent clinical work to either Halifax or Saint John. Public health laboratories could be equally eclectic in their work. Almost all conducted tests to determine water and milk purity, but some conducted original research or manufactured serums and vaccines.⁶⁵ The boundaries between the clinical lab and the public health lab were often blurred, as they were in both Saint John and Halifax, the two major training sites in the Maritimes before the 1940s. Public health, hospital service and university all intersected in the laboratory facilities of the Maritimes.

As laboratories emerged in the last decade of the nineteenth century physicians staffed them almost exclusively. Over time, however, new workers began to assume their place in the laboratory, together with a range of other occupational groups. Indeed, specialization and departmentalization have often been cited as evidence of the emergence of the "modern" hospital.⁶⁶ Conventional wisdom posits that the hospital grew increasingly specialized in the decades before World War II, a process that accelerated after the war. On the surface, the growth of laboratories would seem to confirm this. Specialization, however, has been over-emphasized in the literature, as an examination of laboratories reveals. David Coburn has recently demonstrated the sterility of treating occupational groups as discrete entities.⁶⁷ Chapter Four puts forth an argument against a process of increased specialization, by demonstrating the fluidity of the boundaries between jobs. The work performed by many laboratory workers remained remarkably diffuse before WWII. Most performed a wide range of duties. While other narratives of occupational groups emphasize closure and restriction, what is striking about an examination of the laboratory is the diversity that continued even beyond the

mid-twentieth century. An emphasis on increasing specialization and discrete tasks, as well as restricted access to the work through education, needs considerable revision in the face of the evidence from the laboratory.

III -- FORGING THE PROFESSION

It is not possible to classify lab workers readily. They were nurses, apprentices or persons with some university education. Their duties were as varied as their education and experience. Some performed laboratory tests as part of their nursing duties. Other workers were assigned solely to the laboratory, while some combined the new disciplines of laboratory work and x-ray technology. This latter combination was particularly enduring and even spawned special education courses after 1940. But the experience of laboratory workers remained diverse in the first half of the twentieth century. Educational paths to the laboratory included apprenticeship, education in a hospital environment combining practical and classroom instruction, university courses in laboratory technique leading to a diploma or simply university courses in a laboratory science, broadly defined, or community college courses. Duties varied as well. Some laboratory workers specialized in only one area of laboratory technique, such as haematology or serology. Others worked in specialized institutions, such as a tuberculosis hospital or a university laboratory, or dedicated themselves to a particular range of tests, such as venereal disease testing. Individual workers, even those within the same institution, may not have shared even a common labour process. It is this question of diversity and the multiplicity of roles that makes laboratory

workers particularly interesting. It is impossible to reduce these workers to some essentialist rendering.

Nevertheless, as explored in Chapter Five, a cadre of dedicated laboratory workers from Hamilton created a professional organization. The experience of laboratory workers speaks to the current historiography insofar as it demands some consideration of occupational boundary maintenance. Secondly, it speaks to the power of the professional model for health care workers in the twentieth century. In her recent study of physiotherapy, Ruby Heap has succinctly summarized the state of studies on women health professionals (with the exception of nurses): "the development of the various female-dominated paramedical occupations and of their quest for professional status has been largely neglected by medical historiography as well as by the otherwise burgeoning historical scholarship devoted to women and paid work."⁶⁸ The study of professional women in Canada has, like studies of the laboratory, largely fallen between areas of historical interest. As a result, many of these workers have remained historiographically invisible.

While this may seem to be a petty lament, recent studies have elucidated the difference between professionalization in the nineteenth century -- dominated by the areas of law, medicine, teachers, nurses and university teachers -- and that of the twentieth. If the dominant motif of the nineteenth-century effort was a story of professional closure, exclusion, legislation and monopoly, a very different picture of professionals in the twentieth century is beginning to emerge. In a key recent article, Aline Charles and Nadia Fahmy-Eid have argued "nous verrons à l'oeuvre de multiples stratégies de démarcation plutôt que des politiques brutales d'exclusion."⁶⁹ Rather than

closure, these authors have identified a trend towards interprofessional competition and conflict, where boundary maintenance becomes a critical issue as the health sector became more and more complex. And, in contradistinction with the nineteenth century, where professional groups largely excluded women, the experience of the twentieth century demonstrates that cleavage does not necessarily occur along gender lines. The "demarcation" may occur between professional groups where women are the majority, as in the case of nursing and nursing assistants or auxiliary assistants and dietitians.⁷⁰

The point that needs to be made is that one can study the "health care professions" without adopting a "professionalization model." Nursing leaders have done much to preserve a narrative and understanding of nursing history. The ideal "professional" nurse was emphasized in nursing journals, organizations, annual reports and a host of other media. Nursing history preserved this ideal and imbued it with the spirit of progress. But nearly two decades ago, Melosh listened carefully and heard another voice, a voice that articulated "the shadowy outlines" of another nursing history, a story of opposition, resistance and the daily routine of nursing *work*. And this was the voice of the majority.⁷¹

First and foremost, this is a study of women in a service industry. Laboratory workers may have been organized into a professional society early in their history, but their experience has not been limited to this organization. Rather laboratory workers, akin to their nursing counterparts, were shaped not by pronouncements from Hamilton, or the plethora of health care journals, but rather by the relations of their environment and how these materials were interpreted to offer meaning in that environment. Studies of health care

workers -- "professions," "semi-professions," "allied health care workers" -- enjoy a long and honoured pedigree, but despite the central role of professional formation, particularly in the twentieth century, these entities remain poorly understood.⁷² The development of health care and service industries, which are the dominant employers of women, have received relatively little attention from labour historians. Instead, the historians' ocular has focused on mining, primary industries, skilled workers or women in the household. McPherson recently proffered a challenge to labour historians:

Burdened by the assumption that until recent years claims to scientific status placed nurses in a 'professional' rather than 'worker' category, labour historians have been slow to take seriously nurses' work as work. Because nurses were relatively late in joining the labour movement and public health nurses, especially, appeared to be agents of the state ... labour historians perceived nurses, like doctors, to be citizens whose middle-class status was shaped by their control over scientific knowledge.⁷³

This historiographic pattern is replicated to a large extent in the Maritimes, although there are notable exceptions.⁷⁴

In a seminal review article, Joan Jacob Brumberg and Nancy Tomes argued that while women's historians had successfully demonstrated that gender was a key factor in structuring occupational hierarchies, historians of professionals had failed to take gender into account.⁷⁵ The authors, reminding historians that the study of gender means more than the study of women, argued that "even in those historical works that have examined a predominantly female profession, such as social work or education, the issue of gender is overlooked." "Thus, it appears," wrote Brumberg and Tomes, "that the "culture of professionalism" shaped men, not women, and that women's professional activities represent an

anomaly, a deviation from the larger pattern of professional participation in American life."⁷⁶ The idea of professionalism was a potent organizing motif for laboratory workers. The Canadian Society of Laboratory Technologists was created *despite* the lack of a national education standard or even an agreed syllabus of study. What is most interesting is how the diverse experience of laboratory workers found expression within the nascent society and the meanings that expression carried for laboratory workers, including reduced claims to both knowledge and skill.

NOTE ON SOURCES

The question of sources is often a thorny one for historians working in the twentieth century. There are journals, which offer published accounts of the national scene, such as the *Canadian Journal of Medical Technology* or *Canadian Nurse*. There are also the annual reports of the departments of health, which took an early and active interest in not only public health laboratories, but smaller clinical facilities as well. But these sources are not entirely satisfactory for understanding the workers at the bench. Published accounts of individuals are virtually non-existent, and they lack the prominent leaders of other professions, such as nursing. For this study, the richest sources are held in the national office of the Canadian Society of Laboratory Technologists, where they have been fortunately preserved for posterity. The executive of the CSLT graciously granted access to the membership files, the minutes and other administrative records. For those workers who attended university, student records were available. Finally, several of the earliest workers in Halifax and elsewhere granted oral interviews.

The approach to oral interviews was straightforward. Women were identified through a variety of means and contacted by a letter that explained the project and asked whether they would agree to be interviewed. Those who were willing to recount their experience were interviewed and audiotaped. Interviews were guided by a series of questions and the knowledge already gained of their work experience. Often, questions could be posed about co-workers or developments because of the information found in primary documents. This often aided the discussion. Interviews were, however, unstructured. Individuals were given an opportunity to recall events that they imbued with significance. For many, the years before WWII were dark-days, when their work was rudimentary and their careers were in the early stages. For others, their tenure in the laboratory was a small, and perhaps insignificant, part of their life. Such is the nature of the work. Many stayed in the laboratory for only a brief period before moving on to other careers or to marriage and rearing children.

There are limitations to this approach to be sure. It is not systematic and is not representative. I did not actively seek women from a variety of backgrounds, and there is a strong bias toward those who were university educated. But using a guide and applying insights learned through other kinds of evidence enables the interviews to be contextualized. More remains to be done in capturing the stories of these women. But the modest beginning contained herein enriches the documentation and offers insights not preserved in the primary record. An employment application may tell the historian about a person's abilities or education, but reveals little about what prompted a person to pursue a particular field. Oral evidence does more than illustrate

other forms of evidence, it offers new insights. While the information in these records is evocative, access arrangements with various organizations required confidentiality. Thus, in the chapters that follow, I have endeavoured to use pseudonyms. Margaret Low is the exception.

This study attempts to apply the insights of social history to this important group of health care workers. That they should be overlooked, despite being the third largest health profession in the country, is not entirely surprising. The great discoveries of the lab are usually portrayed in discovery myths as the work of a few scientists. The people who make the work possible -- in common with those who work a rock face in a mine or a loom in a factory -- are invisible. The faces the public remembers and who continue to dominate our historical remembering, are those who accumulate wealth, or lend their name to buildings, institutions, enterprises or discoveries. It is the physician who cures, the scientist who advances knowledge or the government who ensures clean water. That others endeavour behind the scenes is, more often than not, obscured. Stating the obvious, the cumulative effect of these omissions bears heavily upon the history of women. This study will attempt to recover the contribution of this hitherto unexplored group, women laboratory workers.

Endnotes

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- ¹ Dalhousie University Archives, President's Office Correspondence (hereafter DUAPO), A-573, D. Fraser Harris to Dr. A.S. MacKenzie, November 6, 1919.
- ² All data comes from the *New Brunswick Public Accounts*. The classifications were many, ranging from "Lab Assistant" (occasionally numbered ordinally) to "Services." Entries under services include relief clerical work, laboratory work and janatorial duties. It is not always possible to ascertain exactly what services were rendered.
- ³ See Commission of Inquiry on the Blood System in Canada. *Final Report*. Ottawa: The Commission, 1997 and for a popular account, Andre Picard, *The Gift of Death: Confronting Canada's Tainted Blood Tragedy*. Toronto: Harper Collins, 1995.
- ⁴ A number of books addressing these subjects have enjoyed considerable popularity. See for example Richard Preston, *The Hot Zone*. New York: Random House, 1994 and Laurie Garrett, *The Coming Plague: Newly Emerging Diseases in a World Out of Balance*. New York: Farrar, Staus and Giroux, 1994.
- ⁵ Dharendra Verma, *Medical Laboratory Technology Instruction in Nova Scotia*. MA Thesis, Saint Mary's University, 1968.
- ⁶ D.J. MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," *Nova Scotia Medical Bulletin*, 43 (1964), p. 182.
- ⁷ Nova Scotia Department of the Public Health Annual Report (hereafter PHAR), October 1926-September 1927 in *Journal of the House of Assembly 1928* and PHAR 1928-29.
- ⁸ Prior to working for Harris, Low did "a great deal of technical work for Professor [A.G.] Nicholls." Harris complained that he did not have time to prepare the slides for this Histology class, and that his "time could be better occupied than with so mechanical a work." See DUAPO, A-605, Harris to MacKenzie, July 27, 1917.

⁹ DUAPO, A-573, A.S. MacKenzie to D. Fraser Harris, July 27, 1918.

¹⁰ See DUAPO, A-573. Harris to MacKenzie, June 11, 1919; Harris to MacKenzie, July 11, 1919; Harris to MacKenzie, July 30, 1919 and Harris to MacKenzie, November 6, 1919.

¹¹ John Harley Warner, "Science in Medicine," *Osiris*, 2nd Series, 1 (1985), p. 37. Warner perceptively noted, however, that this same historiographic impulse "broadened the range of questions" asked about "science's place in medicine, such as its function as an ideology, a source of cultural authority, an agent of professional legitimation, and a tool for attaining social, economic, and political objectives." See also Warner, "Ideals of Science and Their Discontents in Late Nineteenth-Century American Medicine," *Isis* 82 (1991): 454-478.

¹² Andrew Cunningham and Percy Williams, "Introduction," in Cunningham and Williams, eds., *The Laboratory Revolution in Medicine*. Cambridge: Cambridge University Press, 1992, p. 2.

¹³ Warner, "Science in Medicine," p. 39.

¹⁴ This trend pre-dated the bacteriological and therapeutic advances of the 1870s and 1880s, a fact often omitted in discussions centered on the North American context. Arleen Tuchman suggested that at the middle of the nineteenth century, physicians in Baden "could hardly claim greater effectiveness than their competitors, but by arguing for stricter educational requirements based on increased work in the laboratory and clinic, they were promising to acquire those skills that would let them join the slowly emerging elite of scientists." Tuchman, *Science, Medicine, and the State in Germany: The Case of Baden, 1815-1871*. New York: Oxford University Press, 1993, p. 3. For a North American perspective, see Warner, "The rise and fall of professional mystery," in Cunningham and Williams, *The Laboratory Revolution in Medicine*, p. 133.

¹⁵ It is important to note that the laboratory as a site of authority has received strenuous critique. Hereditarian and environmentalist perspectives endured even after the discoveries of

Pasteur and Koch. See Paul Weindling, "Scientific elites and laboratory organisation in *fin de siècle* Paris and Berlin," in Cunningham and Williams, *The Laboratory Revolution in Medicine*, pp. 142-169. John Harley Warner has added that "[t]he promise that laboratory science would transform medical practice rested, for a time, largely on optimistic faith, but that faith was not entirely blind." See Warner, "The rise and fall of professional mystery," in Cunningham and Williams, *The Laboratory Revolution in Medicine*, p. 139.

¹⁶ Two examples will suffice. In a study of Miramichi Hospital, nearly every division or department within the hospital receives mention except for the laboratory facilities. Mary Gill, *75 Years of Caring: A History of the Miramichi Hospital, Newcastle, N.B. 1915-1990*. Chatham: Gemini Printing, 1990. This invisibility extends to the periodic anniversary celebrations found in newspaper supplements. The obligatory centennial retrospective of the Saint John General Hospital makes only a fleeting reference to the laboratory, noting that "1954 saw the Provincial Laboratory moved from the hospital to a new building." See Supplement to the *Telegraph Journal* [Saint John], September 25, 1967.

¹⁷ Thomas Neville Bonner, *Medicine in Chicago 1850-1950: A Chapter in the Social and Scientific Development of a City*. Madison: The American History Research Center, 1957, p. 161. Charles E. Rosenberg succinctly addressed this point, stating, "From a late-twentieth-century perspective, the resources of hospitals in the era of World War I may seem primitive, but they were impressive to contemporaries. Antiseptic surgery, the X-ray, the clinical laboratories represented a newly scientific and efficacious medicine -- a medicine necessarily based in the hospital." Rosenberg, "Community and Communities: The Evolution of the American Hospital," in Diana Elizabeth Long and Janet Golden, eds., *The American General Hospital: Communities and Social Contexts*. Ithaca: Cornell University Press, 1989, p. 9.

¹⁸ *Annual Report of the Hotel Dieu Hospital*, Chatham, New Brunswick, August 1, 1927 to July 31, 1928.

¹⁹ New Brunswick, Annual Report of the Chief Medical Officer to the Minister of Health for (hereafter NBARMH) the Year Ending October 31, 1936.

²⁰ Gerald L. Geison, *The Private Science of Louis Pasteur*. Princeton: Princeton University Press, 1995, p. 49.

²¹ Robert V. Bruce, *The Launching of Modern American Science 1846-1876*. New York: Alfred A. Knopf, 1987, pp. 9, 13.

²² Bonner, *Medicine in Chicago*, p. 42. The emphasis is mine.

²³ Cited in Naomi Rogers, *Dirt and Disease: Polio before FDR*. New Brunswick: Rutgers University Press, 1992, p. 22.

²⁴ Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England*. Chicago: University of Chicago Press, 1994, pp. 378-379.

²⁵ There are of course, exceptions. See, for example, Steven Shapin, "The Invisible Technician," *American Scientist*, 77 (1989): 554-563, and Chapter Eight of his *Social History of Truth*; Chandra Mukerji, *A Fragile Power*. Princeton: Princeton University Press, 1989, Chapter Seven; and Simon Shaffer, "Astronomers Mark Time," *Science in Context*, 2 (1988): 115-145. Theoretical issues of invisibility are addressed in Susan Leigh Star, "Sociology of the Invisible," in David R. Maines, *Social Organization and Social Process*. New York: Aldine de Gruyter, 1991 and Arlene Kaplan Daniels, "Invisible Work," *Social Problems*, 34 (1987): 403-415. Technicians are of course mentioned in a large number of works, but largely in passing.

²⁶ Shapin, *A Social History of Truth*, p. 126.

²⁷ Two of the better ones in Canada are David Gagan, *A Necessity Among Us: The Owen Sound General and Marine Hospital, 1891-1985*. Toronto: University of Toronto Press for the Grey Bruce Regional Health Centre, 1990 and Colin D. Howell, *A Century of Care: A History of the Victoria General Hospital in Halifax, 1887-1987*. Halifax: Victoria General Hospital, 1988.

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- ²⁸ For Canada, see Paul Adolphus Bator, *"Saving Lives on the Wholesale Plan": Public Health Reform in the City of Toronto, 1900 to 1930*. Ph.D. Thesis, University of Toronto, 1979; Heather MacDougall, *"Health is Wealth": The Development of Public Health Activity in Toronto, 1834-1890*. Ph.D. Thesis, University of Toronto, 1981; Alan F.J. Artibise, *Winnipeg: A Social History of Urban Growth 1874-1914*. Montreal: McGill-Queen's University Press, 1975, esp. Chapter 13; R.D. Defries, *The Development of Public Health in Canada*.
- ²⁹ Bator, *"Saving Lives on the Wholesale Plan,"* p. 12.
- ³⁰ The details for some locales may be found in Jane Lewis, "The Prevention of Diphtheria in Canada and Britain 1914-1945," *Journal of Social History* (Fall 1986), pp. 163-176; Paul A. Bator, "The Health Reformers versus the Common Canadian: The Controversy over Compulsory Vaccination against Smallpox in Toronto and Ontario, 1900-1920," *Ontario History*, 75, 4 (1983), pp. 348-373; Katherine McCuaig, "From Social Reform to Social Service: The Changing Role of Volunteers in the Anti-Tuberculosis Campaign, 1900-1930", *Canadian Historical Review*, 61 (1980), pp. 480-501; Sheila M. Penney, *Inventing the Cure: Tuberculosis in 20th Century Nova Scotia*. Ph.D. dissertation, Dalhousie University, 1991.
- ³¹ The details of Reid's career may be found in Colin D. Howell, "Medical Science and Social Criticism: Alexander Peter Reid and the Ideological Origins of the Welfare State in Canada," in C. David Naylor, ed., *Canadian Health Care and the State: A Century of Evolution*. Montreal: McGill-Queen's University Press, 1992 and Lindsay Linkletter, *An Open Door: Politics and Science in the Career of Alexander Peter Reid, 1878-92*. MA Thesis, Dalhousie University, 1996.
- ³² B.T. McGhie, "The Laboratory in Relation to Public Health," *Canadian Journal of Medical Technology*, 1 (March 1939), p. 38.
- ³³ Eugene Gagnon, "Notes on the Early History and Evolution of the Department of Health of Montreal," *Canadian Journal of Public Health*, 29 (May 1938), p. 220.

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- ³⁴ George Rosen, *The Structure of American Medical Practice 1875-1941*. Philadelphia: University of Pennsylvania Press, 1983, p. 40.
- ³⁵ A.L. MacNabb, "Possible Trends in the Public Health Laboratory Diagnostic Service," *Canadian Journal of Public Health*, 38 (1947), p. 422.
- ³⁶ Reiser, *Medicine and the Reign of Technology*, pp. 141.
- ³⁷ Reiser, *Medicine and the Reign of Technology*, pp. 141-42. Locally, some physicians in Halifax remained unconvinced during the 1890s of the utility of laboratory testing for diphtheria. Nevertheless, by the end of the century, there was widespread agreement of the need "for a certain diagnosis." By 1899, the laboratory reported making more tests in a single year than it had in all previous years combined. JHA 1899, Appendix 14.
- ³⁸ JHA 1897 Appendix 14.
- ³⁹ PHAR, October 1915-September 1916.
- ⁴⁰ Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States Since 1880*. New York: Oxford University Press, 1985, p. 40; Jay Cassels, *The Secret Plague: Venereal Disease in Canada, 1838-1939*. Toronto: University of Toronto Press, 1987, p. 19.
- ⁴¹ Patricia Branca, "Towards a Social History of Medicine," in Branca, ed., *The Medicine Show: Patients, Physicians and the Perplexities of the Health Revolution in Modern Society*. New York: Science History Publications, 1977, p. 90.
- ⁴² Michael J. Smith, "Dampness, Darkness, Dirt, Disease: Physicians and the Promotion of Sanitary Science in Public Schools," in Paul A. Bogaard, *Profiles of Science and Society in the Maritimes Prior to 1914*. Fredericton: Acadiensis Press and Centre for Canadian Studies, Mount Allison University, 1990, pp. 196-99.
- ⁴³ Karen Buhler-Wilkerson. *False Dawn: The Rise and Decline of Public Health Nursing, 1900-1930*. New York: Garland Publishing Inc., 1989, p. 93.
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- ⁴⁶ Bator, *"Saving Lives on the Wholesale Plan,"* p. 31.
- ⁴⁷ Melosh, *"The Physicians Hand": Work Culture and Conflict in American Nursing.* Philadelphia: Temple University Press, 1982, p. 113.
- ⁴⁸ Barbara Gutman Rosenkrantz, "Cart before Horse: Theory, Practice and Professional Image in American Public Health, 1870-1920," *Journal of the History of Medicine and Allied Sciences*, 29 (1974), pp. 56-57.
- ⁴⁹ Cited in Rosenkrantz, "Cart before Horse," p. 60.
- ⁵⁰ Rosenkrantz, "Cart before Horse," pp. 62-63.
- ⁵¹ John Harley Warner, "Science in Medicine," *Osiris*, 2nd Series, 1 (1985), p. 45; Rosenkrantz, "Cart before Horse," pp. 62-63.
- ⁵² Bator, *"Saving Lives on the Wholesale Plan,"* pp. 343-347.
- ⁵³ Rosenkrantz, "Cart before Horse," p. 64.
- ⁵⁴ Paul Adolphus Bator, *Within Reach of Everyone: A History of the University of Toronto School of Hygiene and the Connaught Laboratories, Volume 1, 1927 to 1955.* Ottawa: The Canadian Public Health Association, 1990.
- ⁵⁵ Keller, *Regulating a New Society*, p. 195.
- ⁵⁶ Nicholas Jardine, "The laboratory revolution in medicine as rhetorical and aesthetic accomplishment," in Andrew Cunningham and Percy Williams, eds., *The Laboratory Revolution in Medicine.* Cambridge: Cambridge University Press, 1992, p. 304.
- ⁵⁷ Stanley Joel Reiser, *Medicine and the reign of technology.* Cambridge: Cambridge University Press, 1978, p. 140.
- ⁵⁸ John Harley Warner, "Science in Medicine," *Osiris*, 2nd Series, 1 (1985), p. 45.
- ⁵⁹ Lewis Carroll, *The Annotated Alice: Alice's Adventures in Wonderland & Through the Looking Glass.* New York: Clarkson N. Potter, Inc. 1960, p. 222.

⁶⁰ Reiser, *Medicine and the Reign of Technology*, p. 139.

⁶¹ Harry Braverman, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. New York: Monthly Review Press, 1974, p. 27.

⁶² Braverman, *Labor and Monopoly Capital*, p. 380.

⁶³ Richard Jarrell and Norman R. Ball, "The Study of the History of Canadian Science and Technology," in Jarrell and Ball, eds., *Science, Technology, and Canadian History/Les Science, la technologie et l'histoire canadienne*. Waterloo: Wilfrid Laurier University Press, 1978, p. 5; Robert Bruce, "Foreward," in Bogaard, ed., *Profiles of Science and Society in the Maritimes Prior to 1914*, pp. 7-8; Paul A. Bogaard, "Introduction: Establishing Science in the Maritimes," in Bogaard, ed., *Profiles of Science and Society in the Maritimes Prior to 1914*, p. 20.

⁶⁴ See Bertrum H. MacDonald, "'Just a Little Better than other Sorts of Brains': a Profile of Science and Technology in the Maritimes Prior to 1914," in Paul A. Bogaard, *Profiles of Science and Society in the Maritimes Prior to 1914*. Fredericton: Acadiensis Press and Centre for Canadian Studies, 1990, pp. 26-47. For public health in the region see Douglas O. Baldwin, "The Campaign Against Odors: Sanitarians and the Genesis of Public Health in Charlottetown, Prince Edward Island (1855-1900)," *Scientia canadiensis*, 10 (1986) and Baldwin, "Volunteers in Action: The Establishment of Government Health Care on Prince Edward Island, 1900-1931," *Acadiensis*, 19 (Spring 1990): 121-147. Science in education has been treated more extensively in the nineteenth century. See B. Anne Wood, "Thomas McCulloch's Use of Science in Promoting a Liberal Education," *Acadiensis*, 17 (1987) and Richard Jarrell, "Science Education at the University of New Brunswick in the Nineteenth Century," *Acadiensis*, 2 (1973). An important reminder that "science" was by no means exclusive to education may be found in Martin Hewitt, "Science as Spectacle," *Acadiensis*, 18 (Autumn 1988).

⁶⁵ Naomi Rogers captures this diversity. She cites a survey of forty-seven state health boards in the United States, which found that twenty conducted original research. In Florida, health authorities were concerned with the bacterial flora of soda fountain glasses while in Kansas, spoiled canned food attracted local attention. Rogers, *Dirt and Disease: Polio Before FDR*. New Brunswick: Rutgers University Press, 1992, p. 26.

⁶⁶ Often the emergence of the "modern" hospital is implied in the structure of hospital histories, which emphasize the development of medical departments or particular services. For examples see H.E. MacDermot, *A History of the Montreal General Hospital*. Montreal: The Montreal General Hospital, 1950; D. Sclater Lewis, *The Royal Victoria Hospital 1887-1947*. Montreal: McGill University Press, 1969; W.G. Cosbie, *The Toronto General Hospital, 1819-1965: A Chronicle*. Toronto: Macmillan, 1975; Irene McDonald, *For the Least of My Brethren: A Centenary History of St. Michael's Hospital*. Toronto and Oxford: Dundurn Press, 1992; Neville Terry, *The Royal Vic: The Story of Montreal's Royal Victoria Hospital, 1894-1994*. Montreal: McGill-Queen's University Press, 1994. For overviews of the genre, see S.E.D. Shortt, "The Canadian Hospital in the Nineteenth Century: An Historiographical Lament," *Journal of Canadian Studies*, 18 (Winter 1983-84): 3-14 and J.T.H. Connor, "Hospital History in Canada and the United States," *Canadian Bulletin of Medical History*, 7 (1990): 93-104. Finally, analytical discussions of specialization may be found in Charles E. Rosenberg, *The Care of Strangers: The Rise of America's Hospital System*. Baltimore: Johns Hopkins University Press, 1995, especially pp. 169-175 and, for a discussion of laboratories, pp. 342-343 and Roy Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity*. New York: W.W. Norton and Company, 1997, pp. 381-88 for the development of nineteenth century "specialist" hospitals and pp. 647-48 for twentieth century specialization.

⁶⁷ David Coburn, "Professionalization and Proletarianization: Medicine, Nursing, and Chiropractic in Historical Perspective," *Labour/Le Travail*, 34 (Fall 1994), p. 139.

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- ⁶⁸ Ruby Heap, "Physiotherapy's Quest for Professional Status in Ontario, 1950-80," *Canadian Bulletin of Medical History*, 12 (1995), p. 70.
- ⁶⁹ Aline Charles and Nadia Fahmy-Eid, "La Diététique et la Physiothérapie Face au Problème des Frontières Interprofessionnelles (1950-1980)," *Revue d'Histoire de l'Amérique Française*, 47, 3 (hiver 1994), p. 380.
- ⁷⁰ Charles and Fahmy-Eid, "La Diététique et la Physiothérapie," p. 381.
- ⁷¹ Melosh, "*The Physicians Hand*," pp. 4-5; For arguments supporting this view in the Nova Scotian context see, Kathryn M. McPherson, *Nurses and Nursing in Early Twentieth Century Halifax*. MA Thesis, Dalhousie University, 1982, p. 55 and Barbara A. Keddy, "Private Duty Nursing Days of the 1920s and 1930s in Canada," *Canadian Woman Studies/Les Cahiers de la Femme*, 7, p. 99.
- ⁷² For a recent discussion, see John C. Burnham, "How the Concept of Profession Evolved in the Work of Historians of Medicine," *Bulletin of the History of Medicine*, 70 (1996): 1-24. See also Gerald N. Grob, "The Social History of Medicine and Disease in America: Problems and Possibilities," in Patricia Branca, ed., *The Medicine Show: Patients, Physicians and the Perplexities of the Health Revolution in Modern Society*. New York: Science History Publications, 1977, p. 10; John Burnham, "Will Medical History Join the American Mainstream?," *Reviews in American History*, 6 (1978), p. 49.
- ⁷³ McPherson, *Bedside Matters*, p. 77.
- ⁷⁴ Persons interested in the growing scholarship on women in Atlantic Canada should consult Suzanne Morton and Janet Guildford, "Atlantic Women's History Bibliography," *Acadiensis*, 24 (Spring 1995): 142-180.
- ⁷⁵ Joan Jacob Brumberg and Nancy Tomes, "Women in the Professions: A Research Agenda for American Historians," *Reviews in American History*, 10 (1982): 275-296.
- ⁷⁶ Brumberg and Tomes, "Women in the Professions," p. 75.

Chapter 1

'A crying need'¹:

Building Laboratories in the Maritimes

"Blood, pus and pain ... are not the whole of medical history. For preventive medicine is as important to the health revolution as is therapeutic medicine."²

In Nova Scotia, the origins of laboratory service are murky. In his brief survey of laboratory service in Halifax, D.J. MacKenzie suggests no less than three dates for the origin of laboratories, all from the mid-1890s.³ At this time, the Assembly was concerned about the purity of water, milk and food, as well as sewage disposal. The legislature struck a committee to report on the "question of the relations of Bacteriological Science and the Public Health." The committee recommended that a provincial bacteriologist be appointed and that a laboratory be adequately outfitted to defend the health of the province. Foremost in the mind of the laboratory promoters was diphtheria, particularly "undefined cases." By the 1890s, public health officials were aware that otherwise healthy people could harbour microbes. Only laboratory analyses could definitively reveal the threat. The physician in charge would also arrange for diphtheria antitoxin, supply a reliable smallpox vaccine, examine and report on sputum examinations for tuberculosis and conduct bacteriological examinations of water, milk and food in suspected cases of contamination. The members of the house unanimously accepted the committee's report.⁴

The Assembly quickly moved to finance this new endeavour and a committee of "medical men" worked out the details. The committee agreed that Dr. W.H. Hattie was duly qualified and should receive the appointment as provincial bacteriologist at an annual salary of \$300. The committee allocated a further \$100 for the purchase of necessary equipment, "in addition to what is now available in Government institutions."⁵ The *Maritime Medical News* heralded the initiative. "The Provincial Board of Health of Nova Scotia has taken a step in advance by the appointment of a Bacteriologist and in making provision for a laboratory. It is over four years since efforts were made in this direction and during that time arrangements have been progressing so that the department is likely to be efficient."⁶ Despite the appointment of Hattie, the enthusiasm was premature. Only a rudimentary laboratory was established. From the outset, there was a gap between the government's stated commitment to health care and the resources they were willing to provide. This gap would characterize Maritime laboratories throughout the first part of the twentieth century. While committed to laboratory expansion, hospital and public health authorities sought ways to economize. Often, this had profound implications for laboratory and other hospital workers.

The creation of laboratories in Nova Scotia and New Brunswick presents an opportunity to explore the relationship among public health, the medical profession, the state and other interests during the first half of the twentieth century. In Halifax, the close relationship between Dalhousie University, the hospital authorities and the provincial government was critical. The co-operation among different interest groups in Halifax (and as the only centre of medical education, this extended to other areas of the Maritimes), meant that

laboratories were established with very little conflict. The creation of an adequate laboratory service, despite the real limitations in terms of an adequate staff, was one manifestation of a growing commitment to public health in these years. The laboratory itself, the bricks and equipment, and the expansion of laboratory work, was representative of the seriousness of this undertaking. While the pledge was a genuine one, there were still inadequacies within the laboratory. Limits were placed on both space and equipment. Most importantly, and this is elaborated in Chapter 3, these limits were extended to staff. An exploration of the institutional setting of the laboratory is, at first glance, pedestrian. Yet, it is the context for work. An understanding of laboratory formation, a topic largely absent from the Canadian public health historiography, reveals the multiple interests that shaped laboratory work. Public health promoters, clinicians, hospital and university authorities and the federal, provincial and municipal levels of government all shared an interest in early laboratories. For the workers themselves, the different groups that intersected in the laboratory gave rise to a labour strategy that shaped laboratory work to the middle of the twentieth century and beyond.

I -- ORIGINS

W.H. Hattie served the provincial laboratory for six years, until a new laboratory opened in August 1901. Hattie retired, noting that his "other duties have been such as to make it impossible for me to give the bacteriological work the attention which I felt it required," attesting to the growth of the laboratory service.⁷ By 1901, the peripatetic service of even someone as accomplished as Hattie was no longer suitable. The new laboratory, variously

called the Provincial Laboratory of Hygiene or the Nova Scotia Laboratory of Science, was a modest facility "conducted" in the laboratory of the Halifax Medical College. The laboratory was established "in connection" with the Provincial Medical Board, and placed in the hands of Dr. Andrew Halliday.⁸ Halliday was a native of Hutton, Scotland, who came to Nova Scotia in 1892. This graduate of Glasgow University established a medical practice in Stewiacke. Halliday enjoyed "scientific work" and he maintained a small laboratory in addition to his rural practice.⁹ Halliday taught one session at the Halifax Medical College, and that was enough to convince him to devote his time and career to laboratory medicine. He spent a year in Durham, England, pursuing post-graduate studies in bacteriology, pathology and other public health courses. It was while he was in Durham that Halliday first approached A.P. Reid about the position of laboratory director.¹⁰ By 1901, Reid was of the opinion that Halliday "is just the man N.S. wants," adding "Dr. Hattie has too much to do."¹¹ Upon his return to the province, Halliday was appointed Associate Professor of Pathology at the Halifax Medical College, and Director of the Laboratory.¹²

With the appointment of Halliday, the public health officials expanded the work of the laboratory. The public health role was again emphasized, but the government made explicit the laboratory's role in assisting physicians throughout the province in their clinical work. Another committee was appointed to detail the duties of the provincial pathologist and bacteriologist. The new pathologist, then, would perform a wide range of duties for the medical profession and the province. He would also act in an advisory capacity on matters of public health for the province that did not necessarily involve

actual analyses. As an expert in public health, he was to offer counsel to the provincial and municipal governments as they attempted to establish more robust public health programs.

Physicians recognized the division between clinical work and laboratory-based medicine. There were longstanding tensions between these two areas of medicine. Initially, and not insignificantly, laboratory analyses were portrayed as an adjunct to the clinical acumen of the attending physicians. For their part, many physicians by the early twentieth century acknowledged that laboratory testing, as with x-rays, could reveal health problems overlooked by the clinical exam. Yet they were also mindful of possible competition, especially if the new workers in these services crossed the boundary and began to offer diagnoses. This was not a simple matter of fearing for one's practice. Instead, it represented a fundamental difference in philosophy. Advocates of laboratory medicine believed that the definitive answers provided were sufficient. Clinicians emphasized more patient-centred care, although they listened and tapped with relentless fervour. Nevertheless, they were at the bedside. It was a division that emerged in the wake of the success of medical bacteriology and endures to a certain degree.

Physicians such as Andrew Halliday were well aware of the differences between art at the bedside and science at the laboratory bench. Halliday wrote to Reid that he was interested because he enjoyed the "scientific side" of medicine. The young doctor even did some experimental work in his Stewiacke practice. Halliday also expressed interest in laboratory work because he was "not strong enough for country practice,"¹³ a suggestive comment, insofar as it hints that there was a strong sense that 'country practice,'

'scientific medicine,' or 'university medicine' were tangibly different from one another. Halliday was a "courteous and energetic worker," despite his reported "feebler frame and less robust health."¹⁴ His health was never good, and in 1902, he resigned. When he left the city, the Halifax Medical College honoured him with a special commendation.¹⁵ Halliday died of tuberculosis on March 19, 1903, at the young age of 36.¹⁶

Despite his brief tenure, Halliday brought a level of expertise and commitment to the laboratory that had a lasting impact on the medical community in the province. The work grew steadily under his tutelage, and the number of specimens and samples sent in mounted. While eulogizing the esteemed doctor in the *Maritime Medical News*, it was remarked that the "necessity for a Provincial Bacteriologist is now established beyond question."¹⁷ The work of the laboratory remained small. Yet, throughout Nova Scotia and beyond, physicians were growing convinced of the utility of the laboratory. This was particularly true of those who, like Halliday, showed interest in the science of medicine. The point of departure for many in the tension between the art and science of medicine was whether or not clinical skills would prevail over diagnostic services. For the vast majority of practitioners they would. The introduction of laboratory tests or x-rays were only aids to clinical practice. Through positioning themselves as the ones who ordered and interpreted the meaning of tests for patients, physicians ensured that their judgement would remain supreme.

The laboratory work was growing in importance, but the early history of the laboratory in Nova Scotia was characterized both by shifting locations and changes in personnel. Dr. L.M. Murray, who had trained under Halliday and

augmented this training through a course at McGill and visits to American centres, including Washington and New York, replaced his mentor.¹⁸ In 1904, new equipment was added to the laboratory to facilitate pathological investigation of tumours and tissues. Annually, Murray reported that the work of the laboratory was increasing both in terms of the number of tests performed and the complexity of the investigations. By 1908-09, he suggested that there was a need for both more equipment and some assistance to keep up with the expanding workload.¹⁹ In 1910, the laboratory moved to quarters in the Technical College of Nova Scotia. This was only a slight improvement because the entire lab still consisted of just one room, but it was more satisfactory than the accommodations at the Halifax Medical School. The laboratory was "large" and "well-lighted," and Murray profited by the addition of some new equipment.²⁰

The laboratory would soon be on the move again, however. In early 1911, the Board of Commissioners of the Victoria General was discussing the possibility of building a new pathology laboratory and securing new equipment, and the Liberal government, led by Premier George Murray, even placed the proposed new laboratory in the budget estimates for the next fiscal year.²¹ The new laboratory was conceptualized from the outset to serve a variety of masters, including the clinical needs of the hospital, the pedagogical needs of the university, and the public health demands of the city, province and the federal government.²² When the Committee on the Laboratory reported in the summer, a site on Morris Street had been selected for the proposed brick structure.²³ In 1913, the Assembly called for tenders for construction of the 60 x 20 feet two storey building, with a basement. It officially opened on March 1,

1914.²⁴ The Laboratory cost about \$23,000, and was "very well laid out and well equipped."²⁵ W. W. Kenney, the Superintendent of the Victoria General, claimed that "[t]here are few better laboratories in Canada."²⁶ The opening of a new building with new equipment in a rapidly changing context of medical science probably did much to bolster Halifax's claim. Moreover, the broader context of medicine, including a renewed commitment to medical education and public health likely enhanced that claim. In appearance, at least, Halifax had turned the corner and was ripe for a robust program of health.

The creation of the new laboratory is best viewed as part of what Ian McKay called the "progressive zeal and wave of reform."²⁷ With the 1910s, interest in health matters broadened greatly and the pace of reform quickened. The Murray government is not remembered as one that was generally supportive of the appeals of reformers. Nevertheless the Liberal administration did establish a reform platform that included such things as workers' compensation and a contributory old-age pension plan and factory regulations during the election campaign of 1911.²⁸ At the same time, a period of transition within medical education in Halifax culminated with the re-integration of the Halifax Medical College into Dalhousie University.²⁹ There were campaigns against tuberculosis, such as the efforts of the Tri-County Anti-Tuberculosis League in eastern Nova Scotia, and other manifestations of the reform impulse such as the Jost Mission.³⁰ These, however, were minor efforts compared to the anti-drink effort and the suffrage campaign.³¹ There were health initiatives in Prince Edward Island and New Brunswick would create its Department of Health in 1918.³² In the wake of the great explosion in Halifax harbour, that city embarked on a novel experiment in public health, known as the

Massachusetts-Halifax Health Commission (MHHC), that had a very direct impact on the work of the new laboratory.³³ Halifax became an "innovator"³⁴ in public health nursing when Dalhousie embarked on training public health nurses in 1920.³⁵ The program, like many of the health initiatives, did not survive. The 1910s brought growth to the Maritimes, though there were significant problems in the primary sectors. The economic future nevertheless looked bright. In sharp contrast, the 1920s was a decade of regional economic crisis. Employment in the fisheries declined from a peak of 17, 583 in 1919 to only 12,395 by 1923. Within two years, between 1919 and 1921, employment in the manufacturing and mining sector dropped from over 46,000 to under 28,000 and by 1925, the value of production was less than half of its 1919 total.³⁶ In this context it is not surprising that the reform impulse of the 1910s abated.

But when the new laboratory opened in 1914, the structural problems of the Maritime economy had not yet revealed themselves. The creation of the new laboratory thus fit a broad pattern of reform that touched nearly every aspect of life in the Maritimes. In advance of the new laboratory, a search began for a bona fide "Pathological Director."³⁷ A search was inaugurated and Dr. M.A. Lindsay, of Birmingham, England, who made inquiries in 1910 about securing an appointment in Halifax as pathologist, was the leading candidate. The VG's Board of Commissioners was showing definite interest in him by the spring of 1911.³⁸ Negotiations occurred through the month of May via cablegram, with Lindsay eventually agreeing to a salary of \$2000, plus any consultation fees. This too was an important consideration. The laboratory director would not depend solely on the government for his income, and this preserved his

professional identity and independence. He would remain a member of the community of physicians earning at least part of his living through fee-for-service. Yet, Lindsay would be responsible for the laboratory work for the province, city of Halifax, Victoria General Hospital and some university work, including teaching. For its part, the hospital reserved the right to expand the work beyond that of the hospital. Kenney reiterated that the laboratory was to meet "not only the requirements of the hospital, but also of the Province and the City, and possibly Nova Scotia, and possibl[y] the College."³⁹ Lindsay was to have had a broad role in bringing laboratory science to the medical profession of Nova Scotia, the medical students and public health officials. His task was, however, cut short when he died in the *Empress of Ireland* disaster in 1914.⁴⁰

Following Lindsay's death, the laboratory became a key means to attract a replacement. Writing to the Superintendent of Johns Hopkins Hospital, W. W. Kenney suggested that the new lab was a facility that a qualified director would find entirely satisfactory.⁴¹ In the interim, Dr. L.M. Murray once again assumed the duties.⁴² Many candidates were again considered, before the position was offered to Dr. A.G. Nicholls, of Montreal.⁴³ Nicholls had been born in England, although he was raised in Montreal. He graduated from McGill's Faculty of Medicine in 1894. Post-graduate study took him to Europe and back to McGill, where he eventually earned a Doctor of Science. Before coming to Halifax, Nicholls was a Professor of Pathology and Bacteriology at McGill, and the Assistant Pathologist at the Royal Victoria Hospital.⁴⁴ Nicholls enjoyed some standing in Canada as "an acknowledged authority in pathology and bacteriology."⁴⁵ Initially, he was appointed at a salary of \$2500, to which

Dalhousie University made a \$500 contribution. The recruitment of a prominent pathologist such as Nicholls testifies indirectly to the appeal of the new laboratory and to Halifax's new commitment to the science of medicine. Like Lindsay before him, Nicholls was to be responsible for a broad range of activity, but was permitted to charge fees for consultations or work other than that derived from hospital (regardless of whether the patient was public or private) or public health work.⁴⁶ The investment was a sound one. Nicholls would remain in his position for more than a decade, and preside over the expansion of the laboratory service in Nova Scotia. Although there would be further physical displacement in the 1920s, due to the expansion of the Morris Street laboratory, the diagnostic laboratory had finally found a permanent location and a long-serving director.

II -- PUBLIC HEALTH IN HALIFAX

Nova Scotia established a provincial Board of Health in 1893. The new board was to co-ordinate the efforts of local boards that responded from time to time to the emergence of particular diseases, such as smallpox or typhoid. The establishment of provincial health boards is evidence of the emerging interest in public health matters, prompted by such developments as immigration, industrialization and urban growth. Despite the creation of the Board, health in Nova Scotia was still not an independent department within government: it did not have a minister of its own. In Nova Scotia, a cadre of medical experts, such as Dr. A.P. Reid, instead guided government efforts in matters of health. The presence of such "expert authority," as Magali Larson suggests, justifies and perpetuates class privilege and excludes the public, through the vote, from

decisions that affect their health.⁴⁷ In other words, it invests these experts and bureaucracies with decisions about public health. This general pattern may have been heightened in Nova Scotia. The Liberal government of George Murray (1896-1923) never appointed a minister of health. Nor was this pattern restricted to health. "Experts" similarly administered other important departments in Nova Scotia, including industries and immigration, public utilities, workers' compensation, agriculture and public health. J. Murray Beck has suggested that political interest in these departments was minimal and that these areas were subjected to "only the most general control" by the Liberal regime.⁴⁸

Effectively, this meant that decisions about public health rested with elite physicians, the very community that stood to benefit from enhanced state activity. Thus, the move toward establishing a laboratory was largely orchestrated by the medical community. Other areas of interest benefitted from this same confluence of interest. Sheila Penney notes that for tuberculosis, many calls for the creation of a provincial sanatorium to treat tuberculosis patients emerged in the government's own reports, including the Committee on Humane Institutions, the Board of Health and from W.H. Hattie, the provincial bacteriologist. Penney argues that Nova Scotia's medical elite was a "single fairly cohesive group based in Halifax" that enjoyed a long relationship with provincial legislators and actively shaped Nova Scotia's health policy.⁴⁹ What is significant about this confluence of interests is that it greatly diminished the chance that conflict would erupt over health matters. The battles would largely be petty ones. Yet, as will be demonstrated later, laboratory workers would bear the burden of competing interests in a different way. Professional

medicine, public health (provincial and municipal) and Dalhousie University shared a commitment to expanded laboratory facilities. They also shared a willingness to utilize other hospital workers to ensure their vision would be realized.

By the time of the great disaster in Halifax in 1917, professional medicine had the ear of the provincial government. In the wake of the explosion, the public health initiatives that had begun received unprecedented attention.⁵⁰ For example, a *Chronicle* article from 1925 declared that general and infant mortality had both declined, and that "notable progress" was made in Halifax's public health effort.⁵¹ Just weeks earlier, however, bewildered residents of North End Halifax had complained bitterly about the decision to close that community's Health Centre and centralize work at the Public Health Centre on Morris Street, in the city's South End.⁵² Recently, historians have raised doubts about the long-term benefits of many of the post-explosion efforts.⁵³ In May 1919, the Massachusetts Halifax Health Commission (MHHC) was incorporated by an act of the legislature.⁵⁴ It was financed by \$250,000 left over from the relief effort in the wake of the Halifax explosion and was to use the resources for "the conservation of public health." The membership included Dr. W.H. Hattie, the Provincial Health Officer, Dr. H.A. Payzant, the Medical Officer for Dartmouth, T.S. Rogers who was appointed by the Halifax Relief Commission and G. Fred Pearson (who was elected Chair), H.R. Silver, J.L. Heatherington and Hon. R.G. Beazley, all of whom were appointed by the Massachusetts Halifax Relief Committee. The first task set for the Commission was to hold a conference with a range of volunteer groups, nurses and physicians engaged in public health work at the House of Assembly. From the

outset, the MHHC was largely concerned with the prevention of disease.⁵⁵ The health agencies that attended expressed their views on the needs of the city and the work of the Commission. A wide range of topics were discussed, from infant health to medical social service to feeble-mindedness. Miss Virginia Kilrain, representing the Anti-Tuberculosis League, suggested that a "first class laboratory with the best apparatus obtainable for the examination of the sputums" was a necessary component of the battle against tuberculosis.⁵⁶ The laboratory was an integral part of not only the effort against tuberculosis, but also most public health causes, including the drive for pure milk, another favourite topic of reformers.

In health, the medical community was spearheading a new commitment to public health, but a broad program of public health, such as that articulated at the September 1919 MHHC conference, required adequate laboratory facilities. That the laboratory was broadly useful to segments of the reform effort also meant that it was subjected to a variety of interest groups, including the university, hospital, public health and medical school. All of these intersected in the Morris Street laboratory. Not surprisingly, administering the facility could be somewhat problematic and subject to competing interests. The laboratory was administered by the VG's Board of Commissioners, which was established in yet another fit of reform when the Assembly passed the "Act to Provide for the Management of the Victoria General Hospital" in 1910. That same year the Halifax Medical College entered into a process which would see the proprietary school integrated fully into the university. A.W.H. Lindsay, the Secretary of the Medical College, reported that the faculty was "seriously impressed with the demands of medical education but at the same time

considerably depressed by the pronouncements of educational critics ..."⁵⁷ One critic in particular, Abraham Flexner, damned the school. Since Johns Hopkins was founded in Baltimore in 1892, superior medical education was characterized by cooperation among medical schools, hospitals and laboratories.⁵⁸ There was a generalized opinion that medical education was in dire need of improvement in Halifax, and one of the areas singled out by Flexner was the poor quality of the laboratory facilities at the HMC. There is little doubt that the laboratory facilities were inadequate by Flexner's standards. That Nova Scotia would create a new laboratory with new equipment and dedicated staff suggests that the decade following Flexner was one of significant change for the city.

It was in this climate that representatives from Dalhousie and the Halifax Medical College met with the Board to discuss the working relations between the university and the hospital.⁵⁹ At the same time, there were discussions regarding the appointment of a laboratory director and the construction of a new laboratory. In June 1911, President Forrest of Dalhousie and Dr. A.W.H. Lindsay met with the hospital commission to discuss the possibility of the laboratory facilities being used for teaching medical students, with the pathologist holding an appointment in the medical school.⁶⁰ The hospital was interested in such an arrangement.⁶¹ In August, representatives from Dalhousie again met with the hospital authorities, who suggested that Dalhousie should pay \$300 for the privilege of using the facilities.⁶² The deal was made, although there were further discussions held with regard to acquiring new equipment for teaching purposes.⁶³ When the hospital appointed Dr. M.A.

Lindsay pathologist, he was also made the head of the pathology and bacteriology department of the medical school.⁶⁴

Despite the new facilities and the commitment of a broad spectrum of interests, the medical school was still not on a proper basis, and President A.S. MacKenzie appealed to the Rockefeller Foundation in January 1920 for one and a half million dollars to modernize the facilities.⁶⁵ In his appeal, MacKenzie cited the Medical School's origins as a proprietary school and the adverse findings reported in Flexner's famous report for the Carnegie Foundation. Rockefeller Foundation President George Vincent visited the city in March 1920, followed by Dr. Richard M. Pearce the following month. Together, they examined the range of facilities used for medical teaching, including the laboratory facilities. The report prepared for the Rockefeller Foundation noted that the Pathology Building could be improved, yet the foundation praised the government for building the facility and making it available to the medical school. The report also noted that "the Government is planning public health work on a much larger scale and will need a public health laboratory, which might well be put under the same roof and general direction[.]" The Rockefeller's envisioned one facility, performing the pathology work for the hospital, housing the pathology department of the university and accommodating a public health laboratory. The province would bear the costs of heat, light, power, janitorial service and maintenance for the entire building, and would staff and equip the public health laboratory.

There was no formal agreement but a deal was struck. If the government would undertake to enlarge the Victoria General Hospital and the Pathology Building, Dalhousie would create an outpatient clinic, something the VG

lacked. The expansion of the Pathology Building would add approximately 12,000 square feet and would cost about \$150,000.⁶⁶ The million dollar gift made by the Carnegie and Rockefeller foundations to Dalhousie University, then, came with some conditions. Dalhousie University President A.S. MacKenzie wrote to Premier Murray "[i]t will be seen that an expression on the part of your government of a willingness to proceed in the near future with the stated and much-needed expansion of the Pathological building will put the University in a position to call on the donors for their promised gifts ..."⁶⁷ The government agreed to the scheme and said the gifts "will put the Medical School of Dalhousie University on a solid foundation and ought to open to it a future of great usefulness."⁶⁸

Government moved slowly on the initiative, the spirit of reform now shackled by economic decline, and year after year the inadequacy of the laboratory was noted by its director, A.G. Nicholls. In 1919, Kenney boasted that the lab was "one of the finest in Canada and the staff was sufficient," but only a couple of years later the words rang hollow.⁶⁹ In the fall of 1921, Nicholls wrote that for several years past, the laboratory building was too small to perform the work expected of it, undermining Kenney's assurance to the MHHC in 1919.⁷⁰ The tight quarters made it impossible to work efficiently and, in particular, milk and water examinations suffered. The decision to emphasize these aspects of the work was likely a calculated one. Milk and water exams, after all, were the public face of the laboratory. These examinations affected province and municipality, rural and city dwellers. The next year, a room for blood chemistry was added to the shopping list of demands, and Nicholls noted that his staff "is working under great difficulties,

with consequent waste of time and energy."⁷¹ The next year a more optimistic tone was sounded. Plans were complete, and there was the promise of an entire floor devoted to public health tests.⁷²

Tenders for the expansion were called in early 1924 and they ranged from a low of \$189,200 to \$236,000.⁷³ The hospital was concerned about the costs, and decided instead to modify the original architectural plans of H.E. Gates. Most of the original bidders submitted revised tenders and the estimates ranged from \$162,000 to \$182,207.⁷⁴ Rhodes Curry secured the contract.⁷⁵ The plans called for the expansion of the Pathological Building, which meant the laboratory would have to take up temporary quarters across the road at the Public Health Clinic.⁷⁶ The Public Health Clinic was another outgrowth of the MHHC's work and the Rockefeller grant to Dalhousie University. Opened in November 1922, the clinic served as the outpatient department in Halifax, as none of the hospitals had such a facility.⁷⁷ The work on the new laboratory was completed and in June 1925, the building was occupied.⁷⁸ With the new, expanded facilities, the public health component of the laboratory's work, which previously had been under the supervision of Dr. A.G. Nicholls, was established as a separate enterprise within the building in 1926.⁷⁹

Halifax, then, followed a well-worn path in establishing its first laboratory enterprise. For example, Toronto's diagnostic laboratory, established in 1890, provided that city with empirical evidence that effluent discharged into large bodies of water posed a serious threat to the city's potable water. In 1893, Toronto appointed a part-time bacteriologist to conduct periodic analyses on the water supply.⁸⁰ The bacteriologist, John MacKenzie, also conducted original research on rabies in 1895. His bacteriological investigations were

"among the early systematic laboratory programs in North America."⁸¹ A range of concerns motivated the promoters of medical laboratory science, which can be broadly classified in terms of disease-specific (initially tuberculosis and diphtheria testing) or food-specific (water, milk and food testing). Indeed, in Nova Scotia these concerns would largely prevail until the 1930s. The range of laboratory tests performed in this period reflected these early interests. Tests for the entire period under consideration largely consisted of throat swabs for diphtheria bacilli (with some for haemolytic streptococci), a range of investigations designed to identify tuberculosis, inquiries for enteric pathogens (typhoid and paratyphoid), analyses of milk and water purity and, in the 1920s, venereal disease testing.

III -- NEW BRUNSWICK

In New Brunswick, the laboratory was shaped largely through the government's attempt to create a "comprehensive" public health department. Such a department would provide for adequate inspection of schools, public institutions and factory inspection, ensure the purity of the food supply, occupational safety and enforce hours of work legislation for women and children. An integral part of this department was to be a public health laboratory, located in an urban centre. The result, however, was similar to Nova Scotia's experience. As in Halifax, the New Brunswick laboratory was intended to cover the full spectrum of work, including medico-legal work (not explicitly mentioned in Nova Scotia). The New Brunswick health promoters believed that the organization of the laboratory should begin with the appointment of "one of the best scientific men" available, and that this

appointment "should be one of the first matters to be taken up by this Department."⁸² William F. Roberts, who would become the first Minister of Health, was typical of reformers in the 1910s. He supported suffrage, called for the licensing and regulation of restaurants and theaters, endorsed compulsory vaccination and supported the pure milk campaign. Roberts toured Canadian and American cities, visiting laboratories and searching for a "past master" of laboratory work.⁸³ Six months before the Public Health Act was to come into effect, the laboratory facilities were entirely remodelled and, on May 18, 1918, Dr. Harry L. Abramson arrived in Saint John.⁸⁴

Abramson was born in Russia and raised in St. Joseph, Missouri. He attended Yale University Medical School and graduated from there in 1911. His internships took him to Connecticut and Rhode Island, before he joined the New York bureau. Abramson earned distinction while at New York City's Bureau of Laboratories, where he worked from 1913 to 1918. At the same time, he served as the instructor in bacteriology at the Bellevue Hospital Medical College. Abramson rose to prominence during New York's 1916 polio epidemic. His pioneering research was published in prominent journals such as *Archives of Internal Medicine*, *Journal of the American Medical Association*, *American Journal of Diseases of Children* and the *Journal of Immunology*. There is no indication of why he chose Saint John.⁸⁵

That he did come to Saint John offers some indirect evidence of the international nature of laboratory work, even in a relatively small Canadian city. As with Halifax, the search for a capable director entailed contacting known authorities in the leading cities. Certainly, the opportunity to guide a provincial laboratory service likely held some appeal, for in New York he

worked in the shadow of the great Dr. William H. Park. The facilities in Saint John were sparse, but Abramson was charged with the planning and creation of a laboratory service for the entire province of New Brunswick. Indeed, under an agreement between the Saint John General Hospital and the province, the new laboratory was assigned a room on the first floor for bacteriological work, a room in the basement for chemical work with "some additional space in the basement to be used as a preparation room." Room in the stables was found to house the lab animals.⁸⁶ Christie Woodworking, of Saint John, received the contract to build the laboratory furniture, while Hazel Brothers and Hiram Webb and Son carried out the plumbing and lighting contracts, respectively. Equipment was ordered from suppliers in Toronto and New York City, and there were the inevitable delays because of the scarcity brought on by war. Despite the lack of amenities and equipment, Abramson began to examine specimens on May 20, only two days after his arrival, "through the use of the extremely meagre laboratory apparatus possessed by the General Public Hospital." Better equipment was in place by July and the laboratory began to perform several functions, including bacteriological examinations of milk and water, autogeneous vaccine preparation, pathological examination of tissues and autopsies performed at the request of coroners. Equipment shortages delayed the planned implementation of Wassermann testing until the autumn.⁸⁷

As in Halifax, there were no sharp divisions between laboratory and clinical medicine. Nor should the divisions between the principal general hospital and the many smaller community-based hospitals throughout New Brunswick be overemphasized. Rather, the constituent parts of the emerging health care complex need to be viewed as part of a continuum, with the various

parts interconnected and certainly interrelated. The Department of Public Health was always willing to "assist hospitals throughout the province that are desirous of establishing modern laboratories" and thus a "higher class of work."⁸⁸ Many community hospitals were indeed establishing laboratories. Abramson himself played a leading role in establishing a laboratory service at Moncton City Hospital in 1921-22, to perform the clinical work for the hospital and public health work for that city, including diphtheria cultures, sputum examinations for tuberculosis, Widal tests, venereal disease tests and milk and water examinations.⁸⁹ By the 1920s, laboratories were operating under the direction of local pathologists in smaller facilities, such as Chipman Memorial Hospital, Hotel Dieu in Campbellton, Hotel Dieu in Chatham and Carleton-Fisher Memorial Hospital in Woodstock.⁹⁰

These were limited facilities. The reports from Chatham and Campbellton both identified their facilities as "chemical" laboratories, with Campbellton noting that tissue work was sent to the provincial laboratory in Saint John. This was by design. An important rationale for establishing a comprehensive facility in Saint John, capable of a broad spectrum of analyses, was that it would provide laboratory services to hospitals and municipalities throughout the province. Rev. Sister Superior Walsh, the hospital superintendent of Campbellton's Hotel Dieu, wrote to William F. Roberts, the New Brunswick Minister of Health, to say that "without accessibility to proper laboratory facilities no hospital can do proper work" but the hospital did not have sufficient funds to equip such a service owing to the effort to rebuild the hospital following a fire in 1918. A small "chemical and pathological laboratory" serviced some needs, but specimens were sent to Saint John. Sister

Walsh appealed for an exemption from charges while the laboratory was put in order.⁹¹ Roberts responded:

I quite appreciate what you say regarding the importance of the laboratory and the care of the sick at hospitals. I can also readily understand the almost equal importance of having such a laboratory ... [but to] inaugurate a laboratory that will serve all of the interests required by the general hospital at this particular time in the history of medicine would cost a great deal more money than any corporation or municipality would care about investing. The cost of the equipment itself makes such almost prohibitive, to say nothing of the money required to employ one or more that are proficient and absolutely needed to give results that can be depended upon.⁹²

The provincial government was willing to perform clinical hospital work on a contract basis, in exchange for an annual fee. Results from Saint John would then be telephoned or sent by wire to avoid undue delays.⁹³ The entire system was predicated upon a central laboratory providing core services, while small hospital laboratories would conduct only a limited range of routine tests. For facilities that had no laboratory of their own, the provincial laboratory would conduct any required work for a nominal fee.

Allowing the laboratory to be used for clinical work was a stroke of genius that had positive effects. Physicians from throughout New Brunswick would get used to forwarding specimens and reports to Saint John and receiving laboratory analyses to assist in the diagnosis and management of their clinical cases. This likely aided in ensuring that samples from reportable diseases would also find their way to the Bureau of Laboratories. Secondly, through assisting physicians with their private clinical work, the laboratory overcame any lingering suspicion physicians may have harboured toward laboratory medicine.

While the strategy may have undermined pockets of resistance, physicians were still slow to utilize the laboratory service. In his first annual report for the Provincial Laboratory, Dr. Abramson noted that the medical profession responded slowly to the new service, in part because they "have not been educated" to use "a modern medical laboratory." To overcome this, Abramson authored pamphlets on diphtheria and another entitled "Public Health as a Paying Investment."⁹⁴ There was also an effort to advertise the work of the laboratory to the general public through the press. Abramson frankly commented that "[i]f patients demand the use of modern laboratory methods of precision in the diagnosis of disease, the physician will be compelled to become familiar with the uses of the laboratory."⁹⁵ Abramson also sent periodic form letters to physicians throughout the province. In 1923, he wrote that "[d]iagnosis of diseases of metabolism is not complete without recourse to modern laboratory methods." Abramson went on to note the various tests performed and what the tests indicated. He added that the laboratory "has been performing the tests aforementioned for some time and it is desirous of extending the use of this service through the Province."⁹⁶ By the early 1920s, Health Minister Roberts suggested that the laboratory was an unqualified success.

IV -- EQUIPPED FOR SUCCESS?

The laboratory services were in place in Saint John and Halifax and the government actively worked to ensure they would be used broadly. Yet, these remained small operations initially, poorly staffed and with few resources. The lack of equipment is the most obvious example of the gap between government

claims and the material conditions within the laboratory. The equipment in Halifax and Saint John was very modest, but the laboratories were able to carry out the essential tests. Reporting in 1909, Halifax physicians D.A. Campbell and A.C. Hawkins reported that the equipment for urine and stomach content examinations in Halifax was "fairly complete" and "on the whole fairly satisfactory," a lukewarm assessment at best. The microscope was in adequate repair, although the fine adjustment worked poorly, reducing its utility. The doctors also recommended the acquisition of a bell glass to cover the instrument. Equipment for conducting blood work was incomplete, with some of the equipment having disappeared. The apparatus for pathological histology had also disappeared, with the exception of a Bausch and Lomb microtome. This, however, was resting unused in a corner and was badly rusted. The knife from the microtome was missing. Pathological specimens were found throughout the room, but were often poorly or not at all labelled. This state of affairs was, moreover, actually an improvement on previous inspections. A new plan had been in place which excluded everyone except house staff from the room, which resulted in a cleaner and more orderly facility.⁹⁷

It was not an acceptable state of affairs for the laboratory promoters, but it reveals much about the constraints the Halifax laboratory operated under. Despite the co-operation between medical school, provincial government and medical elite, there were still inadequacies. In March 1912, for example, the Board of Commissioners authorized "immediate measures ... for the temporary installation of equipment to enable the pathologist to do the milk examination. Later on when the laboratory is completed, further [equipment] for the [milk] analysis will be installed ..."⁹⁸ During the same period of expansion, Dr.

Lindsay wished personally to select other equipment, and went to England on an expense paid sojourn. The Board of Commissioners also looked to Montreal, which recently had built a new laboratory, for suggestions.⁹⁹

Most of the laboratory equipment was ordered from foreign firms or from Toronto, although local suppliers were sometimes used, such as in 1915 when guinea pigs were obtained from a Hantsport supplier.¹⁰⁰ When A.G. Nicholls arrived in December 1914, he found the equipment satisfactory. The laboratory was able to complete tests for tuberculosis, diphtheria, typhoid fever, meningitis, and others, in addition to examining milk and water. The laboratory also undertook the production of some biologicals, such as the antityphoid vaccine.¹⁰¹ Despite its working relationship with Dalhousie University, the Board decided not to furnish the student's laboratory with equipment, considering this to be the university's responsibility.¹⁰² There were also the routine orders for items such as microscope lenses, a pyrofuse for the pathological laboratory and biologicals, such as pituitary extract.¹⁰³ Other equipment, such as microtomes, were replaced when warranted.¹⁰⁴ Later, requests were made of the Health Commission, which was willing to pay for some supplies. Interestingly, the MHHC did not undertake to pay for books for the laboratory, at the very time that the laboratory was embarking on training laboratory workers who would bring their skills to hospitals throughout Nova Scotia.¹⁰⁵

V -- PHYSICIANS AND LABORATORIES

The creation of laboratories, even if underequipped, offered public health officials and clinicians a new resource to ensure a healthy population either on

an individual or a population basis. Even before laboratory workers began to be added to the staff, the creation of laboratories in Halifax and Saint John altered the conditions of health care, as physicians negotiated their authority vis-à-vis the new diagnostic technologies. Yet clearly the provincial medical elites, most evident in the relationship between the medical school and the provincial health authorities, were involved in creating the new facilities. More importantly, the role of the laboratories was always subordinated to clinical judgement. Physicians retained final authority in most medical matters, particularly those that earned them money. The continuation of medical authority in this age of institution building and expansion in large measure ensured that physician's would support the new laboratories.

This is not to suggest that physicians merely accepted the presence of the laboratory and adapted quickly to its demands. Specimens were usually forwarded to the laboratory through the post. In the aforementioned circular about testing for typhoid, physicians were told that a small blood sample drawn from a finger-prick could be sent to the lab between clean glass-slips or even on clean, white paper as long as the blood was "allowed to dry thoroughly before folding."¹⁰⁶ The state of specimens received at the lab varied considerably. Hattie reported that many specimens came in "chip boxes, or on paper" and were dried out upon arrival, which made them not only difficult to work with but a hazard, because of "germ-laden dust [which] is set free into the air of the laboratory, thus exposing all who are compelled to breathe that air to the danger of infection."¹⁰⁷ Samples of pus, urine, morbid tissues and milk often reached Hattie "in a condition which did not permit of examination" or was simply not large enough.¹⁰⁸ In 1913, a New Ross physician sent a

specimen directly to W.W. Kenney, the hospital superintendent (and not the laboratory). Kenney passed the specimen along, but it was unusable. When opened, it stuck to the blotting paper and what could be used was "dry and hard." Kenney politely asked for another specimen in reporting to the physician.¹⁰⁹

Ideally, specimens were to be sent in clean glass bottles, which could be packed and shipped safely. Apparently, these methods had not permeated the physician community. Speed, the physicians were told, was of the essence, although "owing to some irregularity in the postal service" delays may occur in results coming back from the laboratory.¹¹⁰ The public health officials might have had legitimate complaints, but so too did postal inspectors, who had to field complaints about "bottles containing sputum and other matter offensive and dangerous to health [which are] forwarded through the mails very insecurely put up." Postal regulations banned certain materials, including explosives, "dangerous or destructive" materials or things that could damage other letters. Diseased tissues (and presumably other material), postmasters were advised, were only considered acceptable for the mail "when enclosed in specially constructed double tin cases, closely packed with absorbent matter, and with closely fitting screw caps."¹¹¹

The laboratory director took the opportunity in his annual report to remind the profession that he had a limited number of mailing cases and instructions for the collection and shipping of water samples. The problem of shipping specimens continued however. After three decades of operation, unsatisfactory specimens were still being received. In 1931-32, the public health laboratory mailed one thousand specimen containers to physicians in Nova Scotia, at

considerable expense. Despite this, specimens were still received in inadequate or "dangerous" containers.¹¹² Following the decision to make tissue examinations free under an initiative to address the cancer problem in 1931, the *Nova Scotia Medical Bulletin* found it necessary to remind physicians that

the giving of an accurate Diagnosis is hindered by many of the specimens arriving at the Laboratory unaccompanied by any history whatever. Often the source of the growth is omitted. A short note on the sex and age of patient, duration of tumour and other relevant points in the history of the case would be much appreciated and would be of considerable help in the giving of a fuller report on Diagnosis and Prognosis.¹¹³

Occasionally, residents who were not physicians sent material to the laboratory and Murray consistently suggested that results would only be provided to a physician.¹¹⁴ The Institute of Public Health at the University of Western Ontario once received a set of teeth from a woman from St. Thomas, Ontario, requesting that they be "analyzed thoroughly," for the woman suspected that they were the cause of her ill health. The lab did not perform any tests, and the woman forwarded stamps so the laboratory could "return the teeth."¹¹⁵ Of course, bacteriological results were really only useful, in the laboratory's opinion, if they were positive. A negative report for something like a diphtheria swab should not be interpreted to mean the patient actually was free from the disease. Rather, physicians were advised to send additional swabs in suspected cases.¹¹⁶

Physicians were unquestionably active partners in the expanding workload of laboratory facilities. The laboratories performed not only public health work, but also provided clinical laboratory analyses for individual physicians. This, together with the general confluence of medical interests in the Maritimes, ensured the place of the laboratory in the expanding health care complex. The

laboratory was novel and it remained unfamiliar to many physicians, however. As the careful instructions regarding the shipment of samples and the increasing standardization of collection methods indicates, physicians may have been participating in the expansion of the workload, but they were not fully attuned to the demands of laboratory science. Nevertheless, the careful presentation of the laboratory as an adjunct to the clinical work of the hospitals or individual practitioners assuaged any opposition to the scientific side of medicine.

Success is a difficult thing to measure, particularly in the constantly changing environment that was the Pathological Institute in the 1910s and 1920s. Nevertheless, periodically through these years, people involved in the work of the laboratory pronounced it a success. As early as 1901, Dr. A.P. Reid suggested that a laboratory and qualified laboratory man were necessary infrastructure for all modern states.¹¹⁷ The previous year, he suggested that the laboratory would provide accurate information to both "lay and professional" people in the province.¹¹⁸ In 1907-08, for example, about 1300 specimens were examined by the laboratory. With such a demand, the annual report asked "How many doctors in active practice have the time to spare which is needed for these examinations, or can afford to inaugurate the expensive laboratory apparatus that is demanded?"¹¹⁹ Thus, while public health was the outward face of the laboratory's work, service to the clinical work of physicians was deemed to be equally important. "[T]he laboratory," said the pioneer W.H. Hattie, "is simply intended to furnish assistance to physicians in the diagnosis of doubtful cases".¹²⁰

It is clear that the laboratory work was increasing in public health and clinical aspects and the staff was increasing over time. Laboratory work can be viewed as part of a system of health information, which included the production of other information such as vital statistics. The laboratory performed tests for diphtheria and typhoid for free, while sputum examinations for TB cost one dollar. In return, the province hoped to garner more accurate data on the prevalence of these diseases.¹²¹ For its part, the laboratory worked to ensure quick results. Widal reactions, sputum samples and urine samples were all examined the day they were received in the laboratory. Throat swabs were done after 24 hours of cultivation. With the addition of some new equipment in 1903-04, the laboratory could also examine a wide array of tissues and tumours on their day of arrival.¹²² The lab also had a vested interest in the accuracy of the results. Reid, the Secretary of the Board of Health, produced a circular in 1896 which requested that physicians participate in determining the "accuracy" of the test for typhoid developed by Widal and Pfeiffer. The circular, which was reprinted in the *Maritime Medical News*, asked that physicians supply the laboratory with a blood sample from confirmed or suspected cases of typhoid fever, together with information on the time of onset, the severity of the attack (with the temperature) and the nature of complications. At the conclusion of the case, physicians were asked to report on the accuracy of the laboratory tests and whether they assisted in a beneficial clinical outcome.¹²³

Laboratory diagnosis, even an established method such as tuberculosis testing, was never intended to displace the clinical judgement of attending physicians. One manual of laboratory science suggested that "[w]aiting until

tubercle bacilli are found in the sputum before making the diagnosis of pulmonary tuberculosis is to jeopardize the patient's chance of recovery."¹²⁴ The laboratory worked hard to be of service to physicians in the course of their clinical work. Communications between the laboratory and community based physicians were routine. Most often, this simply meant sending a report on the specimen forwarded to the laboratory.¹²⁵ When a physician requested a test for the tubercle bacilli, diphtheria bacilli or gonococci, they were also asked to provide the name of the patient, age and a brief history of the case so that the laboratory could compile statistics on the incidence of these diseases.¹²⁶ It must be stressed that laboratory investigation did not displace clinical observation for most investigations. When a patient at the Nova Scotia Hospital was described as "nervous and restless" and suffering from other symptoms such as a speech impairment and insomnia, syphilis was suspected. A Wassermann test was ordered and found positive. Clinical observation was supplemented by a laboratory test, and a diagnosis made. Following the diagnosis, a course of treatment was ordered.¹²⁷

The annual report for 1915-16 noted that there was a "growing appreciation" among medical practitioners "of the value of the laboratory in doubtful cases of illness."¹²⁸ This is not to say that physicians abandoned history taking and clinical examination. Quite the contrary and articles often reiterated the point that laboratory tests and x-rays were adjuncts to clinical judgement, not vice versa.¹²⁹ John Harley Warner has argued that "[t]hinking physicians who opposed the rise of laboratory science ... did not necessarily oppose science in medicine but instead objected to the new definition of what constituted science rooted more in experimental laboratory physiology than in

empirical clinical observation." The debate should concern not whether laboratory science was accepted or not by some physicians, but rather whether there were competing definitions of what should constitute "medical science".¹³⁰ The science of bacteriology, because of its close affiliation with clinical diagnosis and the promise it held for therapeutics, gained the greatest acceptance among physicians. Many still questioned its relevance to the clinical setting, the patient's bed, and others expressed concern that the laboratory would displace the bed as the centre of the medical universe.¹³¹ The debate was not between "an educated elite and the average practitioner; it reflected a disagreement in values; a debate over what it was that the physician was supposed to do."¹³² The problem was linking the work of the laboratory to the bedside and there were different responses. Some endorsed the use of microscopes and laboratory findings while others viewed clinical care and the laboratory as two solitudes. By 1937-38, Public Health Laboratory director D.J. MacKenzie reported that "with but one or two exceptions, every practicing physician in Nova Scotia took advantage" of the laboratory service. In a two short decades, laboratory work was firmly entrenched in the health care of the Maritimes.

CONCLUSION

Laboratories throughout eastern Canada were established rapidly in the opening decades of the twentieth century. Some, such as Halifax, Saint John and Charlottetown were intended to serve their provinces to a limited extent. Local hospitals, such as the Moncton City Hospital, assumed responsibility for public health in the surrounding municipality, while other hospital laboratories

simply carried out clinical work for their wards. Laboratories in the Maritimes were a response to local and provincial interests, as well as demands from both public health and clinical concerns. In Halifax, the complex interplay among the municipal and provincial governments, Dalhousie University and philanthropic foundations exemplifies the new place of the laboratory as a centre of health and of education. In New Brunswick, the development of a comprehensive laboratory service ensured the pre-eminence of Saint John, while allowing local facilities to develop and expand. In both port cities, however, the array of tests and the equipment was limited. While medical authority and provincial governments co-operated to articulate a new place for public health in the Maritimes, the result was not a final or absolute triumph for the laboratory. The tests performed were dominated by examinations of milk and water, and investigations related to tuberculosis, typhoid fever, diphtheria and venereal diseases. While the range of tests was limited, the volume increased exponentially, requiring additions to staff and, ultimately training programs. Young women of various backgrounds stood shoulder to shoulder at the bench, providing answers to the region's most pressing health concerns.

Endnotes

¹ Provincial Archives of New Brunswick (hereafter PANB), RS 136, Records of the Deputy Minister of Health, File A.1a, "To the Premier and Gentlemen of the Executive Council," n.d.

² Patricia Branca, "Towards a Social History of Medicine," in Branca, ed., *The Medicine Show: Patients, Physicians and the Perplexities of the Health Revolution in Modern Society*. New York: Science History Publications, 1977, pp. 90-91.

³ D.J. MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," *Nova Scotia Medical Bulletin*, 43 (1964): 179-184. P.S. Campbell and H.L. Scammell, "The Development of Public Health in Nova Scotia," *Canadian Journal of Public Health*, (May 1939) suggest that "a Provincial Diagnostic Laboratory" was established in 1894.

⁴ "Report of the Provincial Board of Health" in *Journal of the House of Assembly 1896* [hereafter JHA] 1896, Appendix 14. The concern over food and water purity was common in the public health movement everywhere. See, for example, Heather Anne MacDougall, *"Health is Wealth": The Development of Public Health Activity in Toronto, 1834-1890*. Ph.D. Thesis, University of Toronto, 1981, pp. 313-314. The terms of reference for the Committee, comprised of Drs. Farrell, Sinclair and Reid, may be found in JHA 1897, Appendix 14.

⁵ JHA 1897, Appendix 14. One early history suggested "[e]quipment was of the most elementary character and for a long time the only microscope was the property of the director. It is still recalled how the lack of an incubator made necessary the employment of human incubators and house surgeons at the hospital slept with their culture tubes in the pockets of their night attire." Campbell and Scammell, "Development of Public Health in Nova Scotia," p. 233.

⁶ *Maritime Medical News* [hereafter *MMN*], 8 (Feb 1896), p. 73.

⁷ JHA 1902, Appendix 16.

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- ⁸ JHA 1902, Appendix 16.
- ⁹ *MMN*, 15 (1903), p. 108.
- ¹⁰ *MMN*, 12 (1900), p. 376 and Andrew Halliday to A.P. Reid, January 29, 1901 in Public Archives of Nova Scotia (hereafter PANS) RG 25, Series C, Vol. 1.
- ¹¹ A.P. Reid to Hon. George H. Murray, April 11, 1901 in PANS RG 25, Series C, Vol. 1.
- ¹² *MMN*, 13 (1901), pp. 297, 327.
- ¹³ Andrew Halliday to A.P. Reid, January 29, 1901 in PANS RG 25, Series C, Vol. 1.
- ¹⁴ *MMN*, 15 (1903), p. 101.
- ¹⁵ *MMN*, 14 (1902), p. 391.
- ¹⁶ JHA 1903, Appendix 16 and JHA 1904, Appendix 16. *MMN*, 15, (1903). This issue contains an editorial on Halliday and his contribution to the medical profession and public health (pp. 100-101), as well as an obituary (pp. 108-109).
- ¹⁷ *MMN*, 15 (1903), p. 102.
- ¹⁸ JHA 1903, Appendix 16. *MMN*, 15 (May 1903), p. 181.
- ¹⁹ JHA 1910, Appendix 16.
- ²⁰ JHA 1911, Appendix 16 and JHA 1912, Appendix 16.
- ²¹ Minutes of the Victoria General Hospital Board of Commissioners (hereafter BOC), January 14 and February 18, 1911, in PANS RG 25 Series B, Vol. 3.
- ²² BOC. January 14, 1911 and January 21, 1911, both in Victoria General Hospital Letterbook (hereafter VGHL), PANS RG 25, Series B, Section 1.
- ²³ BOC, July 7, 1911. The Committee reported that the proposed laboratory would cost about \$9000. The minutes note, however, that "after some discussion the matter was referred back to [the architect] for plans of a wood building with estimates of cost of same." While committed to improving the laboratory service, it is clear that a measure of economy was to be maintained.

²⁴ The description comes from D.J. MacKenzie, "Laboratory Service in Halifax," pp. 181-182.

The laboratories have stayed close to their Morris Street location until the present day. Most laboratory services connected with the Victoria General Hospital or the Province were located in the Pathological Institute, which was modified in the 1920s and the 1960s. With the construction of the D.J. MacKenzie Building, many of the VG's labs were moved.

²⁵ W.W. Kenney to Dr. John A. Hornsby, October 28, 1914 and W.W. Kenney to Dr. Winder H. Smith, September 21, 1914 in VGHL.

²⁶ W.W. Kenney to Dr. John A. Hornsby, October 28, 1914 in VGHL. See also Kenney to Dr. M.C. Archibald, May 29, 1915 in VGHL.

²⁷ Ian McKay, "The Stillborn Triumph of Progressive Reform" in E.R. Forbes and D.A. Muise, *The Atlantic Provinces in Confederation*. Toronto and Fredericton: University of Toronto and Acadiensis Press, 1993, p. 293.

²⁸ Beck, *Politics of Nova Scotia, Vol. 2*, p. 94.

²⁹ Sheila M. Penney, "Marked For Slaughter": The Halifax Medical College and the Wrong Kind of Reform, 1868-1910," *Acadiensis*, 19 (Fall 1989): 27-51 and T.J. Murray, "The Visit of Abraham Flexner to Halifax Medical College," in *Nova Scotia Medical Bulletin*, 64 (June 1985): 34-41. With the support of the Carnegie Foundation, Abraham Flexner investigated the state of medical education in the United States and Canada. Flexner's report severely criticized the Canadian medical schools at Queen's, Laval, Western Ontario and in Halifax. The influential report did much to document the deficiencies in medical education, but the reform of medical education was already underway as Penney concludes. By the time Flexner completed his report in 1910, the number of medical schools in the United States had already decreased by twenty-five percent.

³⁰ The Association, which encompassed Pictou, Antigonish and Guysborough counties, was created November 18, 1909. See George H. Cox and John H. MacLeod, *Consumption: Its Cause, Prevention and Cure*. London: Eyre and Spottiswoode, Ltd. for the Tri-County Anti-

Tuberculosis League, 1911; Sheila Penney, *Tuberculosis in Nova Scotia, 1882-1914*. MA Thesis, Dalhousie University, 1985; Katherine McCuaig, "'From Social Reform to Social Service' The Changing Role of Volunteers: The Anti-tuberculosis Campaign, 1900-30" in *Canadian Historical Review*, 61 (December 1980), pp. 480-501. For the Jost Mission, see Christina Simmons, "'Helping the Poorer Sisters': The Women of the Jost Mission, Halifax, 1905-1945," *Acadiensis*, 14 (Autumn 1984): 3-27.

³¹ Here the work of E.R. Forbes is most important. See Forbes, "Prohibition and the Social Gospel in Nova Scotia," *Acadiensis*, 1 (Autumn 1971): 11-36 and Forbes, "The Ideas of Carol Bacchi and the Suffragists of Halifax: A Review Essay on *Liberation Deferred? The Ideas of the English-Canadian Suffragists, 1877-1918*," *Atlantis*, 10 (Spring 1985): 119-26.

³² For PEI, see Douglas O. Baldwin, "Volunteers in Action: The Establishment of Government Health Care on Prince Edward Island, 1900-1931," *Acadiensis*, 19 (Spring 1990): 121-147. New Brunswick is discussed below.

³³ Much of this work has been completed by Suzanne Morton and serves as an important reminder that historians should not romanticize this period as one of blissful reform. As McKay suggests, the Liberal regime in Nova Scotia (1896-1923) was influenced by progressivism "in a peculiar way" and while the government passed significant reforms, it also worked to undermine the claims of striking coal miners through creating a provincial police force. For the broader context see McKay, "The Stillborn Triumph of Progressive Reform," pp. 198-200. Developments following the explosion are discussed in William J. Buxton, "Private Wealth and Public Health: Rockefeller Philanthropy and the Massachusetts-Halifax Relief Committee/Health Commission," in Alan Ruffman and Colin D. Howell, *Ground Zero: A Reassessment of the 1917 Explosion in Halifax Harbour*. Halifax: Nimbus and Gorsebrook Research Institute, 1994, pp. 183-193; Suzanne Morton, "The Halifax Relief Commission and Labour Relations during the Reconstruction of Halifax, 1917-1919," in Michael Earle, ed., *Workers and the State in Twentieth Century Nova Scotia*. Fredericton: Acadiensis and

Gorsebrook Research Institute, 1990, pp. 47-67; Morton, "Never Handmaidens," in Ruffiman and Howell, *Ground Zero*, pp. 195-205.

³⁴ Kathryn McPherson, *Nurses and Nursing in Early Twentieth Century Halifax*. MA Thesis, Dalhousie University, 1982, pp. 76-77. See also Nathanel S. Olds, "A Civic Center Devoted to Public Health," *The American City*, 44 (January 1931): 112-113.

³⁵ Peter L. Twohig, *Challenge and Change: A History of the Dalhousie School of Nursing 1949-1989*. Halifax: Fernwood Publishing and Dalhousie University, 1988, pp. 9-11.

³⁶ The literature on the de-industrialization of the Maritimes is vast. The best summary of the literature is chapter six of John G. Reid, *Six Crucial Decades: Times of Change in the History of the Maritimes*. Halifax: Nimbus Publishing, 1987.

³⁷ W.W. Kenney to M.A. Lindsay, May 3, 1911 in VGHL.

³⁸ BOC, October 25, 1910; December 3, 1910; April 1, 1911; April 29, 1911 and May 13, 1911.

³⁹ W.W. Kenney to M.A. Lindsay, May 17, 1911 in VGHL.

⁴⁰ W.W. Kenney to Reuben O'Brien, June 15, 1914 in VGHL and Nova Scotia Department of Public Health Annual Report (hereafter PHAR), October 1913-September 1914.

⁴¹ W.W. Kenney to Dr. Winder H. Smith, September 21, 1914 in VGHL.

⁴² BOC, June 8, 1914.

⁴³ The actual process of finding a candidate was multi-faceted. Kenney corresponded with no less a figure than Dr. J.G. Adami, the esteemed Montreal pathologist. President MacKenzie of Dalhousie also put forward several names, as did contacts in Boston, New York and Toronto. At the same time, several letters were received from British physicians interested in the pathologist position. Finally, Dr. W.H. Hattie was sent to Ontario to find a pathologist. While there, he identified Nicholls as the best candidate. This account was reconstructed using BOC entries from the late spring, summer and fall of 1914.

⁴⁴ *Nova Scotia Medical Bulletin*, 25, 4 (April 1946).

⁴⁵ PHAR, October 1914-September 1915.

⁴⁶ BOC, October 16, 1914. Salary was an issue. Nicholls wanted \$3000, but eventually settled for \$2500 plus a \$300 moving allowance. See BOC, October 26, 1914, November 11, 1914 and November 21, 1914; W.W. Kenney to A.E. [sic] Nicholls, October 31, 1914, in VGHL; A.S. MacKenzie to A.G. Nicholls, January 13, 1915, in Dalhousie University Archives President's Office Staff Files, File 359. Dalhousie was unwilling to contemplate anything more than its \$500 contribution, so responsibility for the increase fell to the provincial government.

⁴⁷ Larson, "The Production of Expertise and the Constitution of Expert Power," in Thomas L. Haskell, *The Authority of Experts: Studies in History and Theory*. Bloomington: Indiana University Press, 1984, pp. 28-83.

⁴⁸ Beck, *Politics of Nova Scotia, Vol. 2:1896-1988*. Tantallon: Four East Publications, 1985, pp. 72-3.

⁴⁹ Sheila M. Penney, *Inventing the Cure: Tuberculosis in 20th Century Nova Scotia*. Ph.D. dissertation, Dalhousie University, 1991, p. 50.

⁵⁰ See, for example, Nathaniel S. Olds, "A Civic Centre Devoted to Public Health," *The American City*, 44 (January 1931): 112-113.

⁵¹ *Chronicle*, July 22, 1925.

⁵² *Mail*, July 3, 1925. For a description of the Public Health Centre, see Esther M. Beith, "The Dalhousie University Public Health Clinic," *Canadian Nurse* (hereafter *CN*), 22 (1926), pp. 359-363.

⁵³ The current historiographic consensus is that the massive effort in the wake of the Explosion did not yield any long term benefits to the population of Nova Scotia. See, for example, two essays in Alan Ruffman and Colin D. Howell, eds., *Ground Zero: A Reassessment of the 1917 Explosion in Halifax Harbour*. Halifax: Nimbus and Gorsebrook Research Institute, 1994: William J. Buxton, "Private Wealth and Public Health: Rockefeller Philanthropy and the

Massachusetts-Halifax Relief Committee/Health Commission," pp. 183-193 and Morton, "Never Handmaidens," pp. 195-205.

⁵⁴ On the Health Commission, see Buxton, "Private Wealth and Public Health," pp. 183-193.

⁵⁵ PANS MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, Report of Conference, September 25, 1919.

⁵⁶ Ibid.

⁵⁷ A.W.H. Lindsay to Chairman of the Committee of the Board of Governors of Dalhousie University on the organization of a University Medical School, August 27, 1910, DUAPO, A-572. The Halifax Medical College passed the following resolution on May 11, 1910: "Resolved That the Governors of Dalhousie University be requested to consider at the earliest possible date, the question of taking over the Halifax Medical College, and establishing in its place, a full time teaching faculty in the University." L.M. Murray to Gilbert Stairs, May 18, 1910, DUAPO, A-572.

⁵⁸ Regina Markell Morantz-Sanchez, *Sympathy and Science: Women Physicians in American Medicine*. New York: Oxford University Press, 1985, p. 236.

⁵⁹ BOC, December 31, 1910 and January 7, 1911.

⁶⁰ BOC, June 24, 1911.

⁶¹ BOC, July 18, 1911.

⁶² W.W. Kenney to Gilbert S. Stairs, July 20, 1921 and A.S. MacKenzie to H. McInnes, December 26, 1911, both in DUAPO, A-817; BOC, August 5, 1911.

⁶³ BOC, July 5, 1913, August 2, 1913, and December 20, 1913.

⁶⁴ [Gilbert Stairs?] to Dr. A.W.H. Lindsay, July 4, 1911 in DUAPO, A-572.

⁶⁵ A.S. MacKenzie to George S. Vincent, President Rockefeller Foundation, January 14, 1920, in DUAPO, A-874.

⁶⁶ A.S. MacKenzie to Dr. A.G. Nicholls, June 29 1923 in DUAPO, A-817.

⁶⁷ A.S. MacKenzie to Premier George H. Murray, June 16, 1920 in DUAPO, A-817.

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- ⁶⁸ Arthur S. Barnstead, Deputy Provincial Secretary, to A.S. MacKenzie, June 23, 1920; Henry S. Pritchett to A.S. MacKenzie, May 29, 1920, both in DUAPO, A-353; PANS RG25 Series B, Vol. 3, Minutes of the Board of Commissioners, July 11, 1921, July ?, 1921, and March 31, 1923.
- ⁶⁹ PANS MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, Report of Conference, September 25, 1919.
- ⁷⁰ PHAR, October 1920-September 1921.
- ⁷¹ PHAR, October 1921-September 1922.
- ⁷² PHAR October 1922-September 1923.
- ⁷³ PANS RG25 Series B, Vol. 3, Minutes of the Board of Commissioners, April 8, 1924.
- ⁷⁴ PANS RG25 Series B, Vol. 3, Minutes of the Board of Commissioners, April 24, 1924; VGHL, Kenney to Hon. E.H. Armstrong, April 9, 1924.
- ⁷⁵ VGHL, Kenney to Armstrong, May 6, 1924.
- ⁷⁶ Business Manager to Arthur and Conn, Ltd., June 17, 1924, in DUAPO, A-230; PHAR, October 1923-September 1924.
- ⁷⁷ P.B. Waite, *The Lives of Dalhousie University, Vol. 1, 1818-1925*. Montreal: McGill-Queen's University Press, 1994, p.246-248.
- ⁷⁸ PHAR October 1924-September 1925.
- ⁷⁹ Campbell and Scammell, "The Development of Public Health in Nova Scotia," p. 234.
- ⁸⁰ Bator, "Saving Lives on the Wholesale Plan," p. 91.
- ⁸¹ Paul Adolphus Bator, *Within Reach of Everyone: A History of the University of Toronto School of Hygiene and the Connaught Laboratories, Volume 1, 1927 to 1955*. Ottawa: The Canadian Public Health Association, 1990, pp. 5, 7. Although the laboratory was conducting systematic inquiry, Bator still describes the laboratory as "primitive."
- ⁸² PANB RS 136, Records of the Deputy Minister of Health, File A.1a, "To the Premier and Gentlemen of the Executive Council," n.d.

⁸³ PANB RS 136, Records of the Deputy Minister of Health, File E5a, William F. Roberts to Rev. Sister Superior Walsh, October 1, 1919.

⁸⁴ PANB RS 136, Records of the Deputy Minister of Health, File A.1a, George G. Melvin, "Five Years of the NB Public Health Act," November 20, 1923 and New Brunswick, Annual Report of the Chief Medical Officer to the Minister of Health for the Year Ending October 31, 1918 (hereafter NBARMH).

⁸⁵ *New York Times*, April 18, 1934 and Naomi Rogers, *Dirt and Disease: Polio before FDR*. New Brunswick: Rutgers University Press, 1992.

⁸⁶ NBARMH, October 31, 1918. In exchange for this space, the General Hospital received \$500 from the Province. As well, the provincial laboratory "was to provide a general pathologic, bacteriologic, and serologic service to the hospital, and the Chief of Laboratories was to be considered the pathologist to the General Public Hospital."

⁸⁷ NBARMH, October 31, 1918. For a brief description of the Wassermann reaction, see *MMN*, 22, 1 (January 1910), p. 2.

⁸⁸ NBARMH October 31, 1921.

⁸⁹ NBARMH October 31, 1921.

⁹⁰ PANB RS 136, Records of the Deputy Minister of Health, Files E5b, E30b, E8 and E7b. These files all contain questionnaires that were administered to hospitals annually and asked, among other things, about laboratory facilities.

⁹¹ PANB RS 136, Records of the Deputy Minister of Health, File E5a, Sr Walsh to W.F. Roberts, August 13, 1919.

⁹² PANB RS 136, Records of the Deputy Minister of Health, File E5a, Roberts to Walsh, October 1, 1919.

⁹³ PANB RS 136, Records of the Deputy Minister of Health, File E5a, Roberts to Walsh, October 1, 1919 and Dr. H.L. Abramson to Dr. L.G. Pinault, September 25, 1922 in PANB RS 136, Records of the Deputy Minister of Health, File E24a.

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- ⁹⁴ NBARMH, October 31, 1919.
- ⁹⁵ NBARMH, October 31, 1918.
- ⁹⁶ PANB RS 136, Records of the Deputy Minister of Health, File Q1, H.L. Abramson to "Dear Doctor," November 5, 1923.
- ⁹⁷ PANS RG 25 Series B, Vol. 2(B), Minutes of the Medical Board, October 11, 1909.
- ⁹⁸ VGHL. W.W. Kenney to John A. Waters, Secretary, Halifax Board of Health, May 11, 1912.
- ⁹⁹ PANS RG 25 Series B, Vol. 3, Minutes of the Board of Commissioners, March 8, 1913 and March 29, 1913. Lindsay ordered over £233 from a Birmingham firm. See VGHL. W.W. Kenney to Messrs. Standley Belcher & Mason, Birmingham, England, August 8, 1913.
- ¹⁰⁰ VGHL. W.W. Kenney to Charles D. Coburn, Hantsport, October 13, 1915.
- ¹⁰¹ PHAR, October 1914-September 1915.
- ¹⁰² PANS RG25 Series B, Vol. 3, Minutes of the Board of Commissioners, March 29, 1913.
- ¹⁰³ VGHL, C.E. Puttner to Bausch and Lomb Optical Co., July 31, 1913 and May 28, 1918; W.W. Kenney to J.B. Prescott & Son, Webster, Mass., March 6, 1914; Kenney to Lederie Antitoxin Laboratories, August 15, 1919.
- ¹⁰⁴ VGHL. W.W. Kenney to Dr. A.G. Nicholls, April 20, 1923.
- ¹⁰⁵ PANS MG 20, Vol. 197. Minutes of the Massachusetts-Halifax Health Commission, June 2, 1921 for supplies; June 30, 1921 for microscopes; August 17, 1921 for supplies; December 8, 1922 and March 1, 1923 for supplies; and December 7, 1923 for books.
- ¹⁰⁶ *MMN*, 8, 11 (Nov 1896), pp. 359-359.
- ¹⁰⁷ JHA 1899, Appendix 14.
- ¹⁰⁸ JHA 1901, Appendix 12; L.M. Murray to S.N. Miller, November 16, 1914; Murray to Miller, November 30, 1914; and L.M. Murray to A.K. Roy, November 3, 1914; all in VGHL.
- ¹⁰⁹ W.W. Kenney to Dr. F.C.L., New Ross, October 28, 1913 in VGHL.
- ¹¹⁰ JHA 1905, Appendix 16.

¹¹¹ W.E. MacLellan, Post Office Inspector to L.M. Murray, December 1, 1905, reprinted in JHA 1905, Appendix 16.

¹¹² JHA 1910, Appendix 16 and PHAR, October 1931-September 1932, pp. 22-23.

¹¹³ *Nova Scotia Medical Bulletin*, 10, 10 (October 1931). This statement accompanied the Provincial Pathologist's monthly reports in the *Bulletin*.

¹¹⁴ JHA 1907, Appendix 16. Murray reported that for most specimens forwarded by private individuals, the name of a physician was supplied and the results reported.

¹¹⁵ This anecdote is recounted in Hendrick Overduin, *People and Ideas: Nursing at Western 1920-1970*. London: University of Western Ontario Faculty of Nursing, 1970, pp. 40-41.

¹¹⁶ JHA 1905, Appendix 16. The Report of the Bacteriologist for 1899 made specific reference to uncertainty of diphtheria. Hattie wrote:

In some quarters there has been a tendency to call in question the utility of the bacteriologic test in diphtheria. It has been urged that the test cannot always be relied on; but it is necessary to allow a certain margin for error in any method of diagnosis. And the fact that once in a while a non-virulent diphtheria bacillus is to be found in the throat, which has quite the same microscopic and cultural appearances as the virulent organism, can hardly be said to argue against the usefulness of the test for at worst this circumstance can only occasion the exceptional adoption of preventive measures when they are not actually necessary.

Of course, such an opinion ignores the fact a wrong diagnosis could impose hardship on a family, which is discussed elsewhere in the chapter.

¹¹⁷ A.P. Reid, "Public Health," in *MMN*, 13 (August 1901), pp. 285-86. Reid originally made the comments in an address before a meeting of the Maritime Medical Association, July 4, 1901.

¹¹⁸ JHA 1900, Appendix 12.

¹¹⁹ JHA 1908, Appendix 13.

¹²⁰ JHA 1900, Appendix 12.

¹²¹ JHA 1898, Appendix 14.

¹²² JHA 1905, Appendix 16.

¹²³ *MMN*, 8, 11 (November 1896), pp. 358-59. Widal published his agglutination technique in 1896 and that same year, Hattie performed over one hundred of them in Halifax. This suggests that the lag-time in adopting and implementing new methods was very short in some instances. See MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," p. 180. Physicians, it should be noted, were often reluctant participants in the exchange of information. William Hattie lamented in 1899 that:

I have again to regret that it so often happens that once we have furnished a report on a case, we hear nothing more of it. It is such a small matter to drop a post-card stating whether the ultimate history of a case agreed with the report that the laboratory had furnished, that physicians are very apt to overlook it altogether. Nevertheless unless this is done it is impossible for form any true doing. I trust that in future those who receive assistance from the laboratory will not neglect to inform us to the accuracy of our reports.

See JHA 1899, Appendix 14.

¹²⁴ Daniel Nicholson, *Laboratory Medicine: A Guide for Students and Practitioners*. Philadelphia: Lea & Febiger, 1930, p. 227.

¹²⁵ Very little of this correspondence has been preserved and there is indirect evidence that the results were communicated by telephone. (See W.W. Kenney to B.S. Bishop, August 18, 1911 in VGHL). However, a very good run of letters may be found in the VGHL for November and December 1914, which reveal the range of samples being examined and confirms that samples were being received from throughout the province.

¹²⁶ L.M. Murray to L. Rockwell, October 31, 1914 and Murray to Dr. W. Rockwell, November 3, 1914; both in VGHL.

¹²⁷ G.A. McIntosh to F.R. Lawley, Nova Scotia Hospital, March 18, 1924, in VGHL.

¹²⁸ PHAR, October 1915-September 1916.

¹²⁹ An article from 1902 suggested that "The general practitioner is apt to look upon microscopical work as of scientific rather than practical value." N.S. Fraser, "The Microscope in Diagnosis," *Maritime Medical News*, 14 (May 1902), p. 162. The Presidential Address of

Dr. L.R. Morse in *Nova Scotia Medical Bulletin*, 1 (December 1922), p. 6 reaffirmed the paramount importance of clinical judgement. For a contrary opinion, see Frank G. Mack, "The General Practitioner and Urological Problems," *Nova Scotia Medical Bulletin*, 5 (March 1926), pp. 6-10.

¹³⁰ John Harley Warner, "Science in Medicine," *Osiris*, 2nd Series, 1 (1985), p. 45.

¹³¹ Warner, "Science in Medicine," p. 45.

¹³² Regina Morantz-Sanchez, *Sympathy and Science: Women Physicians in American Medicine*. New York: Oxford University Press, 1985, p. 236.

Chapter 2

The Context of Laboratory Work

Margaret Low went to work at the Pathological Institute in 1920,¹ although she worked in the medical school for several years before that. Low was appointed at the initial sum of \$70 per month and was to work in the laboratory for 27 years.

Accordingly, there was little doubt that she was the senior person and the head technician.² One of Low's co-workers from the 1930s suggested that "she must have been there from the beginning of time."³ She was remembered as a stern person, although a "nice old soul" who was not above raising Cain with the doctors who would come into the lab smoking. Low was allergic to tobacco smoke and "wouldn't allow it if she had anything to do with it."⁴ Often, as in other facets of her worklife, it was beyond her control.

Work in the Halifax laboratory was defined by the interest of municipal, provincial and federal governments, the relationship with Dalhousie University and even the Massachusetts-Halifax Health Commission. At the close of the nineteenth century, the laboratory was primarily engaged in public health work, sputum samples for the tubercle bacillus, throat swabs for diphtheria and blood specimens for typhoid.⁵ Occasionally, other requests were made, such as examinations of tumours and other tissue samples sent in by physicians "who were in doubt as to the nature of the conditions which they represented."⁶ Public health work was the *raison d'être* for both the Saint John and Halifax laboratories. Nevertheless, both performed significant amounts of clinical work for physicians in their respective provinces.

When the laboratory embarked on its work the tests performed were few in scope, but there was a significant trend to more and more tests. In Nova Scotia in 1896-97,

the first year for which figures are available, the laboratory performed tests on 266 specimens.⁷ Through the first decades of the twentieth century the laboratory built a steady clientele and the health department suggested that the lab's equipment and personnel were being "taxed to [the] utmost."⁸ By 1920 the specimen total exceeded 3300, while it topped 6200 in 1921.⁹ Moreover, a new public health age was dawning in Halifax, expressed most dramatically by the expansion of Dalhousie's medical school. This expansion, sponsored by the American philanthropies, envisioned a "close relationship" between the public health laboratory and the university, with particular emphases on teaching and preventive medicine.¹⁰ By 1919-20, the work was becoming too much for one individual and, for the first time, there were additions to the staff. The number of specimens examined increased over time, but the focus remained on the problems of public health. More than anything, however, the work was defined by the burden of disease. Together, the invigorated attention to public health and the burden of disease combined to create an opportunity for laboratory work.

I -- LABORATORY WORK AND THE BURDEN OF DISEASE

While the clinician retained absolute control over the care of individual patients, state initiatives in health care, while inconsistent, have usually been prompted by specific diseases or the identification of particular health issues as "problems." Cholera prompted quarantine, smallpox incited vaccination and diphtheria provoked isolation. Some diseases, such as cholera or smallpox, raised a clamour because of their sudden appearances and dramatic consequences. Others, notably tuberculosis, influenza or diphtheria, carried off substantial numbers annually in North American cities, but failed to attract widespread attention. Some diseases lack drama. While late nineteenth

and early twentieth century governments and citizens responded to different diseases in different ways, these same diseases shaped the work of the laboratory. When impure milk was "discovered" to be a major cause of infant mortality, cities turned to milk testing and inspection of dairy herds. When concerns were raised about the potability of local water supplies, samples were forwarded to the laboratory. During the First World War, significant numbers of enlistees were found to be harbouring venereal diseases.

The 1920s had largely fulfilled the promise of medical bacteriology that began with Koch four decades before. Bacteriology revealed the agents of disease, hidden in milk and water or carried by individuals in their bloodstream. Medical bacteriology had developed precise tests to identify and differentiate the micro-organisms of the various diseases, including the Widal test for typhoid, the Schick for diphtheria and the Wassermann for syphilis. Laboratories revealed germs, the mechanism by which diseases were transmitted. Analyses became the first step in diagnosis and the products of the laboratory, including sera and vaccines, often provided physicians and public health officials with a means to combat the disease. Health departments now had a fighting chance against some diseases and the basis for this chance was firmly in the public health laboratory.

But what were the issues at hand? The Provincial Board of Health was interested in collecting statistics on infectious disease throughout the province, but their efforts met with little success.¹¹ Physicians and the public alike believed that "disease like bad weather was quite unavoidable"¹² and Maritimers then, as now, could relate to ill weather. Increasingly, however, the statistics that the department diligently collected illustrated that much illness resulted from infectious disease. "Why not prevent it?" asked the *Annual Report* for 1900-01, for if the disease was preventable so too were

the death and discomfort that followed in its wake.¹³ How well was Nova Scotia doing in these years? As the new century dawned, Dr. A.P. Reid believed that the province was lagging behind even other provinces in the effort to improve public health.¹⁴ Several municipalities failed to appoint health officers, as required by the public health legislation, and this rendered them impotent against the appearance of disease.¹⁵ At the precise moment when Nova Scotia was heralding the creation of the laboratory, there were still fundamental shortcomings in public health. The provincial response to illness is best understood as a patchwork. Yet the laboratory, even as early as the war years, gave both the state and clinicians several definitive tests to aid diagnosis and protect the public health.

One such a test was the Widal test for typhoid. A common test throughout the formative years of Maritime laboratories, the Widal is an example of the expanding workload of the laboratory. It also presents a chance to examine the work of the laboratory.¹⁶ To complete the test, a small drop of the patient's blood would be placed on a glass slide. Four drops of water were added and the slide was tipped from side to side to ensure that the cells were hemolyzed. Four drops of formalinized¹⁷ culture of typhoid bacilli were then added, and the slide tilted again to mix the solutions. If the reaction was positive, agglutination would occur in about one minute. If the results were doubtful, the excess fluid was drawn from the slide, which was then dried and fixed over a flame. The dried slide was then stained with methylene blue and examined under a low-power microscope lens. When the test was positive, the bacilli are seen in large clumps. In this early and relatively straightforward example of a laboratory test that was common throughout the 1910s, 1920s and 1930s, the laboratory worker had to be adept at working with the slides, prepare the formalin and carefully stain the slide if the test was to be useful to the clinician.

Though Widal's were common, in terms of the volume of laboratory work they were outpaced significantly by other examinations, such as sputums. Examinations of sputum for pneumococcus streptococcus or influenza, with smears stained with methylene blue or Gram's stain and examined under the microscope. The procedures for these examinations were demanding and tuberculosis smears serve as an important example of this segment of laboratory work. As the work of the laboratory increased, the promoters were careful to suggest that what was being seen was not an increase in disease. For example, when sputum samples increased in 1907 and 1908, laboratory director L.M. Murray believed it was because physicians were making more use of the laboratory service. He did, however, suggest that most of the sputum specimens came from rural areas and were evidence of "the great prevalence of this disease" in the countryside.¹⁸ In this way, Murray demonstrated the utility of the laboratory and the fledgling public health efforts of the department, while ensuring that possible critics of these expenditures did not interpret the laboratory findings as an indication of the failure of public health efforts. Sputum examinations grew dramatically from WWI to the mid-1930s. In Halifax, for example, they grew from 359 tests in 1914-15 to 984 in 1921-22 and 1463 by 1928-29. These numbers continued to grow: over 2100 by the end of the 1920s, almost 4800 in the depths of the depression and topping 8000 samples by 1935-36.¹⁹ Clearly, examining sputum was an important task in the early laboratories. Patients were given clean, wide-mouthed bottles and a new cork. The sample was to be collected from material coughed from the lungs (not, for example, secretions from the nose). Once obtained, the sputum would be placed in a petri dish or on blotter paper. The worker would then remove any larger particles in the sample and set them aside. These particles were then squeezed out with another glass slide until the layer was thin and even, covering about half of a slide. The resulting smear

was then fixed over a flame and the specimen destroyed. Heating was necessary because the tubercle bacilli resisted staining. Heating overcame this barrier. Once stained, the bacillus retained color when washed with alcohol and mineral acids. Next, carbon fuchsin was poured on the sputum. The worker would hold the dry end of the slide and heat the end covered by the stain until steam appeared. After three minutes, the stain was rinsed with water and the smear decolorized with acid alcohol until it turned pinkish-gray when washed again with water. The smear was then counterstained with Loeffler's methylene blue for thirty seconds. The smear was again washed, then dried with blotting paper and heat. After all of these procedures, which demanded the careful attention of the worker, were complete, the sample was ready for examination.

With a stain such as Ziehl-Neelson, common in 1930, rod-like bacilli cells were red while the cells appeared blue under a microscope. The entire smear would be viewed by carefully moving the slide until the entire area was examined. A worker would spend as much as five minutes looking at a smear. When several of the tell-tale rods were identified, a positive diagnosis could be made. But identification required some skill. As with other tests, accuracy was dependent upon the acumen of the workers. Smears that were too thick might retain stain even when the tubercle bacilli were not present. Small imperfections in the glass slide could retain the red stain and it was only with practice and acumen that the observer could identify the bacilli. Picking out the larger particles required patience and other errors could occur. Burning the sputum when fixing the sample, boiling the stain instead of steaming it, allowing the stain to dry off or decolorizing too long all reduced the sample's utility. Time was another issue. The proscriptive literature may have suggested five minutes per slide, but in a busy laboratory, as Nicholson and other authors acknowledged, a half minute

was probably more typical. If the technique was poor, early cases could easily slip detection. The laboratory worker had to be diligent and conscientious if sputum samples were to be examined satisfactorily. Even when everything was done correctly, the work did not end. Workers had to confirm positive findings through the examination of other specimens. In suspected cases of tuberculosis, even a negative sample did not lighten the workload. A negative sample still required subsequent tests, as the bacilli might not be present at all times.

Diphtheria was among the early diseases identified in the laboratory and, appropriately, one of the first targeted with a biological agent developed in the laboratory. Behring and Kitasato laid the foundations for serotherapy by proving that immunity to diphtheria, induced in a guinea pig, could be transferred passively to another animal. They identified the substance in the serum of immune animals and dubbed it "antitoxin."²⁰ Using antitoxin, physicians and public health officials could defend the populace against diphtheria. By the beginning of the Great War, the Nova Scotia Department of Public Health was procuring diphtheria antitoxin and distributing it to both local health boards and (for slightly more) to individual physicians.²¹

Diphtheria also provides a useful illustration of the work of the laboratory. The Schick test, introduced in 1913, was very reliable. Only individuals showing a positive reaction will be susceptible to diphtheria. A minute amount of diphtheria toxin would be injected intradermally and, if susceptible, a red area would develop. Those who enjoyed immunity did not develop this redness. The Schick test began in the laboratory. A fresh supply of diphtheria toxin had to be available, stored in a refrigerator and diluted immediately before injection. The laboratory worker would break off both ends of the capillary tube, being careful not to lose any of the contents.

One end of the tube was placed into a rubber bulb, which was squeezed to mix the contents with a 5-cc. vial of saline. The saline was drawn up and expelled several times to rinse out the toxin, and the resulting dilution was subsequently corked. The worker would then turn the vial several times, shaking the contents. The diluted toxin was only good for twenty-four hours. Exactly one tenth of a cc of the dilution was then injected between the layers of skin on the surface of the forearm. When done correctly, a small white weal appeared on the skin. If incorrect (when the fluid went too deep or was lost on the surface of the skin), another injection was necessary.²²

Diphtheria is notable because it provided clear evidence of the utility of the laboratory for making diagnoses. During the spring of 1916, diphtheria was reported in several areas of the province, and it re-appeared during the fall. Not surprisingly in the midst of war, there was also some concern for the troops who were afflicted with the disease. The outbreak was mild and the mortality was reported to be quite low. However, the Department of Public Health noted "amongst soldiers, a large proportion of the cases lacked the membrane and other signs usually regarded as distinctive of diphtheria, the diagnosis being made by laboratory methods." The Department took the opportunity to remind readers that this experience emphasized the utility of forwarding specimens in all doubtful cases. Only in this way could the effort against diphtheria be assured of progress against often hidden threats to health.²³

The laboratory proved its utility in a different way, during a severe diphtheria outbreak at the Victoria General in 1916.²⁴ In correspondence with the provincial and city medical officers, W.W. Kenney reported the number of cases at the hospital. What are the important elements here? First, that the laboratory was active in testing reportable diseases, such as diphtheria. Second, that testing was sometimes repeated to ensure accurate results. Two suspected cases were quarantined until two laboratory

tests each showed them to be negative. It is unclear what motivated the multiple trials, but it is nevertheless significant. Third, it is important to recognize that laboratory testing was not always oppressive. In this case the negative results enabled the two women to escape quarantine.

The hospital took extraordinary measures to combat the outbreak. The isolation building quickly filled, and the hospital segregated identified "carriers" in the general wards, away from other patients. The hospital also imposed strict limits on who would be admitted to the hospital. Nurses, maids and even patients were subjected to throat swabs, as the laboratory endeavoured to identify potential cases before the disease spread. As Naomi Rogers has suggested, germs were often identified with filth but could appear "insidiously in those who seemed clean and healthy."²⁵ Indeed, by the end of January, 220 cultures for diphtheria were completed, and 33 "carriers" identified among the patients and workers. These individuals showed no clinical signs and could have prolonged the outbreak, possibly with devastating consequences.²⁶

The health of the province's largest hospital was one matter, but whole towns were at risk because of impure water supplies. In 1902, W.H. Hattie reported that inadequate sewage disposal and impure water were contributing to a generalized problem of typhoid fever.²⁷ Again the next year, the *Annual Report* noted solemnly that though typhoid fever continued to be prevalent, it was so "insidious that it does not rouse popular excitement." The report suggested that it was well known that the route of transmission was infection of the water supply by improper sewage disposal. The report concluded succinctly that every water supply should be tested to ensure purity.²⁸ The laboratory, as with the 1916 diphtheria outbreak in the hospital, would render the invisible menace visible, and water testing became a major focus of the laboratory's work.

As the examples of diphtheria and water testing illustrate, the laboratory responded to changing demands placed on it. A decade after its founding, tissue samples from animals, for example, were a notable feature of the lab's work, reportedly the result of increasing public pressure for pure milk and an unadulterated food supply.²⁹ The effort to ensure a safe milk supply, steeped in political and social considerations, was also a fight in which the laboratory could assume a central place. Earlier efforts to ensure a decent milk supply centered on inspecting the cleanliness of cow herds and dairy farms and preventing the adulteration of milk.³⁰ Bacteriological testing of milk allowed reformers to document health hazards and take action. But as Bettina Bradbury has suggested, "science was not harnessed to this end" until the early decades of the twentieth century and children continued to pay a heavy price.³¹ Provincial health authorities in Nova Scotia agreed, suggesting that the milk supply was a significant contributor to Halifax's "excessive" infant mortality rate.³²

The crusade for clean milk was a major health issue in all urban areas throughout North America. The *Maritime Medical News* commented in 1906 that "what were formerly spoken of as water-borne diseases may now be more fairly, perhaps, termed milk-borne." The editorial also suggested a connection between the safety of the milk supply and rural water. "The water supply of cities is now fairly looked after ... But milk is obtained from the farms, and the water supply of farms is, as we know, not always above suspicion -- and indeed in many cases is very bad indeed."³³ This is an interesting example of rural conditions being portrayed as unhealthful, in contrast to city areas, based on the evidence of the laboratory. It draws anti-observational strength from this position -- rural may look better, but laboratory investigation reveals the truth. Paul Bator has suggested boldly that Toronto's successful campaign for clean milk resulted in the imposition of urban standards on farms, standards that ultimately

dispelled the illusion of the healthful rural environment. Concurrently, the resulting regulation of milk signified the emerging dominance of cities, both legally and symbolically.³⁴ Once again, the tests of the laboratory revealed "truth," empirical evidence of hitherto hidden threats.

More pressing were the concerns with the public health of urban areas. In 1911, the City of Halifax Board of Health inquired whether or not the laboratory facilities could undertake milk examinations. The following year, the hospital commissioners suggested that they could find room at Dalhousie College -- the new laboratory facility was being built in 1912 -- if the city would agree to purchase the equipment. Finally, the hospital agreed to perform water and milk analyses for the city, for five hundred dollars annually.³⁵ The equipment was installed at the medical college in July 1912 and the pathologist began to perform the bacteriological examinations for the city.³⁶ In 1915, when the city wanted to expand the agreement to include water analyses, the hospital argued that the \$500 was only for conducting milk tests, while the city maintained that it was for both water and milk tests.³⁷ A new agreement was struck, which saw the hospital procure new equipment and earn \$750 for the city work.³⁸

There is no question that the trend was toward greater regulation of the milk supply. But a nuanced analysis is required. As in the case of diphtheria, when suspected carriers escaped quarantine, milk dealers could occasionally reap the benefits of an accurate test that proved their milk was clean. Reporting to the Provincial Secretary in 1904, A.P. Reid recounted a visit he made to a dairy farm near Milford. The farm was suspect and prohibited from selling milk in Halifax. But Reid found the claim to be unwarranted. The operator of the farm had her business ruined and "when the embargo was raised a prejudice prevented her, and still prevents her from being able to resume her wonted business."³⁹ The damage was already done. Not

even a clean bill from the laboratory could help. For a dairy, negative publicity was detrimental and could happen at any time, with disastrous results for the proprietor. Reid, incidentally, suggested a scheme of licensing milk vendors as a protection not only for the public health, but also for vendors wrongly suspected of unclean operations. A clean bill from the laboratory could prevent false accusations, but could not undo them once made.

The diphtheria outbreak in the hospital and the milk testing also remind us that the laboratory had very direct impacts on the people of the province. While the work of the laboratory was analyzing bits of people or of goods, the test results could have very profound impacts. A positive venereal disease test could reveal infidelity. A negative diphtheria test could see the removal of a quarantine sign from a neighbourhood household and the return of the family members to work, school or other neighbourhood activities. A milk analysis that proved unfavourable could ruin a small family dairy. The laboratory may have been hidden from public view, but it was hardly removed from the public.

By definition public health brought inconveniences to provincial citizens. As a result, many were less than enthusiastic about some aspects of health reform. This manifested itself in a variety of ways. Resistance to smallpox vaccination or quarantine was common, in the Maritimes and elsewhere. And it was not mere ignorance that prompted the resistance. Provincial authorities could be passionate in enforcing their measures. A 1902 smallpox epidemic included the normal recourse to vaccination, but also included measures to confiscate the homes of the infected, destroy their belongings and even destroy family pets. Local health officers closed the post offices and attempted to disinfect the mail, but postal workers subverted their attempts. In 1910, a group in Guysborough County was prosecuted for tearing down a

quarantine placard notifying neighbours that a case of diphtheria had been diagnosed in a local home. The court fined the perpetrators thirty dollars, a first for the province. In 1913, the *Acadian Recorder* captured the feeling of the era, commenting that "law-makers would take away from us all our freedom."⁴⁰

What was the health of the city like? Statistics on mortality rates for this period are highly suspect but they do offer some insight into what the reformers at least thought they were addressing.⁴¹ In its official statement to the Halifax Board of Health, the MHHC suggested that over a period of ten years, Halifax had an average death rate of 20.6 per thousand and an infant death rate about 182 per thousand live births. The corresponding figures for Dartmouth (over an eight year period) were 17 and 170. The MHHC claimed that over the same period of time, Toronto had an average death rate of 13.5 per thousand, and an infant death rate of 131 per thousand, and that these rates had dropped substantially in more recent years. Two of the world's great cities, New York and London, even with their "hundreds of acres of slums," had death rates of 13.4 and 14.4, while infant death rates were 94 and 104.⁴² There were other difficulties as well. In 1920, the MHHC suggested that if Halifax chlorinated its water supply, one hundred and fifty lives could be saved annually.⁴³ Despite the claims of the public health promoters, health in Halifax was a tenuous prospect. The geography of public health is well-known in other Canadian cities, but less so for Maritime cities.⁴⁴ It is reasonable to suggest that there were fundamental and substantial health issues that remained unresolved for the most vulnerable, including the young and the poor. The promise of public health reform was not yet fulfilled for segments of the population. With the severe economic dislocations of the 1920s and 1930s, the promise would remain unfulfilled.

II -- VENEREAL DISEASE

Yet, reformers would point to the work of the MHHC, the reinvigorated medical school, the use of public health nurses, the creation of a state infrastructure, including laboratories, as evidence of marked improvement in public health. There were obvious limits on this success. Any claim that the Halifax laboratory was among the finest in Canada must be balanced by the paltry resources that were dedicated to its operation. This extended to staff. In 1915, for example, the laboratory director A.G. Nicholls claimed that he required more staff.⁴⁵ The work of the laboratory was already becoming complex, with the competing demands of city, province and clinical hospital work, in addition to duties at the university. At the same time that Nicholls was asking for help, the Halifax laboratory also introduced the Wassermann test for syphilis.⁴⁶ He probably did not anticipate that the two would become linked as governments took an increased interest in venereal disease. Venereal diseases came to prominence during the First World War when it was found that many soldiers, many more than any Canadian could have imagined, were infected. Indeed, Canada's official war history records that 66,083 cases of infection were identified among the 418,052 Canadian troops that went "over there."⁴⁷ Public health authorities, doctors and the general public thus embarked upon a campaign against VD and laboratory testing became a small but vital component in a broader program of social reform.

Acute syphilis promotes antibodies in the blood, as a reaction against the infection. In the test-tube, these antibodies will bind together in the presence of an antigen. After this reaction, the bound complement can no longer join with hemolytic serum to hemolyze sensitized red cells which are later added. In other words, when syphilitic antibodies are present in the serum, the red cells will sink to the bottom of the test tube, leaving only a clear fluid above. If the blood sample is free of syphilis, the

complement will join with the serum and cause hemolysis, resulting in a bright red fluid in the test tube. This reaction, known as complement fixation, could also be used for other bacterial diseases using different antigens. To obtain the sample, a tourniquet would be applied to the patient above the elbow. If the veins were small, they could be dilated by opening and closing the hand, slapping the vein vigorously, having the patient swing the arm or even immersing it in a hot-water bath. Once the vein was accessible, the patient was ready to be punctured. The thumb of the left hand was placed adjacent to the vein to steady it and the needle slowly inserted, ideally at a twenty-degree angle. Five to ten cc. of blood was drawn, the tourniquet removed and the needle withdrawn.

Once obtained, the sample was sent to the provincial laboratory within twenty-four hours and without too much agitation. Also, temperature extremes were to be avoided. If it took longer than two days to transport the sample to the destination, it was better to send serum only. In this case, the blood sample would stand for three to six hours in a warm room until the clot began to contract. The test tube would be spun in a centrifuge to drive the clot to the bottom and one or two cc. of clear serum drawn off and placed in a new vial with a cork stopper. Daniel Nicholson, who authored a popular manual in 1930, exhorted that "[e]very extra step increases the hazard of contamination."⁴⁸ With samples arriving in Halifax or Saint John from all over the Maritimes, the extra work was necessary. If the extra steps were not taken, the sample would become hemolized and therefore useless.

Workers had to ensure that the pipette and vial were clean, dry and sterile. The equipment of the laboratory had to be thoroughly cleaned with soap and water and then rinsed three times in distilled water. The equipment was then dried and sterilized in an "ordinary cooking oven."⁴⁹ Indeed, cleaning glassware was a major feature of

laboratory work. If only a few slides, coverslips or test tubes had to be cleaned, ordinary soap and water, followed by rinsing and wiping probably sufficed. For the more stubborn stains, one author suggested a "grit soap" like *Bon Ami*. More extensive cleaning was, of course, frequently required in the laboratory setting. New glassware had to be cleaned with a 76-90 percent solution of alcohol, with one-percent acid. The glass was soaked for five minutes then rinsed, preferably with distilled water. If the glassware contained infectious material, the worker boiled it in a two percent solution of sodium carbonate for fifteen to thirty minutes, then rinsed it. If there were stubborn stains on the glass, the worker would apply heat, then an acid solution and then immersed in another cleaning solution overnight. Some of the solutions, including a sulfuric acid bichromate mixture, were very caustic to the skin. Not surprisingly, given the harshness of the material and the work required, the author noted that it was "questionable whether the time and breakage involved to clean coverslips that have been covered with balsam and oil, makes it worth while [sic] or whether it is better to discard them."⁵⁰ The busy laboratory worker was probably thankful for that concession.

Wassermann tests, while routine, were considered to be highly technical. Nicholson suggested that the test should only be conducted "at a large laboratory where a competent serologist is giving special attention to the reaction."⁵¹ Sufficient controls needed to be in place to ensure the accuracy of the result, but accuracy depended upon specimen collection and patient determinants as well. Hemolyzed blood or the presence of chemicals or bacteria (due to inadequate cleaning) would limit the ability of the laboratory to provide accurate results. Moreover, even in a syphilitic patient, the serum examined could yield different results. Remissions and exacerbations in syphilis patients are common and the Wassermann test was positive

only when the disease was active. High fevers or anesthesia could also produce false positive results, as could the presence of other diseases, including non-pulmonary tuberculosis, diabetes or cancer. The work may have been precise and the test complex, but the interpretation of the results was uncertain at best. Despite these very real limitations, a positive Wassermann was of more diagnostic value than a negative one. If a positive reaction resulted, the test was typically repeated. If it was again positive, the presence of syphilis was almost certain.⁵² The Wassermann test was positive in fully ninety percent of syphilis cases and gave the laboratory enormous diagnostic authority. More broadly, the Canadian campaign against venereal disease began in earnest in 1917. Prominent reformers, among them Dr. C.K. Clarke, reported that evidence from Toronto General revealed a syphilis rate of between twelve and thirteen percent. Gonorrhea, while not assigned a percentage, was argued to be the cause of half the cases of sterility in women, and a quarter of cases of blindness in children. Syphilis caused miscarriage or still-birth, insanity, congenital deformities and generally exacted a heavy toll. Canada, reformers argued, needed legislation.⁵³

The argument convinced Dr. P.H. Bryce, the federal health gadfly, who added the venereal disease plague to his list of reasons for establishing a federal department of health.⁵⁴ The Academy of Medicine, a Toronto medical society, framed the necessary measures to control VD. The Academy reported that both a medical program and an education program for physicians were required. With respect to the former, any general hospital in receipt of federal money should participate in diagnosing and treating venereal diseases. The Commission recommended that the federal government grant participating provinces \$10,000 for laboratory costs.⁵⁵ Most provinces in the Dominion passed legislation that addressed VD in the years before 1920.⁵⁶

Venereal disease control was an integral part of the federal Department of Health when it was established in 1919. VD control was one of the ten divisions and \$200,000, the second largest budget, was devoted to controlling the "secret plague." This money was designed to assist provincial programs, and the federal government itself was to be minimally involved in delivering the program.⁵⁷ The federal government would supply the funds in proportion to provincial population, while the province would deliver the services. In this way, the effort to diagnose and control VD became an early example of federal conditional grants to the provinces.⁵⁸ Federal-provincial conferences were held in February and May 1919, and resolutions were approved which would guide the disbursement of federal funds. In addition to establishing free clinics, beds in hospitals, treating inmates of provincial institutions and establishing a provincial VD division with a specialist in charge, provinces had to maintain diagnostic laboratories to be eligible for grants.⁵⁹

Laboratories, therefore, became important in the effort. The Halifax laboratory conducted syphilis tests free of charge. "All specimens which are considered to relate directly to Public Health matters," W. W. Kenney wrote to the Halifax Visiting Dispensary, "are ... free of charge." Kenney believed that there was an "urgency" in public health services during the war, particularly on the question of syphilis.⁶⁰ The *Annual Report* for 1919-20 noted simply that "the laboratory is being used for [venereal disease] tests to a much greater extent than formerly."⁶¹ Following the Great War, Nova Scotia also established treatment centres in Halifax, Sydney, New Glasgow, and procured equipment for centres in Yarmouth, Lunenburg and Amherst.⁶² These centres, funded on a fifty-fifty basis with the federal government, provided evidence of Ottawa's interest in the matter of venereal disease.

The success of the campaign for a robust response to venereal disease stemmed in part from its definition as a social, rather than a health problem.⁶³ The story of venereal disease in Canada is well documented and it need not be recounted here. What is interesting to note is how the historiography largely replicates this focus on the social relations of VD, exemplified through the information campaign, rather than the efforts toward treatment and diagnosis.⁶⁴ In other words, we know a great deal more about the campaign literature than we do about the development of something like laboratory tests. Even studies that address the campaign to conduct Wassermann testing fail to pause to consider *who* was conducting the tests.⁶⁵ Laboratory workers remain utterly invisible. Margaret Low, the first addition to the staff of the Morris Street laboratory, was one such worker. She was appointed chiefly to handle the large volume of venereal disease tests and paid through a special VD account. Low was the front-line worker assisting in the effort to provide free diagnosis and treatment to those suffering from the "secret plague."⁶⁶

Indeed, from the time the Wassermann was first introduced in 1915, venereal disease testing became a steady part of the laboratory's work. Statistics were reported for the first time in 1919-20, the year that Margaret Low joined the staff, and 610 were conducted that year. The numbers grew through the 1920s, peaking at 2564 in 1921-22 and staying in this range until the Wassermann was displaced by the Kahn test. The change in the testing protocol did not slow the growth in work. The number of syphilis tests conducted in the laboratory increased by sixteen-fold between 1919-20 and the mid-1930s.⁶⁷ While the work of the laboratory expanded over the first two decades of the twentieth century, testing for venereal diseases marked a significant change in the work of the lab. The volume of testing vastly increased, there were expansions to the staff and ultimately the public health work, of which VD testing was a substantial part,

was established as a separate service. Testing for VD also marked a degree of federal-provincial co-operation on health matters. Dr. W.H. Hattie, the provincial health officer and a member of the MHHC, reported that "serious attention" was given to the topic of venereal diseases. Thus, local health officials added their voice to the national effort against venereal disease. More importantly from the perspective of the bench, this attention marked the beginning of a period of growth in the staff of the laboratory.

III -- POLIO

The laboratory exposed health threats, whether in the city or the country, in people or in foodstuffs. As the cases of diphtheria, milk and water and, most especially, venereal disease demonstrate, the public health laboratory, its tests and workers, revealed hidden perils to the well being of the populace. The volume of laboratory work expanded accordingly and entirely new kinds of work were added to the routine. Vaccines were manufactured for the first time in 1908, and the *Annual Report* commented that "no branch of medicine has increased in its usefulness so rapidly as that in which diseases are treated by vaccine, and as their preparation can only be accomplished in a laboratory we must be prepared for a great increase in this work."⁶⁸ Nevertheless, this aspect of laboratory work did not become a major component of the activities, with the notable exception of convalescent serum production in response to the polio scare of the 1930s.⁶⁹

Polio had long attracted the attention of scientists. No less a figure than Simon Flexner put the newly-opened Rockefeller Hospital in New York on the trail of polio in the spring of 1911. There, three of the hospital residents, Drs. Francis Peabody, George Draper and Alphonse Dochez, began their investigations.⁷⁰ Research was also conducted in various other laboratories, but the answers remained elusive. There were

competing theories of transmission. Flies were thought to be culpable, while others thought that dust or other fomites could spread the disease.⁷¹ Uncertainty over transmission did not diminish confidence in the laboratory, however. By the second decade of the twentieth century, after all, bacteriology and immunology had combined to provide a host of products to combat disease. Antitoxins were developed for diphtheria, rabies and tetanus, while vaccines existed for plague, cholera, yellow fever and typhoid. The laboratory also offered a variety of diagnostic techniques, including tuberculosis, diphtheria, typhoid, and several venereal diseases. In 1909, the polio virus was identified and, following the course of other discoveries, clinicians and the public alike believed that the laboratory would soon provide a way to identify those infected and, more importantly, a treatment. After all, medical bacteriology had previously provided diagnostic aids and prophylactics or treatments. One of the earliest attempts was an anti-polio serum made of the blood of patients who had recovered from the disease.⁷² Two decades later "convalescent serum" stood as the only treatment available for polio victims.

Preparing convalescent serum required the blood of patients who, ideally were free of the disease for between a week and a month. The blood was collected in large test tubes under aseptic conditions. An 18- or 20-gauge needle was used and the drawn blood was placed in cold storage overnight. The next day, the clot was loosened from the side of the tube and the sample spun in the centrifuge for thirty minutes. The serum was drawn off using a pipette and the worker had to ensure that no hemoglobin was present in the sample. If present, the hemoglobin would create a severe reaction when injected intraspinaly. With this precaution, the sample was tested for sterility. If found sterile, it was diluted and could be stored for public health use for up to a year. Many public health officials in the late 1920s thought that convalescent serum was valuable

for polio cases in the pre-paralytic stage. The dose would be given intravenously when the patient first presented and the diagnosis established. This was followed by two intraspinal injections of between fifteen and twenty cc with a one day interval. Smaller doses were given to young children. The laboratory offered public health officials a response to the dread disease.

In Halifax, interest in polio was intense.⁷³ In 1929, the public health laboratory prepared convalescent serum for two cases of infantile paralysis.⁷⁴ It was the first time, but foreshadowed a growing battle with the polio menace. Convalescent serum was explained to be a "remedy" for the disease. The *Annual Report* for 1929-30 confidently asserted that "[w]hen given early it is apparently uniform in its results." It replicated data from Ontario, which claimed that when given on the first day of illness, the serum prevented paralysis in 100% of cases, while those receiving its benefits on the second day had an 87% chance of recovering without paralysis. The Department of Health compiled a list of donors within Halifax, and prepared and stored serum in the laboratory. Outside of the city, lists of donors were also prepared, and the services of D.J. MacKenzie were offered "to any hospital centre, for technical advice and assistance, in the preparation of the serum locally."⁷⁵ The laboratory kept a stock of convalescent serum on hand and advertised in the *Nova Scotia Medical Bulletin*, that physicians should "telephone or wire the Laboratory as soon as cases, or even suspected cases of Infantile Paralysis are discovered."⁷⁶ Perhaps in an effort to expedite this process, the next year the laboratory prepared a large amount of the serum and distributed it to Medical Health Officers throughout the province.⁷⁷

Doubts were first raised about the treatment in the Department of Public Health *Annual Report* for 1931-32.⁷⁸ The preparation and distribution of the serum had come to be a major component of the work of the laboratory. But was it a successful

enterprise? In the early 1930s, the threat of polio ebbed once again, with only sporadic occurrences and no epidemics. Reports of infantile paralysis were "disturbing" to parents and health officials alike, and the sequelae, notably paralysis of the limbs, "dreaded." Public health officials in Nova Scotia believed that some of the dread was removed because of the use of convalescent serum. They did, however, acknowledge the controversy. "While doubt has been cast, by some, on the efficacy of the Serum," the Report for 1933-34 stated, "consistently good results have been reported from quarters where it has been extensively used."⁷⁹ A slight shift in the discourse of the treatment protocol accompanied this acknowledgement, for the serum stockpile was now viewed as "an emergency precaution", in marked contrast to the policy of just a few years before when the biological was distributed widely. Subsequent reports continued the trend: 1935-36 commented that the serum was "still being used" and distributed "following the custom of late years" and the report for 1936-37 saw fit to mention "differences of opinion regarding the effectiveness of convalescent serum," while stating blandly that "nevertheless it was used." Also, for the first time, another treatment regimen, a nasal spray, was reported even though its trial in Toronto met with disappointing results.⁸⁰

While testing for venereal diseases (and reporting them) and the effort against polio were major enterprises in the laboratory, there were other changes to the work load. The blood transfusion service was further developed in 1921 and, following the discovery of insulin, a blood chemistry service was established in 1922, consisting of a modest range of tests.⁸¹ Tissue examination was always a significant part of the work of the laboratory, but this received a significant boost in 1931 when these exams were made free in the provincial government's effort to address the "cancer problem" and through the establishment of the Victoria General Hospital's Cancer Clinic the

following year.⁸² The free examination of tissues was touted as "the beginning of an effort to attack the Cancer problem" which the Department of Health believed, would "tend to earlier diagnosis and consequent earlier treatment".⁸³ Not surprisingly, when new work was added such as the free examination of tissues, there were also staff additions. As the next two chapters demonstrate, laboratory workers of varying backgrounds joined Low and Nicholls. Most of the staff additions were women, but there were others.

One of the first expansions of the laboratory staff came through the effort of the Massachusetts-Halifax Health Commission (MHHC). In 1921, the MHHC arranged for another pathologist and a technician to join the laboratory. The only difficulty was that Royer, the head of the MHHC, had failed to gain the consent of the hospital authorities! The VG did agree, after ensuring that the full salary of the additions would be the responsibility of the MHHC.⁸⁴ This incident is, as well, indicative of the ambiguous place of the laboratory even in the mind of the medical and public health community. Royer was fully informed of most aspects of public health in Halifax. But clearly he did not understand that the laboratory was under the jurisdiction of the Board of Commissioners. In 1921, the Health Commission appointed Dr. Harry D. Morse to the public health laboratory as a "laboratory assistant" to deal with samples originating from the Health Centres operated by the MHHC and for "making an extended series of observations on the milk and water supply of the City of Halifax."⁸⁵ Morse resigned in May 1922 to assume a fellowship in urology at the Mayo Clinic.⁸⁶ In October 1923, the Commission appointed Dr. Foster Murray to the laboratory staff.⁸⁷ Staff additions came from other sources as well. The emergence of the "cancer problem" saw the appointment of an additional pathologist in 1931 to deal specifically with tissue examinations. Of course, the etiology of cancer remained shrouded in

mystery, and "health workers [were] thereby hampered in their fight against this menace."⁸⁸ What is significant is not whether or not the "fight" could be won, but rather that it would be waged in part through an expanded laboratory workforce. Through the 1920s, laboratory work expanded in new directions and the volume of tests increased significantly. A greater public health effort, shaped through both the burden of disease and the participation of different interest groups (including, for example, the federal government or agencies such as the MHHC), created more jobs at the laboratory bench.

IV -- UNIVERSITY, PROVINCE AND THE VG

The ever-expanding range of work and the increase in the staff levels of the laboratories are indicative of the increasing complexity of the laboratory, but the Halifax facility was *always* a complex facility, subject to a variety of interests. Government, university, philanthropic and voluntary interests shaped the facilities, something most robustly demonstrated in Halifax but true in Saint John as well. These interests were concerned not only with public health but also with clinical problems, social issues and pedagogical concerns. With a variety of interest groups and competing claims on the work of the laboratory came difficulties in administering the facility.

As early as 1909, the Victoria General appointed a special committee on the management of the laboratory.⁸⁹ A year later, when the provincial government established a hospital commission to administer the Victoria General Hospital, one of the identified areas of interest for the new body was the administration of the laboratory.⁹⁰ And in late 1910 and early 1911, as the medical college was struggling to define a new place for itself, hospital commissioners received delegations to discuss

what new arrangements could be concluded, including access to the laboratory. By the summer of that year, Dalhousie University President Forrest and Dr. A.W.H. Lindsay of the medical school were meeting with the commission to finalize the details of the relationship between the university and the laboratory with respect to teaching.

While nothing was settled because it was a period of both laboratory expansion and the reformation of medical education, the hospital commission agreed to give some consideration to the teaching role the pathologist might play within the medical school and what facilities in the new laboratory might be made available for teaching.⁹¹ There were other difficulties establishing limits on the role of the pathologist who was, after all, a joint appointee of the hospital and university. In 1911, the Board of Commissioners requested that the Medical Board delineate regulations for the pathologist. Drs. G.M. Campbell, Chisholm and D.A. Campbell made eight recommendations, notably that the appointee's services "shall be at the disposal of the Commissioners and he shall not undertake any other work without the consent of the Commissioners."⁹² When Dr. Lindsay was appointed to the facility in 1911, it was determined that he could consult with other physicians when called upon and that fees for this work would be his, over and above his \$2000 salary.⁹³ In allowing the laboratory director to consult in difficult cases, a situation was established where the director became an integral part of the medical community. The director would also be a clinician, albeit a specialist. As with ensuring that the laboratory provided clinical services to the broad medical community, it was a response that ensured that the laboratory would become an accepted service.

By August yet another Dalhousie delegation met with hospital officials and agreed to contribute \$300 per year to help defray the construction and operating costs of the laboratory, in exchange for access to the facility for teaching purposes.⁹⁴ For its part,

the hospital agreed to provide only the physical environment and consistently refused to outfit the "student's laboratory" with microscopes and other moveable equipment.⁹⁵ In correspondence with MacKenzie, Kenney suggested the hospital could not justify "undertaking such an uncertain, and more or less continuous expenditure, as would necessarily be involved in providing and maintaining such equipment." The agreement also specified that the laboratory room was to be used only for teaching and only during "regular teaching hours" and that permission from the Board of Commissioners was required for anything beyond this.⁹⁶ Occasionally, Dalhousie placed even more demands on the laboratory. In 1916, University President MacKenzie asked that the Hospital waive the \$300 facility fee. The Board of Commissioners, the minutes record dryly, "did not view such a proposal favourably."⁹⁷ The relationship with Dalhousie was anything but painless. Nevertheless, the Dalhousie medical school, the Victoria General Hospital and the province of Nova Scotia did recognize the educational value of the laboratory. From the perspective of the medical school, physicians-in-training would benefit from their forays into the microscopic world. For the VG and the province, the laboratory became a place where workers could be educated and staff the smaller hospitals emerging throughout Nova Scotia. The New Brunswick government, in their more comprehensive approach to the health of that province, also acknowledged this. The laboratory, then became a place of education and the central facilities in Saint John and Halifax, through training hospital staff in basic tests, replicated the growing importance of the diagnostic services in smaller hospital throughout the Maritimes.

In 1911, Dr. D.A. Campbell, who was a member of the advisory committee on the new facility, suggested that the laboratory would serve not only to educate students but also physicians who wanted to take "advanced work."⁹⁸ And, in his report to the

Medical Board in 1911, Campbell and his colleagues noted that the pathologist "shall provide such instruction for nurses and students as may be determined from time to time by the Commissioners."⁹⁹ The very first *Annual Report* of the Chief Medical Officer for New Brunswick expressed the desire that the facility become a centre "of medical uplift."¹⁰⁰ Through using the laboratory, physicians could avail themselves of the latest methods of diagnosis, facilitating both the management and treatment of their patients. Not only would the laboratory provide clinicians and public health authorities with results, but the laboratories themselves would also become training centres. In Halifax and Saint John, training programs were initiated to train people to staff the small laboratories that accompanied hospital construction in the early decades of the twentieth century.

Following another laboratory expansion in 1925, W.W. Kenney wrote to William Chisholm, Nova Scotian Minister of Public Works, that the laboratory should be placed under the direct authority of the Department of Public Health. Kenney cited several reasons, suggesting that the expanded laboratory, newly equipped and with more staff, would both meet the needs of the province and meet the teaching needs of Dalhousie.¹⁰¹ A day earlier, the Board of Commissioners concluded that the expanded facility, with more equipment and presumably more demands placed upon it, would be better served if it was transferred to the province.¹⁰² The hospital and provincial authorities exchanged several different transfer schemes.¹⁰³ During the late summer and autumn of 1926, the matter was concluded.¹⁰⁴ The public health portions of the laboratory were essentially hived off from the clinical laboratory work, and placed under the jurisdiction of the Department of Health. This recognized that the public health work was rapidly growing and was manifestly different from the routine clinical work of the hospital. From the perspective of the VG's administrators, the transfer of

responsibility also had the salubrious effect of removing an expensive operation from the books of the hospital. There were other minor changes to the work of the laboratory as well. The Halifax Board of Health established its own laboratory for examinations of milk and the work of the Massachusetts Halifax Health Commission was winding down.¹⁰⁵ There were other discussions with respect to equipment, staff allocation and overhead costs such as heat, water, light, maintenance and janitorial services.¹⁰⁶ The two laboratory services were housed under one roof, but were now administered separately. There was now also two separate staff complements, with the hospital and government "each providing their own."¹⁰⁷

The new arrangement with the provincial government, however, left the university in a somewhat uncertain position with respect to its teaching facilities. While the hospital and government arrived at an agreement, the government and university failed to negotiate any privileges. From the outset, it will be recalled, there was a close relationship between these two institutions, dating from the appointment of Dr. M.A. Lindsay in 1911.¹⁰⁸ Nevertheless, the relationship was not clearly defined. Dalhousie President A.S. MacKenzie described it as "loose and informal" as late as 1919.¹⁰⁹ It was so informal that the university and laboratory had no written agreement through the latter part of the 1920s setting out the terms of the relationship.¹¹⁰ Following the re-organization of the laboratory administration, President MacKenzie lamented to the Rockefeller Foundation that "[a]part from the Pathologist, who is a conjoint appointee of the Hospital Commissioners and the University, our men in Physiology, Biochemistry, Pharmacology, etc., have no access to the Hospital, there is no proper dove-tailing of the laboratory and clinical sides".¹¹¹ Clearly, this was unsatisfactory for the medical sciences departments, which were newly-established in the 1910s and 20s, as medical education in Halifax was reorganized.

While Dalhousie coveted enhanced access to the hospital for teaching purposes, the internal working of the laboratory was simplified by separating the public health work from the clinical work of the hospital. As 1927 dawned in the city, Dr. D.J. MacKenzie began working full-time with the Department of Public Health.¹¹² MacKenzie, of course, had worked in the facility for some time and was shared with Dalhousie University. Beginning in April, however, MacKenzie would supervise the public health laboratory, guiding that facility for several decades. Donald J. MacKenzie was appointed to Dalhousie in 1921 as a Lecturer in Pathology, having returned to Halifax after stints in Montreal and Baltimore sponsored by the Rockefeller Foundation. From the outset, MacKenzie's appointment saw him associated with the laboratory facilities, either through assisting Nicholls or, through an agreement with the hospital commission, "for general laboratory work."¹¹³ In short order, his duties were expanded to include public health work and covering for Nicholls when the pathologist was on vacation.¹¹⁴ Indeed, when illness sidelined the young doctor for nine months the next year, his contribution was considered significant enough (and the workload substantial enough) that he was replaced on a temporary basis.¹¹⁵ Fortunately, MacKenzie recovered by the spring and, fresh from a stay in Ontario and healthy, once again resumed his duties.¹¹⁶ Staff members remember MacKenzie fondly. "Everybody liked him, respected him and everything" recalled one worker, while another suggested he as an "absolutely marvellous character." These same workers admitted, however, that "you never got to know him that well" and that "he did have a temper ... and would let fly."¹¹⁷ A colleague described him as an "efficient teacher" and many in the faculty of medicine wanted him "back on the staff of the Medical School."¹¹⁸

The work of the Public Health Laboratory showed remarkable expansion after it was established as a separate unit. Other areas increased that same year, with throat swabs, VD smears and cerebro-spinal fluid examinations increasing by 33, 35 and 60 percent respectively. The following year, the work of the laboratory increased by 4,676 specimens (67%).¹¹⁹ From 1926 to 1931, the first five years the Public Health Laboratory was separate from other laboratory services, public health work expanded by almost three hundred percent.¹²⁰ Also in 1925-26, the Kahn test was introduced for the first time for syphilis, although the laboratory decided to undertake a comparison of the Kahn and Wassermann tests based on two thousand consecutive cases.¹²¹ The Kahn test was determined to be "more suitable" and the Wassermann test was discontinued in August 1927.¹²² Increases in public health work were recorded every year as the 1920s drew to a close, although about half of this work continued to center on venereal disease testing. Other major initiatives included water testing -- which increased by more than 750% in one year -- the result of the laboratory examining all municipal water supplies within the province at monthly intervals.¹²³

V -- NEW BRUNSWICK

The situation was not remarkably different in New Brunswick. Dr. Harry L. Abramson was recruited for a salary of \$5000, and other staff were appointed to assist him in delivering services to the province. Abramson foreshadowed the need for labour in the 1918 *Annual Report*, the first one, when he noted the need for chemical apparatus and a chemist to assist in analyses of milk, water and food, but also in pathological work. He also suggested the need for "well trained man" to assist in the work, and suggested that such a person could be hired for \$1500 per year.¹²⁴ The need for staff became a familiar lament, together with yearly demands for increased space

and equipment. Indeed, in 1921 following the appointment of a chemist, Abramson noted that "we have the chemist, but nothing for her to work with."¹²⁵ Cecelia LeBrun worked for only about six weeks,¹²⁶ leaving in 1922 to return to her native Sydney, NS. Other workers conducted her tests. Though specialized, the work was routine and it was not unusual for a co-worker to assume new responsibilities during vacations, illness or in the wake of resignations.

Despite the ability of workers to adapt to new responsibilities or learn new procedures, Abramson was beginning to feel that the laboratory could not keep expanding its work with the limited staff. With no additions forthcoming, the Saint John facility tried to lighten the increasing work load in other ways. In the mid-1920s, for example, it delegated milk testing to laboratories in Moncton and Campbellton, in an effort both to improve the accuracy and limit the amount of this kind of routine work.¹²⁷ As in the Halifax facility, there was an increase in the number of tests performed over time, determined both by innovation and the burden of disease. Venereal disease testing, so important in the early work of the laboratory, was delayed owing to the lack of equipment.¹²⁸ Kahn tests joined the Wassermanns in 1925 and for a period, both tests were performed on any blood sample received by the lab.¹²⁹ Increased testing was not equated with an *actual* increase in the incidence of venereal disease, however. As the 1930s dawned, for example, Kahn and Wassermann testing increased by nineteen and eighteen percent, respectively. The laboratory characteristically reported rather that physicians making greater use of the facilities accounted for the increase. William Warwick, who replaced George Melvin as Chief Medical Officer in 1931, proffered another opinion. In the depths of the Depression, Warwick noted, people were seeking treatment in the government clinics in greater numbers, thereby inflating the figures.¹³⁰ While serology tests were free for New

Brunswickers, they also generated income for the laboratory. In 1928-29, for example, Prince Edward Island paid the lab \$285 to perform Kahn and Wassermann tests on its behalf.¹³¹

While public health tests such as those for venereal diseases attracted the attention of the federal and provincial governments, routine tests such as blood counts were equally important for shaping the work of the laboratory. A patient would provide a large drop of blood. Workers would visually count the number of cells in selected squares (four if they were counting leukocytes and five for red cells). In the case of leukocytes, the count was multiplied by fifty and with red cells, four zeros were added to yield the number of cells per cubic millimeter. The resulting counts were then compared against normal values. Differential white cell counts were even more demanding. A blood sample was then divided into three segments and counts made in each of the segments. One hundred white cells were counted in each segment and the kind of cells tallied to calculate the percentage of each kind of white cells. Lymphocytes, monocytes, eosinophils and neutrophils were all counted and compared with normal ranges. An increased count of these white cells indicated different things. A greater percentage of eosinophils, for example, could indicate a recent allergic reaction, whereas heightened levels of neutrophils or lymphocytes may indicate a bacterial or viral infection, respectively. Suffice it to say that the counts were critical and these "manual diffs" were both time consuming and demanding.

Another example of routine laboratory work was urine analyses. These were conducted in nearly every hospital laboratory with even the most basic equipment. Sugar tests and albumin tests were frequently requested and a number of steps were required. The laboratory worker heated water and while it was warming, the specimens were numbered with a marking pencil. Every test tube or slide was assigned a

corresponding number. The worker shook the specimen vigorously to mix any sediment, and fill a 15 cc. centrifuge tube. The sample was then spun for between four and five minutes. Next, 0.5 cc. of urine and 5 cc. of another solution were mixed and when the water reached a boil, the tube was immersed for two to three minutes, after which it would be allowed to cool. The laboratory worker would record the odor, color, clarity or turbidity and specific gravity of the sample. The albumin test would then be performed and the sample left to stand while the sediment was examined microscopically. Finally, all the findings of this protocol would be dutifully recorded. The work was routine, insofar as it would be repeated countless times in a typical day and hundreds of time a year. This routine took the worker through seven precise steps that allowed for the efficient examination of urine, with little loss of time.¹³²

Even routine tests were shaped by shifts in clinical knowledge and the burden of disease. Urinalyses, which had been performed regularly since the Saint John lab's inception, increased by 1100 during 1922-23. As insulin treatment took hold in the General Hospital, the diabetic patients strained the laboratory, for they required daily examination of their urine for sugar levels. The treatment of this patient population also led to the establishment of a blood chemistry service the same year. The equipment necessary for this work cost three thousand dollars.¹³³ Nevertheless it was thought to be a judicious expenditure, allowing patients to avoid travelling to other metropolitan centres and allowed physicians to treat and manage their patients with greater ability. The Lange colloidal gold test was added too in 1922-23, to aid in the diagnoses of diseases of the central nervous system.¹³⁴ Fecal exams, milk and water testing, autopsies, medico-legal work and the aforementioned chemical testing of food all became, to varying degrees, the pursuit of the laboratory. The 1935 *Annual Report* noted the range of the laboratory's work" including all the routine laboratory work of a

modern general hospital, a provincial tissue diagnostic service, the provincial public health and medico-legal work and the administration of a serum depot handling large quantities of expensive and perishable prophylactic, therapeutic and diagnostic biological reagents."¹³⁵ This multiplicity of roles is what is here significant. The range of work performed in emerging Canadian laboratories challenges the assumption that these were places with highly discrete roles, separate from other components of clinical care, medical education or public health work. A variety of competing interests, reflected in the diverse range of work pursued, intersected in laboratories such as those in Halifax, Saint John and elsewhere.

With such a broad range of work and rapid growth, the familiar calls for more staff, equipment and space echoed through the *Annual Reports*. Indeed, the second *Annual Report* began the lament. In an interesting construction, the Bureau of Laboratories suggested that the small space in the General Hospital made accurate work difficult, and an efficient laboratory depended upon accurate work. The lack of space was also blamed for limiting the utility of the lab, for the staff could not perform all the tests demanded of them. Finally, Abramson noted problems associated with venereal disease testing. A private consulting room was necessary, so that persons wanting testing for these afflictions could report "without the fear of [other] persons knowing or surmising" why they were at the laboratory. Patients refused to be seen in such a public setting. Often physicians would not send their patients for venereal disease testing, to save them possible embarrassment.¹³⁶

Equipment was also needed. The lab only had one centrifuge, perhaps the most important piece of equipment in the early laboratory, because it could not spare the room. Should it break, serology and milk testing would stop. There was a need for new equipment to keep up with developments in blood chemistry.¹³⁷ The second *Annual*

Report, conjuring an age old rivalry between two port cities, suggested if "Nova Scotia can afford to have a laboratory building, New Brunswick is not so poor but that she can make the necessary expenditure."¹³⁸ Thereafter, Chief Medical Officer George Melvin and the Chief of Laboratories Harry Abramson made the lack of space and equipment an annual feature of their respective *Annual Reports*. Little would change through the 1920s as economic collapse consumed the reform impulse. Finally, when a new Saint John General Hospital was announced in 1928, the plans included increased space for the laboratory.¹³⁹ On October 1, 1931, the new laboratory was opened, although quickly Abramson noted that the new space was just adequate.¹⁴⁰

VI -- THE EXPANDING WORKLOAD

By the late 1920s, the laboratory staff was working at a furious pace to keep up with the demand for tests. The provincial public health laboratory was working on a regular basis with some twenty hospitals throughout Nova Scotia.¹⁴¹ In New Brunswick, personnel from Saint John were loaned to the Moncton Hospital and Victoria Public Hospital in Fredericton, and special courses were given to workers from Fredericton, Woodstock and St. Stephen.¹⁴² In Nova Scotia, MacKenzie requested the services of a part-time technician shortly after his appointment as director of the public health laboratory. He wanted to ensure that if Miss Henderson was absent or ill, the laboratory could still carry out its work.¹⁴³ MacKenzie even noted in one *Annual Report* that "while his staff is underpaid and often overworked ... they are always ready to continue working even on public holidays in order that reports may be sent out promptly." Efficiency in the laboratory depended, to a large extent, on the training and experience of staff members, but the material benefits of their work did not accrue to the laboratory workers. MacKenzie expressed the opinion that it was

difficult to maintain an adequate staff complement, when other facilities offered Halifax workers as much as two-times their salary.¹⁴⁴ To remedy this, MacKenzie suggested regularly scheduled increments up to a fixed maximum "for exacting and dangerous work ... where so much of its efficiency demands on the training and experience of every member of the staff."¹⁴⁵ The following year, the situation had not improved. The work continued to increase and the staff were "taxed to the utmost." Indeed, the Provincial Health Officer's report expressed the opinion that at least one additional worker was needed immediately.¹⁴⁶ Five years later, the laboratory was still understaffed, resulting in workers putting in "considerable overtime." Nevertheless, faced with this "extra burden" the staff managed to examine the specimens received and report on them promptly.¹⁴⁷

The Provincial Health Officer acknowledged in September 1930 that the laboratory was rendering important service to Nova Scotia and that the demands placed upon it were growing yearly.¹⁴⁸ By this time the laboratory service was considered "an activity without which a Health Department cannot function properly."¹⁴⁹ It played a significant role not only in disease control, but also its prevention. A couple of years later, the Department of Health would again suggest that

[a] properly equipped, efficiently staffed, and well organized public health laboratory is, without a doubt, one of the foundations of modern health work. It is an important factor in coordinating all health activities. In providing an accurate and prompt diagnostic service, the laboratory helps to maintain a satisfactory relationship between the practicing physicians and the health department.¹⁵⁰

The workload was increasing both on the bacteriological and pathological sides, but especially the former. The services were "hives of activity" and "wider application of laboratory facilities and means better methods of disease control".¹⁵¹ The Department of Public Health reported near the end of the 1930s that the large number and variety

of specimens the laboratory received suggested the frequency with which physicians in practice and public health officials were using the facilities. The expanding workload was cited as evidence of a growing interest in prevention and an increasing commitment to "service to all the people."¹⁵²

By the 1920s, laboratory tests were an established part of public health. In Halifax, for example, the number of tests increased from only 759 in 1914-15 to more than to 8,753 a decade later and exceeded twelve thousand tests by the end of the 1920s.¹⁵³ It became tenable to suggest that medical examinations were "incomplete" without lab results.¹⁵⁴ Tests could not, however, provide answers to every question. When reporting "interesting" results, those that were unexpected, beyond expected parameters or in conflict with the clinical opinion, back to physicians, the laboratory would occasionally ask to be updated on developments in the case.¹⁵⁵ In early 1920, a woman was admitted to the Victoria General Hospital for an ulcerated leg, but while in hospital "developed Typhoid symptoms." She was transferred to the Medical Department. A letter to the Massachusetts-Halifax Health Commission, which was paying for this patient, stated that the diagnosis was typhoid, despite the negative laboratory findings.¹⁵⁶ Another case sponsored by the MHHC saw the patient investigated by the full array of tests, including Wassermann, blood examination, x-ray, and testing of cerebro-spinal fluids and globulin. None of these shed "any light on the condition" and the patient died.¹⁵⁷ There were also positive outcomes as well. An Africville resident was admitted to the Victoria General on January 3, 1924 and subjected to a "thorough examination, including gastric analysis, blood examinations, blood Wasserman [sic], Barium series and examination of stools." He was diagnosed as having a gastric ulcer, and improved enough to be discharged (at his own request) on January 24.¹⁵⁸

Related to the issue of uncertainty in diagnoses was the question of error and standards. Recalling the implementation of the Wassermann tests in Halifax, D.J. MacKenzie suggested that "almost every laboratory used its own modification, usually in the direction of over simplification."¹⁵⁹ Error in observation was, of course, nothing new in medicine.¹⁶⁰ Nineteenth-century instruments such as microscopes, thermometers and sphygmographs all provided suspect information and even fine instruments could yield different interpretations when used by different practitioners. As the laboratory gained acceptance, it too, came under increasing scrutiny. Nineteenth-century chemists and physiologists recognized that differences in patterns of work, emotion, digestion or even the weather could influence test outcomes. Specimens, as outlined above, could arrive in various forms affecting the reliability of tests. Laboratory media were not exempt either. Guinea pig serum used in Wassermann testing or media for bacteria cultures could vary considerably from laboratory to laboratory, or within one lab. The considerable diversity in experience and training, as detailed in the later chapters, also heightened the potential for laboratory error. Stanley Reiser argues that the seriousness of laboratory error was compounded by the confidence physicians placed in the results, a confidence which "often blinded [physicians] to the errors caused by carelessness in collecting, preserving and transporting the material to be examined."¹⁶¹

False diagnoses affected not only the public health of a municipality, but also the private life of its citizens. If a laboratory cleared an individual who was, in fact, infectious, an outbreak could ensue. Incorrect positive diagnoses could prove inconvenient or disastrous for the patient, particularly (but not restricted to) tests for venereal diseases. These considerations led the Boston health department to initiate a groundbreaking study to determine the accuracy of laboratory work in 1919.

Specimens were sent to fourteen laboratories, which were asked to examine for gonorrhoea, syphilis, diphtheria, tuberculosis and typhoid fever. The resulting data showed wide discrepancies in the testing of identical specimens. This investigation, together with the generally poor reputation of many laboratories, led American organizations of pathologists, bacteriologists and chemists to request that the American Medical Association begin to supervise these facilities. In 1924, the AMA's Council on Medical Education and Hospitals, with the cooperation of expert opinion, established standards and issued an approved list of facilities. The results of this, which would be emulated in Canada, were that "physicians began to urge that laboratory technicians pass licensing examinations" and that "laboratories formerly run by technicians came under the control of physicians, while some of the worst commercial laboratories went out of business."¹⁶²

CONCLUSION

Multiple levels of government, the medical school, the burden of disease and a changing orientation of practicing physicians and public health officials alike combined to shape the context of laboratory work in the early twentieth century. The workload expanded to meet these interests. The laboratory was gaining credibility as a site of education, for improving the public health and assisting attending physicians in their clinical endeavours. There were successes that bolstered this credibility. The effort against diphtheria and in the diagnosis of tuberculosis and venereal diseases were shining examples of the utility of laboratory work. Milk and water testing became established parts of municipal and provincial public health campaigns. Even when answers remained elusive, as in the effort against polio, the laboratory occupied a central place, indicative of the new commitment to the investigative enterprise. With

established facilities, an enhanced workload and an entrenched position, additions to staff began to be made. Laboratory workers grew from a few individuals in the early 1920s, to an important service within the hospital and the emerging health care complex. The growth of laboratories and the expanding workforce, however, must not be assumed to be evidence of the increasing and linear trend toward specialization. Rather, as subsequent chapters reveal, the workers were incorporated in a way that served a variety of interests, much like the facilities in which they worked.

Endnotes

- ¹ PHAR 1920-21.
- ² Interview with Edna Williams.
- ³ Interview with Edna Williams.
- ⁴ Interview with Ellen Robinson.
- ⁵ JHA 1898, Appendix 14 and JHA 1899, Appendix 14.
- ⁶ JHA 1900, Appendix 12.
- ⁷ The specimens included 65 sputum specimens for tb testing, 43 throat swabs for diphtheria testing, 138 blood samples for typhoid and twenty other samples for various tests. The specimens were forwarded by 120 physicians throughout the province. JHA 1898, Appendix 14.
- ⁸ PHAR, October 1919-September 1920, p. 16.
- ⁹ PHAR, October 1920-September 1921, p. 23. As always, much of the testing resulted from public health efforts in the province. However, in his report, A.G. Nichols wrote "Part of the increase in the amount of material submitted for examination is due to the opening up of new hospitals and clinics in the Province and the activities of the Massachusetts Halifax Health Commission in Halifax ..."
- Comments on the expansion of public health work are found throughout the PHAR, see for example PHAR, October 1923-September 1924 or PHAR, October 1924-September 1925. For the entire period, 1921-1926, public health work increased by 11.3%.
- ¹⁰ PHAR, October 1919-September 1920.
- ¹¹ JHA 1898, Appendix 14. This report reproduces a circular sent to doctors in Nova Scotia which read, in part:
- It is much to be regretted that so many of the [medical] profession have neglected to comply with the request of the Board, only 57 out of about 350 physicians practising in our province having responded. The returns, therefore are so incomplete as to be of little value ... The prime object of our attempts to gather statistics is to provide the Board with information as to the prevalence of the *infectious* diseases, and the death rate therefrom, in the various parts of the

Province. We have no special interest in knowing of the non-infectious cases which come under your care, although it would be profitable to know of the number of deaths occurring among such patients.

¹² JHA 1902, Appendix 16.

¹³ JHA 1902, Appendix 16.

¹⁴ JHA 1900, Appendix 12. To further bolster his argument, Reid included in the report a paper he had presented before the Nova Scotia Medical Society, published in the *Maritime Medical News* in September 1899.

¹⁵ JHA 1902, Appendix 16.

¹⁶ The examples that follow come from Daniel Nicholson, *Laboratory Medicine: A Guide for Students and Practitioners*. Philadelphia: Lea and Febiger, 1930. Nicholson was a professor of pathology at the University of Manitoba and an assistant in pathology at the Winnipeg General Hospital when the book was published. This edition was selected because it was more or less in the middle of the period under study and enjoyed a good reputation.

¹⁷ Formalin was added to a typhoid culture to reduce it to twenty-five percent strength of the total culture. This killed the organisms but the bacilli retained their agglutination properties. The solution could be stored for several months in an ice-chest.

¹⁸ JHA 1909, Appendix 16.

¹⁹ All of this data is drawn from the Annual Report of the Department of Health.

²⁰ Patrick Collard, *The Development of Microbiology*. Cambridge: Cambridge University Press, 1976.

²¹ PHAR, October 1913-September 1914. Diphtheria antitoxin enjoys a prominent place in Canadian history, leading ultimately to the creation of the Connaught Laboratories. John Gerald Fitzgerald, an associate professor of hygiene at the University of Toronto, began producing antitoxin in 1913. Bator has suggested that "the large number of children dying from diphtheria in Canada, despite the existence of a method of treating the disease with antitoxin, angered and baffled many doctors." But the value of providing antitoxin to physicians or health authorities is, of course, dubious. Barbara Gutmann Rosenkrantz has argued that it is not clear that "the splendid practice of making diphtheria antitoxin

available without charge to the physician who treated the poor, as in New York City, or entirely free, as in Massachusetts, had any significant effect on the immunization of patients." Paul Adolphus Bator, *Within Reach of Everyone: A History of the University of Toronto School of Hygiene and the Connaught Laboratories, Vol. 1, 1927 to 1955*. Ottawa: The Canadian Public Health Association, 1990, p. 1 and Rosenkrantz, "Cart before Horse: Theory, Practice and Profession Image in American Public Health, 1870-1920," *Journal of the History of Medicine and Allied Sciences*, 29, 1 (January 1974), p. 71.

²² Nicholson, *Laboratory Medicine* and James Campbell Todd and Arthur Hawley Sanford, *Clinical Diagnosis by Laboratory Methods: A Working Manual of Clinical Pathology*. Philadelphia: W.B. Saunders Company, 1927, p. 820.

²³ PHAR, October 1915-September 1916.

²⁴ Minutes of the Medical Board (hereafter MMB), RG 25 Series B, Vol. 2 (B), Minute Book (1908-1948), January 12, 1916.

²⁵ Naomi Rogers, *Dirt and Disease: Polio Before FDR*. New Brunswick: Rutgers University Press, 1992, p. 4.

²⁶ W.W. Kenney to W.H. Hattie, January 10, 1916; Kenney to Mrs. Margaret Cameron, January 18, 1916; Kenney to Dr. Seymour MacKenzie, January 21, 1916; and Kenney to Dr. W.B. Almon, January 24, 1916, all in VGHL.

²⁷ JHA 1902, Appendix 16.

²⁸ JHA 1903, Appendix 16.

²⁹ JHA 1908, Appendix 13. Noting this development, Dr. L.M. Murray, the director, added that the "subject of animal diseases in their relationship to Public Health, will, probably, in a short time, become of such importance as to demand the special attention of [the Department of Health]."

³⁰ For efforts in Toronto, see Heather Ann MacDougall, *"Health is Wealth": The Development of Public Health Activity in Toronto, 1834-1890*. PhD thesis, University of Toronto, 1981, p. 297.

³¹ Bettina Bradbury, "Women's Workplaces: The Impact of Technological Change on Workingclass Women in the Home and in the Workplace in Nineteenth-Century Montreal," in Audrey Kobayashi, *Women, Work, and Place*. Montreal: McGill-Queen's University Press, 1994, p. 30.

³² PHAR, October 1915-September 1916. While acknowledging the importance of pure milk, the report goes on to suggest that "even more potent factors are the wretched housing conditions ... and the poverty of a very considerable proportion of the people."

³³ *MMN*, 18, 12 (December 1906). Incidentally, readers may be interested to note that the same issue of the *MMN* contains a paper read before the Saint John Medical Society on the milk question. Although it makes very little mention of the local context, it does reprint the milk regulations for that city. See J.W. Daniel, "The Milk Supply and Its Control," *MMN*, 18, 12 (December 1906), pp. 461-68.

³⁴ Bator, "Saving Lives on the Wholesale Plan," p. , 156.

³⁵ BOC, entries for November 18, 1911; March 23, 1912; and May 18, 1912.

³⁶ W.W. Kenney to John A. Waters, Secretary, City Board of Health, July 19, 1912, in VGHL.

³⁷ BOC, July 10, 1915.

³⁸ See W.W. Kenney to John A. Waters, Secretary, City Board of Health, July 14, 1915, and Kenney to Waters, July 26, 1915; both in VGHL. The new agreement was very explicit and quite restricted. Water examinations consisted of total solids, ash, chlorine, nitrates and nitrites, free ammonia, albumoid ammonia, oxygen absorption and bacterial counts. The July 26 letter set out their terms:

to consist of not more than one bacterial and one chemical examination from each service per month for six months, commencing April 1st each year, and for the remainder of the year of not more than once bacterial and one chemical examination per month. It is further stipulated that the city shall bring the samples of water to the laboratory on certain days, collected and preserved in a special manner as may be indicated by the Director of Pathology. The hospital will furnish sterilized vehicles for the water.

The hospital was ready to perform the water examinations by mid-September. See Kenney to Waters, September 17, 1915, in VGHL. The City cancelled the water contract in 1917, although the laboratory continued to perform milk examinations. See BOC, August 16, 1917.

³⁹ JHA 1905, Appendix 16.

⁴⁰ This material is all drawn from Sheila M. Penney, *Inventing the Cure: Tuberculosis in 20th Century Nova Scotia*. Ph.D. dissertation, Dalhousie University, 1991, p. 52.

⁴¹ On the problem of health statistics, see Terry Copp, "Public Health in Montreal, 1870-1930," in S.E.D. Shortt, *Medicine in Canadian Society: Historical Perspectives*. Montreal: McGill-Queen's University Press, 1981, pp. 402-404.

⁴² PANS MG20, Vol. 197. Minutes of the Massachusetts-Halifax Health Commission, October 16, 1919.

⁴³ PANS MG20, Vol. 197. Minutes of the Massachusetts-Halifax Health Commission, August 3, 1920. Dr. Royer of the Health Commission and Dr. Heiser of the Rockefeller Foundation, toured the city watershed with the City Engineer. Infant mortality was recognized as a problem in Halifax by the Department of Public Health several years earlier. It was estimated in 1915 to be 203, claimed to be almost double of London's rate and more than double that found in New York. The *Report* suggested that such a number "is not a creditable showing for the capital city of the Province, to which other communities naturally look for example and guidance in matters of civic administration." PHAR, October 1915-September 1916.

⁴⁴ Examples of this work include Alan F.J. Artibise, *Winnipeg: A Social History of Urban Growth 1874-1914* Montreal: McGill-Queen's University, 1975; Terry Copp, *The Anatomy of Poverty: The Condition of the Working Class in Montreal, 1897-1929*. Toronto: McClelland and Stewart, 1974, especially Chapter 6. Both of these studies illustrate the fundamental differences that existed among neighbourhoods within Canadian cities. The portrayal of some neighbourhoods as "unhealthy" and the target of sanitary reform is another significant part of this historiography. See Kay J. Anderson, "The Idea of Chinatown: The Power of Place and Institutional Practice in the Making of a Racial Category," *Annals of the Association of American Geographers*, 77 (1987): 580-98. Yet, as Suzanne Morton has argued, our understanding of the working class experience of the 1920s remains limited. Morton, *Ideal Surroundings: Domestic Life in a Working Class Suburb in the 1920s*. Toronto: University of Toronto

Press, 1995, p. 6. This extends to portrayals of working-class neighbourhoods as unhealthy or as the objects of a reform effort.

⁴⁵ BOC, June 12, 1915. The Board of Commissioners agreed to this request, but it is ambiguous whether Nicholl's was requesting a technician or another medical scientist.

⁴⁶ MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," p. 182.

⁴⁷ Cited in Jay Cassels, *The Secret Plague: Venereal Disease in Canada, 1838-1939*. Toronto: University of Toronto Press, 1987, p. 123. Cassels notes that these figures should be regarded with caution. Many cases were counted more than once, either because of relapse or poor record keeping. Other cases, of course, may have been overlooked. Nonetheless, the figures offer an indication of what the scope of the problem was thought to be.

⁴⁸ Nicholson, *Laboratory Medicine*, p. 198.

⁴⁹ Nicholson, *Laboratory Medicine*, p. 198.

⁵⁰ Nicholson, *Laboratory Medicine*, p. 378, 385. Not surprisingly, hand cleaning was also a significant theme in the proscriptive literature. Fingernails were particularly suspect. They were to be kept "short, neat and clean," maintained through a regimen of soap, water and a nail brush. The resulting good lather would destroy and diphtheria bacilli, streptococci, pneumococci, meningococci or gonococci. Workers were cautioned against handling chemical or infective material as the skin could never be entirely sterilized. Soaps with antiseptics were considered to be of "questionable value" because they might give workers a "false sense of security." Nicholson concluded "[i]t is as important for the laboratory worker as for the practising doctor to have socially clean hands at all times."

⁵¹ Nicholson, *Laboratory Medicine*, p. 198.

⁵² Nicholson, *Laboratory Medicine*, p. 198.

⁵³ Cassels, *The Secret Plague*, pp. 147-150.

⁵⁴ Portions of Bryce's career are covered in Megan Sproule-Jones, "Crusading for the Forgotten: Dr. Peter Bryce, Public Health, and Prairie Native Residential Schools," *Canadian Bulletin of Medical History*, 13 (1996): 199-224.

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- ⁵⁵ Ibid.
- ⁵⁶ For Ontario, see Bator, "Saving Lives on the Wholesale Plan," pp. 255-256.
- ⁵⁷ Cassels, *The Secret Plague*, pp. 163-169.
- ⁵⁸ Cassels, *passim*, and Buckley and McGinnis, "Venereal Disease and Public Health Reform in Canada," p. 353.
- ⁵⁹ Cassels, *The Secret Plague*, p. 169.
- ⁶⁰ W.W. Kenney to K.D. MacKay, July 15, 1918 VGHL and BOC, RG 25 Series B, Vol. 3, July 9, 1918.
- ⁶¹ PHAR, October 1919-September 1920.
- ⁶² PHAR, October 1919-September 1920. In Halifax, Admiralty House was opened for the treatment of venereal diseases. See. W.W. Kenney to Dr. J.A. Doull, Provincial Inspector of Health, March 17, 1920 in VGHL.
- ⁶³ Suzann Buckley and Janice Dickin McGinnis, "Venereal Disease and Public Health Reform in Canada," in *Canadian Historical Review*, 63 (1982), pp. 349-50.
- ⁶⁴ Judith R. Walkowitz noted that interest in Britain's Contagious Diseases Acts also focused narrowly on the "cultural importance" of the legislation, and failed to consider "the administrative machinery and the medical technology that facilitated their operation." Walkowitz, *Prostitution and Victorian Society: Women, Class and the State*. Cambridge: Cambridge University Press, 1980, p. 69.
- ⁶⁵ Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States since 1880*. New York: Oxford University Press, 1985, Chapter 4.
- ⁶⁶ Cassels, *The Secret Plague*.
- ⁶⁷ PHAR 1919-20 to 1929-30. The laboratory reported doing some 159 Kahn tests in 1925-26, and this number grew to over 2700 the next year, outpacing the 2369 Wassermann's completed. Thereafter, only Kahn's were conducted, topping 4000 in 1928-29, almost 7000 in 1930-31, 9000 in 1933-34 and reaching 10,000 in 1934-35.
- ⁶⁸ JHA 1909, Appendix 16.

⁶⁹ For Canadian context on polio, see Christopher J. Ruddy, "The Middle Class Plague: Epidemic Polio and the Canadian State, 1936-37," *Canadian Bulletin of Medical History*, 13 (1996): 277-314.

⁷⁰ On this early effort, see Saul Benison, "Poliomyelitis and the Rockefeller Institute: Social Effects and Institutional Response," *Journal of the History of Medicine and Allied Sciences*, 29, 1 (January 1974): 74-92.

⁷¹ Rogers, *Polio Before FDR*, pp. 57-59.

⁷² Rogers, *Polio Before FDR*, pp. 73-75.

⁷³ MacKenzie himself published an article on the disease. See D.J. MacKenzie, "Some Phases of Poliomyelitis," *Nova Scotia Medical Bulletin*, 8,9 (September 1929), pp. 415-417.

⁷⁴ PHAR, October 1928-September 1929, p. 23.

⁷⁵ PHAR, October 1929-September 1930, p. 9.

⁷⁶ PHAR, October 1929-September 1930. *Nova Scotia Medical Bulletin*, 10, 10 (October 1931), p. 720. Interestingly, this notice appeared under the "Personal Interest Note" section.

⁷⁷ PHAR, October 1930-September 1931.

⁷⁸ PHAR, October 1931-September 1932.

⁷⁹ PHAR, October 1933-September 1934 and PHAR, October 1934-November 1935. Mortality for polio during the middle years of the 1930s was small. In 1932, four people died, six in 1933, four in 1934, two in 1935 and one in 1936. It nevertheless engendered tremendous fear among the populace. See PHAR, December 1936-November 1937.

⁸⁰ PHAR, December 1935-November 1936 and PHAR, December 1936-November 1937.

⁸¹ MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," p. 182. The discovery of insulin is, of course, a well-known and significant story in Canadian medical history. The details may be found in Michael Bliss, *The Discovery of Insulin*. Toronto: McClelland and Stewart, 1982 and Bliss, *Banting: A Biography*. Toronto: McClelland and Stewart, 1984.

⁸² George M. Murphy, Minister of Public Health to Carleton Stanley, September 22, 1931 DUAPO Staff Files, File 467; Colin D. Howell, *A Century of Care: A History of the Victoria General Hospital in*

Halifax 1887-1987. Halifax: Victoria General Hospital, 1988, p. 72; PHAR October 1932-September 1933; PHAR October 1934-November 1935. One of the stated objectives of the Cancer Clinic, was the study of tumours to establish their type and location. The *Report of the Department of Public Health for 1932-33* noted that the laboratory "now has its doors wide open" for tissue work.

⁸³ *Nova Scotia Medical Bulletin*, 10, 10 (October 1931), p. 692. The *Bulletin* reproduced a letter from George H. Murphy, Minister of Health, dated September 26, 1931. Following this letter, the Provincial Pathologist's monthly returns of work performed in the laboratory were reported in subsequent issues of the *Bulletin*. The reports detailed the number of malignant, simple, and suspicious tumours, "other conditions" as well as the number of tissue samples awaiting section.

⁸⁴ BOC, May 25, 1921. Nicholls was, of course, aware of the MHHC's desire to expand the staff. In January, the Commission discussed appointing an assistant to Nicholls who would also be able to devote his entire time "to the work for this Commission." At a subsequent meeting, held August 12, 1920 the following resolution was passed: "Resolved that the [MHHC] have learned with interest that it is the intention of the Provincial Government to extend the Provincial Pathological and Public Health Laboratory in this City and this Commission begs leave to press upon the Government the necessity of proceeding with the work at the earliest possible moment." The minutes go on to note that the increased work "will necessitate a full time assistant and also an additional technician in the Laboratory, and Drs. Nicholls, Hattie and Royer and looking for suitable persons but up to the present have not been able to locate them." MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, January 17, January 26 and August 12, 1920.

⁸⁵ PHAR October 1920-September 1921 and MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, April 7, 1921, April 21, 1921 and May 19, 1921. Morse, who came to Halifax from the Montreal General Hospital, was appointed as the assistant to Dr. Nicholls at a salary of \$3000 a year.

⁸⁶ PHAR October 1921-September 1922 and MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, March 22, 1922.

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- ⁸⁷ BOC, May 31, 1923 and October 25, 1923; VGHL, W.W. Kenney to G. Fred Pearson, November 6, 1923; MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, October 17, 1923. Murray was appointed at a salary of \$2000 a year. Before assuming his position, he went to Johns Hopkins School of Hygiene to take a nine-week course, for which the Commission advanced \$400. This amount was repaid by Murray in monthly installments, however. The investment was sound.
- ⁸⁸ PHAR October 1931-September 1931.
- ⁸⁹ MMB, entries for August 2, October 4 and October 19, 1909.
- ⁹⁰ *Chronicle* [Halifax], November 28, 1910.
- ⁹¹ BOC, entries for June 24 and July 18, 1911.
- ⁹² MMB, June 20, 1911.
- ⁹³ BOC, entry for June 10, 1911.
- ⁹⁴ BOC, entry for August 5, 1911. This figure remained unchanged while the laboratory remained under the auspices of the VG. See Kenney to MacKenzie for the following dates: May 25, 1915, July 7, 1916, May 11, 1918, May 23, 1919, May 26, 1920, July 5, 1921, May 16, 1924; all in VGHL.
- ⁹⁵ BOC, entries for July 5, August 2, and December 20, 1913. Occasionally, the laboratory was billed for equipment that belonged to Dalhousie. Kenney wrote to one supplier that "Dalhousie University and Victoria General Hospital are two distinct institutions and have nothing in common whatsoever, at least so far as revenue and expenditure is concerned ..." Kenney to J.F. Hartz Co., Ltd., Toronto, February 26, 1917 in VGHL.
- ⁹⁶ See Kenney to MacKenzie, August 5, 1913, in VGHL. This clause was strictly interpreted. When Dr. D. Fraser Harris of the Department of Physiology wanted to establish a lecture room in the facility, he was rebuked by Kenney. "Teaching" clearly meant work at the bench and did not include didactic lectures. See Kenney to Harris, March 14, 1916 in VGHL. President MacKenzie issued a notice at the hospital's request prohibiting Dalhousie students from the laboratory "except when classes are being held during the regular scheduled lecture or laboratory hours." MacKenzie to Kenney, September 12, 1914 in DUAPO, A-817.

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- ⁹⁷ BOC, June 30, 1916.
- ⁹⁸ BOC, entries for June 10 and June 21, 1911.
- ⁹⁹ MMB, June 20, 1911.
- ¹⁰⁰ Annual Report of the Bureau of Laboratories Year Ending October 31, 1918 in NBARMH.
- ¹⁰¹ Kenney to Chisholm, March 28, 1925 in VGHL.
- ¹⁰² BOC, March 27, 1925.
- ¹⁰³ BOC, September 23, 1925, May 7, July 16, August 16, August 26, and September 28, 1926. In July, the Board suggested two models: (1) that the public health department assume responsibility for all laboratory work and staff and charging the hospital for any services rendered, or (2) that the hospital assume responsibility for the work and staff and bill the province for the public health work. When Drs. Jost and Chisholm were presented with the second option, they objected strongly and left a meeting with the Board.
- ¹⁰⁴ A.C. Jost to A.S. MacKenzie, September 20 and September 21, 1926 in DUAPO, A-817. BOC, September 28 and October 16, 1926.
- ¹⁰⁵ PHAR, October 1925-September 1926 and D.J. MacKenzie, "Report of the Work of the Public Health Laboratory" for the year ending September 30, 1926.
- ¹⁰⁶ BOC, October 16, 1926.
- ¹⁰⁷ Ibid.
- ¹⁰⁸ [Gilbert Stairs?] to Dr. A.W.H. Lindsay, July 4, 1911 in DUAPO, A-572. This letter concerns the establishment of a provisional faculty of medicine within Dalhousie University. It notes "With regard to Pathology and Bacteriology, the Governors have -- in accordance with the previous recommendation of the Faculty -- appointed as Professor and head of this department Dr. M.A. Lindsay, recently appointed by the Hospital Commission as Pathologist to the Victoria General Hospital." See also Minutes of the Committee appointed by the Governors of Dalhousie University to confer with the representatives of the medical profession with regard to the organization of a teaching Medical Faculty, May 18, 1911 -- surely the longest committee title in history -- in the same file. These minutes record "That the person

appointed by the Hospital Commission as Pathologist be selected as Professor of Pathology and Bacteriology."

¹⁰⁹ A.S. MacKenzie to Dr. R.F. Rutten, Department of Chemistry, McGill University, May 28, 1919.

¹¹⁰ BOC, June 18, August 3, December 21, 1928 and January 26 and September 11, 1929.

¹¹¹ A.S. MacKenzie to Dr. R.M. Pearce, June 19, 1928, DUAPO, A-995.

¹¹² *Nova Scotia Medical Bulletin*, 5, 12 (December 1926), p. 31 and PHAR, October 1926-September 1927.

¹¹³ A.G. Nicholls, "Report on the Work of the Public Health Laboratory for the Year Ending September 30, 1921" in PHAR, October 1920-September 1921 and W.W. Kenney to Dr. A. Stanley MacKenzie, September 7, 1921, in VGHL. In his letter, Kenney wrote the Board of Commissioners

are quite agreeable to your [Dalhousie's] proposal that Dr. D.J. MacKenzie be permitted to work under and with Dr. Nichols [sic] in doing pathological work in the hospital laboratory. The Board assumes however that in doing this, any expense incurred beyond what would be necessary in carrying on the hospital work, would not be a charge against the institution.

¹¹⁴ A.G. Nicholls, "Report on the Work of the Public Health Laboratory for the Year Ending September 30, 1922" in PHAR, October 1921-September 1922; Nicholls, "Report on the Work of the Public Health Laboratory for the Year Ending September 30, 1923" in PHAR, October 1922-September 1923; and W.W. Kenney to Dr. A.G. Nicholls, June 17, 1922 in VGHL.

¹¹⁵ A.G. Nicholls, "Report on the Work of the Public Health Laboratory for the Year Ending September 30, 1922" in PHAR, October 1921-September 1922 and Nicholls, "Report on the Work of the Public Health Laboratory for the Year Ending September 30, 1923" in PHAR, October 1922-September 1923. MacKenzie's replacement, Dr. J.N. Lyons, was employed on a part-time basis.

¹¹⁶ *Nova Scotia Medical Bulletin*, 7,7 (July 1928), p. 326.

¹¹⁷ Interview with Edna Williams, April 23, 1996 and Interview with Rose Phillips, April 22, 1996.

¹¹⁸ R.J. Bean, Secretary of the Medical Faculty, to Carleton M. Stanley, March 2, 1932 in DUAPO, MS-2-3, A-575.

¹¹⁹ PHAR, 1925-26, p. 22 and PHAR, 1926-27, pp. 22-23. It is important to note that this increase was in *specimens* and not *tests* and is, therefore unrelated to the dual testing of blood samples with both the Wassermann and the Kahn tests. The PHAR for 1927-28 estimated that the dual testing did account for over two thousand tests. PHAR, 1927-28, p. 21.

¹²⁰ See PHAR, October 1930-September 1931, p. 7. For the five year interval 1921-1926, public health work increased by 11.3%. D.J. MacKenzie suggested that the increase was principally due to venereal disease work and sputum examinations, although he acknowledged that this growth would not continue. He did suggest, however, that the province should be conducting twice as many sputum examinations for tuberculosis in the fight against that disease. PHAR, October 1931-September 1932, p. 22.

¹²¹ PHAR, 1925-26, p. 22.

¹²² PHAR, 1926-27, pp. 22-23. The *Annual Report* noted clearly that the Wassermann tests ceased in August, although there may have been some questioning of this decision. The Provincial Health Officer, Dr. A.C. Jost, asked that the medical staff of the Victoria General be asked about the decision to discontinue Wassermann tests. The minutes of the Medical Board record only that the Board "could not speak definitely on the matter at the present time and was not justified in making any recommendation." MMB, December 15, 1927.

¹²³ PHAR, 1928-29, p. 23.

¹²⁴ NBARMH for the Year Ending October 31, 1918. Interestingly, Abramson made this request after only a few months of work. The laboratory began operations officially on June 1, 1918.

¹²⁵ NBARMH for the Year Ending October 31, 1921.

¹²⁶ *New Brunswick Public Accounts*. LeBrun earned \$123.63 for her work in 1921, apparently paid a daily wage. This continued the next year, until she was finally put on salary mid-way through fiscal year 1921-22. For the first 25 weeks she earned almost \$491, while for the last five months of the year, she earned \$416.67, suggesting that the move to "salary" did little to increase her pay envelope.

¹²⁷ Annual Report of the Bureau of Laboratories Year Ending October 31, 1925 in NBARMH.

¹²⁸ Annual Report of the Bureau of Laboratories Year Ending October 31, 1918 in NBARMH.

¹²⁹ Annual Report of the Bureau of Laboratories Year Ending October 31, 1925 in NBARMH. In the first year, over one thousand Kahn tests were performed, several hundred purely for experimental reasons.

¹³⁰ NBARMH, Year ending October 31, 1931.

¹³¹ NBARMH, Year ending October 31, 1929. The Saint John laboratory also performed other tests occasionally for PEI.

¹³² This description is based on Nicholson, *Laboratory Medicine*, p. 276. No statistics were kept on the number of urine tests completed each year at the Halifax laboratory. They were routine and of little interest to the public health authority that generated statistics on public health tests. The exception to this was when work was conducted for the Massachusetts-Halifax Health Commission. In 1924-25, the MHHC asked the laboratory to complete 633 routine examinations and 501 examinations for sugar and albumin. In New Brunswick routine tests were similarly not reported on a regular basis in departmental annual reports.

¹³³ Annual Report of the Bureau of Laboratories Year Ending October 31, 1923 in NBARMH.

¹³⁴ Annual Report of the Bureau of Laboratories Year Ending October 31, 1923 in NBARMH.

¹³⁵ Annual Report of the Bureau of Laboratories Year Ending October 31, 1935 in NBARMH.

¹³⁶ Annual Report of the Bureau of Laboratories Year Ending October 31, 1919 in NBARMH.

¹³⁷ Ibid.

¹³⁸ Ibid.

¹³⁹ Annual Report of the Bureau of Laboratories Years Ending October 31, 1928 and October 31, 1929 in NBARMH.

¹⁴⁰ NBARMH Year Ending October 31, 1931 and Annual Report of the Bureau of Laboratories Year Ending October 31, 1932 in NBARMH..

¹⁴¹ PHAR, October 1924-September 1925.

¹⁴² NBARMH Year Ending October 31, 1938.

¹⁴³ BOC, April 16, 1927.

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- ¹⁴⁴ D.J. MacKenzie, "Report of the Work of the Public Health Laboratory," in PHAR, October 1928-September 1929.
- ¹⁴⁵ Ibid.
- ¹⁴⁶ JHA 1931.
- ¹⁴⁷ JHA 1937 and JHA 1938.
- ¹⁴⁸ Report of the Provincial Health Officer, October 1929-September 1930.
- ¹⁴⁹ Report of the Department of Public Health, October 1930-September 1931.
- ¹⁵⁰ Report of the Department of Public Health, October 1933-September 1934.
- ¹⁵¹ Report of the Department of Public Health, October 1934-November 1935.
- ¹⁵² Report of the Department of Public Health, December 1936-November 1937.
- ¹⁵³ These numbers are based upon data published in the *Annual Reports* and reflect the number of tests, not the number of samples. The totals are my own. Despite the imperfections of these data, they do serve to illustrate the significant growth in the work of the laboratory.
- ¹⁵⁴ G.A. McIntosh to Raymond E. Devillez, June 3, 1924, in VGHL.
- ¹⁵⁵ G.A. McIntosh to Dr. T.R. Johnson, June 30, 1924 in VGHL.
- ¹⁵⁶ W.W. Kenney to B. Franklin Royer, January 12, 1920 in VGHL.
- ¹⁵⁷ W.W. Kenney to Massachusetts-Halifax Health Commission, June 26, 1924 in VGHL. Another case saw a female patient undergo a Wassermann test, urine tests, and an x-ray of the gastrointestinal tract. A blood examination revealed slight anemia, and she was treated with alkalines for her stomach condition. Reporting to her physician, G.A. MacIntosh said that when discharged "she was recommended to be kept on alkalines with arsenic and iron tonic and freedom from work." See G.A. MacIntosh to J.R. MacLeod, August 26, 1925 in VGHL.
- ¹⁵⁸ G.A. McIntosh to Asst. Unit Medical Director, Camp Hill Hospital, January 5, 1925, in VGHL.
- ¹⁵⁹ MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," p. 182.
- ¹⁶⁰ This discussion is largely based on Stanley Joel Reiser, *Medicine and the reign of technology*. Cambridge: Cambridge University Press, 1978, pp. 183-186.

¹⁶¹ Reiser, *Medicine and the reign of technology*, p. 185.

¹⁶² Reiser, *Medicine and the reign of technology*, pp. 185-86. One is struck by the similarity in Reiser's analysis with that of the famous Flexner report on medical education. The old account saw eager, young American physicians carry the latest concepts of medical education and science from Germany to Johns Hopkins, and a select few other institutions. The same account notes the efforts of the AMA in the pressing for higher standards. The final blow in this account comes with the Flexner report, which initiated a period in which medical schools became fewer, smaller and more scientific. This view still finds expression. A recent illustration of this was published in 1986. David E. Rogers wrote: "Starting in the late 1800s, members of the American Medical Association and the leaders of medicine became progressively dissatisfied with the poor quality of medical training in the United States. The development of the Johns Hopkins School of Medicine ... started the revolution. The Flexner report of 1910 was its culmination ... This in turn led to the development of a cadre of dedicated medical science educators, who devoted their full energies to improving medical education, its scientific underpinnings, and the practice of medicine throughout the country." This is the classic Whiggish statement. In contrast, Thomas Bonner has suggested that "No longer is it enough to contrast the backward conditions of American medical schools before 1870 with the remarkable changes brought by study in Germany, an awakened profession, and the famous Bulletin No. 4 of the Carnegie Foundation."

Chapter 3
Not Just Bench Warmers:
Workers in Laboratories

The twentieth century saw hospital development throughout North America. In the United States in 1875, there were 661 hospitals, which increased to slightly over 2000 by 1900. From 1900 to 1929, hospitals were established at the rate of 200 per year.¹ Although no annual data on hospitals was collected in Canada before 1932, Ontario demonstrated a similar expansion. The number of public general hospitals in that province increased from 51 in 1900 to 139 in 1930.² Throughout the Maritimes hospitals were founded in these same years, to augment the few that were built in the late nineteenth century. St. Martha's in Antigonish was founded in 1906, in a small home on West Street that could accommodate only six patients.³ In the dangerous mining district ruled over by the Dominion Coal Company, the need was profound. Two company houses in the Company's No. 2 district were converted to hospitals. In eastern Nova Scotia, the Sisters of Saint Martha staffed many of the new facilities. The Congregation was founded in 1900 by Bishop John Cameron of Antigonish, and the Sisters entered hospital work in 1902, first at St. Joseph's, in Glace Bay. They could be found ministering to the sick and performing a full range of hospital-related work at the newly-established St. Martha's, as well as at St. Rita's Hospital (the Ross Hospital) in Sydney in 1920 and St. Mary's Hospital in Inverness in 1925.⁴ Yarmouth's hospital could trace its origins to 1912⁵ and Western Kings in the Annapolis Valley to 1922.⁶ In New Brunswick, the Moncton Hospital was established on

King Street in 1902, St. Joseph's was established in 1914 to service Saint John's Catholic population and Miramichi Hospital was founded a year later.⁷ There were also a number of specialty institutions in the region.⁸ Mere blocks from the Victoria General Hospital, stood the Children's Hospital (founded 1909) and the Grace Maternity Hospital (founded 1922). The Sisters of Charity began operating the Halifax Infirmary in 1886, while the Halifax Visiting Dispensary serviced the "deserving poor" of Halifax since 1855 and opened a Dartmouth branch in 1877.⁹ A snapshot can be taken on the eve of the explosion in 1917. In that year, in addition to the VG and Children's hospitals, there was also a small infectious disease hospital on Gottingen Street, several private facilities and four military hospitals.¹⁰

The expansion of facilities created opportunities for a myriad of workers, as hospitals became increasingly complex. The place of the hospital as a site of medical and nursing education has long been acknowledged. It should therefore come as very little surprise that these institutions also embarked on training other workers to staff the various hospital departments around the Maritimes. By the 1920s, hospitals everywhere were becoming specialized, at least superficially. Mary Kinnear, using an appropriate metaphor, described the Canadian hospital of this period as "a modern, scientific, progressive laboratory where doctors could perform their new skilled techniques."¹¹ A commemorative booklet produced for St. Martha's Hospital in Antigonish during a 1925 fund-raising campaign stated as much. "In the hospital alone," the booklet declared with optimism, "can a complete and accurate diagnosis be made. Here alone can be found the X-ray machinery, the laboratories, the individual records so necessary to a useful diagnosis."¹² One author described

this complexity as a "partnership" by the 1930s, with doctors organized to practice medicine, while pharmacists, nurses and laboratory technicians "were integrated toward patient care."¹³ There was, however, a very clear hierarchy in the hospital and the interests of some workers were subordinated to those of physicians and administrators.

As demands for services increased, hospitals began to seek workers to fill positions at the laboratory bench. In an unpublished chronology of the Canadian Society of Laboratory Technologists (CSLT), A.R. Shearer suggested that workers were drawn from a wide range of academic backgrounds and were recruited and trained by individual physicians to meet the needs of a particular laboratory. Shearer suggested that some had university science degrees, while many moved from secondary school directly into the "embryonic medical laboratory sciences." Regardless of background, all workers continued their education while at work, either through tutorials or supervised practice and these workers, in turn, trained others who followed.¹⁴ An examination of the laboratory in Nova Scotia demonstrates that there was no one route to the laboratory bench, although many of the women obtained university degrees or at least some university experience.

There was an apparent shortage of trained persons for the work. It will be recalled that when the Massachusetts-Halifax Health Commission recognized that the proposed expansion of the laboratory would require a laboratory assistant and a technician, there was difficulty locating "suitable persons."¹⁵ To meet the demand, hospitals across Canada initiated training programs. Beginning in the 1920s, the Morris street laboratories trained workers for these new positions. D.J. MacKenzie suggested that 1923 was the year that

individuals were first trained in the laboratory, *besides* those who would work in the Morris Street facility. In that year, MacKenzie recalled, there were two students, one from Glace Bay and one from St. Martha's Hospital in Antigonish.¹⁶ In his 1923 report, A.G. Nicholl's wrote that "[t]here have been several applications from persons desirous of qualifying in laboratory work to be taken into the department as students." While the lab could not accommodate all the requests, two students did receive a course of instruction. This was repeated the following year, with two more students taking an eight month course in "laboratory technique," both of whom found work in other institutions. Nicholls commented in that year that "there is an increasing need for additional laboratory technicians" that would be accentuated when the newly expanded laboratory was completed.¹⁷ The annual reports make no further references to training students in laboratory technique, but there is every likelihood that the practice continued for Nova Scotian hospitals. When the laboratory service was founded in New Brunswick, the Minister of Health and the Director contemplated the creation of several smaller provincial laboratories. Staffing for these facilities was to come through Dr Abramson's training efforts in the provincial laboratory.¹⁸

I -- NURSES

Dr. William H. Eagar returned from Boston and New York in the early months of 1908, having completed some courses in x-ray work. By the end of that year, he was on his way to London to be married for the second time, only to return to Halifax in February 1909.¹⁹ Dr. Eagar established his office on Coburg Road, and began to devote his practice to "X-ray and electrical work."²⁰

Eagar, however, coveted a hospital appointment and after several years of pursuing such a position, he was appointed roentgenologist at the Victoria General Hospital in November 1919.²¹ When he was appointed, Eagar was promised that the hospital would supply "an assistant, not necessarily a so called technician, who shall be an employee of the nursing department." The nurse, when working in the x-ray plant, was under Eagar's direction, who assumed responsibility "to train and develop" the nurse for the work.²² An early candidate was Miss Kathleen Sullivan, who lived across the harbour in Dartmouth. In correspondence, Superintendent Kenney suggested that training would last for six months, and that during this time there would be no salary or allowance, although Kenney did suggest that meals might be had for free at the hospital. Moreover, training would not guarantee Miss Sullivan a position.²³ She apparently declined this rather unexciting offer. In late January 1920, Eagar plucked a senior male nurse from the staff to train as a "technician."²⁴

Eagar was not the first roentgenologist at the Victoria General. That distinction instead belongs to Charles E. Puttner. Puttner, who was not a physician, began his career at the hospital in 1867. First appointed as an apothecary, he later served as the clerk and accountant for the hospital. The hospital apparently first made use of x-ray equipment in 1897, when some borrowed (and broken) apparatus was secured from a local physician. In 1904, the hospital procured its own equipment and Puttner assumed responsibility for the service.²⁵ That Puttner was not a physician is indeed significant. Here a lay-person, albeit a well-respected member of the hospital community, assumed control over one of the new hospital departments.²⁶

X-rays were used both for diagnostic and therapeutic purposes, and their use became more common during World War I. They were far from perfect, however. X-rays were not used in mass screening for tuberculosis, even though physicians recognized that clinical examination was not sufficient for detecting tuberculosis. Physicians still harboured a distrust of radiological findings and the equipment was still fairly expensive. Sheila Penney suggests that while early x-rays were not very useful for investigations of soft tissue, by 1919 the technology had advanced to allow lesions to be seen quite clearly. Not surprisingly, in that year the provincial sanatorium in Kentville began using x-rays routinely.²⁷

At the Victoria General Hospital, the x-ray service underwent an expansion under the direction of Eagar. Between 1920 and 1924 the volume of work in the x-ray service, which was established as a department in May 1921, doubled. In the course of two decades, the x-ray service had been transformed from a small service under the direction of a lay-person to an important department within the hospital, under the direction of a physician. Eagar's appointment assuaged the fear of physicians. He had undertaken specialized training in x-ray work and had a decade of clinical practice before being appointed roentgenologist in 1919. As a physician, he did not pose a threat to the clinician's role in patient diagnosis. The replacement of Puttner with a physician, while seemingly straightforward, suggests an important transition. The diagnostic services were not to compete with the clinical community. To ensure this, a physician was to take charge of the department. Accompanying this transition was the addition of staff. Eagar would have an assistant, though not necessarily a "technician." Indeed, he eventually secured the services of a

male nurse. The appointment of staff effectively separated the manual work from the diagnostic. Physicians would retain their position as interpreters of data in the diagnosis and management of their patients. They could consult with their colleague, Dr. Eagar, if a case was particularly vexing. Meanwhile, the work of the x-ray plant, including the maintenance and preparation of equipment would be left to staff members who had nothing to do with interpreting the pictures. The separation of the manual work from the intellectual was assured and through this separation, the preeminence of the clinician was guaranteed. It would become a familiar pattern, not only in the x-ray services around the Maritimes, but also in the laboratories.

As the demand for laboratory tests expanded, hospital administrators at the Victoria General Hospital and elsewhere recognized the need for a training program. At the VG, students often made their way into the laboratory of Dr. A.G. Nicholls. Usually, Nicholls trained two students at any one time, although requests sometimes exceeded this number.²⁸ The length of training varied considerably. Nicholls reported in 1924 that two women received a course of eight months duration.²⁹ It has been suggested that these individuals were likely high-school graduates with neither university experience nor nursing education.³⁰ The historical evidence suggests otherwise. Many of the laboratory women had university experience and nurses were some of the earliest students.³¹ Nurses came for considerably shorter periods, typically only a few weeks. All received practical education at the bench, and frequently received instruction in both laboratory and x-ray work.

Nurses from rural hospitals often recalled their laboratory experience in oral histories collected during the 1980s.³² Greta was born in Glace Bay on

February 14, 1902. Her father ran a grocery store in Donkin, six miles away, and only came home on weekends. Greta was 20 when she entered Glace Bay General, after teaching school for one year. The Superintendent of the Hospital, Isabel MacNeil, was a neighbour of young Greta and that influenced her decision to enter training at Glace Bay General. She started at the hospital in the summer of 1922 and went to work performing x-ray and laboratory work upon her graduation. A staff nurse had performed this work, after taking a "short course" in Halifax. It was Miss MacNeil that suggested Greta take the same course. The new nursing graduate was not enthused and several other young women refused the offer. Greta demonstrated some aptitude for the work, though she worried that these responsibilities would interfere with her nursing work. The Superintendent reassured her that there was not much lab work, only blood counts and urines, and that the x-ray work would not be burdensome. MacPherson recalled that the Superintendent "was anxious for me to do this. Nobody would touch it. So I took instruction ..." Staff nursing positions were few, but MacPherson was offered a position doing lab work, x-rays, some staff nursing and even anesthetics. She spent ten years doing this work and grew to enjoy it, particularly the x-ray work. MacPherson stated "to be a nurse-technician, you're a jump ahead of when you've just taken a technician's course because you already know how to handle patients."³³ The combined skill-set secured MacPherson a position, but benefitted the small hospital as well, which did not have the patient load to justify hiring dedicated staff members in all these areas.

Another Cape Bretoner, Flora K. McDonald, recounted a similar story. McDonald was born on August 1, 1909. Her father worked at Dominion Coal

in a variety of mining jobs and before she was married, her mother worked in a store. McDonald trained in Glace Bay, entering the school on September 15, 1928, and graduated three years later. She remembers that student nurses staffed the hospital almost exclusively. There was of course, a Superintendent and an assistant. But McDonald recalled that there was "a lab technician and an x-ray technician -- a lab and x-ray, and when we went in first they did them both."³⁴ Dorothy Allan, who entered the Yarmouth Hospital School of Nursing on September 1931, recalled that there were only four registered nurses there, including the night supervisor and the operating room nurse. One of the nurses also served as the laboratory technician, according to Allan.³⁵

The issue of choice in education is complex, and many women lacked options. Clara MacKinnon was born on New Year's Day, 1910, the youngest of four children. Her father was a baker and her mother a school teacher who, although she did not teach school following her marriage, did offer instruction in English to Glace Bay's substantial immigrant community. Clara described her parents as early socialists, who believed in education. She did not want to be a nurse, but was enrolled in nursing school by her mother. Her mother then wrote Clara to inform her that she had been accepted and was to enter on October 12, 1929. She had not been asked. Clara had been living in Michigan with a married sister, and when they "motored home" she came with them. MacKinnon, recounting this story, suggested that her mother had always wanted to be a nurse. MacKinnon entered the training school at the Glace Bay General Hospital, and her education was typical for nurses. Doctors offered instruction in surgery, medicine, obstetrics and pediatrics. The Assistant Superintendent taught nursing procedures and techniques, the Superintendent

taught ethics, while the “lab and x-ray technician” offered instruction in bacteriology. Following graduation, MacKinnon worked in the x-ray department, where she had spent some time during training. The nurse who was in charge took three months off to study for an examination, so MacKinnon was placed in charge. She also noted that all the nurses could perform the basic blood examinations and urine analyses required in the laboratory.

The expectation that MacKinnon would perform a variety of tasks reflected the attitude of the Superintendent, who believed that nurses should be able to “do everything, every department of the hospital and fill in,” recalled MacKinnon, “[w]hether it's the kitchen ... even the furnace room ... and you should know the lab, the x-ray, the pharmacy, the laundry, the whole business. Make yourself aware that you know that you can fill in anywhere if you're in the hospital. ... Jack-of-all-trades.”³⁶ Other nurses recounted similar stories. “You were everywhere,” one recalled, “[a]nd you could handle anything.”³⁷ Evelyn Purdy, who graduated from the Yarmouth Hospital School of Nursing in 1920, worked on the hospital books for one month, spent a month in the kitchen assisting the cook and undertook x-ray training.³⁸ Clearly, the Superintendents of smaller hospitals wanted nurses who could fulfill a variety of work within the hospital. George Weir, in his landmark survey of nursing education in Canada, thought the demands were growing large enough and the hospital complex enough that nurses would need more training in the future.³⁹

Nurses, then, were used to filling a variety of roles in the modernizing hospital. When they sought training in laboratory work, the courses were quite

brief and practically-oriented. When a request arrived from Colchester County Hospital in 1925 for a combined course of instruction, Kenney noted that

During the last few years we have in a few instances given a period of instructions in these subjects to nurses from other institutions. ... Attempts have been made to comply with their wishes, but we have never felt that the best could be accomplished in this dull way, [and] now the process is strongly discouraged at least.⁴⁰

Superintendents generally wanted combined x-ray and laboratory courses. But nurses, too, exercised some choice in their continuing education. Nurse MacKinnon arrived somewhat unexpectedly in Halifax to receive a course in x-ray and laboratory work. She was originally supposed to spend six to eight weeks receiving instruction from Dr. Eagar. After two weeks in Halifax, Kenney wrote to Florence Merlin, the Superintendent of New Waterford's hospital, that Nurse MacKinnon wanted to continue her laboratory work, and pursue her x-ray training the following year.⁴¹ Nevertheless, there were increasing demands for courses in the specialty departments, including the laboratory and the x-ray room.⁴² In Halifax, the *Echo* noted in early 1925 that many smaller hospitals throughout Nova Scotia now had their own x-ray plants and that the medical profession was making increasing use of the equipment on a regular basis.⁴³

While the courses for nurses were short, the x-ray and laboratory services at the Victoria General provided instruction free of charge. Kenney, writing to Dr. Eagar of the x-ray department, suggested that it was the policy of the Board of Management that the "specialties at least, should serve and aid in the development of smaller hospitals of the Province to the fullest extent."⁴⁴ In correspondence with A.G. Nicholls, Kenney wrote that the Board of Management believed the laboratory building should be "freely" opened to

smaller hospitals in the province for instruction in laboratory technique.⁴⁵

"Freely" referred to access and not to cost. The VG Board ruled that "so far as the hospital equipment for the work was concerned, it should be available for teaching purposes for other Provincial Hospitals free of charge ... [but] the Pathologist and Roentgenologist would be open to negotiate with the applying institution as to a reasonable fee for their services."⁴⁶ With the increasing emphasis on longer training in each area, generated by the hospital authority in Halifax, the *noblesse oblige* was quickly forgotten. Eagar was the first to raise the issue of compensation for his training efforts. Kenney reported that the Board agreed that some fee could be charged and it was willing to permit negotiation with interested hospitals, provided that the arrangements were not a "hindrance" to those seeking instruction.⁴⁷

It is clear that many nurses accepted work in the expanding service departments. There was an expectation that nurses would perform a variety of tasks as a normal part of their duties. Such were the expectations of employers. It is not entirely clear how nurses themselves felt about these demands. Lavinia Dock, a leading American nurse, recognized that opportunities in the service departments could alleviate some of the overcrowding that was characteristic in American nursing as early as the 1890s. Dock suggested that departments such as dietetics or pharmacy were promising employment alternatives for nurses. Moreover, Dock believed such services would be better served through staffing them with nurses.⁴⁸ Rank and file nurses may have felt otherwise. Some nurses, such as Greta MacPherson, feared new duties would interfere with their nursing work. Greta, after all, suggested that nobody else wanted to do the work, evidence that such positions were not desired.

II -- THE DALHOUSIE LABORATORIES

The presence of so many nurses in the laboratory strongly suggests that there was no formal route to the laboratory or other services and that the needs of hospitals led workers to the bench as much as individual interest in the work or choice. That was also true of the other major employer of laboratory workers in Halifax, Dalhousie University. The pattern of employment was quite different at the university than it was in the Morris Street facility. At Dalhousie, young men often filled the available positions. Samuel Richards, a "laboratory boy" from north end Halifax, began work in the physiology department in September 1925. He was hired on a trial basis, for \$25 a month and proved "very satisfactory" by the end of the month. In January, his wages were increased to \$30.⁴⁹ Richards' work with the department ended on May 1, 1926 and Charlie Mitchum replaced him the following fall. Mitchum received \$30 per month the first year and was an exceptional addition, being efficient and innovative. Professor Boris Babkin wanted to retain Mitchum for the following year, and asked President MacKenzie if arrangements could be made to employ Mitchum through the summer. MacKenzie telephoned Babkin on May 10, telling him that Mitchum could be retained "if he could be kept busy." The young man would spend the summer assisting in the research work of Miss Betty MacNeil, taking electrocardiograms, filing and maintaining animals with fistula. In September 1927, Mitchum's salary was increased to \$35. Mitchum tendered his notice in March 1929, although he agreed to stay on until the end of April, while a replacement was found.⁵⁰

Dr. E.W.H. Cruickshank tried recruiting one "boy" but when this did not materialize, seventeen year old Charles Livingston was named as a possible candidate. Due to his tender age and "immaturity," Cruickshank suggested appointment on a probationary basis for \$15 from May-July and, if found satisfactory, this would be increased to \$35 in August, "with assurance of [further] advance if worthy of it."⁵¹ It did not work out, and in July, Robert John Dempsey was appointed to perform the work. Dempsey decided to return to school in August and left at the end of the month.⁵² There were others: Gregory James in 1929-30 and Daniel Mitchum, who was appointed in the autumn of 1930 and worked in physiology until December 1931.⁵³

Many of the laboratory workers in physiology were in their teens or early twenties, and their wages reflected this. But it was in the biochemistry department where the meaning of this wage structure found bold articulation. Biochemistry was in its formative period, and the biochem lab had five tables, able to accommodate six students on each side. There was very little equipment on hand, in part because until 1923, biochemistry, histology and physiology were all one department, and the extant equipment was divided between the latter two. Shortly after receiving his appointment, Dr. E. Gordon Young, who worked in biochemistry at the University of Western Ontario, inquired of President MacKenzie whether there were laboratory technicians available in Halifax. MacKenzie suggested it "would depend so much upon the qualifications which *he* must possess."⁵⁴ Young intended to arrive in Halifax early in the New Year. He wrote to MacKenzie that there were two "types" of laboratory technicians,

Either a young man of about 20 or a middle aged man with moderate intelligence but without initiative. They can both be trained to be good

technicians. I think that I prefer the former. A knowledge of elementary chemistry is desirable but very rare. It is however very essential that the applicant have a useful pair of hands and be naturally careful. In a few months work I can train him in ordinary manipulation.⁵⁵

An examination of two of the young men employed in biochemistry, Stephen Brown and John Grey, reveal the limitations and frustrations of laboratory work in the medical sciences and male workers trying to earn a living.

Stephen Brown, a young man of about 20, came to work in biochemistry in October 1925 at a salary of \$25 a month. By early in the New Year, he had proved himself "intelligent, most reliable and teachable" and Professor Young suggested an increase to \$30. Despite an increase to \$35 in September 1926, Young believed that although Brown enjoyed his work, he was "discouraged." Writing to President MacKenzie, Young reported that Brown was threatening to leave "unless he can see a living wage and some prospects ahead of him." Now 21, Brown believed his age plus experience warranted a wage of \$45 or \$50 a month. Equally important for Brown was a promise of regular advancement. This suggests that, for this young man, laboratory work might have been more than a temporary job during the passage to adulthood. His aspirations enjoyed the support of Professor Young, who appreciated his services. Young suggested in early 1927 that without Brown, there would be no time for research or a "trained faculty assistant" would be required, presumably a more expensive option. Indeed, it was only the extraordinary capability of Brown that permitted the absence of such an assistant. MacKenzie increased Brown's wages in March to \$45 per month, to be increased to \$50 when he celebrated his second anniversary. With continued progress through "his industry and improved skill" he could expect \$60 if he was deemed to be "worthy of being retained and advanced."

Brown achieved this wage in October 1928, his fourth year in the biochem laboratory. His effort was extraordinary. He often worked on Saturday afternoons and Sunday mornings because of the large class sizes. He also trained himself to blow glass and work metal, thereby saving the university money for new apparatus or employing craftsmen. Perhaps because of his obvious initiative and a sense of frustration over his paltry wages, Brown was growing restless. Young reported that he felt he should "be getting a living wage at least comparable with the boys of his own age" and that "it would be a severe loss if he were to leave." Brown resigned in June 1929.⁵⁶

Brown was replaced by eighteen year old John Grey, a grade ten graduate who was appointed in September 1929 at \$35 a month, and he received an increment of five dollars the following month. Young reported that, like Brown before him, Grey "likes the work and is learning fast." Young apparently learned from Brown's resignation and he suggested that "[f]rom the standpoint of the University it is very essential that he should be contented financially, as good boys are hard to get and hard to train," while noting that there would be a need to consider further salary increases. President MacKenzie apparently concurred, and increased the monthly salary to \$45 in May 1930. MacKenzie suggested that "laboratory boys" needed something to "stimulate them to do better work" and suggested that if his work continued to be satisfactory, his salary would increase to fifty dollars.

MacKenzie and Young agreed that the university would never pay a wage "suitable" for a married man, even though they recognized that staff turnover resulted in lost productivity. MacKenzie explained to Young that the university "cannot afford to pay a salary to a laboratory assistant that will keep a married

man." When this was explained to Grey, he was "very discouraged." His disappointment must have been heightened, for he was in the midst of preparing for his marriage. But Young's intervention carried the day, and MacKenzie was persuaded to increase Grey's salary by another five dollars, effective April 1, 1931 "with the expectation that he will look and find a job" that would provide for him. He charged Young to make it clear to Grey that there would be no further increases, and that Grey "should begin at once to look for some more remunerative work."⁵⁷

Despite his January 1931 marriage, Grey did not leave the biochemistry department at the end of the 1930-31 academic year, as suggested by MacKenzie. In correspondence with new Dalhousie President Carleton W. Stanley, Young argued that

I am entirely opposed to the policy of starving our laboratory assistants so that it is necessary to train new ones every two or three years with a decreased efficiency in the preparation for classes and a decreased research output on the part of the professor. All this is for a saving of a few hundred dollars a year.⁵⁸

Stanley promised to raise the matter at the next executive meeting of the Board, and while there is no recorded response, a budget dated December 29, 1932 shows that \$780, or \$65 a month, was to be expended for a laboratory assistant during 1933-34. Young managed to retain Grey through the rest of the 1930s for \$75, the maximum the University would pay for technical workers.⁵⁹

The debate surrounding the wages for the marriage-minded John Grey did not prevent the appointment of another married man.⁶⁰ In December 1931, the physiology department appointed Albert Hallett, a married man with five children. Hallett had "considerable training in hospital technique" and came well recommended. Because of his age, family situation and experience,

Professor E.W.H. Cruickshank requested that he start at fifty dollars a month. The request was refused. His predecessor had earned only \$45 a month, and only this amount had been budgeted.⁶¹ When Cruickshank renewed his request nearly a year later, he noted again that Hallett was married and had a family to support, adding that only the eldest boy was contributing a wage to the maintenance of the family.⁶²

The medical sciences departments were content to employ young men to perform the necessary tasks for the university to conduct both research and teaching. The medical school of the 1930s simply could not function without workers such as Brown, Grey, Hallett or countless other technicians or assistants in anatomy, biochemistry, pathology and the other medical sciences.⁶³ Assistants, technicians, "lab boys" and research students were all a feature of medical science at Dalhousie. Unlike the hospital laboratories around the Maritimes, staffed in large part by nurses, and in contradistinction to the laboratory workers discussed below, Dalhousie labs employed a significant number of young men. The wages paid these workers reflected both their young age and the perception that they were readily replaceable. The only requirement was that they possess a good pair of hands and were naturally careful, because training could take place at the bench over a couple of months. Demands for wage increments were often rebuffed. Laboratory work at Dalhousie was not a career for a married man desiring to support his family.

The employment of men in the Dalhousie laboratories is distinctive and instructive. The poor wages paid were deeply inscribed by gender. Employees in the Dalhousie laboratories were usually in their late teens or early twenties. The paltry wages and little chance for advancement discouraged some of the

workers and there were frequent staff changes. Yet, staff turnover and the loss of productivity did not emerge as significant issues for the university, even with the apparent difficulty professors such as Gordon Young had in finding competent personnel. Research in the university, which would have demanded some stability in the staff, was not yet pre-eminent at Dalhousie. While Young may have desired consistency, the administration did not see an expenditure for technical hands as a priority. What the professoriate and the administration agreed upon was that Dalhousie would never pay a wage sufficient to support a married man. Ambitious men, according to Young, would not be attracted to the work. Only young men or those without initiative would submit to the low wages offered. Thus, laboratory workers at Dalhousie were viewed as something less than men supporting families, even if they aspired to married life or supported children. Easily replaced and in the absence of a research program that necessitated the continuity of staff, the university was content to offer low wages and bear the consequences of turnover.

III -- MORRIS STREET WORKERS

Gender was a significant feature in determining wages at Dalhousie. It also was a critical factor in hospital-based laboratory work. The addition of services such as x-ray plants and laboratories placed new demands on existing hospital workers, particularly the nursing service. Nurse superintendents and hospital administrators everywhere generally wanted nurses who could fill a number of tasks, chief among them work in both the laboratory and x-ray services. The training nurses received in laboratory or other work was brief and practically oriented, intended to supplement their nursing education. The expansion of

services in hospitals also introduced new workers. To staff their own facilities and provincial hospitals, larger facilities such as those in Saint John and Halifax began to initiate training programs in the 1920s. In New Brunswick, for example, training laboratory workers for the smaller community hospitals was one of the main objectives of the Bureau of Laboratories. While the training grew more formal and regular through the 1920s and 1930s, all laboratory workers continued to learn at the bench, irrespective of how they entered laboratory work. As new tests were introduced, they would learn them either through reading manuals or by visiting larger laboratories and undertaking short programs of study. The provincial laboratories in Halifax and Saint John also trained workers from smaller facilities to assume laboratory duties throughout the Maritimes.

The Massachusetts-Halifax Health Commission sponsored one of the earliest expansions of the laboratory staff in Halifax. Gertrude Hines, who began work in 1920-21 as a MHHC-paid worker, had "considerable laboratory experience"⁶⁴ including five years experience in England. Hines initially worked for \$70 per month, which was increased to \$90 the following summer. Hines had a brother who taught at the Bloomfield School, which likely made her transition to her new city easier.⁶⁵ Familial complications also informed her decision to leave the following spring, when her father died and she returned to England.⁶⁶

Another early addition to the staff was Dr. Margaret Chase. Dr. Chase was appointed as a technician in May in the Department of Pathology and Bacteriology, and Nicholls wanted her to be recognized as well as an assistant in the Pathological Laboratory.⁶⁷ In correspondence, Nicholls noted that Chase,

who graduated from Medicine the previous day, was "willing to come on a technician's salary, that is \$75.00 per month", for duties in the Medical school, the pathology laboratory and museum work!⁶⁸ Chase did not labour in the laboratory for long. Her subsequent career took her to the United States, including Philadelphia and New York. But perhaps her brief experience in the laboratory led her to manage a Red Cross Blood Donor Clinic in WWII. Indeed, Dr. Margaret Chase may be said to be the first female physician to be employed by the Victoria General Hospital. That distinction is traditionally granted to Dr. Eliza Perley Brison. That a physician would toil in the laboratory as a technician for however short a period, suggests the many obstacles facing women doctors in establishing a practice.

Margaret Chase was the thirty-fourth woman to graduate in medicine from Dalhousie and if the career patterns of her predecessors are any indication, it was very difficult for a woman to establish a practice in the Halifax area.⁶⁹ Many of the women graduates left to pursue careers in the United States. Others, including Annie Hamilton, the first woman to earn her medical degree (1894), Florence O'Donnell (1901), Martha Philp (1902) and Grace Rice (1903) went to China. Others chose to pursue medical missionary work in India including Blanche Munro (1904), her classmate Jemima MacKenzie, Minnie Spencer (1910) and Bessie Thurrott (1922). Florence Murray, who rendered exemplary service during the Halifax Explosion and the Spanish flu epidemic in the city, could not build a successful practice in the city and left for Korea in 1921.⁷⁰

Very few graduates took up practice in Halifax, although Annie Hamilton spent nine years in the north end before departing for China and Grace Rice

(1903) established a successful practice on Spring Garden Road. Nevertheless, graduates did find opportunities to practice elsewhere in the province, including Chester, Bridgewater, Sydney and across the harbour from Halifax in Dartmouth. Occasionally familial relations could facilitate entry into practice, as they did for Katharine MacKay (1895) and Clara May Olding (1896). Despite long years of preparation, marriage meant the end of a medical career for other women, including Dr. O'Donnell, who stopped practicing upon her marriage and dropped the appellation "Dr." as well. For others, success was an elusive prospect. Dr. Eliza MacKenzie (1904) opened her office in Charlottetown, Prince Edward Island, but could not build a successful practice. She left for New York, pursued nurses training at St. Luke's Hospital, and continued to work as a nurse until her death in 1930.

Others did enjoy a measure of success. Dr. Brison (1911) was a pioneer in Nova Scotian psychiatry, serving as the Superintendent for the Home for Feeble-Minded Girls from 1918-25. Elizabeth Kirkpatrick (1915) enjoyed a lengthy career in the United States breaking new ground in psychoanalysis, before returning to Halifax to join the Faculty of Medicine in 1960. Ella Hopgood (1920) established the St. John Ambulance in Nova Scotia and was appointed the assistant superintendent of the Nova Scotia Hospital in 1928. The pattern that saw Halifax female physicians work in institutional settings replicated those found elsewhere and distinguished them from their male colleagues who could be found most often in private practice.⁷¹

The different opportunities for male and female physicians suggests the importance of gender in determining the career path of individuals, even if they worked within the same locale, profession and graduated from the same

medical school. Gender, more than these other factors, shaped the professional experience of women and shaped it differently from men. Women physicians could be found at work in the "feminine specialties," which in the nineteenth century meant obstetrics and gynecology and in the twentieth, pediatrics, public health, teaching and counselling.⁷² Certainly, this pattern was apparent among Dalhousie graduates in medicine and serves as an important reminder that gender was deeply embedded in the provision of health care in Halifax, and beyond. And, as the services were expanded through the early decades of the twentieth century, hospitals and agencies alike turned to women to fill the new positions. Even women physicians, who were unquestionably privileged when compared with other women, did not enjoy the same opportunities as their male colleagues. For women workers in Maritime hospitals and health agencies, who lacked the status (however constrained) of a medical degree, gender constructed the addition of new duties to old ones or the creation of new job opportunities.

By 1924 Nicholls was growing increasingly dissatisfied with the level of staff. He requested "more help in order to be a better service," despite the additional help supplied by Hines, Chase and the others. By that time, the laboratory staff consisted of two technicians and one stenographer. But the lab was undergoing expansion in 1924, and the Board of Commissioners was not willing to consider a request for more staff until the work was completed. They did suggest, however, that Dr. D.J. MacKenzie and Margaret Low, both of whom were doing public health work, could assist Nicholls in the hospital work for a modest increase in their salaries.⁷³ Thus even a worker with a seemingly defined role, such as Margaret Low, did not perform a narrow range

of work in the emerging and ever-changing environment of the lab. In late 1924, Low's expertise was pressed into service for the hospital, for which she received an additional \$50.00 per month.⁷⁴ Low's employment with the hospital, primarily to cut microscopical sections, was to be temporary. There is every indication that she would have continued to perform this double-service, except that she was off duty between March 18 and August 25, 1925. When she returned, she worked exclusively in the public health laboratory, and Deborah Henderson was hired in her place, at the same rate of fifty dollars per month.⁷⁵

MacKenzie and Low assisted with the hospital work and the arrangement was to continue "until the Laboratory staff is re-organized."⁷⁶ At the same time, Kenney provided Nicholls with the name of Louise R. Gowanloch, the wife of a Dalhousie University professor, as a possible employee.⁷⁷ When the new laboratory was complete, in the late fall of 1925, the matter of expanding the laboratory staff was again considered. Nicholls presented his needs at a meeting of the Board of Commissioners in November 1925. In addition to the current workers, Margaret Low and Albert Baker, two additional technicians would be added. Baker had only a "limited" education, and had difficulty working with percentages. Therefore, he required supervision when preparing the solutions or media for the laboratory work. He was, however, "fairly capable" at sectioning and fixating tissues, and was good at staining sections and smears. This, together with occasional work in blood chemistry, was the range of Baker's work.⁷⁸

One of the staff to be added on a permanent basis was Deborah Henderson. She would be appointed at \$75 a month.⁷⁹ Henderson was, like Low before her,

known to Dr. A.G. Nicholls and enjoyed a Dalhousie connection. Beginning in September 1924, she assisted in Nicholls' bacteriology course, earning \$30 a month. Nicholls had designs for Miss Henderson, hoping "to train her fully in course of time as a technician". In addition to his tutelage, Nicholls encouraged her to enroll in a biology course, and arranged a tuition exemption with the University President. Nicholls also requested that Henderson be paid for eight months, one month longer than the University desired. She was paid for May "at request of Dr. Nicholls," who noted that her family was not very well off.⁸⁰ By the fall of 1926, Henderson was described as "a mainstay in ... sectioning tissues and preparing tissue slides." Henderson was also permitted to take two afternoons a week in order to pursue a class in histology.⁸¹ She would continue to work at the laboratory until January 31, 1931.⁸² For competent workers, opportunities were created that could see them further their training.

Considerations of family also entered into Henderson's employment, though this could be exceptional. It hints, however, that as in the case of Dalhousie's "lab boys," work, family, education and other factors were all intertwined.

In addition to Henderson, Nicholls had a young man from Scotland in mind, whom he contemplated employing at the rate of \$80 a month. There would also be an "office girl" employed, paid through the Public Health Department.⁸³ By 1926, the pathological service had Nicholls, Baker and Henderson and a student assistant, "who is also the interne [sic] for ambulance calls, and who has classes which must be attended." The intern performed the "simpler clinical work for the hospital" such as examination of stomach contents, assisting in blood chemistry, urinalysis and examination of smears. There was a half-time stenographer, although this service was far from

consistent. Finally, the assistant professor of bacteriology was traditionally appointed the assistant in the pathology laboratory (though without salary).⁸⁴

Some of the workers, like Henderson, Low and Gowanloch, had some connection with Dalhousie University. Many more who worked in the laboratory held degrees from the university. Patricia S. Tingley, who held a BSc with special training in Chemistry, joined the laboratory in 1926-27.⁸⁵ Peggy Cameron was a native of Stellarton, born July 7, 1908. She was the daughter of a railway engineer. She was educated in Stellarton and New Glasgow, before enrolling in Dalhousie in 1926. Cameron took her BA, graduating in 1930. Following graduation, however, she returned for one additional year.⁸⁶ She received an appointment as a part-time technician in June 1929, prior to graduation and during the last year of university, she was "a volunteer worker." She took further courses in bacteriology and biology in June 1931, after which she was made a full-time technician. Her work in these courses complemented her earlier work in chemistry and biochemistry, and in the opinion of the Director, "she will be exceptionally well trained for Public Health Laboratory work."⁸⁷ Another well-trained worker was Mary MacDonald, appointed in June 1938. Like Cameron, MacDonald had pursued classes in bacteriology, chemistry and biochemistry, in addition to physiology. And, again like Cameron, she had worked as a "voluntary technician at the laboratory for nine months" before her appointment.⁸⁸ Other workers brought university experience as well, including Betty Foster (BSc), Katherine Miller (MSc), and Pauline Webster (MA).⁸⁹

Rose Phillip's university preparation for laboratory work was excellent, having completed several chemistry courses and many of the pre-medical

courses in biology and zoology. Some training both on the job and in the public health laboratory, as with other laboratory workers, augmented her education.⁹⁰ Occasionally, this meant pursuing some special aspect of laboratory, or hospital work. In 1933, for example, Phillips was selected to pursue "special instruction" in the radium department, so that she could supply in the event of illness or during vacation periods.⁹¹ Later workers remember students learning on the job, always a component of the laboratory worker's life. Edna Williams recalled that "we all learned there on the job ... Everybody just worked together and learned ... from whoever happened to be doing the job at the time."⁹² A worker from the 1930s recalls that "there were always people who would come in to take the course." This same worker did not feel it was much of a training program, however. "Usually it was somebody who wanted to get away from home everyday. It really wasn't very much of a course. And they helped out you see, they were another body to do things. And they would pick up quite a bit." She also thought that the students were overwhelmingly female and local: "local girls." She remembered that "Some were doctor's daughters, or somebody would have an interest or want during the summer something to do or it was a change perhaps from going down to work in a store, or they didn't want to become a nurse or who weren't interested in schoolteaching. So this was a big deal, I suppose. So we always had somebody."⁹³

Many of the workers received their appointment after a period of volunteering in the laboratory. There is no question that the laboratory benefitted from the presence of "several unpaid assistants or learners" without whom such an increase would not have been possible.⁹⁴ Indeed, the unpaid labour force in the Saint John facility usually numbered about five or six.⁹⁵ One

such volunteer was Moncton native Sylvie Comeau. Comeau worked without pay in various departments in 1936 and 1937, but her contribution was not recorded in the *Public Accounts*.⁹⁶ Not surprisingly, volunteers from the laboratory would often leave, to pursue paid opportunities for work when they became available.⁹⁷ Occasionally, unpaid workers like Peggy Cameron or Mary MacDonald would toil for one year, and then be added to the staff of the laboratory the next.⁹⁸ Cathy Arnold, became an "assistant technician" in Saint John midway through 1936-37 for which she received \$300. By 1943, Arnold was the senior technician in the facility, and earned almost \$1000 annually. Helen Frances was, like Arnold, a volunteer in the mid-1930s, before joining the paid work force. In 1936-37, she earned only \$83 for her services, before joining the lab as an assistant the next year, earning the full annual wage of \$600.⁹⁹ Rachel Hunter, although similarly described as a volunteer, did earn some money before a resignation opened up a position for her, suggesting that voluntarism in the laboratory was not a strict category. Like Arnold, Hunter would eventually rise to the position of senior technician in 1943.¹⁰⁰

IV -- THE BUREAU OF LABORATORIES

As the 1930s dawned, the Chief of Laboratories, seven technicians and a caretaker staffed the Saint John laboratory.¹⁰¹ After more than a decade in operation, there was little indication that the pace of work would slow. Between 1930 and 1933, the total number of examinations increased by more than 100%. This was, in part, precipitated by an agreement between the Saint John General Hospital and the Bureau of Laboratories, which saw the Bureau perform all clinical laboratory work for the hospital. In the same three year

period, hospital work increased by an astronomical 234%. This suggests how important laboratory tests were becoming for the hospital patient and the clinician. Nevertheless, other work still showed a significant increase of 18%.¹⁰² During this same period, only two additional staff members were added to the complement and, the *Annual Report* confessed, "both of these at totally inadequate remuneration for the painstaking work required of them."¹⁰³

With the expanding workload, there was a recognized need for specially-trained laboratory workers both to staff the Saint John laboratory and to service the increasing needs of hospitals throughout New Brunswick.¹⁰⁴ Gertrude Marks, the earliest identified "laboratory assistant" in Saint John, earned \$1000 a year initially and would spend over a decade at the bench, retiring December 1, 1929. She was made the "Chief Assistant" in 1924-25, when both her experience and the addition of several other workers made such an appellation meaningful. This brought with it a salary increase from \$1350 to \$1500 per annum.¹⁰⁵

As in Halifax, there were others at work in the facility, besides Marks and Abramson. Wayne Mobley provided caretaker and other duties for the laboratory, while Nettie McNamara furnished unspecified services. By the early 1920s, Cecelia LeBrun supplied chemistry services and there were several laboratory assistants, some of whom served for only a year or two, while others had a longer attachment. As in Halifax, most of these workers exist only as wage expenses in the *Public Accounts*. Only rarely did the staff changes merit mention in the *Annual Report* to the Minister of Health or in other documentary sources.

Marilyn Clarke first arrived at the Bureau of Laboratories as a student, and stayed for another four years as a member of staff. Like many of her Halifax counterparts, Clarke was educated at Dalhousie, receiving her Bachelor of Arts in 1930. She was described as an "all-round girl" in her yearbook, excelling in her academic studies while "never miss[ing] a party." The yearbook also noted that Clarke wanted to "continue her research in Biology next year, a study in which she is intensely interested."¹⁰⁶ Clarke was a native of Saint John, the daughter of a local dry goods merchant. So perhaps familial connections led her back to that port city to enroll in the laboratory course in 1930. Familial support was likely necessary: while training in Saint John, she was not paid.¹⁰⁷ She was familiar with most routine hospital work, including urinalysis, blood chemistry, hematology, bacteriology, and section cutting and staining. Her peak salary in Saint John was \$600 per year.¹⁰⁸ Clarke left Saint John in September 1935, to assume a position at the Prince Edward Island Hospital in Charlottetown, where she remained until December 1937.¹⁰⁹ In Saint John, she was replaced by Stuart Johnson, who had been "apprenticing" in the facility for several years.¹¹⁰ Johnson's salary shows wide variation. In 1932-33, the first salary recorded, he earned a mere \$50, which was increased to \$300 the following year, and fell to \$250 in 1934-35. In 1935-36, the year he replaced Clarke, Johnson's salary was increased to \$550 for 11 months work.¹¹¹ In all likelihood, Johnson was serving in the laboratory only part-time, working irregularly and earning fifty dollars a month, the same amount paid to women in the laboratory with several years experience.

That same year, long-time employee Mary Peterson died. Peterson was a "faithful and hard-working employee"¹¹² Peterson, a married woman, arrived in

the laboratory in the summer of 1928, earning \$40 per month, a figure which remained unchanged during her entire tenure.¹¹³ There were a few other married women present in the laboratory in the years before the 1945. Mrs. Nellie Bush started in the laboratory in the midst of the Great Depression, earning \$41.33 for what was, in all likelihood, relief work. The following year she provided services while Mary Peterson was on vacation, earning \$17.33. Subsequent years saw her earning small sums, \$6.66 for "assistance" and \$6.66 for "services." She appears to have assumed a regular appointment partway through the 1936-37 fiscal year, and remained in service until 1945. Other married women worked only a brief period in the laboratory. Iris Conrad, for example, left shortly after marriage.¹¹⁴ Other workers, such as Emily Byrne, left laboratory work prior to their marriage. Byrne apparently worked on a peripatetic basis in the laboratory, if her wages are any indication. Beginning in 1931-32, she earned \$50, while subsequent years saw her earn \$292 and \$536. By 1934-35, she was earning the full wage of \$600 per year. Her designation in the public accounts through her years of service remained "laboratory services" -- she was never called a "technician" although when she resigned, her service was called "sterling."¹¹⁵ Other married women worked as cleaning staff for only one year, including Mrs. Night in the late 1930s and Mrs. Angeline Gaugin in the early 1940s.¹¹⁶

Two long-standing staff members were Muriel McCoy and Phyllis Evanston, who worked as a technician and an office worker in the laboratory, respectively. McCoy started in 1926-27 at an annual wage of \$275, which increased in the closing years of the 1920s to \$600. When she joined the Canadian Society of Laboratory Technologists (CSLT) in 1937, only the

seventh person from New Brunswick to do so,¹¹⁷ her application noted that she was the chief chemistry technician, although she could also work in bacteriology, haematology or prepare solutions for use with microscopic work. McCoy eventually achieved the title of "Chief Technician and Provincial Analyst" in the mid-1940s and, for many years, was a prominent member of the CSLT in the Maritimes. Evanston joined the staff in 1927-28 as a clerk and stenographer, at a wage of \$75 per month, which exceeded that paid to most of the other laboratory workers. This sum was raised to \$1020 the following year. There were modest reductions through the mid-1930s to slightly under one thousand dollars, although her wages were restored in 1934-35 and then increased to \$1100. Through the late 1920s and 1930s, Evanston was consistently the second highest paid employee in the laboratory, excluding the salaries of the Directors.¹¹⁸ Evanston kept the accounts for the laboratory, prepared the reports and watched over the filing -- all integral tasks for the work of the lab -- with only occasional assistance. By the early 1940s, this burden was too much and the provincial government made two additions to the office staff.¹¹⁹

That the one long-serving clerical person earned more than most of the bench workers is noteworthy. In Halifax and Saint John, opportunities for women were limited. Even elite women, such as the graduates from medicine, faced significant obstacles in establishing their practices. Female physicians were channeled into "appropriate" spheres such as pediatrics or obstetrics. For many women laboratory work was respectable work, where women with an interest and aptitude for science could find employment. It did not enjoy the visibility of other kinds of women's work such as teaching or nursing, but it

nevertheless appealed to many women. It also offered reasonable salaries and security for women.

Yet laboratory workers were also vulnerable. Married women in Saint John earned less than either men or single women. The laboratories could always add students or recruit "volunteers" to perform laboratory tests, especially the routine analyses, a situation that likely undermined the position of paid workers. If women laboratory workers wanted to stay close to home, if they were indeed "local girls," they had few employment options. Clerical personnel may have enjoyed better options. Evanston earned more than her technical co-workers because first, her work was essential to the operation of the laboratory and, second, she likely had more opportunity for mobility. Moreover, the reports generated were numerous and had to be sent out quickly. As suggested earlier, reports were the productive unit of the laboratory. The reports communicated laboratory results to the clinician or the public health department and while bench workers would sometimes do this work, in the larger labs the volume of reports was quite large. In the nascent laboratory, clerical and technical work were not sharply differentiated. Both were, for the most part, women's work and jobs in laboratories were defined as such.

Men were, as in Halifax, rare as technical workers. Ronald Burns joined the laboratory staff in 1929-30, before he celebrated his twentieth birthday. He was a graduate of Saint John High School and would spend many years at the laboratory, eventually assuming the position of senior technician.¹²⁰ Burns later entered medicine and, by the late 1940s, he was a practicing physician, although he maintained his connections with laboratory work until his retirement from practice in 1977.¹²¹ In the mid-1930s, Burns was joined by

Stuart Johnson who also ultimately left to pursue a medical education.¹²² While pursuing their medical education, Burns and Johnson continued to provide much-needed relief to the laboratory during the war years.¹²³

V -- RECRUITMENT

By the 1930s, when significant additions were being made to the staff in both Halifax and Saint John, laboratory work was overwhelmingly performed by women. In smaller hospitals, this followed the feminization of other aspects of hospital work, including nursing or dietetics. Yet how exactly were women recruited to the laboratory? Workers came to the laboratory in a variety of ways. They viewed laboratory work as one of a range of options, informed not simply by opportunity. Rather, such things as interest and ability, neighbourhood information about available positions, wages, neighbourhood marriages and a broad range of other factors shaped how women came to find themselves working at the bench. The social relations of gender, age, ethnicity and religion, in addition to neighbourhood and education, shaped how people came to the laboratory. Lab work, after all, did not enjoy the visibility of other kinds of "women's work," such as nursing, teaching, or other pursuits such as department store sales.¹²⁴ Finally, there was the perception that work in the laboratory, together with other services such as x-ray work or dietetics, were not only respectable opportunities, but could serve as important alternatives to other kinds of work.

Of course, not every woman enjoyed the same opportunities. Rose Phillips, a native of Bermuda, recognized that choices for women in her native country were limited. She thought she would be relegated to schoolteaching, a career

she did not find particularly enticing. She went home following her graduation in May, but returned to Halifax and her job in the laboratory in late August 1931.¹²⁵ Phillips recounted that she did not apply for her position. Rather, somebody offered it to her. It was the opportunity she was looking for, not having much desire to return to the limited employment opportunities in Bermuda.¹²⁶ Another worker, who began in 1940, recalled that her parents thought that laboratory work presented a good opportunity for their daughter. Nor did the rest of her family, friends or neighbours find her choice of job to be unusual. The worker recalled "it was a service for people," suggesting that it did not deviate too much from the proscribed roles for working women.¹²⁷

Ellen Robinson, who joined the laboratory staff in 1936, nevertheless contrasted work in the laboratory with nursing. Robinson rather enjoyed the training and even liked working in hospitals. But opportunities were few and she found herself working as a private duty nurse shortly after graduation. She recalled how "sitting up with people with strokes, watching them die" held little appeal for her. Laboratory work offered women an escape from dealing with the infirm or the dying. They could find satisfying and remunerative work in health care without dealing with sick patients on a day-to-day basis. Increasingly Robinson looked for new opportunities, eventually securing a position in the laboratory. Six decades later she recalled that her parents "didn't think anything" of her decision to change jobs.¹²⁸

Robinson began to make forays into the laboratory between assignments as a private duty nurse. Dr. A.G. Nicholls, the long-time director of the laboratory, had been a neighbour of Robinson's while she was living on South Street, before her nurses' training. So she knew that this work was available,

and given her interest and aptitude for science, as demonstrated by her final year at Dalhousie, she thought the work would be satisfying. She was, increasingly, looking to get out of nursing. Robinson completed a short course of training at the laboratory, and found that she particularly enjoyed working with pathology specimens. When Rose Phillips left to be married in 1936 the laboratory director, Ralph Smith, recruited Robinson.¹²⁹

Her entry into laboratory work was complex, and multi-faceted. She had a very extensive, though orthodox, education experience, one that took her to the Ladies College, through a domestic science program, Dalhousie University and finally, nursing education. While at Dalhousie, it was a botany professor who recognized her aptitude for science. Botany, of course, enjoys a special place in the history of women's engagement with science. But her education was only one component of her entry into the field of laboratory work. Her neighbour, A.G. Nicholls, introduced her to the work. Personal connections also played a key element in her actually securing the job. In the summer of 1936, just prior to joining the laboratory staff, she worked for a summer at a camp operated by the warden of Shirreff Hall, who was an aunt of Dr. R.A.H. MacKeen. MacKeen was Assistant Professor of Pathology at Dalhousie. Finally, it was the impending marriage of Rose Phillips (and the accompanying resignation that that would entail) that finally secured the position for Robinson. Education, personal knowledge and familiarity and the constraints on working women generally all combined to lead Robinson to laboratory work.

For women who were in university, coursework was often combined with work in university laboratories. One Halifax woman had five and a half years experience in laboratories by the time she applied to the CSLT in 1944 and it is

clear that she worked in the laboratory throughout her university education. A Fredericton woman "studied two afternoons a week" at that city's Victoria Public Hospital, where she did routine laboratory work. Another applicant reported that she worked in the biology laboratory at Acadia University for two years during the course of her studies.¹³⁰ Exposure to laboratory technique while at university and the "freedom" to volunteer at local laboratories was an important entrée to the work for many women.

Others were recruited to the laboratory in other ways. Miss Margaret Robins, for example, was appointed following the resignation of Deborah Henderson in early 1931, while concurrently Virginia White was promoted to the position of senior technician.¹³¹ Some, like Margaret Low, were well known to the medical community and acquired a high degree of competence in their work. But there were other means of gaining a position on the bench. Louise Gowanloch worked at the public health laboratory for six months in the mid-1920s. She was the wife of James Gowanloch, a Dalhousie University professor of zoology hired in 1923. Louise Gowanloch was hired, like many of the staff additions, to perform VD tests.¹³² In 1924, she corresponded with hospital superintendent Kenney about the possibility of finding work at the VG.¹³³ It was unusual, but not entirely unheard of, for a married woman to work in the laboratory service before the Second World War. The workers at the laboratory were overwhelmingly single. There were exceptions, such as Mrs. M.A.H. Swim and Mrs. Dobson, about whom we know very little,¹³⁴ or Louise Gowanloch, but these were very few indeed. But the Gowanlochs were not a traditional Halifax couple. They lived apart for much of their time at Dalhousie. Louise Gowanloch studied medicine in New York, but even when

she lived in Halifax, she lived in a boarding house. In 1929-30, after finishing her medical degree,¹³⁵ Gowanloch took a one-year contract with Dalhousie's Biology Department. Their marriage ended in September 1930, in a divorce scandal that rocked the university.¹³⁶

Edna Williams "always knew" that she was going to work, but also believed that "society girls would work in the hospital labs, the debutantes."¹³⁷ Put another way, laboratory work was considered respectable work for daughters of the upper class. Other women pursued laboratory work because there were few options. Williams remembers being "desperate for a job." Searching for work while a university student, she had her "name in everywhere. Banks and the archives and everything I could think of ... Simpson's, Eaton's." Williams, who started at Dalhousie in 1934, would apply for various jobs every summer, and one of the places she applied was the laboratory. She was eventually interviewed by D.J. MacKenzie, and was successful, in part, because she had a university degree. This also translated into a monetary reward for Williams. Workers without degrees received \$65 a month, which was a typical government rate for clerks in government. But people with degrees in the public health laboratory earned eighty dollars a month.¹³⁸

Other women found opportunities to change their career paths liberating. Laura Piers was educated in the Saint John facility for fifteen months, from August 1944 to November 1945. Shortly after completing her training, she assumed a position at Moncton City Hospital, serving in a supervisory position for one month. Her subsequent career in New Brunswick would see her work at the Blanchard Fraser Memorial Hospital, a Department of Veteran Affairs

Hospital in Sussex. In 1947, she took a haematology course at the Thordyke Memorial Laboratory, at the Boston City Hospital and from there she went to the Toronto General Hospital, working in haematology and biochemistry from 1948 to 1959. Piers later went on to work at St. Thomas Hospital, London, England, the Royal Victoria Hospital in Montreal and back to St. Thomas. Finally she arrived at the Pathology Institute in Halifax, where she returned as the senior technologist in the haematology section in November 1964.¹³⁹

While Piers's travels were more extensive than most, many workers exhibited a great deal of geographic mobility, pursuing opportunities across Canada. Robert Mitchell, arrived in Canada in 1930, and went to work at the Queen Alexandra Sanatorium, London, Ontario, where he stayed until 1937. From 1937 to 1942, Mitchell worked for the International Nickle Company Hospital in Copper Cliff, Ontario where, in addition to his laboratory work, he served as an assistant x-ray technician. Industrial work was not uncommon. Ann Macauley worked for a munitions company hospital in Cherrier, Quebec during 1942 and 1943, serving as the senior technician in a company with between fifteen and twenty thousand employees. There she performed routine tests in haematology and biochemistry, and conducted research projects on employees who were exposed to TNT. In 1943, she joined the staff of the Moncton Hospital, and after a year off, joined the Moncton Tuberculosis Hospital, where she served from December 1946 to the spring of 1950. She later relocated to Ontario, where she worked for the Ottawa Civic Hospital, a physician and the Bell Telephone Company.¹⁴⁰

When Robert Mitchell arrived in Halifax in 1942, he joined the staff of the Royal Canadian Navy Hospital.¹⁴¹ One of his co-workers at the RCN Hospital,

Christie Hart, had a similarly diverse career. She had completed four months of laboratory training and six months of x-ray training at the Montreal General Hospital. Her subsequent career took her to the Miramichi Hospital in Newcastle, New Brunswick, where she worked as x-ray technician. From New Brunswick Hart returned to Montreal, working in the office of Dr. R.F. Kelso, Macdonald College, where she stayed for eight years doing x-ray, laboratory work, basal metabolism and short wave diathermy. Finally, in 1943, she joined the staff at the RCN Hospital Laboratory.¹⁴²

Laboratory workers, in common with many daughters and sons of Maritimers, left the region as well. Maureen Noonan laboured at the public health laboratory in Charlottetown from 1943-45 doing work for the sanatorium and public health work. In 1945 she went to Kingston General Hospital and worked in the lab there as a junior technician from 1945 to 1947. She then entered the Canadian Red Cross Blood Transfusion Service, serving in the Edmonton and Calgary depots (1947-48), the Vancouver depot (1948-49) and the Hamilton depot (1949-52). In the last position, she served as senior technician. Noonan then went to New Westminster, British Columbia, working in the Royal Columbian Hospital. In 1955, she returned to the Red Cross, working at the National Headquarters as a technical consultant.¹⁴³ In slightly more than a decade, her career took her across Canada to seven different cities. Such geographic mobility was not uncommon in the years following the Second World War.

For many, time in the university exposed them to scientific apparatus and laboratory work. Time in the university nurtured their interest in laboratory technique and undoubtedly their skills. University also provided many,

particularly the Halifax women, with personal contacts that led them into laboratory careers following their graduation. Many factors entered into the decision to pursue laboratory work. It was a complex and multi-faceted process that was shaped by gender, interest and aptitude, personal knowledge and social relations. Yet, laboratory work should not be viewed as a kind of occupational ghetto for women. Some found that work in the laboratory offered a chance to travel, either to learn new tests or to pursue new employment opportunities. It was stable, remunerative and respectable work. It also provided educated women with a chance to escape from the demands of caring for the sick or the dying (as in nursing) or children (as in teaching). In a period of limited opportunities for women, laboratory work was likely a welcome alternative for some.

VI -- DEMAND FOR WORKERS

If some of the women who entered laboratory work found it satisfying, there were also a fair number of opportunities in the field. As some of the careers indicate, jobs were opening in many parts of Canada, even beyond. With the Second World War, jobs for women expanded generally and the demand for technicians increased both in the armed services and at home.¹⁴⁴ In Halifax one worker recalled how vacant positions were filled with "older [workers] that had left and they also, of course, kept the married ones [whose] husbands were overseas."¹⁴⁵ Through 1939, the CSLT expressed an interest in participating in the response to war and early in 1940 began negotiating how the membership could best serve the war effort. The society created a military service register to identify interested members. Laboratory workers were

admitted to the armed services as privates, in sharp contrast to the nurses who joined the medical corps as officers.¹⁴⁶ The military viewed qualifications as unimportant because the duties required in the military hospitals were routine tests in haematology, biochemistry, bacteriology and the ubiquitous urinalysis.¹⁴⁷

While "qualifications" were unimportant for war service, the CSLT was committed to defending the standards it had established through the 1930s. The CSLT resisted a military classification as a "trade". Laboratory workers in the military were carrying out the same duties they discharged in civil life so, the argument went, why would a civilian "professional" group be downgraded to a trade in the military? As a correspondent to the *Canadian Medical Association Journal* ably pointed out "[i]n our enthusiasm to help our country we must not overlook the effects of our actions on the profession after the war is over." The CSLT must do "everything in their power to prevent the lowering of the standards of our profession."¹⁴⁸ Professional standards were, however, very much being negotiated as the next chapters illustrate.

By 1942, the national office estimated that two-thirds of its male members were serving in the Armed Forces. Ileen Kemp, the secretary of the society, noted that members were "conscientiously accepting their responsibility."¹⁴⁹ By October, the CSLT executive suggested to the armed services medical directors that all the male technicians were likely enlisted.¹⁵⁰ By 1944, nearly ten percent of the members were in active service for the war effort.¹⁵¹ The shortage in the armed forces was so acute that the military considered offering short courses for laboratory work, an idea endorsed by the CSLT executive. This did, however, raise the question of what would happen to these men and women

when they returned to civilian life.¹⁵² Would they seek employment in the laboratories across Canada? While patriotic fervour led the CSLT executive to support any scheme that would ensure an adequate supply of laboratory workers on the home front and overseas, they were quick to defend the drive for standards that was characteristic of the CSLT in its formative years. A streamlined training program, while necessary for the war effort, "may not be ... adequate training for a career as a technician." The CSLT did concede that the training and experience could count toward qualification, but asserted that membership in the national society would not be extended to returned men and women automatically.

The CSLT, having educated hospitals to "insist upon properly trained technicians," had invested too much to allow its efforts to be undermined by returning men and women.¹⁵³ In 1944, the CSLT Executive decided that "students trained in technical work in the Armed Forces should be given special consideration on their return and some allowance given on their training requirements for the training and experience in the Armed Forces."¹⁵⁴ What is interesting is how this contrasts with the drive for membership less than a decade before. Many of the early members of the national society held only specialty certificates, suggesting that they performed only a very narrow range of tests on a regular basis. Many, in the period before a common general education, likely did not perform a full complement of tests. In other words, they were not general laboratory workers and not that much different than those who gained training through for service in the armed forces. While the early society welcomed specialty workers, the drive for standards had made

sufficient headway by the mid-1940s that the national office decided to exclude the service personnel.

By the middle of the 1940s, there was an emerging shortage of laboratory workers. In 1945, for example, the CSLT received sixty-five requests for technicians, of which only thirty were filled through the formal registry of technicians. Another twelve were filled through other means. The next year, there were eighty-three requests for workers, of which twenty-two remained unfilled at the end of the year. The majority of requests came from Ontario, which accounted for fifty of the 83 requests in 1946, with the rest coming from across the country. Laboratory workers everywhere enjoyed good prospects however. Sybil Pelton, the secretary of the New Brunswick branch of the CSLT placement bureau, reported receiving requests for technicians from New Brunswick and Nova Scotia, but was unable to find an available technician.¹⁵⁵ Nationally, most of the requests came from hospitals, although they also came from other employment streams such as clinics, atomic energy concerns, universities, sanatoria, doctor's offices and from the Grenfell Association.¹⁵⁶

As the 1950s dawned, the Canadian Society of Laboratory Technologists struggled with trying to create a stable workforce from which it could grow. In 1951, the CSLT had approximately twelve hundred members. Of these, 120 worked in the United States. In Canada, there were another eight hundred persons working in laboratories who were not members of the CSLT. Significantly, the CSLT estimated that there was a shortage of perhaps five hundred technicians and that this deficiency would grow more acute in the post-war world.¹⁵⁷ There were many reasons for the shortfall. Approximately ten percent of Canadian laboratory workers made their way to the United States

each year, to pursue further education or better salary opportunities. The national society estimated that another sixty percent of the workers trained each year left the workforce to be married. Finally, in the post-war years, opportunities for women were expanding and applications to laboratory training schools dropped. Only a few years before, school directors could expect as many as 150 applications for fifteen positions. As the 1950s dawned, many classes in Canada were conducted at less than their capacity.¹⁵⁸

Marriage undoubtedly exacted a heavy toll on the workforce. Several workers from the 1930s and 1940s suggested that married women in the laboratory were unusual, with the exception of the war years. "Perhaps you weren't allowed to work" suggested one worker adding that at the very least "that would have been frowned upon." A worker from the early 1940s remembers "when you got married in those days, you left." The same worker also hinted at the class dimensions of such expectations. "I don't suppose anybody was ever married at any job, unless widows, that's about it. Girls from the ... reasonably well off classes didn't expect to work at all. ... I always knew I was going to work but not everybody did."¹⁵⁹ While many of the laboratory workers came from the middling classes, it is likely that they held fast to the notion that married women did not work. The retirements due to marriage, recorded in correspondence and annual reports alike, suggest the presence of a *de facto* marriage bar, except in extraordinary periods of labour shortage.¹⁶⁰ As late as 1952, the impending marriage of an employee warranted the comment that following the nuptials, the worker was "coming back to work with us after her honeymoon."¹⁶¹ Resignation from a position in a laboratory usually, of course, meant resignation from the CSLT.

As Cynthia Cockburn has suggested "[m]arriage is seen as making a man into a positively better bet as an employee and colleague. It gives him stability, a purpose in sticking to the job. It makes a woman a risk, and childbirth clinches it."¹⁶² Marriage offered advantages to men, while for women the alternatives "too often involved prolonged economic and social dependency or poverty."¹⁶³ Nuance is required however. Marriage also complicated the relationship with the employer for the young men working at Dalhousie. Unwilling to pay a family wage, the university instead opted to employ a succession of young men and bore the cost of the resulting inefficiency and lost productivity. For most women, marriage meant the end of the work at the bench. Marriage, then, operated differently for men and women, but it could entail departure from laboratory work for both groups. Men, of course, had the appearance of choice, while women believed, even if erroneously, that they had to leave.

In his 1952 presidential address to the CSLT, Joseph Scott stated that more than two hundred technicians graduated in 1951, but the demand was strong. He continued

We would like to see more men in the profession, but there is a need for greater economic inducement before we are likely to get them. Salaries in general have continued to improve, but they lag far behind those offered in the United States. ... The lure of higher salaries in the United States, and the fact that many girls leave the profession each year for marriage, combine to cause a heavy drain upon the number of available technicians.¹⁶⁴

Here, in a nutshell, was a post-war plan for professional uplift. It involved expanding the laboratory personnel and the physical facilities in hospitals so that the laboratory could maintain an efficient service, while concurrently providing an expanded training program to sustain an adequate supply of

laboratory workers. Higher wages, ensured through national salary scales, would keep Canadian graduates on this side of the border. Both of these suggestions were grounded in the material conditions that prevailed in the expanding Canadian health care system in the post-war years.

More curious, however, was the suggestion that men should be recruited to the profession. The CSLT executive, prior to the presidential address, suggested that "the need to improve the economic aspect of laboratory technology in order to offer greater financial security to *men* so that a larger percentage who have interest in the work will find in it the incentive of a decent future."¹⁶⁵ The appeal to male recruitment served to legitimize the need for increased wages for *all* laboratory workers. Concern for prestige or salary are usually reserved for occupations in which men dominate. But in the early 1950s, indeed throughout the entire history of the laboratory workers in Canada, women dominated at the bench. In 1951, ninety-six percent of newly-registered technicians were women. The same year in the United States, fully ninety-five percent of members listed in the American Registry of Medical Technologists were women.¹⁶⁶ The higher salaries in America, often cited for luring Canadian workers, did little to recruit men to laboratory work.

The ethos of the day suggested that where women predominate, there was no need to worry about status, or providing a living wage. The CSLT knew full well that their American cousins, even with higher wages, failed to attract significant numbers of men. The appeal for more men in laboratory work was a gender-inscribed argument for higher wages for laboratory workers. By articulating a need to raise the profile, status and wages of the work, ostensibly to attract men, the national society was framing a demand for wages in the

language of gender. A "profession" dominated by women is somewhat less than a real profession. The failure to measure up gets translated into diminished status, claims to expertise and economic rewards. Improvements in these areas could only come through attracting men to the work. When men failed to be recruited in any significant numbers, the claims of women laboratory workers were fatally undermined and the bankruptcy of the professional model for women revealed.

The debate over wages for the employees of the medical school signifies the important difference between some male laboratory workers at Dalhousie and their counterparts across Morris Street. Clearly, men such as Stephen Brown and Albert Hallett were articulating a need for a wage sufficient to maintain their families. As Joan Sangster has suggested, the origins of the family wage ideal are disputed, though the consequences were clear, particularly for women. The notion of a family wage "constructed an image of women as dependent and transitory workers, thus making them more dependent; and it ignored the realities of women who were self-supporting or were the sole support of their families, or whose husbands were unemployed, temporarily or permanently."¹⁶⁷ In Saint John, the married women who worked in the laboratory earned forty dollars a month while their co-workers, both single men and women, earned fifty dollars a month. Beyond gender, the other significant factor in determining wages for laboratory workers concerns status. While the CSLT may have claimed professional status, as discussed in the next chapter, their claims were consistently undermined.

Another element present in the discussion of the Dalhousie laboratories is what David Montgomery has called the "historic discovery of labour

turnover."¹⁶⁸ Both Gordon Young of the medical school and A.G. Nicholls suggested at different times that staff turnover presented a drain on the productivity of their respective laboratories. The front-end savings realized through inadequate wages was countered by the cost of continually training replacement workers. That is to say that cheaper workers were expensive to replace. Without a defined skill-set or standardized education or apprenticeship, responsibility for replacement workers fell to senior staff members or laboratory directors, with an attendant loss in efficiency, productivity or research activity. In contrast, highly skilled workers (such as those with either significant education or experience), could be replaced because their skills were portable, hence there was a shorter learning curve. The management strategy thus became one of paying a wage sufficient to maintain the staff, but recognizing that others could assume the bench work if wage demands became excessive. Nationally, the concern with maintaining staff gave rise to innovations in management, such as personnel departments and corporate welfarism. Locally, departures were common as employees found more remunerative work, or retired in favour of other life-pursuits. Concern for staff turnover was a short-lived manifestation of labour scarcity. By the later 1920s and through the 1930s, laboratory workers also had to contend with the annual presence of "volunteers" or "students." As in hospital schools of nursing these students could be an important source of labour, easily moulded to respond to increasing work loads or new innovations.

CONCLUSION

The creation of a labour supply for the new service departments that came to define the hospital through the 1920s, 30s and 40s was guided by a variety of factors. Increasingly, these services came under the direction of physicians, but the routine work was carried out by trained workers. Many of the earliest workers were nurses, particularly in the smaller hospitals that were being established throughout the region. Nurses were to be "all round" employees, capable of doing any task within the hospital. Within laboratories, nurses could often be found labouring at the bench and, as will be demonstrated in the next chapter, persons working in labs also supplied labour for other departments as well. Although there was a clear emphasis on fulfilling a variety of roles within the growing hospital complex, there was also a growing demand for formal courses of instruction.

Gender was a significant operative in the expansion of this labour force. Women's engagement with paid work was thought to be temporary and therefore their wages did not have to support a family. As the discussions of Margaret Low following the death of her brother suggest, the wages for women, even a single woman, were thought to supplement those of other family members. Conversely, much of the debate over providing salaries for the young men at Dalhousie centered on family maintenance. Men were thought to be sustaining families, even if older boys were contributing to the family economy, as in the case of Albert Hallett. Such discussions never arose with women. Other factors such as marriage also intervened to remove women from the laboratory. For the men at Dalhousie, marriage also complicated their

position. The university declaration of never paying a family wage meant that only young persons were recruited to the work and, as they married, they often moved to other careers. The wages paid these workers often reflected their young age. Dalhousie intended only to employ young single men and was willing to bear the cost of labour turnover rather than pay a sufficient wage to keep a married man.

Finally, opportunities for women were still constrained. There were few options for women in any profession. As the brief discussion of female physicians who graduated from Dalhousie illustrated, opportunities were few, even for highly educated women. While many of the laboratory workers enjoyed a good education, the prospects for a career remained limited. For many, a job in a laboratory may have been a welcome departure from caring for their families, tending the sick on the ward, hawking goods in department stores or a teaching career. Women used a variety of ways to identify opportunities at the bench. In Halifax many workers had a Dalhousie connection, with some holding degrees, workers used a wide variety of means to secure positions, including personal connections and neighbourhood information about marriages and job openings. Others demonstrated an interest and aptitude for science during their education. For these women, the laboratory was not entirely a dead-end career. It provided a choice for women interested in science, albeit in a limited fashion.

Endnotes

- ¹ George Rosen, *The Structure of American Medical Practice 1875-1941*. Philadelphia: University of Pennsylvania Press, 1983, p. 46.
- ² M.C. Urquhart, ed., *Historical Statistics of Canada*. Toronto: Macmillan, 1965, Series B182, p. 49.
- ³ St. Martha's Hospital Fund Campaign, Antigonish, "The Story of St. Martha's Hospital 1906-1925," n.d. [1925], p. 5.
- ⁴ Lewis R. MacDonald, "Golden Gleanings: commemorating the fiftieth anniversary of St. Joseph's Hospital 1902-1952 and its School of Nursing 1905-1955." n.d. [1952].
- ⁵ Evangeline R. Pothier, *Mary Ann Watson and the Yarmouth Hospital*. [Yarmouth]: s.n., [1986], pp. 33-34.
- ⁶ Kathleen E. Cogswell, *Western Kings Memorial Hospital: The First Sixty Years 1922-1982*. New Minas: R.S. Babcock Ltd., [1982?].
- ⁷ *Moncton Daily Times*, June 11, 1968 [Moncton Hospital Anniversary Supplement], Mary Gill, *75 Years of Caring: A History of the Miramichi Hospital, Newcastle, N.B. 1915-1990*. Chatham: Printed by Gemini Printing, 1990 and *75 Years of Caring: St. Joseph's Hospital [Saint John]*.
- ⁸ For the history of some of these institutions, see Daniel Francis, "The Development of the Lunatic Asylum in the Maritime Provinces," *Acadiensis*, 6 (Spring 1977), pp. 23-38.
- ⁹ Kathryn M. McPherson, *Nurses and Nursing in Early Twentieth Century Halifax*. MA Thesis, Dalhousie University, 1982, p. 14.
- ¹⁰ Janet F. Kitz, *Shattered City: The Halifax Explosion and the Road to Recovery*. Halifax: Nimbus, 1989, p. 58.

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- ¹¹ Mary Kinnear, *In Subordination: Professional Women 1870-1970*. Montreal: McGill-Queen's University Press, 1995, p. 107.
- ¹² St. Martha's Hospital Fund Campaign, Antigonish, "The Story of St. Martha's Hospital 1906-1925," n.d. [1925], p. 9.
- ¹³ Stanley Joel Reiser, *Medicine and the reign of technology*. Cambridge: Cambridge University Press, 1978, p. 153.
- ¹⁴ A.R. Shearer, ed., "Canadian Society of Laboratory Technologists: A Chronology 1937-1980," Unpublished mss., CSLT National Office, [1983]
- ¹⁵ PANS MG20, Vol. 197, Minutes of the Massachusetts-Halifax Health Commission, August 12, 1920.
- ¹⁶ D.J. MacKenzie, "The Origin and Development of a Medical Laboratory Service in Halifax," *Nova Scotia Medical Bulletin*, 43 (1964), pp. 182-183.
- ¹⁷ JHA 1924 and JHA 1925.
- ¹⁸ PANB RS 136, Records of the Deputy Minister of Health, File E5a, Roberts to Walsh, October 1, 1919.
- ¹⁹ Eagar's first wife, Constance Hill of Dartmouth was a nurse at the Victoria General Hospital. They were married on June 2, 1902, but Constance died just over three years later. For details of Dr. Eagar's life see the following volumes of *MMN*, 14 (1902), p. 221; 17 (1905), p. 381; 20 (1908), pp. 116, 480; 21 (1909), p. 75.
- ²⁰ VGHL, W.W. Kenney to P.A. Parker, December 22, 1911.
- ²¹ BOC, May 16, 1914 and MMB, November 24, 1919. Eager stayed in this position until 1926, see BOC, August 13, 1926.
- ²² W.W. Kenney to W.H. Eagar, November 10, 1919 in VGHL. In correspondence with the Hon. E.H. Armstrong, the Minister of Public Works and Mines, Kenney wrote that the VG

"will supply a *technician* [my emphasis] to this department ..." Kenney to Armstrong, November 26, 1919 in VGHL.

²³ W.W. Kenney to Mary Noonan, January 20, 1920, VGHL.

²⁴ W.W. Kenney to Dr. A.F. Miller, Superintendent, Nova Scotia Sanatorium, January 27, 1920 in VGHL. While unnamed, it is likely that the man was Michael MacInnis, who would serve as x-ray technician well into the 1940s. See BOC, June 2, 1943.

²⁵ *Acadian Recorder*, May 28, 1897; Colin D. Howell, *A Century of Care: A History of the Victoria General Hospital in Halifax 1887-1987*. Halifax: The Victoria General Hospital, 1988, pp. 30-31, 47, 60-61.

²⁶ While Puttner was undoubtedly respected, the Halifax Medical Society did raise the question of whether the x-ray department should be under the direction of a "competent medical X-Ray specialist, who has a thorough knowledge of anatomy and electro-therapeutics?" The inquiry encapsulates the growing trend toward placing this service, and others, under the direct control of medical authority. The VG's medical board did, however, respond to the inquiry in only a lukewarm fashion and the matter was dropped. Not until 1919 did the medical staff pass a resolution that the department be placed under the control of a medical radiologist. See MMB, entries for January 26, 1913 and July 15, 1919.

²⁷ Sheila M. Penney, *Inventing the Cure: Tuberculosis in 20th Century Nova Scotia*. Ph.D. dissertation, Dalhousie University, 1991, p. 85.

²⁸ PHAR, October 1922-September 1923.

²⁹ PHAR, October 1923-September 1924.

³⁰ Dharendra Verma suggested that "From 1914 to 1922, young women were trained in the laboratory to conduct a few simple tests. There was no definite pattern of training." Verma also suggested that "Young high school graduates were chosen by hospitals, shown how to perform various tests in the laboratory, and were appointed permanently as regular laboratory

technologists." Verma, *Medical Laboratory Technology Instruction in Nova Scotia*. MA Thesis, Saint Mary's University, 1968, pp. 5, 19. While no evidence could be found to refute or substantiate this assertion, it is a reasonable inference that the longer training course was in all likelihood intended for such young women.

³¹ W.W. Kenney to Dr. W. Eagar, November 4, 1924 in VGHL.

³² This material is drawn from the Barbara Keddy Fonds, Series 018, Social History of Nursing in Nova Scotia in the 1930s, held at PANS. I am grateful to Dr. Keddy for her permission to cite from this important collection.

³³ Keddy Fonds, Series 18, MF160-11, Interview with Greta MacPherson. When Keddy asked MacPherson about radiation exposure from doing the x-ray work, MacPherson replied that "I always blamed that for my infertility," suggesting the hazards associated with this work.

³⁴ Keddy Fonds, Series 018, MF160-10, Interview with Flora K. McDonald.

³⁵ Keddy Fonds, Series 018, MF160-2, Interview with Dorothy Allan.

³⁶ Keddy Fonds, Series 018, MF160-4, Interview with Clara M. Buffet.

³⁷ Keddy Fonds, Series 018, MF 160-10, Interview with Flora K. McDonald.

³⁸ Evangeline R. Pothier, *Mary Ann Watson and the Yarmouth Hospital*. [Yarmouth]: s.n. [1986], p. 52.

³⁹ George Weir, *Survey of Nursing Education in Canada*. Toronto: University of Toronto Press, 1932, p. 263.

⁴⁰ W.W. Kenney to Miss M.E. MacKay, October 30, 1925, in VGHL.

⁴¹ W.W. Kenney to Florence H. Merlin, November 29, 1924. See also Kenney to Eagar, November 4, 1924 and Kenney to Merlin, November 6, 1924, all in VGHL. The fact that MacDonald arrived unexpectedly arose out of the continuing confusion over who administered the laboratory. Merlin wrote directly to the laboratory director, Nicholls, to arrange for the course. Nicholls requested that she write to Kenney. In the meantime, the laboratory director

received a telegram saying that MacDonald was on her way. Kenney accommodated the nurse, but noted that the laboratory or x-ray departments could not "undertake any special or extraordinary obligations without the knowledge and consent of the executive of this hospital ..."

⁴² For examples of training in the x-ray department, see Kenney to Edmund MacDonald, Secretary, Harbour View Hospital, August 29, 1922, Kenney to J.S. Calder, Superintendent, City of Sydney Hospital, January 21, 1924 and Kenney to Dr. J.K. MacLeod, January 22, 1924, all in VGHL. A course in hospital pharmacy work would not be offered until the early 1930s. See BOC, April 24, 1931, May 8, 1931 and May 21, 1931.

⁴³ *Echo* (Halifax), March 20, 1925.

⁴⁴ W.W. Kenney to Dr. W. Eagar, November 4, 1924 in VGHL. In another instance Kenney wrote in early 1924 that the hospital "felt for a long while that it was perhaps one of our public duties to assist in any way we possibly could the smaller hospitals of the province ..." Kenney to Miss J.S. Calder, Superintendent, City of Sydney Hospital, January 21, 1924 in VGHL.

⁴⁵ Kenney to A.G. Nicholls, November 17, 1925 in VGHL.

⁴⁶ BOC, November 12, 1925.

⁴⁷ Kenney to Eagar, November 13, 1925 in VGHL and BOC November 25, 1925. Eagar negotiated a fee of \$30 for his part, but Nicholls requested a larger sum. Correspondence does not record what amount was ultimately negotiated by Nicholls. See Kenney to Miss M.E. MacKay, November 16, 1925, Kenney to Eagar, November 19, 1925, Kenney to Eagar, November 26, 1925 and Kenney to Nicholls, December 1, 1925, all in VGHL.

⁴⁸ Susan Reverby, "'Neither for the Drawing Room nor the Kitchen': Private Duty Nursing in Boston, 1873-1920," in Judith Walzer Leavitt and Ronald L. Numbers, eds., *Sickness and Health America: Readings in the History of Medicine and Public Health*. Madison: University of Wisconsin Press, 1997, p. 260.

⁴⁹ B[oris] Babkin to A. Stanley MacKenzie, September 9, 1925; Babkin to MacKenzie, September 28, 1925; Miss Harris to Babkin, January 6, 1926; Babkin to Harris, April 30, 1926; all in DUAPO, A-606.

⁵⁰ Babkin to MacKenzie, September 4, 1926; Babkin to MacKenzie, September 11, 1926; Babkin to Miss Harris, September 27, 1926; Babkin to MacKenzie, May 1, 1927; Babkin to MacKenzie, September 15, 1927; E.W.H. Cruickshank to MacKenzie, March 13, 1929; Cruickshank to MacKenzie, April 18, 1929; all in DUAPO, A-606.

⁵¹ Cruickshank to MacKenzie, April 18, 1929 and MacKenzie to Cruickshank, April 29, 1929; in DUAPO, A-606.

⁵² C.W. Startup to Miss Harper, July 3, 1929; Startup to Harper, August 19, 1929; in DUAPO, A-606.

⁵³ Information on all these individuals may be found in DUAPO, A-606.

⁵⁴ E. Gordon Young to A.S. MacKenzie, October 3, 1923 and MacKenzie to Young, November 9, 1923 in DUAPO, A-597. The emphasis on the gender, which is mine, may be significant given the evidence that men were to be employed in the biochem lab through the 1920s and 1930s.

⁵⁵ Young to MacKenzie, November 28, 1923 in DUAPO, A-597.

⁵⁶ Young to Professor H.R. Theakston, February 24, 1926; Young to MacKenzie, January 26, 1927; MacKenzie to Young, March 2, 1927; Young to MacKenzie, September 14, 1927; Young to MacKenzie, October 28, 1928; Young to H.L. Harper, June 28, 1929; all in DUAPO, A-597.

⁵⁷ Young to Harper, September 12, 1929; Young to Harper, October 28, 1929; MacKenzie to Young, November 1, 1929; Young to MacKenzie, November 12, 1929; MacKenzie to Young, April 14, 1930; Young to Miss H. Joyce Harris, September 25, 1930; Young to MacKenzie, March 18, 1931; MacKenzie to Young, March 24, 1931; all in DUAPO, A-597.

⁵⁸ Young to Carleton W. Stanley, October 6, 1931; in DUAPO, A-597.

⁵⁹ Young to H.G. Grant, November 2, 1939; in DUAPO, A-597.

⁶⁰ See E. W.H. Cruickshank to Carleton Stanley, December 8, 1931; Stanley to Cruickshank, December 11, 1931; Cruickshank to Stanley, March 21, 1932; Stanley to Cruickshank, March 22, 1932; Cruickshank to Stanley, October 4, 1932; H.G. Grant to Stanley, June 3, 1937; all in DUAPO, A-606.

⁶¹ E.W.H. Cruickshank to the President, December 8, 1931 and Carleton Stanley to Cruickshank, December 11, 1931, both in DUAPO, A-606.

⁶² Cruickshank to President, October 4, 1932 in DUAPO, A-606. Howitt's eldest son, incidentally, was also employed in the medical school, working for Dr. N.B. Dreyer of the physiology department.

⁶³ In 1931-32, the medical school expended almost \$1100 for assistants in anatomy, \$750 for biochemistry, \$1130 for pathology, \$570 for pharmacy and \$573 for physiology. See "Analysis of Medical School Costs," June 30, 1932; in DUAPO, A-575. Occasionally, "technical assistants" were supported through grants. Donald Maitland of the department of anatomy received a grant from the Banting Research Foundation and he chose to employ his wife, who had experience measuring the size of nuclei and cells. See Donald Maitland to Carleton Stanley, November 15, 1931; in DUAPO, A-595.

⁶⁴ JHA 1922.

⁶⁵ PANS MG20, Vol. 197. Minutes of the Massachusetts-Halifax Health Commission, June 2, 1921, and August 30, 1922.

⁶⁶ PANS MG20, Vol. 197. Minutes of the Massachusetts-Halifax Health Commission, August 8, 1923 and PHAR, 1922-23.

⁶⁷ BOC, May 31, 1923.

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- ⁶⁸ A.G. Nicholls to A.S. MacKenzie, May 9, 1923, DUAPO, A-817 and BOC, May 31, 1923; *Nova Scotia Medical Bulletin*, 5, 11 (November 1926), p. 36 and 6, 9 (September 1927), p. 35. See also Enid Johnson MacLeod, *Petticoat Doctors: The First Forty Years of Women in Medicine at Dalhousie University*. Porter's Lake: Pottersfield Press, 1990, pp. 90-91. The entry for Chase records nothing of her work in the laboratory, however.
- ⁶⁹ This account is based upon MacLeod, *Petticoat Doctors*, pp. 9-91.
- ⁷⁰ Murray, incidentally, worked as a demonstrator in anatomy for a brief period before leaving for Korea.
- ⁷¹ Kinnear, *In Subordination*, p. 61.
- ⁷² Regina Markell Morantz-Sanchez, *Sympathy and Science: Women Physicians in American Medicine*. New York: Oxford University Press, 1985, pp. 61-62.
- ⁷³ BOC, August [?], 1924 and W.W. Kenney to A.G. Nicholls, December 3, 1924 and Kenney to Nicholls December 30, 1924, both in VGHL.
- ⁷⁴ BOC, Sept 23, 1925.
- ⁷⁵ BOC, Sept 23, 1925 and W.W. Kenney to A.G. Nicholls, Sept 24, 1925, in VGHL.
- ⁷⁶ BOC, August [?], 1924 and December 29, 1924. W.W. Kenney to A.G. Nicholls, December 30, 1924, in VGHL.
- ⁷⁷ W.W. Kenney to A.G. Nicholls, December 3, 1924 and W.W. Kenney to Mrs. J. Nelson Gowanloch, December 3, 1924, both in VGHL.
- ⁷⁸ "Memo re: Staff Pathological Department. Victoria General Hospital," October 1926, DUAPO, A-817.
- ⁷⁹ BOC, November 25, 1925.
- ⁸⁰ A.G. Nicholls to A.S. MacKenzie, September 3, 1924, in DUAPO, A-817. Robinson later registered as a student in histology, and Nicholls again exacted a tuition exemption from Dalhousie, apparently in exchange for her work as a laboratory assistant in bacteriology.

Robinson, Nicholls wrote, "will be very useful in this particular and will well earn the amount in question." See A.G. Nicholls to Prof. Murray MacNeill, September 15, 1926, in DUAPO, A-817.

⁸¹ "Memo re: Staff Pathological Department. Victoria General Hospital," October 1926, DUAPO, A-817. When Robinson registered as a student in histology, Nicholls again exacted a tuition exemption from Dalhousie, apparently in exchange for her work as a laboratory assistant in bacteriology. Robinson, Nicholls wrote, "will be very useful in this particular and will well earn the amount in question." See DUAPO, A-817, A.G. Nicholls to Prof. Murray MacNeill, September 15, 1926.

⁸² BOC, February 12, 1931.

⁸³ BOC, November 25, 1925.

⁸⁴ "Memo re: Staff Pathological Department. Victoria General Hospital," October 1926, DUAPO, A-817. In 1930, Pathology Director Ralph P. Smith requested a full-time assistant, which was rejected by the Medical Board of the hospital. Dalhousie apparently wanted Smith to devote more time to the medical school, a stance the hospital rejected outright. The medical board explained "that the Hospital would have the first claim on the Pathologist's time, and that the University would accept what time the Pathologist had to give after he had rendered full service to the position of Provincial Pathologist, and the Board was of the opinion that if this understanding was fully implemented there would be no necessity for a full time assistant ..."
BOC, February 24, 1930.

⁸⁵ JHA 1929.

⁸⁶ Dalhousie University Student Registers, DUA.

⁸⁷ JHA 1931.

⁸⁸ JHA 1939.

⁸⁹ JHA 1935 and JHA 1936.

⁹⁰ Interview with Rose Phillips.

⁹¹ BOC, January 18, 1933.

⁹² Interview with Edna Williams.

⁹³ Interview with Rose Phillips.

⁹⁴ It is not clear from the reference whether the assistants and learners were the same people, or whether there was a distinction being made between the two. Certainly, with the training that was going on in the Saint John facility in this period, learners could also have been unpaid assistants. See NBARMH, October 31, 1933.

⁹⁵ Annual Report of the Bureau of Laboratories Year Ending October 31, 1936 in NBARMH.

⁹⁶ CSLT membership files.

⁹⁷ Annual Report of the Bureau of Laboratories Year Ending October 31, 1934 in NBARMH. The report notes the addition of several additional volunteers, while one of the previous year's volunteers left to assume a position at Amherst's Highland View Hospital.

⁹⁸ Annual Report for the Bureau of Laboratories Year Ending October 31, 1937 in NBARMH. Two "apprentices" from the previous year -- Constance Fewings and Frances Crocker -- were added to the staff of the Saint John facility in 1936-37.

⁹⁹ *New Brunswick Public Accounts*. Crocker resigned in 1938-39 to return to her native Fredericton. See Annual Report of the Bureau of Laboratories Year Ending October 31, 1939 in NBARMH.

¹⁰⁰ Annual Report of the Bureau of Laboratories Year Ending October 31, 1936 in NBARMH. The annual report for 1935-36 clearly identifies Pelton as "voluntary member of the staff" for the two previous years, but the *Public Accounts* reveal that she did, in fact, earn some income the previous year, the small sum of \$118.68 in 1934-35. Pelton was initially paid for "lab services", then named a "lab assistant" before becoming the "senior technician". See *New Brunswick Public Accounts*.

¹⁰¹ PANB RS 136, File A1a, "The New Brunswick Department of Health," June 2, 1930.

¹⁰² NBARMH October 31, 1933.

¹⁰³ NBARMH October 31, 1933.

¹⁰⁴ PANB RS 136, Records of the Deputy Minister of Health, File E5a, William F. Roberts to Sister Superior Walsh, October 1, 1919.

¹⁰⁵ *New Brunswick Public Accounts* recorded that Fleming earned \$1000 in 1919-20, \$1200 in 1920-21 which was increased to \$1350 in 1923-24 and \$1500 in 1924-25, the figure she earned until retirement. See also NBARMH, October 31, 1929.

¹⁰⁶ *Pharos* 1930, p. 35.

¹⁰⁷ CSLT membership file.

¹⁰⁸ *New Brunswick Public Accounts* 1934-35.

¹⁰⁹ NBARMH, October 31, 1935.

¹¹⁰ NBARMH, October 31, 1935.

¹¹¹ *New Brunswick Public Accounts*. This figure is suggestive, because it works out to \$50 per month. There is every possibility that he was paid the same amount in the previous three years, but only worked for one, six, and five months, respectively. His salary increased to \$660 the following year, but beginning in 1939-40, the sums diminished greatly, and it would appear that Stewart performed only selected tests for the Bureau of Laboratories.

¹¹² NBARMH, October 31, 1935.

¹¹³ *New Brunswick Public Accounts*.

¹¹⁴ CSLT membership files.

¹¹⁵ See *Public Accounts* and Annual Report of the Bureau of Laboratories Year Ending October 31, 1936 in NBARMH. Incidentally, when she resigned, Mullins was replaced by Sybil Pelton, who had served as a volunteer for two years previously.

¹¹⁶ CSLT membership files.

¹¹⁷ A.R. Shearer to Gloria D. Gould, July 12, 1973 and Shearer to McGeouch, August 7, 1973 in CSLT.

¹¹⁸ *New Brunswick Public Accounts*.

¹¹⁹ Annual Report of the Bureau of Laboratories Year Ending October 31, 1942 in NBARMH.

¹²⁰ Burns described himself as "Chief Technician" in his application to the CSLT. This designation does not appear in the *Public Accounts*. Burns was described variously as the laboratory assistant and paid for laboratory services. Nevertheless, he was the highest paid worker in the laboratory until his departure, which bolsters his claim.

¹²¹ CSLT membership files.

¹²² *New Brunswick Public Accounts* and Annual Report of the Bureau of Laboratories Year Ending October 31, 1939 in NBARMH.

¹²³ *New Brunswick Public Accounts* and Annual Report of the Bureau of Laboratories Year Ending October 31, 1942 in NBARMH. On the difficulty of maintaining an adequate staffing complement during the war, see Annual Report of the Bureau of Laboratories Year Ending October 31, 1941 in NBARMH.

¹²⁴ Susan Porter Benson, in her work on department store sales clerks has written that:

Workers and managers carry in their heads a cultural map of the work world which balkanizes it into enclaves according to sex, age, ethnicity, race, and class. But this map cannot predict what any individual will do for a living. Virtually no woman job-seeker between 1890 and 1940 had a statistician's grasp of the opportunities nor, even if she had, would she have based her decision on quantifiable variables alone. Her personal needs and inclinations guided her along with gossip about good jobs, good bosses, good workplaces, and available openings that circulated in family, neighborhood, and peer networks.

Benson, *Counter Cultures: Saleswomen, Managers, and Customers in American Department Stores 1890-1940*. Urbana: University of Illinois Press, 1986, pp. 181-182. In Canada, Cecelia Reynolds has explored how gender, ethnicity and class affected not only individual's decision to enter teaching, but also their place within the educational hierarchy for the period 1930 to

1980. Reynolds, "Naming the Experience: Women, Men and Their Changing Work Lives as Teachers and Principals," Ph.D. dissertation, University of Toronto, 1987.

¹²⁵ Interview with Rose Phillips.

¹²⁶ Interview with Rose Phillips.

¹²⁷ Interview with Edna Williams.

¹²⁸ Interview with Ellen Robinson.

¹²⁹ Ibid.

¹³⁰ CSLT membership files.

¹³¹ BOC, February 12, 1931.

¹³² See *Public Accounts*, JHA 1926.

¹³³ W.W. Kenney to A.G. Nicholls, December 3, 1924 and W.W. Kenney to Mrs. J. Nelson Gowanloch, December 3, 1924, both in VGHL.

¹³⁴ Ibid.

¹³⁵ Gowanloch graduated from Rush Medical College in New York in August 1929, and interned at the Metropolitan and Bellevue Hospitals. She enrolled in Rush under her maiden name of Ross. See DUAPO, Staff Files, "Gowanloch, L.R."

¹³⁶ See Henry Roper, "Two Scandals in Academe," in *Collections of the Royal Nova Scotia Historical Society*, 43, (1991): 127-145.

¹³⁷ Interview with Edna Williams.

¹³⁸ Ibid.

¹³⁹ CSLT membership files and Interview with Laura Piers.

¹⁴⁰ CSLT membership files.

¹⁴¹ CSLT membership files.

¹⁴² CSLT membership files.

¹⁴³ CSLT membership files.

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- ¹⁴⁴ The best context for the war years is Ruth Roach Pierson, *"They're Still Women After All": The Second World War and Canadian Womanhood*. Toronto: McClelland and Stewart, 1986.
- ¹⁴⁵ Interview with Edna Williams.
- ¹⁴⁶ Minutes of the CSLT Executive Meeting, December 14, 1940 and *CJMT*, 2 (1940). The Royal Canadian Air Force ran an advertisement for twelve workers in this edition. Enlistees were promised "rapid advancement to corporal and sergeant." See also Andrew Blackwell, "A Military Hospital Laboratory," *CJMT*, 6 (1944).
- ¹⁴⁷ Minutes of the CSLT Executive Meeting, May 4, 1940.
- ¹⁴⁸ Letter to the Editor from Eleanore Siekawitch, General Hospital, Moose Jaw, Saskatchewan in *CJMT*, 2 (1940), p. 146.
- ¹⁴⁹ CSLT Annual General Meeting (hereafter AGM), June 13, 1942 and AGM, May 29, 1943.
- ¹⁵⁰ G.H. Agnew and W.J. Deadman to the Directors of Medical Service for the Navy (Surgeon Captain A. McCalum), Army (Brigadier G.B. Chisholm) and Air Force (Air Commodore R.W. Ryan), reproduced in Minutes of CSLT Executive, October 17, 1942.
- ¹⁵¹ AGM, May 20, 1944. For one perspective on laboratory services during war, see F.W. Bowman, "Laboratory Work in the Field," *CJMT*, 2 (December 1939), pp. 34-35.
- ¹⁵² Minutes of Canadian Medical Association Executive Committee, Ottawa, October 30-31, 1941.
- ¹⁵³ G.H. Agnew and W.J. Deadman to the Directors of Medical Service for the Navy (Surgeon Captain A. McCalum), Army (Brigadier G.B. Chisholm) and Air Force (Air Commodore R.W. Ryan), reproduced in Minutes of CSLT Executive, October 17, 1942.
- ¹⁵⁴ Minutes of the CSLT Executive, March 11, 1944.
- ¹⁵⁵ Minutes of the CSLT Executive, Detailed Agenda, December 7, 1952.
- ¹⁵⁶ AGM, June 1, 1946 and AGM, May 31, 1947. The Grenfell Association, founded by Wilfred Grenfell in 1895, provided medical services in northern Newfoundland and Labrador. See Ronald Rompkey, *Grenfell of Labrador: A Biography*. Toronto: University of Toronto

Press, 1991, particularly part four. For the broader context, see Peter Neary, *Newfoundland in the North Atlantic World 1929-1949*. Montreal: McGill-Queen's University Press, 1988, pp. 52-54.

¹⁵⁷ Minutes of the CSLT Executive, May 27, 1951. In that year, there were 57 approved schools across the country training laboratory workers, with an annual enrollment of about 175. The CSLT estimated that an additional two thousand technicians would be required by 1960, suggesting a shortfall of about 800.

¹⁵⁸ Minutes of the CSLT Executive, May 27, 1951.

¹⁵⁹ Interviews with Rose Phillips and Edna Williams.

¹⁶⁰ Recently, Joan Sangster has suggested that:

The knowledge that a marriage bar existed -- at least until the Second World War and in some factories until the 1950s -- also put closure on the women's mental images of job change. This marriage bar was so pervasive in the local industries that some women believed 'that was the law then.' Moreover, the hostility sometimes directed by co-workers towards pregnant or married women (who in one factory were referred to as 'money grubbers') did not encourage resistance to this barrier.

Sangster, *Earning Respect: The Lives of Working Women in Small-Town Ontario, 1920-1960*.

Toronto: University of Toronto Press, 1995, p. 78.

¹⁶¹ CSLT registry files.

¹⁶² Cynthia Cockburn, *Machinery of Dominance: Women, Men, and Technical Know-How*.

Boston: Northwestern University Press, 1988, p. 136.

¹⁶³ Bettina Bradbury, *Working Families: Age, Gender and Daily Survival in Industrializing Montreal*. Toronto: McClelland and Stewart, 1993, p. 52.

¹⁶⁴ AGM, May 19, 1952.

¹⁶⁵ Minutes of the CSLT Executive, May 27, 1951. The appeal for men also occurred in the early years of the twentieth century in Ontario's public schools. There school boards were encouraged to pay higher salaries to men to retain them, thereby ensuring the "quality of education" for older boys. See Susan Gelman, "The 'Feminization' of the High Schools?"

Women Secondary School Teachers in Toronto: 1871-1930," *Historical Studies in Education / Revue D'Histoire de L'Education*, 2 (1990): 119-148. Within health care, physiotherapy underwent a similar debate in the 1950s and 1960s, suggesting that recruiting men would enhance the professional status of physiotherapy. See Ruby Heap, "Physiotherapy's Quest for Professional Status in Ontario, 1950-80," in *Canadian Bulletin of Medical History*, 12 (1995), p. 73.

¹⁶⁶ AGM, May 19, 1952.

¹⁶⁷ Sangster, *Earning Respect*, p. 74. While the importance of family wage ideology is unquestioned, wages were, as Bettina Bradbury has suggested, "seldom the only source of survival" for families. See Bradbury, *Working Families*, p. 48.

¹⁶⁸ David Montgomery, *The Fall of the House of Labor: The workplace, the state and American labor activism, 1865-1925*. Cambridge: Cambridge University Press, 1987, p. 239. See also Montgomery, *Workers control in America: Studies in the history of work, technology, and labor struggles*. Cambridge: Cambridge University Press, 1979, pp. 32-33.

Chapter 4:
Diversity in the Laboratory

"Oh she's a gal who fares far worse
Than any stiff-starched graduate nurse."¹

As Canadian hospitals grew in number and bed capacity over the opening decades of the twentieth century, they also grew in complexity. New services were added, including departments such as dietetics, formal x-ray departments, physiotherapy and, of course, expanded laboratory facilities. The expansion of the Canadian hospital and new opportunities for health care workers should not, however, lead one to conclude that there was necessarily a trend toward specialization. This chapter suggests that a variety of factors shaped the work environment of not just laboratory workers, but all hospital workers. The demands of patients and physicians for enhanced services, the constraints of budgets or recruitment and the interests and desires of workers themselves combined to order the work-life of the hospital. The resulting discussions of appropriate work and the maintenance of distinctions between occupational groupings suggests the importance of understanding the interrelationship among hospital workers (and services), instead of treating them as discrete groups that happen to occupy the same building.

I -- SALARIES, MOBILITY AND RETENTION

Laboratory workers endured wage reductions during the Depression, but the period suggests the variability of workers in different employment situations and across the country. Salary reductions, for example, were

removed from workers in the public health lab in 1935, but this did not extend to workers in the pathological laboratory.² There were other differences in salary as well. Workers in the public health laboratory were generally paid more than those who worked in the pathology laboratory, and not until September 1, 1939 was parity achieved.³ In New Brunswick, the passage of a Civil Service Act in 1944 was hailed by the Bureau of Laboratories as a measure that "should enable us to attract and keep technicians" by offering a standardized starting wage and scheduled increments. "More than anything else" the *Annual Report* mentioned, "it has produced a feeling of stability and permanence which was lacking before."⁴ Attrition through marriage, the lure of the United States and better paid opportunities elsewhere in Canada complicated the issue of staff retention for Maritime laboratory directors. The CSLT, still struggling to carve out an identity in the 1940s, also became concerned with the ebb and flow of its membership.

In the 1940s, the issue of salary standardization became important for the CSLT.⁵ The Maritimes had a particular interest in this issue. CSLT members from New Brunswick wrote that the Department of Health in that province was falling behind not only other provinces, but also behind the rates paid at "smaller hospital laboratories" within that province. Evidence from Nova Scotia supports the claim.⁶ A combined technician earned \$80 a month at Dawson Memorial Hospital in Bridgewater, Nova Scotia in 1941. The next year, the technician re-located to Halifax to pursue general laboratory work at the Pathological Laboratory. Her salary remained at \$80, although she no longer received her meals, room or laundry as she had in Bridgewater. Thus, at a glance, it would seem that her real salary had been reduced by the move to

the port city. Any reduction was, however, likely offset by the reality that she returned to her parental home.⁷ Others might not have been so lucky. In 1941, a technician with three years experience earned \$73 a month in the Saint John laboratory, with no meals or room.⁸ In 1942, the New Brunswick laboratory director noted that high salaries elsewhere meant that New Brunswick could only retain "local girls" once they had completed their course and passed the examinations.⁹ The comment suggests that poor salaries and opportunities elsewhere limited the ability to recruit workers to fill vacancies.

In 1942, the Canadian Hospital Council studied 230 representative hospitals across the country and then divided the hospitals into categories based on bed capacity.¹⁰ While the survey had 230 responses, there were well over seven hundred hospitals in 1942,¹¹ so the sample was small. Much of the data was based on very few respondents, in some instances only one questionnaire was returned. The data, presented in Table 4.1, was adjusted for maintenance such as meals and rooms and also excluded the very small salaries earned by religious orders. There was tremendous variation in the wages offered to various workers not just according to hospital size, but also variation according to residence. For example, kitchen help in the smallest hospitals were paid as low as \$10 a month in one Saskatchewan hospital, while a hospital in Quebec paid \$40 for the same work. Only two hospitals in the 26-50 bed range reported housekeepers, and the salaries were \$18 and \$65 respectively. Local economies, the variety of demands on workers and the patient load of the hospital established what a worker would be paid. There is, then, a need to situate workers in their regional context. While hospital development occurred across Canada, it showed tremendous variation

depending on the institution (and its clientele), its setting (rural or urban), and its size. Salaries for technicians in hospitals of between 51 and 100 beds ranged from \$60 with full maintenance to \$125 with one meal. Regional averages, however, showed only slight variation. The Maritimes averaged \$75.45, Ontario \$76.25, while the Prairies averaged \$73.50.

In 1943, Dr. Arnold Branch, the Director of the Provincial Laboratory, submitted a letter supporting the demands of New Brunswick workers.

Branch's letter was read into the CSLT minutes:

From a purely selfish point of view it is becoming increasingly difficult for me to retain our girls or employ new trained staff. We have never been able to engage other than local girls who can live at home, as the initial salary we pay is not enough for anyone dependent on boarding out and the maximum reached after six years is about what the minimum should be.¹²

Dr. Branch renewed his complaints about New Brunswick salaries the next year in Toronto.¹³ In 1944, he was joined by his Nova Scotian counterpart, Dr. Ralph P. Smith. Reporting to the General Council of the Canadian Medical Association in 1944, Dr. Smith requested a survey of technician salaries across the country. The results suggested that workers in the Maritimes were paid at a "much lower" rate than their counterparts elsewhere in the Dominion.¹⁴ CSLT President Frank J. Elliott wrote to J.A. Doucet, the New Brunswick Minister of Labour and Health that he found it "difficult to understand how technicians in New Brunswick can be expected to clothe themselves and pay living expenses, etc., on the salaries which they are now receiving. I do not know how the Directors of your laboratories can keep their trained staff, or replace them when they leave, for I am sure you must be losing a number of well trained

Table 4.1
Monthly wages for selected workers in Canadian hospitals, 1942

Job Title	Number of Beds				
	Up to 25	26-50	51-100	101-200	201+
Superintendent	\$73.50	\$103.50	\$138.75	\$174.00	n/a
Assistant Superintendent	\$70.00	\$76.50	n/a	\$103.75	\$287.66
Business Manager		\$118.00	\$139.00	n/a	\$241.00
Accountant		\$74.50	\$77.50	\$96.50	\$166.00
Nursing Superintendent	n/a	n/a	\$125.00	\$126.56	\$176.00
Assistant Nursing Superintendent				n/a	\$118.50
Instructress		\$70.00	\$84.45	\$95.00	\$113.55
Night Supervisor		\$67.00	\$73.00	\$82.00	\$96.50
OR Supervisor		\$72.30	\$76.00	\$86.90	\$104.40
Obstetrical Supervisor		\$71.66	\$71.50	\$78.90	\$96.50
Other Supervisors			\$62.66	\$71.00	\$79.50
Graduate Nurses	\$53.50	\$61.85	\$57.00	\$55.90	\$59.35
Technicians		\$78.75	\$75.45		
Radiology Assistant					\$213.45
Radiology Technician				\$74.60	\$82.30
Radiology Chief Technician					\$143.25
Pathology Technician				\$67.00	\$83.25
Medical Record Librarian			\$70.00	\$68.20	\$92.90
Dietitian		\$64.80	\$66.90	\$80.95	\$104.45
Kitchen Help	\$23.90	\$23.30	\$23.20	\$25.85	\$43.70
Housekeeper	\$30.00	\$41.50		\$40.45	\$70.30
Janitor	\$43.20	\$72.25	\$82.50		
Maids	\$16.95	\$20.70	\$23.25	\$19.35	\$26-32
Orderlies	\$35.00	n/a	\$46.00	\$48-61	\$56-66

Source: *Canadian Hospital*, 19 (October 1942): 44-50 and *Canadian Hospital*, 19 (November 1942): 34-40. Blanks in the table indicate that the job described was not present at the reporting hospitals. Where insufficient data was reported (even though the position was present), n/a has been used.

technicians."¹⁵ A Saint John worker wrote in the early 1950s that new recruits were discouraged from laboratory work because of the inadequate wages, and suggested to her confidante that "they weren't like us -- we had to pay board in the city and buy everything with not a penny paid."¹⁶ With expanding opportunities for employment in the post-war world, perhaps the new recruits were weighing a laboratory career, with its low salary and limited opportunity for advancement, more carefully.

There is little doubt that retaining staff was difficult for Maritime hospitals. Laboratory workers in medium-sized hospitals showed remarkable variation in the 1942 survey, while regional variations were not significant. Given the exasperation of Maritime laboratory directors and the small survey sample, it is likely that the survey simply under-reported regional discrepancies. There was the lure of the United States and other parts of Canada. Even within a province, some hospitals paid better than others. Opportunities were plentiful and laboratory workers frequently pursued better positions. Neither the Canadian Medical Association nor the CSLT thought they could do anything about the disparity across the country. Nevertheless, the head office of the CSLT suggested that laboratory workers enduring low wages "leave and take ot[h]er positions at higher salaries thus making it imperative that the employees salaries be raised in order to bring in an adequately trained staff to do this work."¹⁷

While local economies, patient load and the variety of work performed all affected worker salaries, other factors worked in favour of retaining laboratory staff in Maritime hospitals. There was a desire to stay close to home for some, either so they could contribute to the maintenance of the family or, at the very

least, avoid paying room and board. Many laboratories, as directors were quick to point out, employed mostly "local girls." While the directors viewed this as a sign of their inability to recruit outsiders to the positions, for the women themselves the option to work close to home was a happy one. As a Middleton nurse reminded advocates of university education for all nurses, small hospitals offered young women the chance to become nurses "almost within the shelter of their homes."¹⁸ The decision to stay or leave a position was not always motivated by better wages.

II -- THE COMPLEXITY OF WORK

Work in the laboratory was complex and the staff was acknowledged to be making a valuable contribution to patient services and public health. At the Morris Street laboratories, and in Saint John, wages compared favourably to those of the Dalhousie laboratories. But these were not young "laboratory boys." Rather, they were workers who invested some time in education and some years in training and acquiring skills at the bench. There was also a baffling array of personnel within any one laboratory. A worker at the federally-operated Lancaster Hospital in New Brunswick wrote that there were "nine technicians, three laboratory helpers, three students, a biochemist and a research assistant" by the end of the 1940s.¹⁹

In 1936, the Bureau of Laboratories in New Brunswick acknowledged the "loyalty, technical ability and conscientiousness" of the workers who were working under an increasing burden of tests.²⁰ In the same year that Phyllis Evanston received the much needed assistance, the annual report suggests that workers took responsibility for individual aspects of the laboratory work.

Rachel Hunter and Dorothy Jakeman worked in serology, Cathy Arnold was responsible for histological work, Evelyn Russell for chemistry, Jean Hayes in haematology and Margaret Bryden and Dorothy Tapley shared the heavy workload in bacteriology.²¹ The experience of these individuals varied. Hunter had several years experience by the early 1940s while her co-worker in the bacteriology section, Dorothy Jakeman, was a fairly recent appointment. The workers were variously described as technicians, assistants or paid for "services." The exception to this was Bryden, who was described in the public accounts as a bacteriologist, as was her predecessor Patricia Carew.

It is exceedingly difficult to interpret the meaning of these designations, to completely understand exactly what work individuals performed. Some workers are more readily identified. Caretaker services, stenographers, cleaners of various types, painters and others are recorded in the annual public accounts. But "lab services" or "lab assistant" are decidedly ambiguous terms. Clearly, it included technical work. But in 1944 when the Saint John lab appointed Mae Bell in the glassware department, her work was deemed to be "laboratory services" as well, while the next year she was acknowledged as a lab assistant.²² Was she performing tests or cleaning glassware for the laboratory? The historical record is not sufficiently complete to draw a conclusion. What is important to acknowledge is that workers did not always perform discrete tasks.

Miss Isabel Robinson presents an interesting case both because of her peripatetic journey through the Halifax laboratory and the work she performed. She held "temporary appointments" for many years and provided "valuable services" preparing diagnostic outfits and as a relief stenographer.²³ Robinson's

presence reminds us not to draw too sharp a distinction between clerical and "technical" workers in these early decades. Further cautionary evidence comes from Deborah Henderson, who worked at the Victoria General Hospital as a "Stenographer Path Tech" in September 1925. Such a designation appears to be largely arbitrary, however. Payroll records list Henderson as a Stenographer Path Tech on July 15, 1927, but in the very next payroll period, ending July 31, she was designated a pathological technician.²⁴ Later in 1927, she was described as a "part time technician" at the laboratory.²⁵ In Saint John, Dorothy Jakeman's first foray into the lab was in 1939-40, when she earned slightly over \$45 for relieving the caretaker during his illness. The following year, she joined the staff as "lab technician."²⁶

The examples of Robinson, Henderson and Jakeman demonstrate that the rhythm of the laboratory was a fluid one for the workers. When the public health lab for Nova Scotia was hived off from the pathological laboratory in 1926, the hospital lab workers lost their stenographer. Typing duties fell to the workers. Margaret Rogers was fresh from high school and therefore several years younger than her co-workers. Not surprisingly, she was assigned responsibility for typing all the pathological reports on specimens. The laboratory no longer had a dedicated stenographer or typist, which meant that when Rogers was out -- as she was once with an extended middle-ear infection -- these duties fell to other workers. Sixty years later, Ellen Robinson suggested "I could *still* type those [reports]. ... I used to start with the gross and histological appearances of such-and-such ..."²⁷ And while short, many reports had to be sent out the same day that a specimen was received. Writing in 1950, the head technician of the Cape Breton Public Health Laboratory wrote "well,

among other jobs here I am doing all the typing of reports. I typed 23 letters alone before 9 a.m. the other morning. It is just 7.30 a.m. now. This getting up at 5.45 am. isn't so hot, believe me. ... I have a lot of reports to type so they can catch the mail going out at 10 so I'd better hike."²⁸ Reports were the productive unit of the laboratory, the essential link between the science of the laboratory and the clinical diagnosis or management of the case. Though essential, the onerous production of the reports, which was as critical as the actual laboratory analysis insofar as it communicated information to attending physicians, fell to the workers in what was a familiar pattern of multi-tasking.

III -- MULTI-TASKING

Typing and record keeping were part of the work for most laboratory workers, but occasionally the demands extended to responsibility for other entire services. No less an authority than *Canadian Hospital* suggested in 1930 that in smaller hospitals, pharmacists may also perform selected laboratory tests or serve as the x-ray technician for the hospital.²⁹ When one man began his career in 1920, his day would be spent dispensing in the morning, developing x-ray films for an hour, while the afternoon was spent in the laboratory.³⁰ The hospital where he worked -- County of Carleton General Protestant Hospital in Ottawa -- had an average capacity of 180 patients, so it was a larger hospital. Many workers performed lab analyses in addition to other duties in the pharmacy, as nurses or in other services such as dietetics or x-ray. Alice Thorngate, in her published personal narrative, offers a clear illustration of the variety of roles laboratory workers filled:

Times were rough in the 1930s and laboratory jobs were especially hard to come by. I tried various kinds of work while waiting for something

in the laboratory field to open up. ... Eventually I found a position as technician and general office girl in a doctor's office in central Wisconsin. Beside doing blood counts and examining urine specimens, I took simple x-rays, acted as receptionist, kept the books, took care of correspondence, made out insurance forms and did surgical dressings on fingers and toes.³¹

When the Chipman Memorial Hospital appointed an anesthetist in 1922, they sent one of their own nursing graduates Miss Margie Fitzpatrick, to Lakeside Hospital in Cleveland Ohio, to pursue training. Fitzpatrick, who had been working in Arizona as a nurse, returned to Chipman in October following receipt of her anesthetist diploma. When the laboratory equipment was upgraded at a cost of several hundred dollars the same year, responsibility for the work fell to Miss Fitzpatrick. On January 29, 1921, Fitzpatrick had graduated with her classmates in the Chipman Town Council chambers. In the two years that followed, she had gone to Arizona to nurse, Cleveland to further her training, and back to Chipman, where she assumed responsibility for laboratory and anesthesia work!³² The path from training, to appointment as a nurse, to work in other services was a familiar one through the 1920s, 30s and into the 1940s.

Irene Mellish was born in Halifax in 1909, the eldest of six daughters. Her father had wanted to be a physician, but worked instead for the local Bible Society. Mellish pursued nurses training at the Victoria General Hospital, beginning in September 1929, after completing her Grade 10 education. Mellish would later become the Superintendent of Eastern Kings Memorial Hospital in 1942, where she would remain for twenty-five years. She "was responsible for management of the whole hospital, right from the top right down to the bottom, lowly janitor. ... we didn't have a pharmacist, we didn't have a dietitian. ... [We had] nurses and cleaning staff."³³ With such a limited

staff, it is not surprising that workers fulfilled multiple roles in a variety of services.

Mary Kathleen Murphy was born on February 1, 1906 in Sydney, the daughter of a steelworker and a dressmaker. She obtained her grade 11 and took her nurses training at the New Waterford General Hospital. She entered training in September 1925. It is interesting that in recounting her work, she was asked whether or not she cooked. Her response was "Ourselves? No, we had a cook and an intern and a maintenance man. We had everything they have today, actually." But clearly they did not. For example, x-rays and laboratory work were part of the nurses duties at New Waterford. But the perception was that this was part of normal duties. Murphy recalled, "we had a Miss A.J. MacDonald, she was next to the Superintendent and she was in the laboratory, she of course took x-rays and she did all the work like urines and sputums and she was really something. It was funny, she took me and used to give me a lot of training in the lab. And I'll never forget what she taught me, she taught me to take x-rays." Murphy, despite her nurse's training, would spend two decades "taking pictures."³⁴ Yet, in recalling her work experience, she did not consider this unusual or unexpected. That nurses would fill roles in other departments, even for years, suggests that the demand for labour quickly consumed any professional identity in many hospitals.

This also extended to professional education itself. Nursing schools were administered by hospitals and the education of students was often subordinated to the demands for workers in the hospital wards.³⁵ Sister Catherine DeRicci, who entered the Halifax Infirmary nursing school in 1927, recalled that senior students would often be found in the operating room, x-ray department and "all

those places,"³⁶ presumably including the laboratory. As Susan Reverby suggested, "[n]ursing education was called training; in reality it was work."³⁷ In Halifax lectures were scheduled around twelve or thirteen-hour shifts. Students often missed lectures because of duties on the ward and the lecture schedule varied both in quantity and quality, depending upon the availability of doctors.³⁸ Indeed, the workload of apprentice nurses had become so substantial that in his influential 1932 report George Weir felt compelled to comment that nursing schools "should be considered primarily as an educational institution rather than as an economic asset to the hospital."³⁹ In the 1920s and 1930s, students were clearly an integral component to the expanding hospital labour force. Nurses had to discharge their duties on the ward floors, perform a variety of domestic tasks, complete administrative duties and, increasingly, work in other patient services, including the laboratory.

Workers from throughout the Maritimes continued to perform a broad range of hospital work through the 1930s and 1940s. In 1930, the Mirimachi Hospital in Newcastle purchased new x-ray equipment and requested one of its own nursing graduates, who had graduated earlier in the year, to take a combined course in x-ray and laboratory training.⁴⁰ The registry information of the Canadian Society of Laboratory Technologists confirms the variety of duties workers performed.⁴¹ Two registrants from 1940 offer examples of combining laboratory and x-ray work. A woman at Dawson Memorial Hospital, in Bridgewater, Nova Scotia, performed laboratory and x-ray work. Her laboratory work was restricted to general work in bacteriology, haematology and urinalysis tests, while other tests were sent to Halifax. A

Catholic sister in charge of the laboratory at St. Mary's Hospital in Inverness, Nova Scotia, also took charge of the x-ray department.

X-ray work was, like work in the laboratory, largely considered appropriate for women. As Cynthia Cockburn has suggested, this might seem at first glance surprising.⁴² Here, Cockburn argues, women were fully engaged with technology. They were, however, operators of the equipment, a designation that limited the status and rewards that accrued. Originally, as with work in the laboratory, x-ray work was the pursuit of an interested physician, although as the evidence from the Victoria General indicated, there were quickly demands for a variety of assistants, either from the nursing service or in educating trained workers. As the work became more routine, these workers could operate the equipment and deal with the patients. The fact that they were women allowed hospitals to avoid one of the more difficult management aspects of the service. Women patients, if served by female technicians, would not have to be chaperoned. This overt fear of sexuality in the x-ray service confirms what Susan Porter Benson suggested, namely that social relations were a significant part of every work situation,⁴³ even highly clinical ones. The employment of female technicians, then, served the ends of their employers, by overcoming a sensitive issue of respectability.

Despite their obvious role in expanding the x-ray service, the diagnostic role (the intellectual work) was carefully disaggregated from the technical side of the work (the manual work). Workers would labour in the dark room or watch the meter on the deep therapy machine to ensure its correct operation. Workers came to be defined as operators. Such a designation limited the status and accompanying rewards for this technical work, even though they served the

interests of the hospital's authority in conducting the clinical exam. The differentiation of patient service from medical outcomes has been portrayed as the division between "curing" and "caring". Using this binary opposition, Judi Coburn suggested that caring was the responsibility of "a complex of technicians, aides, maids, cooks, clerks, and cleaners, all of whose work was essential, but who were, and continue to be, accorded of no power or credit. All credit for patient recovery went to the doctor since it was supposedly only he who participated in the science of 'curing.'"⁴⁴ The separation of technical work from diagnostic was one way of undermining any claims to enhanced status. Equally important, however, was that x-ray workers most often did not work exclusively in this service. By imposing a variety of roles on women, their engagement with the technology was diminished as their work with the x-ray apparatus became part of a wide range of duties that they were expected to perform. Despite the multiple roles, workers in x-ray quickly organized themselves into professional bodies. As early as 1930, there were indications that x-ray workers would form their own national society, which would "create and supervise a standard of radiology of practice."⁴⁵ In Nova Scotia, x-ray workers founded the provincial Radiographers Society in May 1940.⁴⁶

IV -- DIVERSITY

A senior member of the Charlottetown Hospital, when she joined the CSLT in 1939, noted that she supervised not just the laboratory, but also the records and pharmacy departments. There was little doubt that she was well prepared for these duties, holding certifications as a Record Librarian, a degree in Pharmacy and an American Society of Clinical Pathologist MT designation for

laboratory work. This suggests that the duties were not forced upon this individual at least. Rather, as she assumed new responsibility within the Charlottetown Hospital, she pursued educational opportunities.

While the Charlottetown nurse pursued newly assigned duties with apparent vigour, a nurse from Colchester County Hospital was less certain. She was responsible for routine laboratory tests, including blood counts, fecal examinations, urinalyses, sputum, blood groupings and a variety of other tests. Other analyses, such as all the pathology work, serological tests for syphilis and some blood work, were sent to Halifax. In addition to the laboratory work, this worker also served as the x-ray technician and, in her capacity as nurse, was in charge of the operating room. Despite this responsibility, the nurse was by no means sure of her abilities in all these areas. After eighteen months in the CSLT, she wrote to the national secretary Denys Lock requesting whether there was a one-year course in laboratory technique "for people who already have some knowledge of the subject, but feel that their training and experience is not sufficient."⁴⁷ In the spring of 1939, there was no such course available in eastern Canada.

The career of an individual worker illustrates only the range of openings waiting to be filled within the modernizing hospital. It says nothing of the meaning of these opportunities, either for the individual or for entire occupational groups. With duties in a range of departments frequently assigned to one individual and the diversity found in the typical Canadian hospital, how did workers struggle to meet the wide and often disparate demands of potential employers, as new services opened and the content of work was shaped and re-shaped?

Of course, a number of variables determined the abilities desired by hospitals, including whether or not the facility was large or small, serviced a rural or urban area, or was a general or specialty hospital. The Aznoe employment agency advertised for a "Laboratory X-Ray Technician, able to do blood chemistry" for an Eastern Canadian position in 1930.⁴⁸ Some prospective employees marketed a range of skills. An advertisement for a "Woman Laboratorian" emphasized eight years of excellent experience, in addition to her nurses' training. Others stressed their training, such as the 32 year old "Nurse-Laboratorian" who had "trained under outstanding pathologists" and had nine years experience or the "Woman Laboratorian" who trained for one year under a Professor of Pathology and had ten years experience.⁴⁹ Occasionally, ads from medical students appeared. One third-year medical student desired a position as lab assistant in bacteriology, biochemistry or pathology in Eastern Canada.⁵⁰

While the medical student may have desired to obtain some practical experience in a laboratory to further his education, many nurses took on laboratory work as part of their duties in smaller hospitals. One resident of Drumheller, Alberta emphasized that she was a registered nurse, but also "qualified" as a laboratory technician. In addition, she offered a prospective employer training in x-ray and cardiographic work.⁵¹ A hospital in Lethbridge searched for a "nurse with laboratory training and experience."⁵² An advertisement from the Colchester County Hospital in Truro searched for an "X-Ray and Laboratory Technician" adding that "a graduate nurse is preferred."⁵³

Some individuals, such as Mildred Dobson of Winnipeg, emphasized their college education, in this case chemistry, and their technical abilities. Dobson was not only "capable of taking full charge" of the laboratory, but also offered experience in routine laboratory analyses, Widal's, bacteriological work, blood chemistry and basal metabolisms.⁵⁴ Finally, lest we become too comfortable in our thinking that all the workers were women, men also searched for positions using the same strategies. One Canadian male, J.G. Truax of Hamilton, emphasized his training at the Northwest Institute of Medical Technology in Minneapolis, in "laboratory, X-Ray, physiotherapy, and basal metabolism technique."⁵⁵

Most hospital histories in Canada detail a process of increased departmentalization and specialization through the twentieth century, but an examination of the laboratory worker demonstrates that the boundaries were more fluid than many accounts would lead us to believe. This fluidity was not without its effects. The professional promoters recognized the various demands placed on workers. CSLT President Grace Arnold told her executive in 1944 that when suggesting educational paths for potential workers, she always recommended a business course. The executive minutes reveal an alternative viewpoint, suggesting that while typing was undoubtedly an asset, students might be better served pursuing courses in science in a University. "It would seem only logical" the minutes record, "that the additional study in science that such a course would offer should increase the student's interest and ability for service to the Medical Profession."⁵⁶

The evidence from laboratory workers is compelling, but it is not alone. A *Canadian Hospital* item on the Nova Scotia Pharmacy Act, commented in

passing that pharmacists in smaller hospitals who "had the necessary training" may find themselves performing routine laboratory analyses or serving as the x-ray technician. Such pharmacists -- assumed to be women -- would in this way demonstrate "a wide field of usefulness to the medical staff."⁵⁷ Other workers also fulfilled multiple roles in the hospital. One commentator noted that smaller hospitals combined the work of the dietitian with "those of the housekeeper, the laboratory technician or the laundry supervisor," although she conceded that in such cases "it is quite possible to overwork the individual." Another hospital, with an average patient census of 134, combined dietetic and lab work, "but only because the dietitian is personally responsible for the blood counts alone."⁵⁸ An historiography that emphasizes an unfettered, linear process of specialization obscures the complexity of hospital work. Moreover, it is a portrayal rooted in assumptions based on class and gender, largely informed through the examination of hospital-based physicians.

There is abundant evidence that the notion of the laboratory worker remained diffuse. Michael Katz has suggested that when positions are added to an institution over time, there is confusion in the definition of roles.⁵⁹ As a result, how duties are defined becomes obscured and this overlap creates tension within groups and among them. In some hospitals, laboratory work grew slowly, from a few simple urinalysis tests to a larger variety and volume. Others, such as Saint John and Halifax, were planned facilities, designed to provide services for entire provinces. Laboratory work was, however, a planned extension of the modern hospital. It simply could not exist without the purchase of equipment, the preparation of reagents and adequate staff. To function, laboratories needed the co-operation of departments of health, clinical

departments and physicians. In other words, the development of laboratory service, even a small one, could not be described as anything but planned. Still, the workers in the service performed a wide variety of roles.

The labour process in the early part of the twentieth century was shaped, according to Susan Reverby, by two twin concerns. First, hospitals had a desire to maintain a stable workforce. This did not always translate into high wages for the workers, however. As demonstrated in the previous chapter, wages were determined through a careful consideration of the local economy, gender and a considered weighing of the cost of replacing workers. Reverby also suggests that the labour process in hospitals was shaped by organized nursing's desire "to establish its professional status[.]"⁶⁰ Hospitals had long utilized an informal division of labour, that would see workers in one service assume duties in another, as the situation demanded. As the workload in these services increased, or as beds were added to the hospital, this division was extended and then formalized, and new categories of workers began to emerge.⁶¹ Before the Second World War, nurses assumed a wide variety of tasks as what constituted patient care expanded.⁶² It was not until the post-war period that registered nurses were joined by ward aides, licensed practical nurses and registered nursing assistants. These "subsidiary workers" performed tasks formerly done by graduate nurses and those still enrolled in nursing schools.⁶³ Junior nurses regularly performed cleaning duties before WWII, while after the war such tasks became the responsibility of a completely separate service "and are now not considered nursing tasks at all."⁶⁴ Concurrently, nurses themselves began to assume new responsibilities and duties that facilitated a heightened specialization. A wide variety of courses were offered in such areas as x-ray

technique, obstetrical nursing or operating room technique, and employees were offered bursaries to attend the courses, which lasted from four months to two years.⁶⁵

As new tasks were assumed and old ones relinquished, the content of nursing work, and other work in the hospital, became a matter for discussion. At the heart of the debate was establishing the "boundaries" between new occupations and old.⁶⁶ How the content of the work, which had implications for staffing levels, worker satisfaction and opportunities for advancement, was negotiated became a key feature of the modern health care community. In the twentieth century, this has led to competition and conflict among groups of health care workers who are predominantly female.⁶⁷

It is difficult to know how nurses responded to the multiple demands placed upon them. One author, writing in *The Canadian Nurse* in 1941, commented that small hospitals may enjoy an adequate staffing complement for nursing, but could very well lack people in the laboratory and other services. The duties in the specialized departments, together with keeping records, inevitably fell to the nurse.⁶⁸ As the oral evidence from Nova Scotia suggested, it is not at all clear that nurses considered these duties to be outside the field of nursing. Mrs. Grace Cann returned to nursing in 1946 near her hometown of Overton, Nova Scotia. She had been out of nursing for five years, and unexpectedly assumed the position of second night supervisor following the death of her husband. She found the night work a strain and had difficulty sleeping during the day, with the noises of downtown Yarmouth filling her room. She eventually found day work, rotating through all the wards before finally landing in the laboratory. She worked exclusively in the lab for over a

year, before assuming responsibility for the children's ward. Interestingly, while Cann "took charge" of the ward, she also "helped" with medical records, "did some work in the lab" and dispensed drugs.⁶⁹

A nurse writing in *Canadian Nurse* considered work as a laboratory technician, in the x-ray department or as a record librarian to be "good fields" for the graduate nurse. In laboratory work, women could escape the demands of patients and physicians alike to a large extent, a freedom that undoubtedly appealed to some of the women. The author ended by noting that nurses were "being shut out more and more from choice positions in the hospital," concluding that the nurse is "losing out in the hospital because she is not willing to prove that she can do better work than those who are not nurses."⁷⁰ Sister Catherine Gerard made a slightly different observation from her perch at the Halifax Infirmary. Writing in 1948, she lamented the decreasing quality of nursing service, placing the blame on the expanding opportunity for nurses in government employment and "in those hospital departments which formerly did not require nurses -- for example, the x-ray department and laboratories."⁷¹ Gerard was suggesting that these new opportunities were draining potential staffers, at a time of a nursing shortage in Halifax, but was she also implying that there was a form of high-grading going on? Were these new opportunities taking the best potential nurses? There is no way to be certain. Gerard's comments are, however, suggestive that the lines of demarcation between work within the hospital were growing increasingly rigid. In other words, women who would have found their way into nursing, or pursued these tasks *in addition* to their nursing duties were instead simply not nursing at all.

V -- DEFINING LABORATORY WORKERS

Another explanation must therefore be advanced. There is little doubt that the laboratory had, by the dawn of the Second World War, established itself in major tertiary care hospitals, specialty hospitals and community based hospital throughout the region and Dominion. The service had proved its utility in public health campaigns such as the efforts for pure milk or to control VD, its clinical utility for diagnosing and managing diseases such as diabetes and as a site of education and research for the medical school and other health professions. Workers at the bench, however, were clearly secondary to other concerns in all these issues, chiefly to physicians. That they often performed a variety of services indicates the subordinate position to the clinical judgement of physicians or the demands of administrators. A wide variety of services were increasingly being utilized to aide the diagnosis and management of health care problems; that nurses, dietitians and laboratory workers came to perform a variety of duties undermined their claims to expertise. Ultimately, this diminished claim even became internalized into the professional portrait of the laboratory technician.

Evidence for the diminished claim to expertise may be unmasked from the records of the professional society, the Canadian Society of Laboratory Technologists. It is found in their relations with the Canadian Medical Association and within their organization. It extends to their very portrayal of the ideal laboratory technician. In a promotional brochure, the CSLT's education committee put forth the following definition of a medical laboratory technologist:

a person who performs tests in a hospital or medical laboratory;
analyzes blood, spinal fluid, sputum, urine, and body tissues in quest of

abnormal chemical levels, cells or bacteria; prepares tissue for microscopic examination by pathologist; performs animal inoculations; prepares vaccines; types blood for transfusions; may engage in research.⁷²

This definition is clearly centred on technique, not knowledge. Technical skill has often been defined outside of professional skill, which hinges not on manual skill but rather some notion of intellectual mastery. Professionals usually portray themselves as offering a "trained mind" not a resource used to meet the demands of others.⁷³

"Profession" is a term that is both bountiful and barren for most historians. Its meaning is elusive and, as a category of analysis, perhaps too elusive to be useful.⁷⁴ Gerald Geison observed that since 1915, when Abraham Flexner published an essay entitled "Is Social Work a Profession?", commentators have struggled with the meaning and limits of the word.⁷⁵ Writers such as Donald Scott have argued convincingly that professions need to be understood in their sociohistorical context.⁷⁶ Scott's study of public lecturing, which enjoyed a brief period of popularity in the mid-nineteenth century, suggests how professions change over time according to the demands of the public and changing ideas about particular roles and responsibilities. To be meaningful, studies of occupational groups must move beyond internal analyses and ask meaningful questions of the proscriptive descriptions that emanate from the national and local offices of professional societies.

The history of professionals has been dominated largely by studies of particular occupations, with physicians and lawyers perhaps being the best known.⁷⁷ The 1960s and 1970s saw a remarkable effort to understand the relationship between social order and professions, an effort which dissipated

somewhat in subsequent decades. Part of the reason for the turn away from studying professions is that these analyses are frequently limited by the narrowness of their focus and, more importantly, by a conceptual approach that differentiates them from analyses of other kinds of workers. David Coburn has suggested that there are two 'literatures' that examine workers and their work. The first of these has as its central focus class, while the second is concerned with 'occupations and professions.' These two literatures are largely separate -- perhaps akin to the division between historians of science from those of medicine discussed in the introduction.

Defining laboratory workers as *workers*, proposes that this segment of allied health workers were progressively subordinated to the interests of the emerging health care system. This is not a raw proletarianization argument that during the twentieth century professionals were de-skilled and subjected to Taylorism, in a downward spiral of the degradation of work.⁷⁸ Rather, it suggests that the labour of laboratory workers was from the beginning subjected to a form of managerial control and departmentalization that undermined their status as "professionals" with control over the processes of their work. The fact that they often filled multiple roles within the hospital and the constructions we have seen of the idealized worker further reinforce this point.

In her influential work on American nurses, Barbara Melosh refutes the degradation argument. Melosh wrote

Like other workers, nurses faced a fundamental reorganization of work that changed the content and experience of nursing. But unlike many others, they did not suffer a dilution of skill. Indeed, the changing scientific base and technological innovations in medicine gave nurses new skills and authority on the job. Rationalization also changed the

social relations of work in ways that gave nurses more control. ... The reorganization of nursing created new possibilities for managing and interpreting nurses' traditional relationships to doctors and patients.⁷⁹

In contrast to private-duty work, for example, hospital-based nurses found work that enhanced their skills. In hospitals, nurses benefitted from an expanding medical therapeutics that increased their status in the minds of patients, provided an opportunity to assert themselves both in their interactions with patients and physicians, and they gained a sense of community and camaraderie from working shoulder to shoulder with other nurses on the wards.⁸⁰ However, Melosh does concede that nurses may have been a kind of labour aristocracy among women, suggesting that they enjoyed benefits and opportunities not available to other women and perhaps were exceptional.⁸¹

What then of laboratory workers? They were assuredly subordinate to more powerful class and state interests, both technically and ideologically. That is, they never exerted control over the process of their work. Although they did possess the knowledge required to perform their jobs, decisions about which tests would be utilized or what equipment would be purchased were made elsewhere. Nor did the laboratory workers determine how the results of their work would be used, either clinically or publicly, or how it was used to bolster arguments in society at large (such as the efforts against venereal disease or polio). Although workers exercised a degree of control over their work, they existed within a bureaucratic organization and were dependent upon that organization to perform their work. Unlike other workers, who were often subjected to direct management, a complex experience of education, supervision and ideological inculcation served to develop a “professional” ideal among laboratory workers.

The implications of the "professional ideal" for women are as yet poorly understood. Nursing organizations, x-ray workers and women professionals of all kinds organized themselves during the opening decades of the twentieth century. Among laboratory workers, the Pathological and Bacteriological Laboratory Assistants Association was founded in Britain in 1912, while the American Society for Medical Technologists was formed in 1933.⁸² These organizations provided educational service, employment opportunities and fostered sociability among members. Many replicated their membership, through information sessions with students, sponsoring bursaries and scholarships for students, or awards for students who demonstrated particular aptitude during the course of their education. These organizations, as Nancy Cott suggested, existed for the benefit of the "profession" and actively discouraged "sex-based loyalty."⁸³ The result were organizations that were constituted by women, but which did not exist *for* them. To be a woman professional was to be a person in conflict, for the model professional was assumed to be a man.⁸⁴ And many women recognized this ambiguity and rejected membership. Cott cites the example of the American Medical Women's Association, which never accounted for more than one-third of women physicians in the United States.⁸⁵

So-called 'white-collar work' dominates the landscape of work in Canada. Almost three out of four people in the labour force work in white-collar jobs, and in the post-modern, post-industrial age, this proportion may very well continue to expand. What is important to recognize is that many of these workers, especially those occupying the lower echelons of this stratum (in terms of their education, salary or other such criteria), are subjected to

processes of managerial control equivalent to those of the routinized factory worker. White-collar workers, to which laboratory workers certainly belong, are often viewed as part of the new middle class or as service workers in the post-industrial economy. Others consider such workers to have “contradictory or ambiguous” class location, informed not only through a process of proletarianization but also through ideological, non-work criteria.⁸⁶

Nevertheless, these workers have largely escaped the attention of historians interested in class. The difficulty is magnified for women working in the new occupations of the twentieth century. Women working in department stores, offices, as nurses or other occupations of the new middle-class, largely fell outside of the research priorities of labour historians who were still seeking to incorporate working class women into the historical narrative. The result was an “unnatural dichotomy” that ordered class over gender and failed to understand the many similarities among working women.⁸⁷

Even within studies of “professional women” there is a temptation to over-emphasize the differences found among occupational groupings, rather than seeking to identify the “common demographic, economic, and cultural conditions to which almost all conformed.”⁸⁸ For example, in her study of five Canadian professions, Mary Kinnear has found that all of these women lacked control over their work, were paid at a rate less than their male counterparts and that these were two incontrovertible “governing principles” of being a woman professional. Moreover, despite these principles, female professionals enjoyed substantial advantages over their sisters in manufacturing, in department stores, clerical work or personal service. Notably, they earned more money and generally enjoyed greater stability in their jobs.⁸⁹ Although there

were obstacles, these workers were further privileged to a large extent by virtue of their education and their race. As Kathryn McPherson suggests in her study of nurses in Canada, the professional bodies and education processes fostered a "racial and cultural exclusivity" that even denied access to some women.⁹⁰

Laboratory work suggests that treating occupations, particularly those which share a work environment, such as allied health workers in a hospital, as highly discrete entities is a futile endeavour, obscuring more than it reveals. These workers were assuredly subordinated but they also operated within an environment where they interacted with a large number of other workers, similarly organized and sharing similar values (indeed perhaps even working in two services simultaneously), and all of them operated under medical authority. Providing health services was contested terrain as newly-created services carved out niches of practices, and old ones redrew or shored up their right to some forms of practice.

By the 1930s, when laboratory workers were beginning to organize, women had gained the right to practice in all the professions, though their presence was minuscule in most fields, with some professions even utilizing quotas to limit the number of women.⁹¹ Observing the professionalizing efforts all around them, a dedicated cadre in Hamilton, Ontario, embarked on a project of their own. More important for our consideration, a definition that was centred on technique rather than education, was more inclusive.

There were many portals through which one could gain access to the laboratory bench and these endured, they were not the vestigial limbs of an earlier era, but rather, as argued previously, a realistic response to the needs of the different components within the emerging health care complex.

Laboratories were increasingly important, to public health, teaching and clinical care. Smaller or specialized hospitals recognized the growing importance of laboratory analyses in the clinical setting. Not unexpectedly given their small resources, such hospitals sought ways to fill the necessary positions by combining laboratory work with other services. Thus, as late as the post-WWII era it is possible to characterize a variety of laboratory workers.

Beyond the experiences of individuals, diversity in the Canadian medical laboratory is also revealed through a survey of leading medical periodicals. In Canada, before 1950, it is possible to group workers as nurse laboratorians, combined workers, and dedicated laboratory workers. These classifications were not successive -- one did not displace the others. Before 1950, one could find any of these workers in a Canadian hospital, depending on size, location and clientele. In Halifax, for example, one could find one of the earliest recognized training programs dedicated to training laboratory technologists, while at the Tuberculosis Hospital, which was practically next door, there was a combined laboratory and x-ray technician.⁹² Employers searched for workers that could fill either one particular task or, more commonly before 1950, a variety of tasks within the hospital. This was true also of other hospital workers, as the experience of nurses during the 1920s and 1930s illustrated.

Prognosticating about the future of laboratory diagnostic services, A.L. MacNabb classified workers as follows: the part-time worker in the small institution; the full-time assistant working in bacteriological or chemical testing; the senior worker who prepared tissue samples, undertook haematological tests and some bacteriological work; and the laboratory worker who graduated from "an arts faculty in which a course of instruction has been

taken in biochemistry, haematology, and other related subjects, in connection with diagnostic procedures."⁹³

Who was a laboratory worker? There was obviously tremendous diversity available to people pursuing this work. Some may be interested in tissue work, others in serology, others in dissecting and mounting museum specimens, etc. Moreover, laboratory work was not the pursuit of one single science, but rather a combination of sciences. The skills involved in the different departments could be quite disparate. After two decades of operation, the CSLT had succeeded in exerting sufficient influence that there was widespread agreement on a definition. Medical laboratory technologists, or laboratory technicians were fact-finders for physicians, the "successors to the work of Pasteur, Koch and others who first brought the techniques of modern science to the practice of medicine."⁹⁴ A loose definition to say the least!

Despite this diversity, it is possible to reconstruct the idealized laboratory worker and discern what physicians and professionalizers deemed to be the essential qualities for these workers. Most important was the emphasis on service. This was an essential component of professionals' self-definition, but there it usually meant service to the public. For laboratory workers, however, the stress on service was increasingly conceptualized along the lines of hospital efficiency and understanding of their place within an emerging complex of service and authority.

At the CSLT Annual General Meeting in June 1950, a Code of Ethics was presented. The Code of Ethics was developed as an "outgrowth of a desire to maintain the dignity and the high esteem of the profession of medical technology. It is a guide for the technologist in all professional activities and

relationships ..." In the introduction, it was noted that "[m]edical technology is one of the newer branches of the medical arts and sciences, but it has a worthy role to fulfill. The medical technologist, appreciative of the valuable work done by doctors, nurses and others, should endeavour to co-operate fully with them in the care and healing of the sick." Reaffirming this code the pledge for medical technologists was presented at the 1954 annual meeting. The pledge was to be recited at graduation ceremonies across Canada.⁹⁵

The idealized laboratory worker was both accurate and honest and reported laboratory findings without suggesting a diagnosis. Laboratory workers were constantly reminded that their role did not permit them to be diagnosticians, effectively separating the manual portion of the work from the intellectual enterprise of drawing a conclusion based on the results. No less a figure than Frank J. Elliott, the first President of the CSLT, commented on this issue at the first Annual General Meeting, carefully noting that technicians were not qualified to make diagnoses, although they may do so in their own mind. Rather, workers made reports and forwarded these to doctors. Such reassurance was not mere rhetoric, and was likely in response to the real fears of physicians. In Massachusetts, for example, the State Society of Technicians was trying to legalize the diagnostic role of technicians.⁹⁶

A pamphlet first prepared by two prominent members of the CSLT in 1954 suggests that the technologist

must at all times be *exact* and *trustworthy*. An *inquisitive mind*, and an *interest in scientific work* are next in importance. *Manual dexterity* is an essential, but it can be acquired. To have "good hands" in a laboratory is simply to find oneself at ease in handling the many and varied pieces of equipment. *Co-operation* is exceedingly necessary.

Whether working alone in a small hospital or in a complex teaching hospital, the technologist was encouraged to have "good personal relationships" with other departments, doctors, nurses and all the other staff.⁹⁷ Harvey Hall, writing in an early edition of the *Canadian Journal of Medical Technology*, suggested that workers were "not to play favourites. Just because you get along better with one or two physicians does not give you any excuse for doing their work first."⁹⁸

The journal also presented a little morality play entitled "Team Work -- A Time Saver." The play concerns relations among hospital occupational groupings, but is cast not in terms of professional jurisdiction or authority, but rather in terms of laboratory (hence hospital) efficiency.⁹⁹ Another sketch presented the next year involved the selection of a technologist for a hospital opening. It presents a number of candidates, including Toots Timewaster, Ida Dunno, Miss Intelligencia and Maud Dell. Needless to say, Miss Dell received the appointment in this farce.¹⁰⁰

If, as Melosh suggest, nurses occupied the upper ranks of health care workers, where did laboratory workers fit in the health care hierarchy? Clearly the professional body, both through pronouncements from Hamilton and through the national journal, emphasized that laboratory workers were part of a health care team. Following this, the emphasis was placed on co-operation with other services and a detached demeanour when organizing one's work day (ie., personal relations were not to enter into the decision making). The emphasis on co-operation and harmonious relations was affirmed both by the code of ethics and the graduation pledge. At a time when new workers were assuming duties in the hospital at a remarkable rate and the relations of work *within* the hospital

complex were very much in the midst of negotiation, a professional ideology that stressed co-operation served to ameliorate the distinctions among laboratory workers, instead emphasizing their commonalities with other workers in health services.

Laboratory workers were "only a link in the chain" and "responsibility for action will always rest with the members of the medical profession."¹⁰¹ Physicians were responsible for the intellectual work of reading laboratory results and making a diagnosis or case management decisions on the basis of those reports. In Canada, medical men determined the procedures that were implemented in the laboratory and shaped the training programs that became common throughout the Dominion in the 1940s and 1950s, discussed in the next chapter. While many laboratory workers enjoyed a variety of roles within the hospital and combined modalities of work, their duties, rights and responsibilities in all these areas were highly circumscribed. Their place in the hospital hierarchy was entrenched and their working conditions fairly rigid, despite the illusion of option. Not surprisingly, such an environment did little to nurture a collective response to their subordination to physicians or even other health care workers.

In addition to the stress on service, good laboratory technique consisted of other critical elements. Much stress was placed on "thoroughness," in addition to the related issue of dedication, with one employer commenting that "I have no use at all for the type of assistant who works with his eye on the clock. The laboratory technician must always be prepared to go on till the work is done."¹⁰² As we have seen from the case of Nova Scotia, this was well-established practice long before the formation of the CSLT.

Another author suggested that "[o]f course, we all like our pay cheques. But the true technician is interested in his work to the extent that the money side of it is of secondary importance. If you haven't a genuine love for the work itself you aren't living up to your true capacity as a technician."¹⁰³ Laboratory workers were not supposed to accrue material benefits for working overtime, and they were not supposed to be ill either. A writer in the CSLT journal suggested in 1939 that absence from work even for a day, disrupted the work of the laboratory, perhaps a recognition of inadequate staffing levels. His remedy? He always told his employees "not to go too often to the movies and in times of epidemics of influenza they should avoid them altogether." Workers were to avoid trolleys for similar reasons. To preserve one's health and ensure reliable service to one's employer, "take plenty of exercise in the fresh air both summer and winter and be wise in your dieting."¹⁰⁴

"Skill" was another important issue, in this case referring to manual dexterity. Technicians were to be "neat handed," and many thought women to be particularly suited to some tasks. Manual dexterity could not be guaranteed through a university education, noted one writer, and only natural ability or experience could ensure this facility.¹⁰⁵ A worker from Nova Scotia recalled how excited laboratory director D.J. MacKenzie was when he recruited a young woman from St. Francis Xavier University in Antigonish. "She knew all about bacteriology," recalled the worker. "She came, she might have known her stuff, but she was totally useless. She would get mouthfulls of stuff, and spill things ..."¹⁰⁶ Such a recounting emphasizes the apprentice culture, discussed more fully in the next chapter, that prevailed at the bench, where the content

and experience of work were more significant than formal education. What one could do, and how one did it trumped what one was presumed to know.

The emphasis that work culture placed on competence at the bench does not, however, mean that laboratory work was "skilled work." The actual demands of work are less important in shaping skilled work than receiving economic benefits. This is to suggest that "skill" is socially constructed and workers who can successfully wrestle benefits from employers or managers will, *ipso facto*, be defined as "skilled." Skill is indicative of a political process through which some workers (those who make successful representations), secure more economic power or are able to use their position to leverage concessions.

Predominantly women, laboratory workers also had to endure an intense personal scrutiny that male workers usually avoided. Personal qualities were often related in applications for registration or in employment recommendations. The CSLT had a form on which references could comment on a variety of attributes for the candidate. In order, the references were given the opportunity to comment on moral integrity, intelligence, dependability, accuracy, co-operation, ability as a laboratory technician and personal appearance. The form letter also suggested that the information "will be treated with the strictest confidence" and few of the forms appear to have survived. One Catholic Sister wrote of another that "Sister appears a little retiring and of a ruddy complexion, average build. To a stranger, she would appear [pr]obably a little stern, which may be due to a little shyness." Nevertheless, the Sister thought that the applicant was a "very fine character, serious and very conscientious. She is meek, affable, affectionate and well liked by her clients.

Her staff are very fond of her."¹⁰⁷ What is fascinating is that these evaluations were not given in support of an employment application. Rather, they accompanied the younger Sister's CSLT examination and her application to the national society. The same Sister submitted another evaluation. "Sister has a very pleasing personality, fine looking, rather corpulent and well built. Her appearance is inviting and she should be well received by patients." Besides this inordinate focus on her appearance, the senior Sister also suggested that the applicant was "confident of her knowledge and is never hesitant in expressing her opinion. She is very alert and bright and she is well trained, in my opinion."¹⁰⁸

A senior physician from New Brunswick suggested that one of the workers in his laboratory was "very agreeable in the Laboratory and a capable and steady worker. She is well liked. I should think she would make a very good technician ..." A letter of support from an Acadia University professor suggested that a worker "is neat in her appearance. She is quiet. She has poise. As far as I know her character is above reproach. ... She seemed to get along nicely with her fellow students. She cooperated satisfactorily with me. I chose her as my assistant because I considered her the most promising girl in her class."¹⁰⁹ Another interesting example came from the pathological laboratory in 1940. Ralph Smith wrote of an applicant that she had attended classes regularly, was a hard and thorough worker and "has a pleasing tidy personality." Smith also suggested that "his" technicians thought very highly of her and that "we feel that she is worthy of being a member ..."¹¹⁰

There were, of course, exceptions to all these elements. Dexterity made women desirable, but "the young woman whose main object in life is to secure

a husband is out of place in the profession."¹¹¹ Also, although women were generally thought to be more nimble, superior workers came in all body shapes. The author of this item cited the example of a "massive bombardier" who could mount incomparable pathological specimens. Although vigour and health were desired, they were not absolutely mandatory. It was a profession where those with "delicate" health or even the disabled could find a home, with one author reminiscing fondly about an Edinburgh "hunchback" who could produce superior microscopic slides of tissue samples.¹¹²

The *Canadian Journal of Medical Technology*, was not above poking fun at such strictures on their behaviour and demeanor. The 1946 volume contains an article entitled tongue-in-cheek "Interim Report On A Survey Being Conducted To Determine Why Technicians Have Such Dispositions."¹¹³ Showing a flash of wit, Margaret Gleason of Owen Sound General and Marine Hospital notes how patients invariably called technicians blood-suckers or vampires, asked whether they had run out of nail polish (undoubtedly not said to males) or whether they were thirsty, and requested jokingly not more than a gallon be removed. These queries, hardly original, elicited one of several responses according to Gleason: "(1) Pretend to be deaf, (2) Reciprocate with frayed stock replies. (3) Miss the vein the first three times."

CONCLUSION

Requesting an assistant in 1924, Dr. W.H. Eagar sought "a woman of intelligence to do work in the Dark Room and watch the meter when the deep therapy machine was in operation and perform such other duties as might from time to time be assigned her. The salary for this position to be such as would

ensure and retain the services of an intelligent person."¹⁴ The medical board, responding to the request, agreed that Eagar could use another assistant and dispatched a nurse to round out the staff complement in the x-ray department. Dr. Eagar's request captures many of the elements of work in the laboratory and, more generally, in Canadian hospitals in the first half of this century.

Workers sell their labour for cash and the amount hospital workers of all types were paid varied considerably according to hospital size, location and the tasks performed. Laboratory directors had difficulty filling vacancies at the bench or even retaining workers already in their employ. Nationally, attrition through marriage, better job prospects in other fields or departing for the United States exacted a heavy toll on laboratory workers, and made it difficult to build a solid foundation upon which to erect a national society. The Maritimes suffered the additional problem of offering some of the lowest wages in the country, making staffing a perennial problem for many laboratory directors.

The work performed by individuals could change significantly over the course of one's career. Many of the women discussed herein began their careers as nurses, but had stints of varying lengths at the laboratory bench. Isabel Robinson, Deborah Henderson and Dorothy Jakeman all performed work for the laboratory other than lab analyses, before receiving their appointments at the bench. Many others crossed the often fuzzy boundary between student or volunteer in the lab to paid employees.

Workers, then, did not always perform discrete tasks, which undoubtedly served the interests of hospitals, but also provided workers with a degree of mobility. Many laboratory workers performed their work in conjunction with

some other work, such as dietetics, nursing, or work in the x-ray or pharmacy departments. In an era before sharp distinctions were drawn among areas of service, this afforded workers with an opportunity to shape their work within the hospital. Workers could advertise their skills in a variety of services and choose among hospital departments. Boundaries were fluid, as hospitals filled openings in new services and workers struggled to meet new demands. The experience of laboratory and other hospital workers belie an emphasis on unfettered specialization as the twentieth century progressed. There is abundant evidence that the people at the bench were diverse. This fluidity and the overwhelming multi-tasking suggests a need to re-orient analytical conceptualizations of hospital work away from discrete units to larger frameworks. The idiosyncratic nature of hospital work, which varied not only between hospitals but could very well vary between night and day shifts or among floors, suggests the need to understand health care professions in the context of their work and with their relations with other health care workers.

Endnotes

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- ¹ "The Technician's Trials and Tribulations," *CJMT*, 8, 2 (1946).
- ² PANS RG25 Series B, Vol. 3 (1910-1943) Minutes of the Board of Commissioners (hereafter BOC), January 18, 1936.
- ³ BOC August 3, 1939.
- ⁴ Annual Report of the Bureau of Laboratories, Year Ending October 31, 1944 in NBARMH.
- ⁵ The issue was raised at the Annual General Meeting of the CSLT in 1942. While the issue was discussed, no action was taken, although the secretary reported that salaries for workers had increased about twenty percent since the society was founded. AGM, June 13, 1942.
- ⁶ Of course, standards varied widely. In 1938, a worker in the Digby General Hospital who had attended classes at Dalhousie University earned \$50 a month, with meals and a room. She had been at work for six months. Across the Bay of Fundy in Saint John that same year, another new worker earned \$70 a month.
- ⁷ CSLT membership files and M.C.H. to Helen L. Smith, March 16, 1942.
- ⁸ CSLT membership file.
- ⁹ Annual Report of the Bureau of Laboratories, Year Ending October 31, 1942, in NBARMH.
- ¹⁰ While the survey had 230 responses, much of the data was based on very small numbers, in some instances only one response. It is used for illustrative purposes only. See *Canadian Hospital* (hereafter *CH*), 19 (October 1942): 44-50 and *CH*, 19 (November 1942): 34-40.
- ¹¹ M.C. Urquhart, ed., *Historical Statistics of Canada*. Toronto: Macmillan, 1965, Series B125, p. 46.
- ¹² AGM, May 29, 1943.
- ¹³ AGM, May 20, 1944.

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- ¹⁴ Minutes of Canadian Medical Association General Council, Montreal, June 11-12, 1945. Canadian Medical Association Minute Book, Annual Meetings. National Archives of Canada MF reels 7486 and 7487.
- ¹⁵ F.J. Elliott to J.A. Doucet, June 21, 1944 in PANB, RS 136, File Q4.
- ¹⁶ M.D. to Ileen Kemp, May 8, 1952.
- ¹⁷ Minutes of the CSLT Executive, October 17, 1943.
- ¹⁸ *CN*, 33 (October 1937). See also Kathryn McPherson, "The Country is a Stern Nurse: Rural Women, Urban Hospitals and the Creation of a Western Canadian Workforce, 1920-1940," *Prairie Forum*, 20 (Fall 1995): 175-206.
- ¹⁹ M.J.D. to A.R. Shearer, September 20, 1961 in CSLT membership files. This diversity also represented a substantial expansion of the workforce following the Second World War. This worker completed her laboratory training in 1943, and then returned to complete her baccalaureate education at the University of New Brunswick. She graduated in May 1944 and joined the federal civil service the following month. When she assumed her position at Lancaster, there was only herself and one other technician.
- ²⁰ *New Brunswick Public Accounts and Annual Report of the Bureau of Laboratories Year Ending October 31, 1936* in NBARMH.
- ²¹ *New Brunswick Public Accounts and Annual Report of the Bureau of Laboratories Year Ending October 31, 1942* in NBARMH.
- ²² *New Brunswick Public Accounts and Annual Report of the Bureau of Laboratories Year Ending October 31, 1944* in NBARMH.
- ²³ JHA 1939.
- ²⁴ PANS, RG25, Series B, Section VI.16.
- ²⁵ BOC, May 7, 1927.
- ²⁶ *New Brunswick Public Accounts*.

²⁷ Interviews with Ellen Robinson and Rose Phillips.

²⁸ CSLT registry file.

²⁹ *CH*, 7 (December 1930), p. 35.

³⁰ CSLT registry file.

³¹ Alice A. Thorngate, *That Far Horizon: The Medical Technology Program at the University of Wisconsin-Madison, 1925-1975*. Madison: A-R Edition, Inc., 1983, p. 31.

³² *Annual Report of the Directors of the Chipman Memorial Hospital*, years ending December 31, 1921 and 1922.

³³ Keddy Collection, MF 160-13.

³⁴ Keddy Collection, MF 160-27.

³⁵ In the United States by 1923, there were over 1700 nursing schools. See Susan M. Reverby, *Ordered to Care: The dilemma of American nursing, 1850-1945*. Cambridge: Cambridge University Press, 1987, p. 61. Of course, given such numbers, there was tremendous diversity among these schools. Reverby notes that in Boston, hospitals with as few as 16 beds or as many as one thousand had nursing schools. The growth of nursing schools in Canada was also substantial in the early decades of this century. In 1909, there were 70 schools of nursing in Canada and this expanded to over 200 by the 1920s. In 1931, there were 256 schools of nursing across Canada, over half of which were in Ontario (98) and Quebec (46). Nova Scotia had 18 schools, New Brunswick had 16, while tiny Prince Edward Island boasted three schools. See McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990*. Toronto: Oxford University Press, 1996, p. 30 and McPherson, *Skilled Service and Women's Work: Canadian Nursing 1920-1939*. PhD Thesis, Simon Fraser University, 1989, p. 175. Most of these schools required three years of training, so the contribution of "student nurses" to the labour supply for the hospital was substantial. By the later 1930s, any hospital in Nova Scotia with over twenty beds could operate a nursing school, effectively ensuring a labour

supply for even small rural hospitals. Peter L. Twohig, *Challenge and Change: A History of the Dalhousie School of Nursing 1949-1989*. Halifax: Fernwood Publishing and Dalhousie University, 1998, pp. 11-12.

³⁶ Keddy Collection MF 160-35.

³⁷ Reverby, *Ordered to Care*, p. 27; Barbara A. Keddy, "Private Duty Nursing Days of the 1920s and 1930s in Canada," *Canadian Woman Studies/Les Cahier de la Femme*, 7, 3, pp. 99-102.

³⁸ Kathryn M. McPherson, *Nurses and Nursing in Early Twentieth Century Halifax*. M.A. Thesis, Dalhousie University, 1982, pp. 26-27.

³⁹ G.M. Weir, *Survey of Nursing Education in Canada*. Toronto: University of Toronto Press, 1932, p. 301.

⁴⁰ *Annual Report of the Miramichi Hospital*, May 1, 1930 to April 30, 1931.

⁴¹ The CSLT graciously permitted me access to these files. I would like to thank Lynn Zehr and Kurt Davis for facilitating this access. The arrangement does not permit me to identify individuals by name, but this section is based upon a reading of all members of the Maritimes from 1937 to 1945.

⁴² Cynthia Cockburn, *Machinery of Dominance: Women, Men, and Technical Know-How*. Boston: Northwestern University Press, 1988, pp. 112-143.

⁴³ Susan Porter Benson, *Counter Cultures: Saleswomen, Managers, and Customers in American Department Stores 1890-1940*, p. 125. On the role of nurses chaperoning patients, see W.W. Kenney to Dr. W.H. Eager, February 4, 1924 and Kenney to Miss Strum, February 4, 1924, both in VGHL.

⁴⁴ Judi Coburn, "'I See and am Silent': A Short History of Nursing in Ontario," in Janice Acton, Penny Goldsmith and Bonnie Shephard, *Women at Work: Ontario, 1850-1930*. Toronto: Women's Educational Press, 1974, p. 157.

⁴⁵ *CH*, 7, 11 (November 1930), p. 10. The organization never materialized, and it was not until 1934 that workers in Ontario founded the first provincial society.

⁴⁶ *Nova Scotia Medical Bulletin*, 19 (October 1940), p. 554 and *Nova Scotia Medical Bulletin*, 20 (April 1941), p. 188.

⁴⁷ CSLT membership files.

⁴⁸ *CH*, 7 (October 1930).

⁴⁹ *CH*, 8 (March 1931) and *CH*, 8 (August 1931).

⁵⁰ *CH*, 8 (Oct 1931).

⁵¹ *CN*, 33 (Nov 1937).

⁵² *CN*, 34 (July 1938).

⁵³ *CN*, 37 (December 1941).

⁵⁴ *CH*, 9 (February 1932). Although she did not claim any experience in the field, Dobson's advertisement also states that she "Understands X-ray technique," perhaps an indication of her ability to learn this area, if it was required.

⁵⁵ *CH*, 9 (December 1942).

⁵⁶ Minutes of the CSLT Executive, March 11, 1944. Most of the laboratory-based training programs would only accept students who were 21 years of age, hence the advice on what to pursue during the period between high school and training for the bench.

⁵⁷ See *CN*, 7 (December 1930), p. 35.

⁵⁸ "How Large a Hospital Should Employ a Dietitian-Laboratory Worker?" *CN*, 18 (December 1941), p. 36.

⁵⁹ Michael Katz, "The Emergence of Bureaucracy in Urban Education: The Boston Case, 1850-1855," *History of Education Quarterly* (Summer 1968): 155-87.

⁶⁰ Susan Reverby, "The Search for a Hospital Yardstick: Nursing and the Rationalization of Hospital Work," in Susan Reverby and David Rosner, eds., *Health Care in America: Essays in Social History*. Philadelphia: Temple University Press, 1979, p. 206.

⁶¹ The issue of maintaining discrete work boundaries has been explored most thoroughly for the case of nursing. Barbara Melosh has suggested that in the United States, both professionalizers and rank-and-file nurses worried about the role of nursing auxiliaries, fearing they would "undercut the private-duty market and threaten the place of the graduate nurse." However, after about 1940, nursing leaders began to play an active role in the development of practical nursing, while those in the rank and file retained their suspicion of the auxiliaries.

"Essentially," Melosh concluded, "leaders accepted the redefinition of nursing as a middle-management function, while ordinary nurses remained wedded to older craft values, which placed bedside nursing at the center of their work." Melosh, *"The Physician's Hand": Work Culture and Conflict in American Nursing*. Philadelphia: Temple University Press, 1982, pp. 177-178.

⁶² On the multi-tasking of nurses, see McPherson, *Bedside Matters*, especially pp. 95-107.

⁶³ McPherson, *Bedside Matters*, p. 21. McPherson points out elsewhere that student nurses did not just perform less desirable (ie., "subsidiary") tasks. Rather, they performed duties that would come to be assigned to physiotherapists, pharmacists and other allied health care workers, who would not become a regular feature of patient care until after WWII. See McPherson, *Skilled Service and Women's Work*, p. 5.

⁶⁴ Kathryn McPherson and Meryn Stuart, "Writing Nursing History in Canada: Issues and Approaches," *Canadian Bulletin of Medical History*, 11 (1994), pp. 5-6.

⁶⁵ McPherson, *Bedside Matters*, p. 220-221. It bears pointing out that the meaning of nursing practice varied considerably in space and time, and that the "nurse" is not an essentialist category easily understood across decades and in different places. New tasks were frequently

assigned to nurses or old ones withdrawn. As early as 1915, for example, the Victoria General Hospital approved training nurses in anesthesia "with the view to employing them as anesthetists." See BOC, January 2, 1915. However, as hospitals expanded, the question of boundary maintenance gained importance.

⁶⁶ This is an ongoing debate among health care professions. For a recent example from nursing, see H. Cooke, "Boundary work in the nursing curriculum: the case of sociology," *Journal of Advanced Nursing*, 18 (December 1993): 1990-8. The abstract for this article suggests that "[b]oundary work enables a discipline to stake out a claim to its legitimate territory and the resources that go with it. In a practice discipline such as nursing, the boundaries between nursing and supporting subjects, such as sociology and physiology, create problems of transfer of learning."

⁶⁷ Aline Charles and Nadia Fahmy-Eid, "La Diététique et la Physiothérapie Face au Problème des Frontières Interprofessionnelles (1950-1980)," *Revue d'Histoire de l'Amérique Française*, 47, 3 (hiver 1994).

⁶⁸ Anne Wright, "Administration in Small Hospitals," in *CN*, 37 (April 1941), p. 230. Kathryn McPherson suggests that for student nurses, too, a variety of tasks were recounted in student yearbooks, including work in laboratories. See McPherson, *Bedside Matters*, p. 109.

⁶⁹ Keddy Collection, MF 160-9. This interview is erroneously listed as Grace Long in the finding aid to the Keddy Collection.

⁷⁰ Pearl L. Morrison, "The Nurses in Hospital Administration," *CN*, 36 (October 1940).

⁷¹ Sister Catherine Gerard, "We Look at Nursing Service," *CN*, 44 (October 1948), p. 827.

⁷² Agnes Gerard and Ileen Kemp, "Medical Laboratory Technologist." Toronto: The Guidance Centre, Ontario College of Education, 1958. This was a Guidance Centre Occupational Information Monograph, first published in 1954 and re-published in 1958.

⁷³ For the implications of this definition for women, see Cott, *The Grounding of Modern Feminism*, pp. 216-217.

⁷⁴ Bruno Latour has recently written that "one cannot get much mileage out of" the term, because of the lack of specificity. "[A]ll kinds of people" Latour wrote "are being professionalised during the nineteenth century, from bank-tellers to doctors." Similarly, the infrastructure that is developed – the buildings and organizations – is often portrayed as the "institutionalization" of these professions. Latour concludes that "[e]very single discipline is doing the same in the nineteenth century: getting a profession, institutions and buildings. So it is a nineteenth-century feature; it is not specific." Latour, "The costly ghastly kitchen," in Andrew Cunningham and Percy Williams, eds., *The Laboratory Revolution in Medicine*. Cambridge: Cambridge University Press, 1992, pp. 295-296.

⁷⁵ Gerald L. Geison, "Introduction," in Geison, ed., *Professions and Professional Ideologies in America*. Chapel Hill: The University of North Carolina Press, 1983, pp. 3-4.

⁷⁶ Donald M. Scott, "The Profession That Vanished: Public Lecturing in Mid-Nineteenth-Century America," in Geison, ed., *Professions and Professional Ideologies in America*, pp. 12-28. For the need to understand national contexts, see Charles E. McClelland, "Escape from freedom? Reflections on German professionalization, 1870-1933," in Rolf Torstendahl and Michael Burrage, eds. *The Formation of Professions: Knowledge, State and Strategy*. London: Sage Publications, 1990, pp. 97-113.

⁷⁷ Rolf Torstendahl, "Introduction: promotion and strategies of knowledge-based groups," Torstendahl and Burrage, eds., *The Formation of Professions*, pp. 1-10 and Joan Jacob Brumberg and Nancy Tomes, "Women in the Professions: A Research Agenda for American Historians", *Reviews in American History*, 10 (1982): 275-296..

⁷⁸ Braverman, *Labour and Monopoly Capital*; Raymond Murphy, "Proletarianization or bureaucratization: the fall of the professional?," in Torstendahl and Burrage, *The Formation of*

Professions, pp. 71-96; David Coburn, "Professionalization and Proletarianization: Medicine, Nursing and Chiropractic in Historical Perspective," *Labour/Le Travail*, 34 (Fall 1994): 139-162.

⁷⁹ Melosh, *The Physician's Hand*, p. 9.

⁸⁰ Melosh, *The Physician's Hand*, p. 184.

⁸¹ Melosh, *The Physician's Hand*, p. 219.

⁸² A.R. Shearer, ed., "Canadian Society of Laboratory Technologists: A Chronology 1937-1980," [1983], p. 1. The British organization was renamed the Institute of Medical Laboratory Technology in 1942. The American Society was preceded by a Registry of Medical Technologists, which began in 1928 under the auspices of the American Society of Clinical Pathologists.

⁸³ Cott, *The Grounding of Modern Feminism*, pp. 230-231. The relationship between professionalism and feminism is explored in Chapter 7 of Cott's work.

⁸⁴ Mary Kinnear, "Disappointment in Discourse: Women University Professors at the University of Manitoba Before 1970," *Historical Studies in Education/Revue Histoire de L'Education*, 4 (1992), pp. 282-283.

⁸⁵ Cott, *The Grounding of Modern Feminism*, p. 231.

⁸⁶ Coburn, "Professionalization and Proletarianization," p. 140.

⁸⁷ Joan Jacob Brumberg and Nancy Tomes, "Women in the Professions," pp. 276-77.

⁸⁸ Mary Kinnear, *In Subordination: Professional Women 1870-1970*. Montreal: McGill-Queen's University Press, 1995, p. 152.

⁸⁹ Kinnear, *In Subordination*, p. 152, 162.

⁹⁰ McPherson, *Bedside Matters*, p. 17.

⁹¹ Paul Axelrod, *Making a Middle Class: Student Life in English Canada during the Thirties*. Montreal: McGill-Queen's University Press, 1990, p. 90.

⁹² The Canadian Medical Association Committee on Approval certified the Pathological Institute to provide classroom and practical training in laboratory technology in 1941. For information on the combined position at the Tuberculosis Hospital, see "News Notes," *CN*, 45 (December 1949), p. 943.

⁹³ A.L. MacNabb, "Possible Trends in the Public Health Laboratory Diagnostic Service," *Canadian Journal of Public Health*, 38 (1947), p. 426.

⁹⁴ Canada. Department of Labour. *Medical Laboratory Technologist*. Ottawa: Queen's Printer, 1957. This publication as part of the "Canadian Occupations" series.

⁹⁵ CSLT Annual General Meetings, June 26, 1950 and June 7, 1954. The pledge was modeled on an American document, and had been in development for two years. See CSLT Executive Meeting, May 18, 1952. The CSLT pledge declared,

As I am about to commence my career as a medical technologist, and to assume its special responsibilities, I solemnly promise, before God:
 To carry out the duties assigned to be faithfully, and to the best of my ability.
 To remember that a patient's life may depend upon the accuracy and reliability of my work.
 To respect human life, and to be sympathetic towards all patients.
 To hold inviolate the confidence placed in me by both patient and doctor.
 To work harmoniously with my fellow technologists, and others who care for the sick.
 To uphold the ethics and dignity of my profession.
 To maintain an open mind for new ideas, and new truth.

⁹⁶ CSLT Annual General Meeting, December 11, 1937. See also B.T. McGhie, "The Laboratory in Relation to Public Health," *Canadian Journal of Medical Technology* (hereafter *CJMT*), 1 (March 1939), p. 36.

⁹⁷ Agnes Gerard and Ileen Kemp, *Medical Laboratory Technologist*. Toronto: The Guidance Centre, Ontario College of Education, 1958.

⁹⁸ Harvey Hall, "Do's and Don'ts for Technicians," *CJMT*, 1 (1939), p. 51.

⁹⁹ "Team Work -- A Time Saver," *CJMT*, 7 (1945).

¹⁰⁰ "Choosing a Technician," *CJMT*, 8 (1946).

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- ¹⁰¹ James Miller, "The Characteristics and the Training of the Technologist," *CJMT*, 1 (March 1939), p. 42.
- ¹⁰² Miller, "Training of the Technologist," p. 42.
- ¹⁰³ Harvey Hall, "Do's and Don'ts for Technicians," in *CJMT*, 1, (1939), p. 52.
- ¹⁰⁴ Miller, "Training of the Technologist," p. 42.
- ¹⁰⁵ Mary W. O'Donnell, "O Pity the Poor Student -- Or Should We?" in *CJMT*, 4 (1942), pp. 41-42.
- ¹⁰⁶ Interview with Edna Williams.
- ¹⁰⁷ CSLT membership files, 1938.
- ¹⁰⁸ CSLT membership files, 1938.
- ¹⁰⁹ CSLT membership files, 1942.
- ¹¹⁰ CSLT membership files, 1940.
- ¹¹¹ James Miller, "The Characteristics and the Training of the Technologist," *CJMT*, 1 (1939), p. 43.
- ¹¹² Miller, "The Characteristics and the Training of the Technologist," p. 43.
- ¹¹³ *CJMT*, 8 (1946).
- ¹¹⁴ BOC, January 1924. See also W.W. Kenney to Dr. W.H. Eagar, November 23, 1923, in VGHL.

Chapter 5

'Though the "noble nurse" gets all the glory,

Technicians also have their story'¹:

Organizing the CSLT

INTRODUCING MURIEL

In August 1942, a 20 year old Moncton woman began her training at the Bureau of Laboratories in Saint John. Like the students before her, in Saint John and elsewhere, Muriel rotated through the various sections. Three months in haematology, two months each in bacteriology, serology and histology, a little longer in biochemistry, while she spent a couple of weeks learning the techniques of urinalysis, parasitology, and media and stains. In October 1943, after fourteen months of training Muriel sat for and passed the Canadian Society of Laboratory Technologists (CSLT) registration exam. There was nothing remarkable about her training or experience. Not until she applied to the Canadian Society of Laboratory Technologists for registration did she encounter a problem. The Moncton woman had not completed her senior matriculation.

She was not alone.² Another woman training in Saint John had, like Muriel, failed to attain her grade twelve certificate. Helen was also refused membership in the national society despite having completed twenty-two months of nurses training.³ At 30 years old, Helen had already worked in the Bureau of Laboratories on two previous occasions, in November 1937 and January 1938 and spent one year working in a doctor's office. The director of the Saint John laboratory, Dr. Arnold Branch, suggested Helen was "very good in practice"

and had "no hesitation in recommending this young woman both to her ability & character." The applicant had already secured a position in a hospital, thanks to her experience, education as a nurse and abilities.⁴

Women like Muriel or Helen were not permitted to enter training programs, according to the admission rules set out by the CSLT and the Canadian Medical Association (CMA). It did not matter that they completed the training course, had work experience or other education beyond junior matriculation. Muriel had, after all, successfully completed the training course and the national exam. Nor did it matter that she had completed three and a half courses at Acadia University prior to undertaking her laboratory training.⁵ Despite a modestly successful year in university, the CSLT was unmoved and held Muriel's application in abeyance, suggesting that she sit for her exam again in the fall of 1944. Steadfast, the national society wrote to the Saint John training program that the woman should "try to complete her matriculation work during night courses".⁶ She was to work at the bench and attend class at night to receive her registration, a registration that did little for her employment prospects or opportunities for advancement.

Muriel rejected this. Instead, she continued her education and her work-life. She accepted a position at the Moncton Hospital, serving as assistant laboratory technician for fourteen months, before taking a job at the Nova Scotia Sanatorium in Kentville as head technician in early 1945. Her return to Kentville also provided her with an opportunity to resume her university studies at Acadia and she promptly enrolled and completed another half-course in botany. With several years experience behind her, she asked the CSLT "[h]ave I adequate qualifications to receive my registration[?]"⁷ This woman,

despite feeling rejected by the national society merely on the basis of her failure to complete Grade 12, continued her work and her studies. Her own society "felt I was not worthy of my registration,"⁸ despite her success passing the exam and completing the training program.

Several of the themes illustrative of laboratory workers, their work and their organization swirl around Muriel's story. More generally, the development of the national society allows one to situate the experiences of Maritime laboratory workers in the national context and, in so doing, understand the broader implications of that experience. The CSLT played an active role in legitimizing a portrayal of laboratory workers that emphasized the divide between manual and mental work and concurrently valorized the latter. Ultimately, the national society drew a division between laboratory workers and other hospital workers, creating a social cleavage within the hospital that left laboratory workers on rather tenuous ground, with a highly ambiguous identity. This is all the more surprising given the nature of laboratory work during the 1920s, 30s and 40s. What, then, were the important features of laboratory work that the Maritime experience revealed? Perhaps most importantly, that there were many paths to the laboratory bench. This diversity among laboratory workers was clearly demonstrated in both Halifax and Saint John. Another feature of the work was the multi-tasking that was endemic in Maritime hospitals. Many hospital workers combined work in one service with that in another or even several. This was particularly true of laboratory workers in smaller hospitals. These two features of laboratory work, the lack of a common route to the bench well into the 1950s and multi-tasking gave rise to two tenuous claims related to knowledge and skill, respectively.

Laboratory workers, in an age when new tests were being added, did not successfully articulate a claim to that body of knowledge. In part, this was because they shared the terrain of the laboratory with other workers, most notably nurses. The flexibility that was a feature of many aspects of hospital work was particularly damaging to an emerging labour force within the hospital. The ambiguity of laboratory roles discussed in Chapter Four essentially meant that all laboratory workers were grouped as an undifferentiated mass. There were students, those who were labeled "technicians" or those merely providing laboratory "services." The fact that these individuals could not be distinguished from one another homogenized and effectively devalued laboratory work to a large degree. What is most striking is how this sharply contrasts with the growing specialization of medicine and, concurrently, departments within the hospital. This confirms the belief that women workers, in this case laboratory workers, were viewed as interchangeable, while physicians, most of whom were men, had recognizable and individual skills.⁹ Equally important was that laboratory workers had no exclusive ownership over skills. The debate over skill is, of course, a rich one historiographically.¹⁰ What is most germane to the laboratory is that physicians occupied the critical position of laboratory director and it was they who shared in the socio-cultural network of medicine that valorized the interpretation of results over the preparation of those same results. The skill attached to the reading is what was important and shaped how work was organized and rewarded within the hospital. Few women and virtually no laboratory workers shared in this culture.

The increasing number of medical specialties and the services that often accompanied them introduced new workers to patient care. As new groups became established and expanded, they attracted the interest of professional medicine. The CMA's desire to exert their authority over the education and registration of laboratory workers was in part a recognition of the growing place of these workers in the chain of diagnosis and service to patients.

Muriel's rejected registration is indicative of the increasingly restricted entry to education, hence access to laboratory work. While hurtful to her, the rejection she encountered also demonstrated that control over the labour market by the CMA and, secondarily, the CSLT was incomplete. Nevertheless, Muriel still sought membership in the national society, suggesting the power of the professional model for Canadian health care workers.

I – ORIGINS

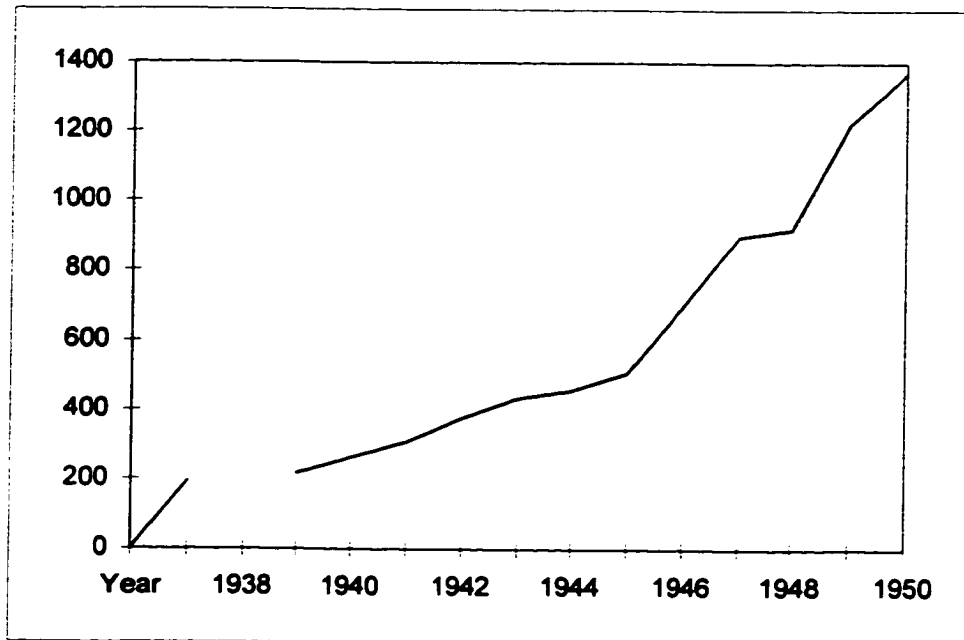
On November 8, 1936, a meeting of eight laboratory workers in the Hamilton General Hospital resulted in the establishment of the Canadian Society of Laboratory Technologists. The society had six stated objectives, including improving the "qualifications and standing" of laboratory workers and, once this was achieved, to "promote a recognised professional status" for the workers. The society would achieve this through establishing practical and theoretical examinations to ensure laboratory workers were fully qualified.¹¹ The original name was, in fact, to be the Canadian Society of *Medical* Technologists, but in February 1937, the Department of Pensions and National Health objected to the use of word "medical," viewing such a description as the sole purview of "qualified and registered Medical Practitioners."¹² The

substitution of the word laboratory for the more descriptive "medical" was a decision "forced" upon the executive of the fledgling national organization.

The charter members of the CSLT included seven bench workers, an analytical chemist, a surgeon, a physician, a pathologist and a secretary.¹³ The society attracted interest very quickly. By February 1937, there were 23 members. To a remarkable extent, the society's membership came from across Canada. Every province except Alberta was represented among the first one hundred members, and there were two registrants from Newfoundland. By the first annual general meeting, which 27 keen members attended in a dining room in Hamilton's Royal Connaught Hotel, there were 193 members drawn from every province. While the society was clearly "national" in scope, the province of Ontario dominated. Almost half of the membership at the time of the 1937 annual meeting came from that province.¹⁴ A decade later, the CSLT could boast 1200 members from across Canada and provincial branches in British Columbia, Saskatchewan and New Brunswick, although Ontario continued to dominate membership (See Figure 5.1).¹⁵

Circulars were dispatched from Hamilton to laboratories across the country informing workers of the national society and asking that they join. Many were sceptical. "What will be the advantage of taking examinations for registry in the Canadian society or of belonging to the Canadian society," asked a potential New Brunswick member, "if one already belongs to the American society".¹⁶ The question was perhaps heightened by the fact that membership fees in the CSLT were three times that charged by the American counterpart!¹⁷

Figure 5.1
Growth of CSLT, 1937-1950



Source: CSLT. Minutes of Annual General Meetings 1937-1950. No data was available for 1938.

The American Society of Clinical Pathologists (ASCP) was founded in the early 1920s and the ASCP recognized that they should play a role in training laboratory workers. As one laboratory technician wrote "people with varying backgrounds and degrees of competency were employed in the laboratories" and the ASCP sought to remedy this through a three-pronged approach. First, there should be a standardized education for laboratory workers. Second, these education programs needed approval from a qualifying body. Third, there was a need for certifying graduates from these training programs. To attain these goals, the ASCP organized a Board of Registry for lab workers in 1926 as a standing committee and in 1928 began receiving applications for registration.

In 1933, American laboratory workers organized themselves into a national society, but responsibility for approving programs and registering graduates remained with the ASCP.¹⁸

The ASCP also registered Canadian laboratory workers. In 1936, two Saint John workers passed the examinations and received accreditation from the ASCP as a "medical technologist." The *Annual Report of the Bureau of Laboratories* suggested that the "MT" designation was "becoming increasingly important and will serve in time to place trained laboratory technicians in a more secure position in competition with those whose training has been superficial."¹⁹ The next year, two more workers received their MT, bringing to four the total registered with the ASCP. That so many of the laboratory workers in Saint John successfully completed the exams and were registered with the ASCP was taken as evidence of the "very excellent training" provided through the Bureau of Laboratories.²⁰ Even after the creation of the CSLT, some workers in Saint John continued to write the American exams and register with the ASCP.²¹ The *Annual Report* for Nova Scotia does not record similar instances, although one informant did recall that three workers in the laboratory sat for the American exams.²² Nevertheless, registration was unusual for early laboratory workers. Among the earliest thirty members of CSLT from the Maritimes who joined in 1936 or 1937, only three held ASCP memberships at the time of registration.²³

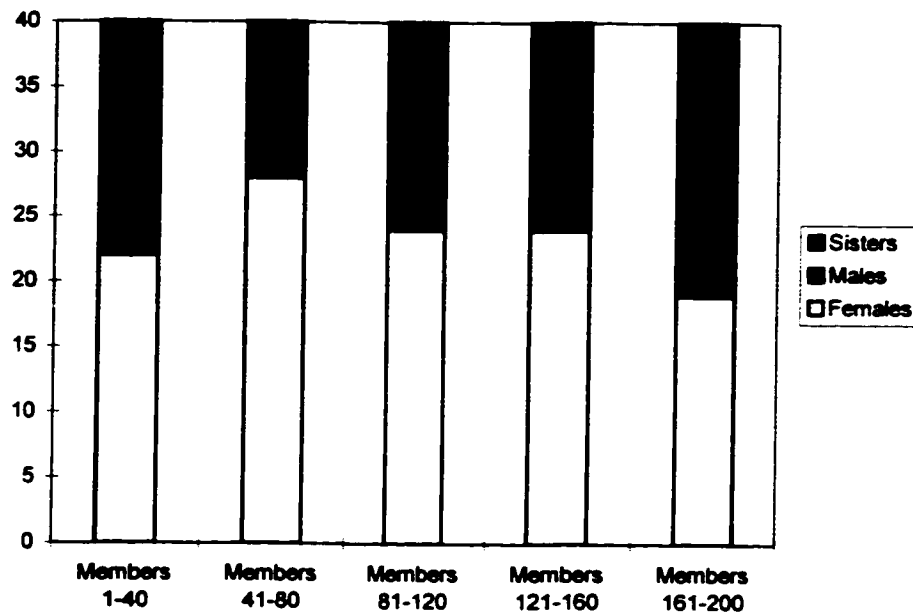
While few laboratory workers exhibited interest in registration with the ASCP, many did seek membership in the Canadian body after its founding. The CSLT initially drew on the support of women laboratory workers to a great extent. Of the first two hundred individuals, all of whom joined in the last

months of 1936, through 1937 and the first months of 1938, 158 (79%) were women. Included in this number were 41 nuns providing service at religious institutions across the country. Twenty-one percent of the first two hundred were men (See Figure 5.2). Males were over-represented in the first cohort of forty members, suggesting that men were quick to join the national body. Conversely, women in religious orders, who represented a fifth of the first two hundred registered, were slower off the mark and under-represented in the first two groups of forty. Representatives from Catholic hospitals were prominent in other national health organizations such as the Canadian Hospital Council.²⁴ It is difficult to know exactly why nuns were slow to join the CSLT, but it likely suggests the vagaries of recruiting members to the new society.

The registry is also a good source of information regarding laboratory workers from the Maritimes and Newfoundland who joined the CSLT in its first decade. From 1936 to 1946, seventy-four members joined from the Maritimes and Newfoundland. These were overwhelmingly single women when they registered, although there were seven men. As well, there were twelve nuns. The average age of the members was 27.9, while the average of the women (excluding nuns) was slightly higher at 30.1 years old. Applicants averaged slightly over four years service, but 39 of the 74 had two years or less.

A number of factors inflated the age of the applicants. The first was that the CSLT grew initially from persons who were established in their work life and therefore had an interest in a national society. A second factor was that the CSLT imposed a condition of membership of at least 12 months service. Education also likely inflated the age, through delaying entry into the labour

Figure 5.2
The first 200 persons registered with the CSLT



Source: CSLT Registry of Technicians

force. Nineteen of the applicants from the Maritimes and Newfoundland had university degrees when they applied to the CSLT, while another 19 had some university education. Fourteen had undertaken laboratory courses of varying length in a hospital. There were also eight applicants who had nursing education, while another eight had some other education, including business courses. Twenty-three had no education beyond high school, while fifteen combined education from one arena with that of another.

II -- EDUCATION

The early membership of the CSLT, then, reflected the diversity that was characteristic of laboratory workers. At the first annual general meeting, the

national society addressed the difficulty of inclusion. How does a newly constituted organization determine its membership? The CSLT took a very broad approach to membership, agreeing to "more or less cover all technicians at present employed."²⁵ All that would be required was a certificate from a "prominent" associate, attesting to the candidate's ability and acceptability. The application form was more precise: it requested the names of two clinical pathologists. Physicians would comment on the moral integrity, intelligence, dependability, accuracy, co-operation and ability as a laboratory technician of the candidate. From the outset, physicians would play a significant role in determining membership. Symbolically, investing physicians with such a role reveals much about the relations between the two groups.

The labour shortage during the Second World War would pose a challenge to the inclusive membership strategy. While seemingly a source of strength for the nascent society, allowing the membership rolls and the coffers to grow, such a broad strategy permitted entry from workers with only modest training. The CSLT recognized that while the war effort demanded such training, the consequences for the national society and lab workers following the cessation of hostilities could be devastating. In 1941, the CSLT refused several applications from soldiers who were being trained in Toronto.²⁶ In early 1942, faced with an increasing number of laboratory workers within the military, the CSLT decided that "unless their qualifications were considerably outstanding, to recommend them to try the examination."²⁷ There would be no relaxation of the registration requirements for service personnel.

There were already problems on the homefront. There was a generalized shortage of laboratory workers in the early 1940s as the war took its toll on the

ranks and as diagnostic services continued to expand. In the midst of labour scarcity, hospitals often found novel solutions. In Montreal, laboratories turned to the Junior League for assistance. There was, after all, a need on the homefront and women across Canada were making substantial contributions where they could. The young society women of the Junior League were used to performing volunteer welfare work and may not have objected to working in hospital labs for ten dollars a month. But for the CSLT, still struggling with questions of membership and admission to the registry, the presence of the young women and the low salary was an affront to their emerging professionalism.

The CSLT found such employment "contrary to the spirit of the newly appointed registry," but despite their objections the Canadian Medical Association did not pursue the matter.²⁸ Expressing the view of the CMA, Dr. G. Harvey Agnew stated that

the presence of these [Junior League] workers, some of whom may not have their honour matriculation and many of whom may not intend to continue the work seriously, does tend to upset the standards of qualification which you have set up but, in matters like this, where long established custom would have to be upset I think that your association would be well advised to make haste slowly. For many years to come some of our larger hospitals will probably continue to train their own technicians, in part at least, without giving much consideration to educational qualifications[.]²⁹

The Canadian Medical Association, like its American counterpart, was concerned not just with its physician members, but with the activities of all health service workers in the hospital, including laboratory workers. But clearly the concerns and aspirations of laboratory workers were secondary. The relationship between the CMA and the CSLT was not one between equals.

The shortage of laboratory workers in the 1940s also prompted changes to the registration requirements. Most notably, in the mid-1940s the eligibility age was decreased from 21 years to 19. This reduction allowed interested students to enter laboratory training sooner than before, which undoubtedly aided recruitment to the bench. This was likely augmented when applicants with junior matriculation were allowed to be admitted to the register. Five years laboratory experience would stand in the place of graduation from a recognized program until July 1, 1946. Registered nurses would continue to be admitted to the laboratory society without prejudice until that same date.³⁰ Cumulatively, these changes opened registration to a wider pool of workers. At the same time, however, the changes likely ensured that future laboratory workers would enter training without the benefit of the other kinds of education that were common before WWII, including university and business courses.

Laboratory workers did not share a common education experience. Some workers had a few courses in a laboratory science, while others held degrees in the Arts, or graduated from nursing programs. Obviously, the CSLT did much to accommodate this diversity in its early years, leading to a vibrant and healthy organization. Nevertheless, it was greatly concerned with the issue of education. As the number of approved schools expanded through the 1940s, education would become one of its chief foci. Education standards, approval of education programs and certification were familiar planks in the effort to professionalize and, in common with their American counterparts and a broad swath of health care workers, the Canadian society pursued the same goals.

In early 1937, Mountain Sanatorium in Hamilton applied to the American Medical Association for approval of its training program for laboratory

workers. The AMA contacted the Canadian Medical Association to see whether the latter organization had any objection to the AMA approving the program. The CMA did not have its own evaluation process, so it raised no concerns. The request did, however, prompt the CMA to establish a committee to investigate the education and registration of laboratory workers in Canada. Dr. W.J. Deadman, a prime mover in the creation of the CSLT, was appointed chair and Dr. G. Harvey Agnew secretary. The rest of the membership was drawn from across Canada, including Dr. Ralph P. Smith of Halifax.³¹

The CMA approval program endeavoured to ensure students began laboratory courses with a reasonable knowledge of high-school science and that the programs they entered were accredited in some fashion. The CSLT expressed the opinion that the CMA would not let "every hospital train technicians."³² When the CMA Committee on Laboratory Technicians reported in 1939, they were not disappointed. The committee worked for a short time, and submitted an interim report to the CMA in June 1939. The committee endorsed the idea of approving schools and set out thirteen requirements for approval, including the size of the laboratory, amount and nature of the work performed, the qualifications of the instructor, and facilities to name only a few. The committee decided that schools should be "in adequately organized departments of pathology associated with hospitals having at least 400 beds, or in public or other laboratories providing comparable experience." The CMA rejected outright that commercial laboratories had a place in the training of laboratory workers. Course content initially remained the responsibility of the hospital and the laboratory director. The CMA did prescribe a twelve month training program and that any specialty training should be preceded by twelve

months of general training. General training would cover technique in haematology, bacteriology, medical zoology, histology and pathological chemistry. Specialized training could include advanced technique in serology, bacteriology or biochemistry.³³ By emphasizing the importance of general training, hospitals could be assured that all graduates possessed a core body of knowledge.

This was also an attempt at imposing some uniformity on what was a complex training system. The move toward standardization had begun, and would be furthered by the creation of a syllabus of study for these newly approved training programs.³⁴ When the CMA Executive Committee met in Winnipeg in June, 1941, four laboratories had been approved for training workers.³⁵ By March 1942, when the *Canadian Journal of Medical Technology* published its first list of approved schools, there were nine.³⁶ Most of these were concentrated in the eastern half of Canada, but the CMA and the CSLT were confident that the number in the Prairies and British Columbia would increase.³⁷ Approved schools did grow in number. From nine schools in 1941, the number of approved schools expanded to 30 by 1946, 58 by 1951, 82 by 1956 and 110 by 1960.

Throughout this same period, laboratory training programs were established in the Maritimes and Newfoundland. In Nova Scotia, the Pathological Institute housed the first approved school. Approved in 1941, the Morris street laboratory was followed by the Halifax Infirmary (1947), St. Martha's Hospital (1947), Aberdeen Hospital (1959), the Cape Breton Laboratory of the Nova Scotia Department of Health in City Hospital, Sydney (1959), St. Rita's Hospital and St. Elizabeth Hospital jointly (1960) and Glace

Bay General Hospital (1960). There were other options in the region, including the Bureau of Laboratories in Saint John (1942) and the Lancaster DVA Hospital, Saint John (1950) in New Brunswick; the Division of Laboratories, Provincial Health Centre, Charlottetown, Prince Edward Island (1947); and St. John's General Hospital (1950) in Newfoundland.

As demand for workers to staff laboratories increased, there were calls to increase the number of training programs. The widespread shortage of laboratory workers during and following the Second World War indicated the need for expanded educational opportunities. Nevertheless, the same shortage of workers made it difficult for individual laboratories to increase their training capacity. Much of the preparation still depended upon experienced workers passing their knowledge on to students through apprentice situations.³⁸

The presence of students undoubtedly aided the work of the laboratory, but the one-to-one ratio of registered workers to students limited the number of learners approved programs could accept.³⁹ The prevailing form of apprenticeship training at the bench required that every student be matched with a registered laboratory worker, so the maximum number of students was proportional to the volume of work. An education rooted in apprenticeship required that a large number of hospitals had to participate in training future workers. A decentralized training system allowed hospitals to train a small number of students, without disrupting the clinical work. It was also important for the training of the students themselves. Some tests were ordered only infrequently. The number of students in any one laboratory had to remain small, to expose students to uncommon tests and ensure that they performed a sufficient volume of work to achieve both confidence and competence.

Laboratory directors and hospital management in larger Canadian hospitals had to work actively to expand their training programs to meet the labour demand. The CMA Committee on Approval noted in 1948 that candidates were plentiful and schools were annually swamped with applicants.⁴⁰ If hospitals were to be adequately staffed with laboratory workers, hospitals with the ability to train must do so. Only in this way would smaller hospitals have sufficient staff. Putting it frankly, the CSLT executive commented in 1951 that "[t]his entails an acceptance of the responsibility by the larger hospitals to train technicians for the market as well as for their own needs."⁴¹ That year, there were 54 training schools across the country. Despite the addition of six more accredited schools, there was still a shortage. A question from the floor of the annual general meeting asked whether any more schools were scheduled to be opened. The answer, in spite of the "desperate" need, was not optimistic. The society concluded that most of the major hospitals in Canada had already been approved as training centres. In larger centers, more tests were performed on a daily basis and more workers employed. Thus, the potential for training students was greatest in larger facilities. With only smaller hospitals on the horizon, there was also a diminished capacity to turn-out students. The number of hospitals offering training and, more importantly, the capacity of these hospitals to train students would likely decrease.⁴²

With the shortage of laboratory workers in the 1940s, the educational standard for access to training programs was a common debate. Discussions took on an interesting tenor, with some advocating decreased entry standards in order to allow programs to expand,⁴³ while there also some consideration of whether university education was appropriate for laboratory workers.⁴⁴ Nor did

the move toward general education, promoted by the CMA and the CSLT, enjoy unanimous support within the medical and hospital communities. The Registrar of the Ontario College of Physicians and Surgeons remarked in 1948 that a difference of opinion existed among doctors, with "some men preferring students from the Canadian Society of Laboratory Technologists, and others who won't have anything to do with those whom they have not trained themselves."⁴⁵ For other physicians, it was not a question of who was doing the training, but rather the content of the curriculum. One student remarked that doctors were often ready to exclaim "I don't believe in general technicians. I want a technician who can do one job well, and I still think only university graduates in science should be employed as technicians."⁴⁶ One wonders how prevalent such a view actually was and the evidence on the point is ambiguous. For example, the multiple roles filled by laboratory workers provide some evidence that specialization was not desired.

But what constituted specialization? It is likely that a small laboratory would require a worker with a knowledge of a full range of tests, perhaps in addition to other duties such as dietetics, x-ray technology or nursing. Such a worker was highly "specialized," having pursued a variety of training programs and employment opportunities. Some physicians clearly did not value this specialization. Moreover, the multi-tasking characteristic of laboratory work before 1950 was anathema to the professional dream of twentieth century health care workers, each trying to carve out and maintain a sphere of activity in an increasingly crowded and competitive occupational environment. A more elitist view of the laboratory worker likely frowned upon this kind of occupational diversity (one might even say occupational pluralism, although it

was pursued *within* the one work environment of the hospital) and this view in all likelihood prevailed in some laboratories. A dedicated pathology laboratory, close to a university, could afford to be more selective in its staffing decisions. If it had sufficient resources, it could also afford to hire persons to conduct a considerably more narrow range of tests, in contradistinction to the smaller hospitals that dotted the Canadian health service landscape.

III -- RELATIONS WITH THE CMA

In spite of its position vis-à-vis the Junior League, the CMA did share with the CSLT a commitment to raising the standards for laboratory workers. A CMA committee of biochemists and pathologists came to the conclusion that Canada needed a way to recognize "qualified technicians" and recommend them for vacancies in hospital and other laboratories. In this way, potential employers could have "reasonable assurance" that those registered would have a basic knowledge of laboratory procedures.⁴⁷ "The technician ... plays an important role in the chain of diagnosis and treatment of the sick as well as in the field of preventive medicine," added the Committee on Laboratory Technologists. "The importance of these workers has steadily increased during the last forty years and his [sic] status has at the same time improved. Moreover women have taken an increasing part in this branch of medical work. With expanding usefulness the necessity of higher preliminary education and more elaborate training has developed."⁴⁸ The CMA decided that instead of establishing a registry under its auspices, it would defer to the newly organized CSLT.

The open membership policy, as the first president Frank J. Elliot declared, was a "necessity if only by virtue of the fact that to have an organization capable of attaining its aims that same organization must be strong in numbers and representation." Such a position was "consistent with British ideals of fair play that those technicians who, through no fault of their own, are not as advanced as others should have representation in an organization such as ours."⁴⁹ Similarly the society readily admitted those who specialized in only one aspect of laboratory work, such as serology or histology, upon the presentation of a letter of support from the laboratory director. Elliot did acknowledge, however, that "all future technicians, whether desiring to become general or specializing technicians, should have at least one year of general laboratory training."⁵⁰

Laboratory workers had to pass a national examination for admission to the registry. Again, the CSLT took a de-centralized approach to the examination. A local laboratory director interviewed interested applicants and administered the examination. Exams were scheduled twice a year. There was a practical exam, which was not to exceed one hour and a written examination of between three and four hours. Both portions of the exam were weighted equally and the pass mark was seventy percent. There was also a provision for workers specializing in particular segments of laboratory work. If the individual had one year experience, a letter supporting their application from the laboratory director was sufficient.⁵¹

The CSLT and the CMA were clearly interested in encouraging the imposition of national standards on laboratory work. The CMA in particular, carefully guided the effort to establish the registry, set exams and approve

education programs. Through their laboratory committee, professional medicine kept an ever-watchful eye on professionalizing laboratory workers. For example, the CMA's laboratory committee carefully considered every school that applied for approval to train laboratory workers. Schools were initially sent a questionnaire, which was augmented by the personal knowledge of committee members regarding the ability of the school to conduct a rigorous education program. Occasionally, schools were discouraged from seeking approval, presumably on the basis of the personal knowledge of the CMA committee members. On other occasions, the committee requested more information from schools that applied. If applications were received but committee members continued to harbour doubts, an inspection would be carried out. If applications were received from inferior programs, the committee did not grant approval.⁵² Expansion would not occur at any cost. Such a high-minded stance was probably easier to pursue in an occupation that still did not require certification from its workforce. After all, rejecting schools did little to diminish the labour supply. Unapproved laboratories could still offer training to fulfill their own needs and these workers could likely still find positions in laboratories across Canada.

With the growing number of approved education programs, the CMA continued to monitor the situation closely. In 1944, the CMA expressed some concern about the lack of training standards. The CSLT admitted the first 275 members without any examination whatsoever, in an effort to "give the Society a start" in the opinion of the CMA Committee on Laboratory Technicians. The committee erroneously believed that by the mid-1940s the laboratory society was only allowing persons enrolled in approved schools to sit for

examinations. In fact, the CSLT was still permitting any worker to sit for examinations, regardless of when they completed their training or whether they met a minimum standard of education.

The CMA thought that it had a verbal agreement with the CSLT that after a specified date, only graduates from approved training programs would be permitted to write examinations and only those who passed the exam would be entered into the register. There was some disagreement between the CSLT and the CMA regarding the date, however, as there was no written agreement. The CMA committee decided unilaterally to establish the date again at July 1, 1945, after which time only those who passed the examination would be entered into the registry.⁵³

The struggle of the CMA over exams and registration is only the most overt example of professionalized medicine's interest in controlling the labour supply for the ever-increasing number of hospital laboratories across Canada. Indeed, through the laboratory and education committees, the CMA established control over entry to laboratory work. While the CSLT was struggling to attract members and define a role for itself among health care workers, organized medicine was establishing control over the education and training of laboratory workers. The CMA did delegate control of the national registry to the CSLT, but it was clear that the CMA would ensure that the standards that *it* defined were enforced by the laboratory organization. The CSLT may have been struggling to create a national voice for laboratory workers, but it was a voice at best singing in concert with professional medicine and, at worst, only part of the chorus. Replicating the hospital hierarchy, the CSLT would be subordinate to the CMA.

IV -- MEMBERSHIP

The new society welcomed workers from small and large hospitals, from Catholic and Protestant institutions and those who had broad experience in the laboratory or whose work was restricted to one particular area of lab tests. It was a membership roll that initially embraced laboratory workers in all their diversity. From the outset, the CSLT recognized two original classes of membership, "active" which was to include "technicians engaged in medical laboratories" and "honorary" which was to "include persons otherwise engaged whose assistance and co-operation would be of value in the organising of the society."⁵⁴ It was in the midst of this diversity that a dedicated cadre of laboratory workers in Hamilton managed to fashion a national society of laboratory workers in 1937. That promoters of the CSLT made such an attempt speaks to the power of the professional image in the health care sector. The inclusiveness was a practical response for a society struggling to define its membership and its place within the web of hospital workers.

Any impetus to create a national society was constrained by the opinion of laboratory directors and physicians across the country, many of whom were less than certain of their support for a national body of laboratory workers. When the CSLT registry was established in 1937, entry gave workers the "registered technologist" (RT) designation. At the inaugural annual meeting of the CSLT, one member asked whether all technicians would be required to register. The President replied "[w]e cannot force anyone to register." The member then replied "[t]hose doctors who do not approve of the Society -- their technicians will not be registered."⁵⁵ Immediately the society recognized

that there would be many laboratory workers who would not be encouraged to seek membership or who would reject the national society for their own reasons. In the late 1930s, entry into laboratory work did not carry with it the expectation of membership in a national society. The professional model for Canadian health care workers may have been ascendant, but workers and physicians alike could avert their gaze.

But many peeked. "Hardly anybody bothered with the Registered Technologists business in those days" recalled one Halifax worker. Apparently, the workers in the Halifax facility reflected the attitude of the director, D.J. MacKenzie. "He didn't care for it one little bit ... because he said that it was a bunch of girls ... He went by what you were like and what you did. He didn't care if you had RT after your name or not."⁵⁶ MacKenzie "sure thought RTs weren't any use around the lab, I think that was his theory." Despite the lack of confidence her supervisor had in the meaning of registered laboratory workers, this worker did join the national society, exercising some choice in the association and hedging her bets. Some of the workers joined "on our own ... in case it ever got to be essential".⁵⁷

Not surprisingly, many of the applicants to the CSLT used the same references when submitting their forms, usually the laboratory directors of the hospitals or those involved in training the workers. These individuals, as the informant suggested, could play a role in encouraging application to the CSLT or, through their indifference, undermine the effort to organize. Occasionally, one worker in a laboratory would serve as an agent to recruit others within their laboratory or within the locale.⁵⁸ The CSLT registry also offers indirect testimony to this registration process. The first seven members came from

labs in Hamilton or Dundas in Ontario. Such "clustering" of applicants is found throughout the registry for the early years. For example, six members from London, Ontario joined consecutively, fourteen joined from Vancouver in a short space of time. Applicants from other cities, such as Halifax, Saint John, Pembroke, Ottawa and Toronto were entered consecutively on the membership rolls. The registry suggests then, that laboratory workers joined the national society in identifiable groups, coming from particular cities or hospitals within those cities. Such a process was undoubtedly governed by the workers' commitment to the idea of a national society, the encouragement of some laboratory directors, and the enrollment of entire classes of students during the course of their training.

With a diverse membership drawn from across the country, the idea for a journal was advanced at the inaugural annual meeting. A professional journal is perhaps the most outward sign of a health care organization's commitment to contributing to the advance of health and the production of knowledge. One of the guest speakers at that meeting, Dr. Kirk Colbeck, of Welland, Ontario, suggested that the society should have a "bulletin or magazine, typewritten, mimeographed or printed -- the form does not matter so long as you have one." Communication was an important ingredient in any national society, and it was costly. As Colbeck tellingly reminded the small gathering, "if the doctors can't afford to [maintain communication], God help the technicians."⁵⁹ There was, however, hope. Colbeck suggested that the various pharmaceutical manufacturers, who supplied the chemicals and reagents for laboratory work, might be willing to advertise in the journal, thereby ensuring its success. The first journal was a mere thirty pages, the second one doubled to 66 pages and

then it doubled again to 139. With the third edition, advertisements began to appear in greater number and, in the fourth volume of that initial year, readers were reminded to "[w]henever possible patronize the advertisers."⁶⁰

By 1940, the circulation of the journal was fifteen hundred, which had increased from 350 for the inaugural October 1938 issue. The journal was sent to all the members of the society, to about eighty pathologists, over a hundred paid subscribers, to eight hundred hospitals in Canada and to twenty-five institutions of learning. Subscribers were reported to come from across Canada, although the society conceded that they were "mainly centered in Hamilton."⁶¹ The next year, for example, forty of the 62 physicians who subscribed to the journal were from Hamilton.⁶²

A tremendous amount of work went into maintaining contact with the membership. In addition to the journal, members regularly received minutes (which totaled 195 pages for the years 1949-54) and the bilingual CSLT *News Bulletin*, that was inaugurated in 1951. The minutes and newsletter were mimeographed in-house, on "work nights" when volunteers gathered for five or more hours to collate, staple, fold, stuff and address this material to the members and students, work done in the cramped quarters of the head office.⁶³

The *Bulletin* was bilingual and in 1955, the presidential address included a "few words of greeting" for francophone members.⁶⁴ The CSLT had made earlier endeavours to reach out to French-speaking constituents. In 1947, the CSLT amended its by-laws to add a francophone director to the executive.⁶⁵ Correspondence was often sent out in both languages and when Ileen Kemp made a "grand tour" of eastern Canada in 1951, a translator accompanied her when visiting Montreal, Quebec, Chicoutimi and Sherbrooke.⁶⁶ When Kemp

arrived in Halifax, she attended a "lively and valuable" meeting of seventy-five workers and physicians. There were also meetings in Sydney and Antigonish, and Kemp felt the prospects for a Nova Scotian branch of the CSLT were promising.⁶⁷

Table 5.4
Geographic origins of people joining the CSLT by province and year, 1936-1945

	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	TOTAL
NF	0	3	0	0	0	0	0	1	0	2	6
NS	0	15	2	8	3	0	7	3	2	12	52
NB	0	6	3	7	5	3	10	4	12	5	55
PEI	0	7	0	3	0	0	0	0	3	2	15
PQ	0	8	1	4	6	15	4	14	4	15	71
ON	13	80	4	25	39	11	25	38	20	53	308
MB	0	7	1	4	2	0	1	13	9	12	49
SK	0	14	6	5	4	4	7	5	7	22	74
AB	0	10	4	3	4	3	3	1	0	20	48
BC	1	33	0	1	1	1	2	3	10	17	69
OTH	0	0	0	0	2	0	1	2	2	2	9
TOTAL	14	183	21	60	66	37	60	84	69	162	756

Source: CSLT Register

Despite the initiatives of the national office such as the *Canadian Journal of Medical Technology*, the *Bulletin*, and attention to French-speaking members, was the CSLT truly a national society? The national registry for the CSLT, presented in Table 5.4, offers some data on the geographic origins of the membership. In the years 1936 to 1945, Ontario, with its close proximity to the national office and numerous hospitals, accounted for 41% of the registered members, 23% came from the Prairies, 16% from the Maritime provinces and 9% each from British Columbia and Quebec. The remaining persons on the register came from Newfoundland, the United States or elsewhere. The society

was aware that it had work to do beyond Ontario's borders. One correspondent noted that very few of the laboratory workers in Edmonton were registered and that "the general impression has been that the organization is, to quote, 'An Eastern affair.'"⁶⁸

The society did have strong roots in British Columbia, where as early as 1937 the national executive appointed George Darling as the CSLT's provincial representative.⁶⁹ A provincial branch of the society was successfully established in Saskatchewan that same year.⁷⁰ In her 1949 presidential address, Ileen Kemp commented on the organizational disparity between the east and the west. There were vibrant provincial organizations in British Columbia and Saskatchewan and workers in western provinces held their own annual meeting, beginning in 1947. It is clear, however, that when Kemp spoke of the "east" she meant Ontario: "what is Ontario doing?" she asked. The large numbers of laboratory workers in that province made a provincial organization difficult to organize. Instead, keen laboratory workers organized "local academies." The academies hosted information sessions, saw workers present papers and provided a chance for sociability among laboratory workers. Beginning in Toronto in 1949, local academies expanded to other Ontario cities over the next several years, and provided a firm foundation on which to build the provincial branch, which was achieved in 1952.⁷¹

Activities outside Ontario also increased. In 1948, workers in New Brunswick established a provincial branch of the CSLT.⁷² By 1950, local activity reached an unprecedented level. There were three provincial branches in British Columbia, Saskatchewan and New Brunswick. Calgary boasted an active local group "in existence for some years" although there was no

province-wide organization. Quebec City and Halifax also had active local societies.⁷³ Manitoba had established a society outside of the umbrella of the CSLT, but in 1950 re-constituted itself as a provincial branch of the national organization. CSLT president Joseph Scott marked the occasion by reiterating his desire that "those provinces in which no branch has been formed will soon follow".⁷⁴ Others did. In 1953, Alberta organized a provincial society, followed by Prince Edward Island in 1954, Quebec in 1958, Nova Scotia in 1960 and finally, Newfoundland in 1961.⁷⁵

V -- UNIONIZATION AND WORK CULTURE

That laboratory workers organized local groups suggests that segments of workers were interested in collective activity in these areas. But provincial branches of the CSLT or even the informal local academies were not the only manifestations of collective activity in these years. In 1944, workers at the Regina General Hospital in Saskatchewan successfully organized and became members of the local civic employees' union. Regina laboratory workers were drawn into the labour movement and turned to the national society for advice. The national executive discussed "unions and their affect in Hospitals", and Frank Elliott argued that "they go into this union one hundred percent." Although no formal decision is recorded on the matter, Elliott believed it to be a good idea if it enabled them to deal more effectively with local authorities. There was another opinion. An executive member from Toronto stated that laboratory workers in that city had recently held a meeting and debated "whether they wanted to be unionized or remain a professional group and they voted 99% to remain a professional group."⁷⁶ A professional could not be a

union member in this view. It is a dichotomy that would inform much of the debate at the national office.

In late 1948, when another Regina laboratory worker inquired regarding unionization, the executive took a conciliatory position. They considered membership in civic unions to be a local matter, but thought it better to avoid association with unions "in order to maintain a professional status." Nevertheless, many laboratory workers were civic workers and therefore entitled to membership in municipal unions. The national society acknowledged that it "could not prohibit such an affiliation" as long as there was no infringement on the code of ethics and no formal connection between a union movement and the society.⁷⁷

At the third annual western business meeting of the CSLT, held May 19, 1949, members discussed unionization. One member, the Chairman of the Standing Committee for the British Columbia branch, expressed his opinion that laboratory workers should not join trade unions, which he considered "non-professional." Preferring the status quo, CSLT president Ileen Kemp suggested that the national society neither support nor discourage unionization efforts, although she acknowledged that in hospitals across Canada, "trade unions have provided material advantages."⁷⁸ Both believed that the answer rested with provincial legislation ensuring that only registered workers be employed in hospitals. The national society had a decidedly ambiguous attitude toward unionization. Faced with wage disparity across the country the CSLT believed that mobility, and not collective action, was the best response. When opportunities were plentiful, many workers did protest with their feet, seeking work across Canada or in the United States. When laboratories could no longer

retain staff, the thinking went, they would be forced to raise wages.⁷⁹ Such a perspective diminished the place of collective action, but also suggested that the CSLT would do little to ensure its members had a strong common voice.

Unionization would continue to be an important issue in the 1950s. As hospital workers organized, laboratory workers were inexorably drawn into union drives. In 1954, at least two groups of laboratory workers contacted the head office in the wake of union drives. These groups, which were not identified, were reportedly "drawn against their will into labour unions" that struggled to organize *all* hospital workers. The CSLT was alarmed that laboratory workers were included in such a diverse group whose interests they thought were quite distant from those working at the bench. These groups, plus two others organized earlier, were all asking the CSLT for advice regarding exclusion. This suggests that for some members, the CSLT's advice on unionization was in keeping with the desires of at least some of the membership. That is, some workers rejected inclusion in unions that represented the breadth of hospital workers.

In the 1950s and 1960s, unions typically organized entire hospitals. This was not their first strategy. Formerly, a union might organize a department, such as laundry or housekeeping workers, then move on to another department, all the while seeking the appropriate authority to act as the bargaining agent for the organized workers. Hospital administrators objected to this and unions were required to organize entire staffs. Employers, not unions, prompted the change in strategy. Employers believed that by forcing unions to organize entire staffs, including health care providers thought to be hostile to the labour movement, they could stem the unionization tide. The result was that, when

successful, health care workers such as nurses, laboratory workers, physiotherapists and others were brought under labour's umbrella.

The rejection of the labour movement by a proportion of laboratory workers was not unique in health care. While nurses in Quebec ushered in a process of collective bargaining for nurses in 1939 and the Canadian Nurses' Association approved the principle four years later, many nurses continued to believe that membership in unions was unethical.⁴⁰ The health care system in Canada in the late twentieth century is highly unionized, but most of the organization of hospital workers occurred during the late 1960s and through the 1970s.⁴¹ For the CSLT, inclusion in a union was "detrimental" to professional status. Employers were "antagonized" by unions and laboratory workers who became members, by choice or otherwise, were "naturally tarred with the same stick as everybody else." If laboratory workers wanted to achieve professionalism, the CSLT believed they must resist the siren call of the labour movement. In 1949, the executive stated the matter bluntly. The CSLT should not "affiliate with any union, since that might tend to classify us as labour rather than as professional."⁴² The national society resisted any formal relationship with organized labour, though it did adopt the position that individual members or groups of laboratory workers were free to exercise their democratic right to unionize. Laboratory workers, the CSLT believed, were "falling blindly into situations which may be to their eventual detriment if not to their immediate detriment."⁴³ The national body wanted its membership to see the light of professionalism.

At the annual general meeting in 1955, the CSLT addressed the question of unionization. Laboratories in hospitals were being unionized at an increasing

rate, "either voluntarily or without knowledge." "In spite of the apparent advantages of union affiliation" the minutes continue, "experience has shown that professional groups have been confronted with serious problems arising from such affiliations. Members of such groups are influenced by union thinking, which in many respects is against our code of ethics." The CSLT suggested that problems in "medical service groups" such as laboratory workers were "vastly different from problems of industry and non medical groups within the hospital." By its own estimation, the national society figured that over fifty percent of the labour force in a typical Canadian hospital was from the "non-medical" groups.⁴⁴ In defining itself as a professional body, the national society differentiated itself from many hospital co-workers and distanced themselves from the common struggles that might arise in a shared work environment.

The CSLT then took a much more bold position than earlier. The national society did not oppose unionization, but did "discourage the affiliation of its members with them." The minutes go on:

The individual medical laboratory technologist has a responsibility to the patient and to the service, and that responsibility is realized only by an association such as your representative body. Technologists as members of a service group must be prepared to render service according to need and sometimes beyond regular hours of duty. Their duties should not be subject to the authority or control of bodies outside the profession who do not understand medical laboratory technology, and whose aims and rules may be in conflict with the professional loyalty [sic] of the individual technologist. Labour unions cannot offer to the technologist the understanding and leadership that they have in their own Society. We therefore believe that union affiliation should not be sought by medical laboratory technologists for the purpose of collective bargaining[.]⁴⁵

Janet Plater, the Chair of the Committee on Employment Relations, then put forward a policy statement that reiterated this position, a position that emphasized service over benefits for the workers, and the professional organization over collective bargaining. There was, remarkably, no discussion from the floor and the statement was adopted unanimously. The ascendancy of the professional ideal over union-based organization and the commitment to service over that of class was complete. The laboratory worker was now an allied health care professional, and the alliance would not be troubled by the politics of class.

There were, of course, other forms of collective activity that did flourish in the laboratories everywhere. It is not surprising that the laboratory presented an opportunity for women to find friendship with one another. By the war years, women in Nova Scotia's public health laboratory worked from nine to five through the week, but enjoyed an hour and a half at noon. One worker recalled that the long lunch was wonderful and that she and her colleagues would dash to the Waegwoltic athletic club for a lunchtime swim. Alternatively three or four workers "would race downtown and try to get some nylons" when they were available.⁶⁶ After work hours, friends from the lab would "hop on the streetcar and whip down to the Capitol or the Orpheus [theaters] ... we went to an awful lot of shows. And we had parties and all that."⁶⁷ Interaction between the workers in the two services, pathology and public health, may have been limited in terms of work, but there was a similar pattern of sociability following work hours.⁶⁸ Nicknames were an important part of this culture. Persons separated by such things as geography and age would often refer to one another with a familiar name. Miss Boutlier of Cape Breton became "Boots" to

her confidantes in Ontario, while members of the CSLT executive were known across Canada as "Kempie", "Smitty" or even "old girl."⁸⁹

Barbara Melosh was among the earliest nursing historians to introduce the notion of "work culture" to the history of nursing. Melosh suggested that both professional culture and occupational culture offer nursing strengths to draw on and that they can each be resources "for moving forward nurses' claims to authority at work."⁹⁰ Also, the persistence of "apprenticeship culture" was remarkable, in the face of a concerted effort on the part of professionalizers to ascribe superior status to college trained nurses. Apprenticeship culture could manifest itself in a variety of ways. Certainly the derision with which college graduates, who were often less skilled in the manual work, were treated was a feature of apprenticeship culture. When Edna Williams recounted the incident of the St. F.X. grad who lacked savvy at the bench, she was effectively approaching the issue from an apprentice culture perspective.

Enduring routines of work were an important indicator of this culture. A particular way to perform a task, to organize a work day or to deal with one's patients or peers could reveal much about where one was trained and whether or not a laboratory worker was attempting to fit the work culture of a particular hospital. While useful for inculcating new workers into the labour process of a particular hospital and building solidarity with one's co-workers, the limits of such an approach become readily apparent. To transcend these limits, a broader vision that articulated the values of the rank-and-file had to emerge from the laboratory workshops. Thus, while health care "professionalism" has often been portrayed as a conservative force on an occupational group, it was not inherently so. The CSLT, for example, did consciously reject a definition of its

membership as workers. This limited "professional" identity masked interests shared across occupational boundaries and struggles common to other hospital workers. The CSLT emphasis on a conservative professionalism was only one choice. It could have articulated a different vision.

VI -- DIVERSITY IN EDUCATION

The career of one Catholic Sister from eastern Nova Scotia is suggestive of processes common to laboratory workers throughout Canada. A Sister of Saint Martha from Antigonish attended St. Francis Xavier University in that town in 1937-38 and then completed a practical course at the Ottawa General Hospital. From Ottawa, she returned to Antigonish and pursued several summer courses. In 1938, the sister wrote and passed the CSLT examinations. Periodic trips to Halifax also became a feature of her work life, to maintain her skills in performing tests that were infrequently ordered at Saint Martha's Hospital and to learn new techniques. Occasionally, she would work "with the staff until I was able to do the test I was interested in as well they could."⁹¹ University education, a period of practical instruction in a hospital laboratory and informal, periodic refresher courses were a common feature of the experience of most laboratory workers.

Saint Martha's was probably typical of many hospitals in rural communities. From 1938 to 1942, Sister worked doing general laboratory work for the 150-bed hospital. During this period, she was the only worker. Another joined her for the period 1942-47, and a third was added in 1948. The laboratory also embarked upon training workers, approved by the CMA and CSLT in 1947. In 1956, the laboratory underwent a considerable expansion.

There were now five departments, expanded from three, staffed by four workers and four students.⁹² The expansion of the labour force, the development of a training school, with its concomitant presence of students, and the addition of new tests were common features of hospital laboratories throughout Canada in the post-war period of laboratory organization.

As the career of the Catholic sister suggests, diversity at the laboratory bench endured despite the move toward approving courses for technicians. Hospitals such as St. Martha's underwent expansions, which exposed their workers and students to an ever-widening array of laboratory tests. The experience of a student in Antigonish was likely considerably different from that of a student in Toronto or even Halifax. While both the CMA and the CSLT had approved a curriculum, there was no way of ensuring that individual schools were adhering to it.⁹³ There was also no definite training period. Some courses ran the minimum one year, others were eighteen months or even two years.⁹⁴ Occasionally, examiners refused to accept an approved or standard method that was not used in a particular school.⁹⁵

Provincial governments encouraged workers to undertake new training, as the number and range of tests increased. For example, in the early 1940s, New Brunswick sent two senior workers to the Royal Victoria Hospital in Montreal for two weeks training. One of the workers pursued advanced techniques in haematology, while the other learned new histological methods. The *Annual Report* noted that the "laboratory has profited by these girls added experiences" and the director of the lab, R.A.H. MacKeen, expressed his hope that these opportunities would be continued.⁹⁶ Occasionally, changes were prompted by alterations to the CSLT syllabus of studies. In 1944-45, the Saint John

laboratory added lectures in biochemistry in addition to those in haematology and bacteriology. The addition of biochemistry was prompted by the CSLT desire to have emerging workers familiar with kidney anatomy and function.⁹⁷ A registered technician with the CSLT who worked in a doctor's office would spend time in Saint John "brushing up and learning the new methods" while her physician-employer was away.⁹⁸ Perhaps a University of New Brunswick graduate, also trained in Saint John, best summed up the prevalence of continuing education, suggesting she "studied a great deal more over the past eight years in the Lab, than I ever studied at College."⁹⁹

While the CSLT apparently avoided the worst excesses of service demanded by nurses' training, this issue did rear its head periodically. One problem was that training programs were enrolling students only to fill vacancies in their own staff, instead of supplying workers for the growing Canadian market.¹⁰⁰ A more common problem was the issue of student service. One such example occurred in the CSLT's own backyard, at Hamilton's Mountain Sanatorium. This hospital was violating the regulations set out by the CMA. Students were being employed in the laboratory at "a minimum salary" and in place of "qualified technicians." The CSLT concluded that the "students are not qualified to do the work or teach other students under this set up."¹⁰¹ The CSLT executive was also concerned that laboratory workers be fully prepared for their duties. In 1950, the executive noted

A very disturbing feature in most of the hospitals, arising in some cases out of the general practice of remuneration to students during their period of training, is the policy of requiring the student to accept the full responsibility of night duty after six months of training. ... on the whole the practice of requiring students to accept the full responsibility of a qualified technician while still in the training period would seem to be highly undesirable.¹⁰²

Other jurisdictions moved to adopt regulations that would govern student bench workers. Saskatchewan passed legislation in 1946 that forced hospitals to pay student nurses and student technicians a minimum wage of \$18.50 per week, a stipulation vehemently opposed by the Saskatchewan Hospital Association.¹⁰³ Other hospitals paid students a monthly stipend, which was graduated so that as students progressed through the program, they earned more money. In Ontario for example, students received a salary during the last five months of training.¹⁰⁴ When the federal government initiated health grants to the provinces in 1950, some of this money found its way to support laboratory training programs and the students enrolled. Many provinces offered students bursaries or other forms of assistance, in exchange for a promise of service for a specified period.¹⁰⁵ In other training programs, students did not receive any support and were charged a small tuition fee.¹⁰⁶ There was, then, tremendous variability in laboratory education in the different provinces or even within one province.

Students were of course not passive victims of education courses and would complain to the CSLT head office if training schools failed to follow the regulations set out by the national society and the CMA.¹⁰⁷ Students also explored educational opportunities close to home, regardless of whether they were approved or not. In the late 1940s the CSLT received inquiries from students who were interested in training at St. Catherines General Hospital and St. Joseph's Hospital in Hamilton, neither of which was an approved school. In other cases, students who undertook training in programs yet to be certified transferred to approved schools to ensure that they could be registered. While the CSLT made such concessions because of the shortage of laboratory

workers, it recognized that yielding to the requests of students jeopardized their standards and their relations with the CMA. In late 1947, the CSLT executive reaffirmed its resolve that only students attending approved programs would be permitted to register and that transfers would only be permitted "in exceptional circumstances."¹⁰⁸ The professional bodies would be the final authority in education matters and would consolidate their authority through the 1950s.

The diversity that was a feature of laboratory work continued and found accommodation in the education for the laboratory bench. Nurses continued to be instructed in laboratory work. At the Owen Sound General and Marine Hospital, for example, student nurses were exposed to the laboratory early in their training. The experience in the lab ensured that nurses could interpret the pathological and laboratory tests that they encountered in their work on the hospital wards. The nurse would become familiar with the terminology of the laboratory, the classification of disease and the connection between results from the lab and the etiology and progress of disease. This theoretical work was, not surprisingly, augmented by a practical turn in the lab. Each nurse at the General and Marine was required to do sixty urinalyses for patients under her care. It was a simple procedure, but one that would allow her to correlate the results with the history of the patient. The nurse also *observed* blood being drawn and the tests that were ordered on the samples.¹⁰⁹ The important element in this description was that the exposure to the laboratory was not to train the nurse as a laboratory worker, in contrast to the narratives encountered earlier. Rather, the practical and theoretical experience in laboratory technique was to supplement the nursing education, to give greater confidence and a "more

complete understanding" of disease processes, thereby ensuring an enhanced level of patient care.

This is not to say that nurses were abandoning the laboratory entirely. Clearly, in many smaller hospitals in the Maritimes and elsewhere, nurses worked in the laboratory as a feature of their worklife. St. Joseph's Hospital in Victoria, British Columbia offered an eighteen month post-graduate course in medical technology in 1945, although it was the only such offering in Canada.¹¹⁰ Despite their continued presence in hospitals across Canada, particularly but not exclusively in rural areas, the laboratory staffed by a nurse was no longer the ideal. Both the CMA and the CSLT articulated a vision of the dedicated laboratory worker in the post-war era. Standardized education programs, a national exam and, indeed, a national society of laboratory workers dedicated to the advancement of the "profession" cumulatively served to delineate the boundaries of laboratory workers and their work.

Despite the vision of the professionalizers, the boundaries remained fluid and continued to be shaped by the labour demands of hospital work. The most dramatic example emerged in Saskatchewan, when Dr. W.A. Riddell of Regina inaugurated a combined x-ray and laboratory course for hospital workers in 1946.¹¹¹ Riddell co-operated with the CSLT and the radiologists' society to create a corps of workers particularly for smaller hospitals to continue the rich tradition of multi-tasking, well-established by the mid-1940s.¹¹² The first class began on October 6, 1946 and consisted of fifteen returned service people. A second class of twenty was slated for the new year and there were reportedly one hundred and fifty applications for these positions.¹¹³ Students spent three months each on laboratory work and preparation for work in x-ray

departments. The laboratory training, not unexpectedly, focused on the basic tasks, work such as urinalysis and basic haematology (red and white blood cell counts, haemaglobin estimation, sedimentation rate and simple staining techniques). Following the six month training period, students would be placed in a hospital laboratory and either a qualified technician or a laboratory director would continue to make supervisory visits for an unspecified period.¹¹⁴ These workers, given the unwieldy name of "provisional laboratory and radiological technologists," would not become full members of the CSLT until completing further training.¹¹⁵

As the announcement in *Canadian Hospital* acknowledged, the program was not designed to train "fully qualified technicians" but rather that "the immediate need [for workers] can be met and the technicians can take subsequent instruction and ultimately qualify for certification under the CSLT."¹¹⁶ Such combined programs became common in provinces with rural hospitals. In addition to Saskatchewan, Alberta also offered a combined course lasting six months, while Nova Scotia and Newfoundland had eight-month programs. In all of these instances, the graduates were designed to fill positions in smaller, rural hospitals and carry out limited duties. None of these programs were offered yearly, but were a direct response to the labour demands of rural hospitals in an era of expanding hospital services.¹¹⁷

In 1950, Riddell offered another education innovation. He proposed a new training program at Regina College, which would see didactic instruction take place at the college, followed by a practicum in an approved hospital laboratory. This essentially ensured a balance between theoretical and practical education and offered a "more academic approach to training."¹¹⁸ The time

spent on theory and elementary bench training prepared students for a twelve-month hospital based program, allowing students to enter with a basic knowledge of equipment, techniques and some ability. The CSLT acknowledged that such a division, between the college and the hospital lab, liberated the latter from the most basic parts of education which "so burdened" training laboratories. At a time when labour was scarce, and large hospitals already training, the proposal was sound. It allowed for greater numbers of students to be prepared for practical work, while limiting the time trained staff had to spend teaching rudimentary tasks.¹¹⁹

The CSLT recognized there was a need to expand educational opportunities, but wished to maintain the balance between practical and theoretical work. This practical orientation also led to the rejection of university-based education. In 1940, the Canadian Medical Association's committee on laboratories rejected the idea that laboratory training should be based in the university and the CSLT shelved the idea.¹²⁰ In 1944, the secretary for the CSLT estimated that about fifty percent of those seeking registration held university degrees. Moreover, seven Canadian universities were offering instruction or setting up programs in clinical laboratory technique.¹²¹ In 1949, the national society passed a resolution on education qualifications that stated "every encouragement be made to bring into the Society students who have University degrees and to also encourage present members to pursue their academic qualifications leading towards University degrees but that the present educational requirements not be raised."¹²² A balance was achieved. The national society found a way to incorporate university graduates and encourage

laboratory workers to further their education in university courses, yet rejected the need to make baccalaureates the standard for entrance to laboratory work.

Grace Arnold, an executive member, "questioned the advisability of increasing the years of study necessary to qualify for the work of a medical technologist, in the case that there might arise in the minds of some the tendency to dictate rather than be dictated to, by the medical profession."¹²³ Her concern was dismissed on the premise that laboratory work exists as a *service* and therefore insubordination was a "rather remote possibility." Indeed, from the outset, professionalizers worked to eliminate or minimize the potential for conflict among hospital workers. The emphasis on service, the rejection of unionization and, indeed, the focus on training rather than university education created a complex matrix that, combined with considerations of gender and skill, limited the power of laboratory workers.

Universities were not a significant gateway to laboratory work in a formal sense, though many workers did attend university. As early as 1943, not long after the CMA rejected the idea of university-based education for laboratory workers, the CMA general council heard that Queen's University, McMaster, and the University of Saskatchewan were planning "more extended courses" for training laboratory workers.¹²⁴ The University of Saskatchewan offered a certificate in clinical laboratory technique to university graduates who had completed the requisite courses and who spent a year apprenticing in a recognized hospital laboratory.¹²⁵ While this course was clearly in keeping with the objectives of the CSLT, it was not an approved course. This prompted Dr. G. Harvey Agnew, the secretary of the CMA committee on school approval, to remind the CSLT that only persons graduating from approved schools should

be writing registration exams. "This agreement," Agnew declared, "must be clearly understood by all and rigidly followed or the work of [the CMA] Committee loses all significance." Moreover, if this could not be effected, the CMA would inaugurate its own registry, thereby subverting the place of the CSLT. The CSLT discussed this letter, noting further that the society received numerous applications from programs that were not approved, but nevertheless worthy. They agreed to ask program directors to seek approval from the CMA.¹²⁶

Ultimately, the University of Saskatchewan and the CSLT agreed upon a process that would see the exams marked and entered on the university record, and then they would be forwarded to the CSLT to be marked for the purpose of registration. When the University of Western Ontario initiated its own course for medical technologists in 1947, the same arrangements were made.¹²⁷ Other universities also considered establishing laboratory courses. Beginning in 1951, Laval University also offered a two year certificate course, with an additional forty weeks of practical training in approved hospitals.¹²⁸ At the same time, the University of British Columbia proposed another option and the CSLT executive thought that the course would "provide laboratory services with a supply of technicians with a level of training."¹²⁹ Other universities were also contemplating university programs of various durations.¹³⁰ With all the university courses, there was always a concern that sufficient practical training be offered, that the internships be with pathologists or other registered training staff and the preferred location was in hospitals with approved training programs of their own.¹³¹

Dalhousie University explored a formal course in laboratory technology in the early 1950s and even developed a proposed curriculum. Dalhousie planned to offer practical instruction in laboratories over two summers, followed by an entire year of practical work. The course, which was to be supported through federal health grants, would last for five years and have a special emphasis on courses in biochemistry and bacteriology. Students would earn a BSc and receive the RT designation. During the final year, the student would work at the public health laboratory across Morris Street. During this year, and the required summers, the student would be paid.¹³² The CSLT went so far as to include the Dalhousie program in one of its brochures, suggesting that the university was offering a degree course, "made up of three and four years of academic work followed by one or two years of practical clinical training in approved hospital laboratories."¹³³ The program was, however, never implemented. This is not very surprising. In 1951, Dalhousie was still struggling with the presence of a nursing school on campus, established two years earlier on a temporary basis and with funding through the National Health Grants.¹³⁴ The Director of the School of Nursing, Electa MacLennan, recalled that a Senate member had difficulty with nurses at Dalhousie, but could not countenance more manual programs, such as economics or engineering. MacLennan recalled how the professor said "there would be no cookin' and plumbin' on campus."¹³⁵ The rejection of laboratory training thus fit a broader pattern of university politics that resisted the presence of "trades" on the university campus.

University training for laboratory workers was also a political issue among laboratory workers. Despite the endorsements and enthusiasm for university

education among a segment of laboratory professionalizers, the issue was charged with an underlying tension. In Manitoba, where the University of Manitoba considered establishing a laboratory course as early as 1945,¹³⁶ the provincial branch of the national organization felt that undergraduate education was "unnecessary for all routine laboratory work and that there should be two levels of technologist training."¹³⁷ There was a shortage of workers, so most hospital authorities, the CMA and the CSLT rejected a long period of university education. The opposition to university based education may have been a practical response to a labour shortage, but many laboratory workers already held university degrees as the Maritime sample suggests. A practical twelve month course ensured a steady supply of workers, but it also undermined wage claims for these same workers. Defining workers as quickly-prepared technical hands without responsibility for determining diagnoses, concurrently defined bench workers as inexpensive labour.

VII -- RECRUITMENT TO THE CSLT

Concomitant with the concern to provide sufficient and appropriate educational opportunities for would-be laboratory workers, the CSLT was also concerned with recruiting members to the profession. Even in Saskatchewan, where there were a number of options for those interested in a career in the laboratory, the effort to organize workers into a professional body was stillborn. In 1952, there were eighty-eight hospitals in the province and of these, twenty-one did not have any dedicated laboratory workers. Outside of the larger centers of Regina, Moose Jaw and Saskatoon, there were only twenty registered technologists, while there were thirty-two working without any kind

of certificate. There were also 12 combined x-ray and laboratory workers and another three with "questionable certification".¹³⁸ The effort to ensure laboratories were adequately staffed by workers registered with the national society was a dismal failure, particularly poignant in light of the diverse training options open to Saskatchewan residents. While the CSLT and the CMA attempted to nurture a professional identity among laboratory workers, many in the rank and file rejected the effort.

The CMA supported the efforts of the CSLT to grow. The Committee on Laboratory Technicians reiterated this in the mid-1940s. Reporting to the CMA executive, the committee felt

very strongly that it is advisable to have as many technicians as possible linked up with some official registry such as the CSLT. This is all the more necessary because of the trend of future developments. The want of interest of many technicians in the CSLT is in part due to lack of knowledge of existence of such a body and the advantages to be derived from membership. In this connection the Secretary has written to Miss Kemp [the CSLT president] to give widespread publicity to the present position of affairs.¹³⁹

Isabel Mailhiot, the chair of the CSLT Committee on Public Relations, agreed. For Mailhiot, it was not enough to conduct one's work with "a high degree of technological skill, [and] unswerving moral and intellectual integrity." The laboratory worker must also work at "top efficiency" in order to "sell" laboratory work to other health care workers and the public "as an integral part of the healing arts, as a profession that deserves the respect, admiration and support of society, as something essential to the welfare of the people."¹⁴⁰

In 1945, the *Canadian Nurse* reported a survey of 566 young women in high school graduating classes across Canada. Perhaps not surprisingly, fully 34% selected nursing as their career of choice. More relevant for this study was

that the survey offered some data on laboratory work. One Maritimer, three respondents from Ontario and Quebec, two from the Prairies and one from British Columbia suggested that they would pursue "university, then lab technician." But did this indicate a generalized lack of interest across the nation for laboratory work? The extremely low numbers are likely indicative of the construction of the question. Perhaps had a question been posed about entry directly into laboratory training, increasingly the model portrayed by the CSLT and CMA, the numbers would have been higher. "Teaching" for example, received a total of forty answers, whereas "university, then teaching" received only nine.¹⁴¹ There were other examples. An unspecified booklet outlining hospital careers noted nursing schools across the country, but remained silent on opportunities for laboratory work.¹⁴² If laboratory workers were going to raise their profile among high school students, they were going to have to do it themselves.

The society did embark on a recruitment campaign in the post-war era, responding to the shortage of workers during the Second World War, the demands of an expanded health care system in the reconstructed Canada and the short working life of most laboratory workers. The federal department of labour suggested that the labour shortage has led to a "vigorous program to recruit and train new workers."¹⁴³ A Committee on Recruitment was organized in 1956 in response to the "acute shortage" of laboratory workers.¹⁴⁴ The recruitment committee encouraged members to become active in advancing interest in laboratory work, through speaking to "teenagers or even to those in their twenties."¹⁴⁵ The society regularly distributed career sheets to Canadian high schools as part of a recruitment program.¹⁴⁶ Individual members were

occasionally asked to speak to groups of interested students. When a Cape Breton worker received such a request in 1958, the national society provided her with a recruitment talk, fifty copies of the "sample career sheet" and two dozen copies of a pictorial pamphlet. Other recommended resources included an American film strip that the CSLT used during the 1950s and the Department of Labour pamphlet.¹⁴⁷

The CSLT Committee on Education, chaired by Sister Agnes Gerard of the Halifax Infirmary, completed a pamphlet entitled "If you like Science, why not be a Medical Laboratory Technologist?", which was reprinted several times through the 1950s.¹⁴⁸ This brochure was aimed at high school students and provided a general outline of what constituted a career at the bench, answering such questions as "what do you need?" and "where will you train?" Potential students were warned "it takes study and constant application" and that this did not end with the training period, because "the good medical technologist keeps abreast of scientific advancement."¹⁴⁹

In 1959, the national society produced another brochure, entitled "Medical Technology: A Career With A Future." This brochure established the link between "science" and laboratory work more boldly. Laboratory workers were not only key in the fight against diseases such as polio or cancer, but were members of "medicine's vast army of professional workers." The authors posed the question of how laboratory workers aided the fight against disease. The answer they provided was predictable. The laboratory worker was "a member of a behind-the-scenes corps of workers, a fact finder for the physician" or assisted in "carrying on research for new facts and improved techniques."¹⁵⁰ A similar pamphlet produced by the Ontario Hospital Association suggested that

young students with an aptitude for the sciences" could find an "absorbing and satisfying career" at the bench.¹⁵¹

The question of salary was addressed in the CSLT brochure. It is instructive to examine how the national society portrayed itself. "For those university graduates," the brochure declared, "who have post graduate work leading to a master's degree or a doctorate, earnings are the equivalent to those with similar training in other fields. Salaries of from \$8000 to \$12,000 are being offered microbiologists and biochemists in the very large hospitals."¹⁵² Such extravagant claims were clearly misleading, drawing a spurious connection between laboratory work as a technologist and these other career options. On the surface, they shared a work environment and were joined in their common pursuit of pathogens. But their places in the research environment and in shaping their work were clearly a world apart. While those holding graduate degrees could expect between eight and twelve thousand dollars per annum, a 1957 CSLT survey found that 61% of members earned between two thousand and four thousand dollars a year.¹⁵³

Those with graduate degrees clearly reaped the reward of their expertise. Laboratory workers did not. There were opportunities "for both minimally qualified technologists and those holding a university degree." Work at the bench provided an opportunity for those "whose interest is scientific" and offered "a challenge in a field of research in which the enquiring mind need feel no limit." But clearly there were limits. The work was routine, with the same tests being completed day after day, albeit with precision. Laboratory work was not science but "an opportunity for service to humanity." And, of

course, there was the wide variety of tasks in smaller labs, and workers here should have "[a] knowledge of typing, bookkeeping and filing."¹⁵⁴

It was, as suggested previously, an area of work that provided opportunity, however constrained, for the women who laboured in the lab. The geographic mobility and the opportunity to shape one's work-life to suit particular interests were features of laboratory work in the 1930s and 1940s. It was also an area of work where married women could work on either a full- or part-time basis, undoubtedly aided by the post-war labour shortage.¹⁵⁵ Workers could seek opportunities in hospital or public health labs, commercial facilities, or industrial, government or university research labs. A variety of other opportunities were also detailed:

With additional training they may go into other hospital work -- medicine, nursing, X-ray technology -- to name only a few fields. University-trained technologists who have a teacher's certificate may turn to the teaching of science subjects in high school or university. Technologists who have a flair for salesmanship may become sales representatives for large drug houses and suppliers of laboratory equipment because of their familiarity with the needs of the trade.¹⁵⁶

These, of course, were not really opportunities for those emerging from training programs. Instead, they all required further training. Laboratory workers were trained to perform discrete tasks in the service of others: physicians, patients and the state.

CONCLUSION

Looking back in 1951, CSLT President Joseph Scott thought that the organization had made tremendous progress, despite its tender age. Laboratory workers had "gained added respect and dignity" from their colleagues, while collectively workers "developed a professional consciousness, and a greater

awareness of our common interests on an ever widening scale." All the while, laboratory work was become more "complex and specialized," so much so that even a laboratory worker who met the standards of the CSLT could no longer hope to be proficient in every branch of the service.¹⁵⁷

There were ambiguities in the professionalism articulated by the CSLT. There was an overwhelming desire to standardize the experience of becoming a laboratory worker. Efforts to establish an agreed curriculum, standardized national examinations and registration were all designed to impose a homogeneity on laboratory workers beginning their careers at the bench. At the same time, however, the CSLT was a national society that sought to accommodate diversity within its membership. It was a body steadfastly committed to maintaining "professional" standards, and vigorously opposed definitions that diminished the perceived status that accompanied such standards. The society articulated its independence, yet clearly remained subservient to the interests of the medical community that set its examinations and demanded stringent registration requirements. It struggled to define itself as a national society, yet faced the difficulties of all such bodies in maintaining sufficient strength and interest in its constituent parts.

The CMA approval program, which encompassed the training of laboratory workers in hospitals, universities or government laboratories, remained in effect until the early 1960s. Finally, in the early 1960s, the CSLT gained some control over accrediting education courses, although hospital-based training programs remained within the purview of the CMA. The basis for approval, established by the CMA with the limited participation of the CSLT was essentially unchanged over the course of this study. Opposition to commercial

enterprises and, to a lesser extent, university-based training programs in laboratory technique ensured that the education of bench workers would be under the direction of physicians. Control over education and training of laboratory workers gave Canada's medical profession considerable influence over the production of future workers and, hence, the division of labour within hospitals. In shaping the registration requirements of the CSLT and exercising authority over the approval of schools, the CMA determined the content and length of training, the choice of students and the certification of graduates. The professional ideal may have added to the prestige of the national society, but it also meant that laboratory workers at the bench viewed themselves as apart from other hospital workers. The diversity that was so much a feature of the bench worker and even the national membership was increasingly subsumed to the professional vision, and the cost borne by rank and file workers.

Endnotes

¹ "The Technician's Trials and Tribulations," in *CJMT*, 8, 2 (1946).

² Besides the two cases discussed, there were other circumventions of the admission rules in Saint John. In 1947, two students were admitted to the training program having only completed one science credit, instead of the mandatory two. The CSLT decided to let these women sit for the national exams because the change to the admission policy had been a recent one and "Dr. MacKeen accepted these girls not knowing of our regulations at that time". Moreover, the society was confident that "it would not occur again." See CSLT Executive Meeting, October 18, 1947

³ H.B. to Ileen Kemp, June 29, 1945 in CSLT.

⁴ CSLT Membership files.

⁵ CSLT Membership files and F.W. Patterson to Ileen Kemp, September 21, 1943 in CSLT. The student completed courses in English, two courses in household economics and a half-credit in botany in 1941-42. She did not, however, successfully complete a course in chemistry or a zoology half-credit.

⁶ Ileen Kemp to M.D., February 24, 1944 in CSLT.

⁷ M.R. to Ileen Kemp, June 29, 1945.

⁸ M.R. to Ileen Kemp, June 29, 1945.

⁹ This has been argued for a somewhat later period and in an office setting by Gillian Creese. Creese, *Contracting Masculinity: Gender, Class and Race in a White-Collar Union, 1944-94*. Don Mills: Oxford University Press, 1999, p. 94.

¹⁰ See, for example, Cynthia Cockburn, *Brothers: Male Dominance and Technological Change*. London, 1983; Jane Gaskell, "Conceptions of Skill and the Work of Women: Some Historical and Political Issues," *Atlantis*, 8 (1983): 11-25; Cynthia Cockburn, "The Gendering of Jobs: Workplace Relations and the Reproduction of Sex Segregation," in Sylvia Walby, ed.,

Gender Segregation at Work. Philadelphia: Open University Press, 1988, pp. 29-42; Joy Parr, "Disaggregating the Sexual Division of Labour: A Transatlantic Case Study," *Comparative Studies in Society and History*, 30 (1988): 511-533; Joy Parr, *The Gender of Breadwinners Women, Men, and Change in Two Industrial Towns 1880-1950*. Toronto: University of Toronto Press, 1990. The best regional study of skill and gender is Shirley Tillotson, "The Operators Along the Coast: A Case Study of the Link Between Gender, Skilled Labour and Social Power, 1900-1930," *Acadiensis*, 20 (1990): 72-88.

¹¹ Minutes of the CSLT Executive, November 8, 1936. The other objectives, contained in the by-laws, were the promotion of research, to promote co-operation between laboratory workers and the medical profession, and to "more efficiently" aid in the diagnosis and treatment of disease.

¹² *CJMT*, 1 (October 1938), p.18.

¹³ A.R. Shearer, ed., "Canadian Society of Laboratory Technologists: A Chronology 1937-1980," p. 3.

¹⁴ "Report of the First Annual General Meeting," *CJMT*, 1 (1938), p. 24. Ninety-seven members came from Ontario, although every other province was represented as well, as was Newfoundland. Membership was as follows: 97 from Ontario, 34 from British Columbia, 15 from Nova Scotia, Saskatchewan 14, eight each from Alberta and Quebec, seven from Manitoba, six from New Brunswick, one from Prince Edward Island, and three from Newfoundland.

¹⁵ Shearer, "Canadian Society of Laboratory Technologists," p. 13.

¹⁶ Ronald Burns to CSLT, February 11, 1937 in CSLT membership files.

¹⁷ A Digby correspondent to the CSLT also suggested that the application fee was three dollars. See A.B. to D.R. Lock, December 28, 1937 in CSLT. The minutes from the 1938 annual general meeting indicate that the fees were later reduced to one dollar. See AGM, December 10, 1938.

¹⁸ Alice A. Thorngate, *That Far Horizon: The Medical Technology Program at the University of Wisconsin-Madison, 1925-1975*. Madison: A-R Editions, 1983, p. 8; Carol A. Brown, "The Division of Laborers: Allied Health Professions," in Samuel Wolfe, ed., *Organization of Health Workers and Labor Conflict*. Farmingdale: Baywood Publishing, especially pp. 76-78; and Shearer, "Canadian Society of Laboratory Technologists," p. 1. See also Kano Ikeda, "Survey of Training Schools for Laboratory Technicians," *American Journal of Clinical Pathology*, 1 (1931): 467-476.

¹⁹ NBARMH, October 31, 1936.

²⁰ *Ibid.*

²¹ NBARMH, October 31, 1938. That year Cathy Arnold joined the Canadian society, while a "student technician," Evelyn Russell, gained registration with the ASCP.

²² Interview with Rose Phillips.

²³ CSLT membership files. No systematic analysis was undertaken for other regions of Canada. Among the organizers of the CSLT, however, eight of ten of the charter members held ASCP "MT" designations.

²⁴ Indeed, in 1937-39, the formative years of the CSLT, Father George Verreault headed the Canadian Hospital Council. See G. Harvey Agnew, *Canadian Hospitals, 1920 to 1970*, Appendix C. The national Catholic Hospital Council of Canada was not founded until the early 1940s.

²⁵ Minutes of CSLT Annual General Meeting (hereafter AGM), December 11, 1937.

²⁶ Minutes of the CSLT Executive, May 10, 1941. The applicants were from the military hospitals at Camp Borden and Kingston, Ontario, Calgary and Esquimault.

²⁷ Minutes of the CSLT Executive, January 31, 1942.

²⁸ Minutes of the CSLT Executive, October 19, 1940 and December 14, 1949.

²⁹ Harvey Agnew to Denys Lock, October 31, 1940, in CSLT correspondence. See also Lock to Agnew, October 22, 1940.

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- ³⁰ Minutes of the CSLT Executive, October 25 1945 and April 6, 1946.
- ³¹ CMA Executive Committee, June 18-19, 1937; *CJMT*, 1 (October 1938), p. 5; Shearer, "Canadian Society of Laboratory Technologists," pp. 2-3. The other members were Dr. E.H. Mason, Montreal, Dr. James Miller, Kingston, Dr. George Shanks, Toronto, Dr. J.C. Patterson, Regina and Dr. J.J. Ower, Edmonton.
- ³² AGM, December 11, 1937.
- ³³ "Report of the Committee on Laboratory Technicians," CMA General Council, June 19-20, 1939; CSLT Executive, February 8, 1941.
- ³⁴ CSLT Executive, February 8, 1941.
- ³⁵ CMA Executive Committee, June 20-21, 1941. See also CMA Executive Committee, March 14-15, 1941.
- ³⁶ *CJMT* March 1942. By the next CMA General Council meeting, there were ten approved schools and the applications of several other laboratories were pending. CMA General Council, June 15-16, 1942.
- ³⁷ The approved schools were in Halifax, Saint John, Montreal, Ottawa, Kingston, two in Toronto (St. Michael's Hospital and Toronto Western Hospital) and two in Hamilton (Hamilton General Hospital and Mountain Sanatorium).
- ³⁸ CMA Executive Committee, October 30-31, 1941; CMA General Council, June 15-16, 1942.
- ³⁹ A.D. Kelly to Helen Smith, November 3, 1948, in CSLT correspondence.
- ⁴⁰ A.D. Kelly to Helen Smith, November 3, 1948, in CSLT correspondence.
- ⁴¹ CSLT Executive, May 27, 1951.
- ⁴² AGM, June 25, 1951.
- ⁴³ CSLT Executive, November 6, 1948. This was a minority opinion, but one that originated in the CMA Council.
- ⁴⁴ References to university education were frequent in the CSLT documents. See for example CSLT Executive, January 27, 1940 and March 11, 1944.

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- ⁴⁵ CSLT correspondence, Robert T. Noble to W.J. Deadman, March 29, 1948.
- ⁴⁶ Mary W. O'Donnell, "O Pity the Poor Student -- Or Should We?" *CJMT*, 4 (1942), p. 41.
- ⁴⁷ Minutes of Canadian Medical Association General Council, June 19-20, 1939, NAC and *CJMT*, 3 (1941), p. 154.
- ⁴⁸ Minutes of Canadian Medical Association General Council, June 14-15, 1943, NAC.
- ⁴⁹ Frank J. Elliot, "Open Letter To All Members From the President," in *CJMT*, 1 (October 1938), p. 6.
- ⁵⁰ Frank J. Elliot, "Open Letter To All Members From the President," in *CJMT*, 1 (October 1938), p. 6.
- ⁵¹ AGM, December 11, 1937; Minutes of the CSLT Executive, May 28, 1937 and January 31, 1938; *CJMT*, 1 (October 1938), pp. 5-6. An undated CSLT "Instructions to Local Examiner" described the duties of the laboratory director for the examinations and the preliminary interview. During the interview, in addition to discussing training and previous experience in the laboratory, examiners were to "size up applicant as to personality and appearance. Submit your opinion in writing when returning the papers."
- ⁵² CMA Executive Committee, March 14-15, 1941; "Report of the Committee on Laboratory Technicians," CMA General Council, May 22-23, 1943.
- ⁵³ Minutes of the Canadian Medical Association Nucleus Committee on Technicians, February 9, 1944, in CSLT and "Report of the Committee on Laboratory Technicians," in Canadian Medical Association Executive Committee, March 3-4, 1944, NAC.
- ⁵⁴ Minutes of the CSLT Executive, November 8, 1936.
- ⁵⁵ AGM, December 11, 1937.
- ⁵⁶ Interview with Edna Williams.
- ⁵⁷ *Ibid.*
- ⁵⁸ See for example, J.R.W. to D.R. Lock, March 12, 1937 in CSLT membership files.
- ⁵⁹ *CJMT*, 1 (October 1938), p. 20.

⁶⁰ *CJMT*, 1 (September 1939), p. 149. This edition was only a modest thirty pages, perhaps indicative of the difficulty in producing a journal entirely on volunteer submissions and labour over the summer months. The prevalent voluntarism at the national office is discussed below. Before the *CJMT* began publication, Denys Lock sent a letter to the membership informing them of the journal and asked them to "please consider this letter as a personal appeal to you and send in a contribution in the form of an article on some technique which you yourself may have originated." D.R. Lock to Member, June 25, 1938, in CSLT Correspondence Files. The request for this particular kind of submission is suggestive of the shape the executive wished the journal to assume, namely, a scientific journal, rather than a newsletter or other such publication.

⁶¹ AGM 1940.

⁶² AGM, May 31, 1940.

⁶³ AGM, June 6, 1955.

⁶⁴ AGM, June 6, 1955.

⁶⁵ Minutes of the CSLT Executive, May 28, 1947.

⁶⁶ Minutes of the CSLT Executive, January 21, 1951.

⁶⁷ Minutes of the CSLT Executive, April 1, 1951.

⁶⁸ CSLT membership files, September 1945.

⁶⁹ Minutes of the CSLT Executive, January 6, 1937.

⁷⁰ Shearer, "Canadian Society of Laboratory Technologists," Appendix D.

⁷¹ AGM, May 20, 1949, AGM June 26, 1950 and AGM, June 25, 1951.

⁷² AGM, May 20, 1949.

⁷³ AGM, June 26, 1950. When the Manitoba organization entered into discussions with the CSLT, there was a question of membership. Some of the Manitoba members were not members of the national society, although they were "most actively interested in their Manitoba Society." The Manitoba executive was keen to maintain these members and asked the national office

whether they could be admitted. The CSLT decided that they could be, as "auxiliary" members, without voting privileges and not eligible for office. See Minutes of the CSLT Executive, June 25, 1950. In Nova Scotia, Sister Agnes Gerard worked tirelessly to form a Nova Scotian branch, but to no avail. See Minutes of the CSLT Executive, April 1, 1950.

⁷⁴ AGM, June 25, 1951.

⁷⁵ AGM, June 7, 1954; Executive Meeting Detailed Agenda, March 20-21, 1954; and Shearer. "Canadian Society of Laboratory Technologists," Appendix D.

⁷⁶ Minutes of the CSLT Executive, October 14 and October 30, 1944.

⁷⁷ Minutes of the CSLT Executive, November 6, 1943.

⁷⁸ AGM, May 20, 1949.

⁷⁹ Minutes of the CSLT Executive, October 17, 1943.

⁸⁰ McPherson, *Bedside Matters*, pp. 230-234.

⁸¹ R. Sykes and A.S. Sethi, "The Labour Movement in Health Care: Canada," in Amarjit Singh Sethi and Stuart J. Dimmock, eds., *Industrial Relations and Health Services*. London: Croon Helm Ltd., 1982, pp. 42-53. See also Jerry P. White, *Hospital Strike: Women, Unions, and Public Sector Conflict*. Toronto: Thompson Educational Publishing, 1990 and Karen Brodtkin Sacks, *Caring by the Hour: Women, Work, and Organizing at Duke Medical Center*. Urbana: University of Illinois Press, 1988.

⁸² Minutes of the CSLT Executive, April 10, 1949.

⁸³ Minutes of the CSLT Executive, March 20, 1954.

⁸⁴ AGM, June 6, 1955.

⁸⁵ AGM, June 6, 1955.

⁸⁶ Interview with Edna Williams.

⁸⁷ Ibid.

⁸⁸ Interview with Rose Phillips.

⁸⁹ CSLT membership files, 1950.

⁹⁰ Melosh, *"The Physician's Hand,"* p. 207. For Canada, McPherson argues that divisions between the "professional ideology" of the elite and the "work culture" of the rank-and-file were not as distinct as in the United States. Nevertheless, McPherson endorses the use of the "work culture" concept, for shifting attention to nurses on the job.

⁹¹ CSLT membership files.

⁹² CSLT membership files.

⁹³ Minutes of the CSLT Executive, July 26, 1947.

⁹⁴ AGM, June 1, 1946.

⁹⁵ Minutes of the CSLT Executive, June 2, 1946.

⁹⁶ NBARMH, October 31, 1941 and October 31, 1943.

⁹⁷ NBARMH, October 31, 1945.

⁹⁸ CSLT membership files.

⁹⁹ CSLT membership files.

¹⁰⁰ A.D. Kelley to Helen L. Smith, November 3, 1948.

¹⁰¹ Minutes of the CSLT Executive, January 31, 1948. See also CSLT Executive, April 10, 1949. It is unclear where the complaint originated, but it appears to have come from both the students and the laboratory workers.

¹⁰² Minutes of the CSLT Executive, January 22, 1950.

¹⁰³ "Saskatchewan Hospitals Protest Student Nurse Salary Order," *CN*, 23 (September 1946), p 41.

¹⁰⁴ Canada. Department of Labour. *Medical Laboratory Technologist*. Ottawa: Queen's Printer, 1957.

¹⁰⁵ *Ibid.*

¹⁰⁶ On health grants, see Minutes of the CSLT Executive, April 1, 1950; Malcolm G. Taylor, *Health Insurance and Canadian Public Policy: The Seven Decisions that Created the Canadian Health Insurance System and Their Outcomes*. Montreal: McGill-Queen's University

Press, 1978, pp. 162-164 and C. David Naylor, *Private Practice, Public Payment: Canadian Medicine and the Politics of Health Insurance 1911-1966*, pp. 132-134, 153. For discussion of fees for training, see Minutes of the CSLT Executive, May 18, 1952. The only direct evidence of tuition charges in the Maritimes was an application from Saint John that indicates that the student paid \$25 to enroll in the thirteen month course. See CSLT membership files. Indirect evidence from Saint John also suggests that several years earlier, the Bureau of Laboratories considered the work students performed more than sufficient. The laboratory report for 1931-32 noted that "several young ladies and two young men" were taking instruction in laboratory technique and that "[t]hey render help in return for the instruction which they receive."

¹⁰⁷ Minutes of the CSLT Executive, July 26, 1947.

¹⁰⁸ Minutes of the CSLT Executive, October 18, 1947.

¹⁰⁹ *CN*, 37 (January 1941), p. 34.

¹¹⁰ *CN*, 41 (July 1945), p. 552. Two schools in Quebec offered post-graduate courses in x-ray technology, The Phillips Training School for Nurses at Montreal's Homeopathic Hospital and the Hôpital Générale Saint-Vincent de Paul in Sherbrooke.

¹¹¹ AGM, June 1, 1946.

¹¹² The CSLT recognized that "the need in small hospitals is very great for technicians who can do blood groupings, blood counts and urinalysis and x-rays of chests and fractures." The frequent combination of these skills led the CSLT to discuss affiliation with the radiology society in the mid-1940s. See AGM, 1946.

¹¹³ *Canadian Hospital* (hereafter *CH*), 23, 11 (November 1946), p. 84.

¹¹⁴ *CH*, 23, 11 (November 1946), p. 84.

¹¹⁵ Minutes of the CSLT Executive, June 2, 1946 and October 5, 1946.

¹¹⁶ *CH*, 23, 11 (November 1946), p. 84.

¹¹⁷ Department of Labour. *Medical Laboratory Technologist*; Minutes of the CSLT Executive, March 19-20, 1955. It is worth noting that the Saskatchewan government re-instituted the

combined x-ray and laboratory course in October 1953. See Shearer, "Canadian Society of Laboratory Technologists," p. 16.

¹¹⁸ Shearer, "Canadian Society of Laboratory Technologists: A Chronology 1937-1980," p. 13.

¹¹⁹ Minutes of the CSLT Executive, May 17, 1952 and AGM May 19, 1952. Of course, the University of Saskatchewan was by this time also offering an education option for persons who wanted to work in laboratories. The Regina College program would garner a student partial credit toward fulfillment of the university degree requirements.

¹²⁰ Minutes of the CSLT Executive, January 27, 1940. The decision of the CMA was a response to inquiries from the University of Western Ontario. See Denys R. Lock to Harvey Agnew, December 12, 1939 and Agnew to Lock, January 18, 1940 in CSLT. Agnew believed that the rejection was predicated, in part, on the belief that the "full university course was being considered as the only type of training for technicians".

¹²¹ Minutes of the CSLT Executive, March 11, 1944.

¹²² Minutes of the CSLT Executive, December 10-11, 1949.

¹²³ Minutes of the CSLT Executive, March 11, 1944.

¹²⁴ "Report of the Committee on Laboratory Technologists," CMA General Council, June 14-15, 1943. See also the laboratory committee's report to CMA General Council, June 11-12, 1945.

¹²⁵ Minutes of the CSLT Executive, April 17, 1943. The minutes reproduce a letter from W.S. Linday, Dean of Medical Sciences at the University of Saskatchewan.

¹²⁶ Minutes of the CSLT Executive, April 17, 1943.

¹²⁷ Minutes of the CSLT Executive, January 31, 1948. There were differences in the two programs. While students at the University of Saskatchewan took their practical training following three university years, students at the University of Western Ontario took their practical rotations at approved hospitals during their university years.

¹²⁸ Minutes of the CSLT Executive, December 16, 1951.

¹²⁹ Minutes of the CSLT Executive, December 16, 1951.

¹³⁰ AGM, May 19, 1952.

¹³¹ These questions were raised specifically in reference to the UBC program, but were generally applied across the country. See CSLT Executive Meeting Detailed Agenda, December 7, 1952.

¹³² Minutes of the CSLT Executive, October 21, 1951.

¹³³ Gerard and Kemp, "Medical Laboratory Technologist".

¹³⁴ Taylor, *Health Insurance and Canadian Public Policy*, pp. 162-164 and Naylor, *Private Practice, Public Payment*, pp. 132-134, 153. National Health and Welfare Minister Paul Martin addressed the issue of federal aid to nurse training in *Canadian Nurse*, 47 (May 1951). On the School's first decade at Dalhousie, see Peter L. Twohig, *Challenge and Change: A History of the Dalhousie School of Nursing 1949-1989*. Halifax: Fernwood and Dalhousie University, 1998, pp. 22-47.

¹³⁵ Lynn Kirkwood interview with Electa MacLennan, December 10, 1983. I am most grateful to Dr. Kirkwood for allowing me to use this transcript and to John Gordon for providing me with a copy.

¹³⁶ Minutes of the CSLT Executive, April 15, 1945.

¹³⁷ Minutes of the CSLT Executive, October 14, 1951.

¹³⁸ Minutes of the CSLT Executive, December 7, 1952.

¹³⁹ "Report of the Committee on Laboratory Technicians," in CMA Executive Committee, March 3-4, 1944, NAC.

¹⁴⁰ "Report of the Committee on Public Relations," CSLT Executive Meeting Detailed Agenda.

¹⁴¹ *CN*, 41 (September 1945), p. 696.

¹⁴² Minutes of the CSLT Executive, November 20-21, 1954.

¹⁴³ Department of Labour. *Medical Laboratory Technologist*.

¹⁴⁴ AGM, June 20, 1956.

¹⁴⁵ AGM, June 20, 1956.

¹⁴⁶ In 1952, for example, over 2700 career sheets were mailed to every province. See CSLT Executive Meeting Detailed Agenda, October 19, 1952 and Minutes of the CSLT Executive, October 19, 1952. At the annual general meeting for 1953, it was reported that the sheets had been mailed to every high school in Canada. AGM, May 18, 1953.

¹⁴⁷ Ileen Kemp to Mrs. D.B.M., April 23, 1958. Kemp said the national office tried to "distribute the career sheets fairly liberally and to reserve the pictorial pamphlets for the hands of the more interested students since it is a fairly costly item and we don't have the funds to pass it out as we can the career sheet." The CSLT prepared its own leaders for before and after the strip to "Canadianize" the strip and replaced the American recruitment film in 1965. In that year, the society produced a 20 minute, 16mm colour recruitment film complete with narrated sound and background music, at a cost of \$3600. Shearer, "Canadian Society of Laboratory Technologists," p. 37; Department of Labour. *Medical Laboratory Technologist*.

¹⁴⁸ Shearer, "Canadian Society of Laboratory Technologists," p. 15.

¹⁴⁹ CSLT Committee on Education, "If You Like Science Why Not Be a ... Medical Laboratory Technologist?" May 1952 in CSLT.

¹⁵⁰ CSLT, "Medical Technology: A Career With A Future," January 1959.

¹⁵¹ Ontario Hospital Association, "Hospital Careers: Opportunities Youth," n.d. [1958?]

¹⁵² CSLT Committee on Education, "If You Like Science Why Not Be a ... Medical Laboratory Technologist?" May 1952 in CSLT.

¹⁵³ Department of Labour. *Medical Laboratory Technologist*.

¹⁵⁴ Ibid.

¹⁵⁵ As suggested in the previous chapters, attrition was very high among laboratory workers. Those emerging from training programs were sufficient to replace those who left the workforce, either through emigration or marriage. Nevertheless, laboratories were being constructed or enlarged across the country and vacancies were common.

¹⁵⁶ Department of Labour. *Medical Laboratory Technologist*.

¹⁵⁷ AGM, June 25, 1951.

**Conclusion:
'Standing on the Shoulders of Giants,
Leaves Me Cold'¹**

"Apart from the primary function of a hospital ... let us consider that a hospital has an educational value in as much as young women are therein trained to render great and durable service to the community."²

The history of the hospital looks different from the perspective of workers.³

This examination of laboratory workers has suggested that the hospital is really a series of linked work environments, many of which are gender-bound, that share the same physical space. Perhaps the Maritimes were unusual because of the deindustrialization and underdevelopment or because of the many small community hospitals dotting the rural landscape. Yet, the same conclusion is supported when the Maritime experience is placed in the national context. Perhaps there was something unique about laboratory workers, that linked this kind of work to others in a way that was not typical of other hospital workers. This, too, does not seem to be the case. Nurses, dietitians and x-ray workers were all interconnected as well, with the laboratory and with one another, though we know very little about the meanings of those connections for these hospital workers. A more orthodox interpretation, such as the institutional framework developed in the first chapter, might have followed the growth of the laboratory service as *part* of an already assumed story of hospital departmentalization and increased specialization. One could point to the foundation of the different kinds of laboratory work, including the

development of serology, bacteriology, chemistry, haematology, virology and pathology, dutifully tracing the origins, adoption and growth of the various tests composing each. One could examine the growth of formal training schools with an approved curriculum, the creation of entrance standards to those programs and the institution of a formal examination as evidence of "professionalization." One could even assess the relative shortcomings and strengths of the Canadian Society of Laboratory Technologists' drive to organize and recruit members or negotiate and carve a place for those members among other health care workers. What such an interpretation would miss are the very real ways in which laboratory workers belie this assumed story. Theirs is a story of diverse routes to the laboratory, diversity at the bench (and among CSLT members once it was established) and multi-tasking. The implications of the organization of work in this way remains unexamined, indeed largely unacknowledged among historians of health.

Institutional development was an important part of the public health effort in the opening decades of the twentieth century. While the role of the laboratory in public health is most often emphasized in existing studies, and rightly so, our view of the laboratory should not be limited to public health work. In Saint John and Halifax, laboratories conducted clinical work for hospitals throughout the Maritimes, thereby consolidating the good will of practitioners beyond the city limits. In New Brunswick, the laboratory was conceptualized from the beginning as an integral part of a robust department of

health, but its influence extended even into Prince Edward Island. Most explicit in Nova Scotia, the Morris Street laboratory was a place of medical education and the new facility constructed in the wake of the Flexner Report did much to "modernize" instruction in selected medical sciences. The facilities in Halifax and Saint John were never narrowly conceived. While the institutional history of the laboratory may seem insignificant, it reveals how multiple interests shaped the work of the laboratory, including different levels of government, hospitals of varying sizes and the medical school. This, in turn, shaped a perception of workers as flexible labourers who should be able to conduct a broad range of work. In smaller community hospitals, this extended well beyond laboratory work to entire other departments.

The principal laboratories in the Maritimes were not "important" institutions. They did not make any great bacteriological discoveries or significantly advance medical science. The laboratories in Saint John and Halifax, however, did stand as a clear manifestation of the scientific and diagnostic power of the new public health. By the middle 1890s many jurisdictions in the United States and Canada had established diagnostic laboratories and within a few years they had become an integral part of any modern health department. Thus, in 1918 when New Brunswick set out to establish its new department, complete with the first Minister of Health in the Dominion of Canada, a laboratory was an integral part of the plan. Routine testing became common and there was a movement toward extensive testing

for a host of diseases. In John Duffy's words, "science rather than sanitation now seemed to be the solution to sickness and disease."⁴ The creation of laboratories, by providing vaccines or antitoxins or revealing vectors and healthy carriers through lab analyses, also solidified the somewhat tentative link between science and medicine.

But this is not the story of competition between those who advocated "scientific medicine" and those who maintained their faith in the clinical examination. Indeed, the establishment of facilities in Saint John and Halifax reveal the cooperation between community physicians and their brethren in the public health departments, the medical school or the laboratory itself. Essentially, there was no sharp division between the two in the Maritime context. This was not merely good fortune. The laboratories in Halifax and Saint John were part of the new health consciousness that manifested itself in such diverse activities as medical school reform, the activities of the Massachusetts-Halifax Health Commission, the renovation and expansion of large hospitals in Halifax and Saint John and the construction of community hospitals throughout the region. The laboratory stood as testimony to the commitment of various provincial governments to improving the health conditions of the population and were part of a larger reform movement. Yet, while provincial governments were willing to support the establishment of laboratories, there were significant constraints. As the optimism of the 1910s evaporated in the wake of the economic collapse of the Maritimes during the

1920s, complaints about inadequate space, faulty or missing equipment and the frequent laments about inadequate staff were regular mantras in the laboratory reports. What the complaints reveal are the very real limitations on public health in the Maritimes that were apparent by the 1920s.

Nevertheless, the laboratory was clearly ascendant in the Maritimes on a variety of fronts, including medical education, public health and clinical care. The close relationship between the medical profession and a variety of private and state interests ensured this ascendancy. The same relationships shaped the work of the laboratory. This is most apparent in Halifax, where the province, city and university all contributed to the operation of the laboratory. The Morris Street laboratory also assured residents of Nova Scotia that they had potable water supplies and that milk producers adhered to some level of sanitary standard. Laboratory analyses revealed threats to the public's health, from diphtheria to syphilis. It also made health a priority for everyone, since an apparently healthy individual or "pure" water supply, could infect unsuspecting individuals. Equally significant in shaping the work of the laboratory was the burden of disease. The utility of laboratory work was clearly demonstrated in the campaign against diphtheria and in the diagnosis of tuberculosis and venereal diseases. As new diagnostic arrays became available, they were incorporated into the test battery. Municipal and provincial government alike wanted to ensure that there was milk and water testing available. As the work of the laboratory grew and the facilities were established, then expanded,

additions were made to the staff. Laboratory workers grew from a handful of individuals in the early 1920s, to an important service by the end of the decade, one that encompassed a broad spectrum of work, including serology, bacteriology, hematology, to name a few.

A local study of laboratories in Saint John or Halifax, or other services, reminds historians that these are social institutions. Hospitals insert themselves into the community in a number of ways. Hospitals provided training for several generations of nurses and education for the bench was centered there as well. The first applicants to the informal laboratory courses in Halifax and Saint John were nurses, for whom work at the bench was a regular part of their duties. Training programs were initiated in the 1920s and grew more formal and regular through the 1920s and 1930s. In New Brunswick, one of the functions of the provincial laboratory was to train workers to staff smaller clinical laboratories throughout the province. The demand for training was prompted by the expansion of hospitals, the services they offered, and external factors, such as the hospital accreditation movement. The result was that new workers were introduced to the hospital. Regardless of whether they came from a nursing background, straight from secondary school or from university, all workers learned at the bench. One learned by working, and didactic instruction was minimal. The laboratory course in Saint John began in 1919 when Abramson joined the Department of Health and drew students from across New Brunswick, from the southwestern portions of Nova Scotia and from

Prince Edward Island. There was no beginning date for courses, but students were enrolled when the laboratory could accommodate them.

The growth of facilities and the expanding workforce must not be assumed to be evidence of the increasing and linear trend toward specialization. The laboratory worker may have performed bench work, but often filled a variety of roles within the hospital. Laboratory workers were a diverse lot. The specialization that is so often touted as a characteristic of the modern hospital is severely complicated by the experience of laboratory workers. The creation of labour force for the laboratory and the other hospital service departments was guided by a number of factors. The new services came under the direction of physicians, while trained workers carried out the routine work. Nurses filled many of the earliest positions in the laboratory, particularly in the smaller hospitals that were being established throughout the region. Nurses were expected to fill any number of roles within the hospital, including the laboratory. Other workers also had the same expectations forced upon them. That is to say, persons working in labs also supplied other departments as well. There was, then, a clear emphasis on fulfilling a variety of roles within the growing hospital complex. This obviously served the ends of hospitals, but it may also have allowed workers to shape their own career. Advertisements in medical journals detailed the skills that individual workers possessed, and these could be manipulated to secure a desired position.

The knowledge and skill set of laboratory workers is an ongoing matter of negotiation. Jeanne Irwin, the president of the CSLT in 1996, acknowledged that the society was entering a period of transition. Diminishing levels of staff or of persons entering laboratory work would certainly take a toll on the national membership. Irwin believed that the national society would have to "encompass laboratory assistants and other lab workers as part of the membership". Persons with baccalaureate degrees, a BSc in microbiology, for example, may work next to an individual with a RT designation. Laboratories that are more automated may offer less opportunity for "hands-on" work, but will demand workers acquire a "lot of different training and expertise to be of value."⁵ The downsizing that was so characteristic of hospital work environments through the late 1980s and 1990s brought history into focus. There was talk of upskilling, multi-tasking and flexible-specialization, the buzzwords of an age trying to come to terms with fiscal constraints. Yet, these have always been a feature of laboratory work, one of the continuities between the past and the present. What remains to be negotiated is whether laboratory workers can assert some authority and claim economic reward, job security or enhanced status.

In advance of the diamond jubilee of the Canadian Society of Laboratory Technologists in 1997, the national organization turned an eye toward history. They began to run a series of profiles entitled 'On the Shoulders of Giants' that purported to recognize individuals for their "extraordinary contributions to the

growth and development" of laboratory work in Canada. The national society wanted to acknowledge exemplary individuals that aided "medical laboratory technology reach the high standards of professionalism it enjoys today."⁶ One of the subjects of these profiles, Norman Senn, did not apparently consider himself a giant, but rather "a minor person in a great organization."⁷ What made a "giant" in laboratory work? Indeed, one could suggest that the most famous laboratory worker ever was Mary Mallon. Mallon, "Typhoid Mary" as history remembers her, began to perform selected bacteriological tests while held in quarantine.⁸ It is probably not the figure one wants to associate with an emerging profession. Of course, there are the great breakthroughs of the laboratory but these hardly belong to the technical hands who for the most part remain obscure, even in the most critical accounts of laboratory discoveries.

Laboratory workers are hidden from view. Samples are sent "down" to the laboratory, regardless of where it is actually situated within the modern health care complex. In the imagination the laboratory is always in the basement, and this is a profound signifier of the fact that laboratories are subordinate to other health services and also invisible to the public. The most recent National Medical Laboratory Week, held in April 1998, had as its theme "Reaching Beyond Technology to discover the secrets of your health."⁹ The theme was selected in part to "create a personal link between the medical laboratory technologist and the community by emphasizing the important role technologists play in an individual's health care."¹⁰ A recent provincial civil

service campaign in Nova Scotia was entitled "The Secret Service" and included laboratory workers among many of the invisible workers essential to the operation of the modern hospital. A decade earlier, the theme for medical technology week was aptly titled "the quiet perfectionists."¹¹

Laboratory workers, in common with health care workers of all kinds, have endured a difficult period during the 1990s, sometimes quietly but often seeking to be heard.¹² Hospitals have been closed or restructured and opportunities for laboratory work have become increasingly constrained. In Nova Scotia, the medical laboratory technologist training program at the Community College's Institute of Technology campus was suspended because of the lack of jobs in the field and, presumably, as a cost cutting measure within the Department of Education.¹³ Under the auspices of reform, staff levels have been reduced, laboratory services amalgamated in the pursuit of rationalization and workers have been asked to take on an increasing level of responsibility for authoring methods or approving new equipment, without corresponding wage increases. The health care system is under tremendous pressure as the twentieth century closes, having become subject to a variety of competing claims from "stakeholders," an elusive term that includes patients, health care providers, hospital corporations and private companies all eager to take over responsibility for portions of health services (notably laboratory work). Yet, the experience of laboratory work was always dependent upon the confluence of a variety of interests at the bench.

In contrast with the "giants" are the vast majority of workers who constitute laboratory workers in all their diversity. Many laboratory workers continue to see themselves as "just bench techs."¹⁴ But these are the workers who are the vast majority of the membership. Call them the rank and file, as historians are apt to do, or the "heart and soul" as workers prefer, but the vast majority of laboratory workers will never occupy a place of national or scientific "significance". But they do perform essential tests for patients and doctors. They are an essential service for the modern hospital, even if it is a "secret" one. There is no such thing as "just a bench tech." As Pierce herself suggested, "I am a medical laboratory technologist. I am employed by the department of Microbiology at the IWK/Grace Health Centre. The key word in 1996 is employed. To identify myself as 'just a bench tech' I might just as easily say I am 'just a woman' and you'll not hear that."¹⁵

There is no doubt that gender was a significant operative in the expansion of laboratory work. Again, the local study of laboratories, reminds the historian that these are not simply places of science but are also sites of work. The technical hands may be unimportant to the person interested in clinical care, but reconceptualizing the lab as a place of work opens new lines of inquiry. Much of the debate over salaries within Dalhousie University concerned the question of family maintenance. Men were usually thought to be primarily responsible for sustaining families, even their children were contributing to the family economy, as in the case of Albert Hallett. Marriage complicated the

discourse surrounding wages in the Dalhousie laboratories. Clearly the university, in keeping with its philosophy of never paying a family wage, tried to employ only young persons. The tender age of the recruits was reflected in the low wages paid to these workers. The university maintained that the work was not suitable for a married man who had a family to support. Men who worked in the laboratories were also thought to be less ambitious than other men. It seemed the university believed that determined men would simply look for more remunerative work, despite the obvious recognition that an effective laboratory worker aided instruction and research. The skill of these workers was not acknowledged either ideologically or financially. They could simply be replaced. The university was willing to bear the cost of frequently training new workers, rather than paying a wage sufficient to retain competent staff. Age, gender roles and a belief about ambition in the capitalist world combined to justify the low wages paid to the support staff in the university. What is interesting is that any justification was proffered at all. For the women across Morris Street or in Saint John, no explanation was necessary. After all, the entry of women into paid work was presumed to be temporary and their wages were not necessary for family maintenance. The wages for a single woman such as Margaret Low could be depressed with impunity. Only when her brother, who had provided partially for Margaret's well-being, died did the question of *adequacy* ever emerge and then, only briefly.

Women did not enjoy the range of opportunities of men. There was a wide range of constraints on the working lives of Maritime women. Even elite women, such as female physicians, faced a dazzling array of obstacles to establishing successful practices. Some were forced to practice in rural or less desirable locations, while others abandoned medicine altogether for more "suitably female" pursuits. Many of the earliest laboratory workers had the benefit of a good education but despite this they too had only limited career prospects. A job in the laboratory did offer them a significant alternative to other forms of work. As a friend who works in a laboratory once told me, "nursing is like being a maid, while laboratory work is like cooking, and I would rather be a cook than a maid." Working in the laboratory offered women a chance to escape tending to the demands of their own families, caring for the sick, or teaching children. It also allowed women with an interest and aptitude for science to pursue their interest, although in a highly constrained way. Nevertheless, laboratory workers were also relatively privileged. They worked regular hours, were paid a decent if not exorbitant wage and were entitled to annual vacations. For some, it was a good job.

At the same time as the CSLT was planning its 60th anniversary and honoring its past, it also changed its name. The CSLT became the "Canadian Society for Medical Laboratory Science" and the new identity was to give the membership "a new face and a new pride in our profession."¹⁶ The emphasis on science was not new, but the name is certainly more inclusive, intended to

expand the membership from technologists, to include those with baccalaureate or graduate degrees in the medical sciences, PhD researchers and even medical specialties such as haematologists. The need to expand the membership of the national society beyond the bench worker is a challenge for the new millenium. In a sense, it marks a return to the origins of the national society.

There was an overwhelming desire to standardize the experience of becoming a laboratory worker. Efforts to establish an agreed curriculum, standardized national examinations and registration were all designed to impose a homogeneity on laboratory workers beginning their careers at the bench. At the same time, however, the CSLT was a national society that sought to accommodate diversity within its membership. It was a body steadfastly committed to maintaining "professional" standards, and vigorously opposed definitions that diminished the perceived status that accompanied such standards. The society articulated its independence, yet clearly remained subservient to the interests of the medical community that set its examinations and demanded stringent registration requirements. It struggled to define itself as a national society, yet faced the difficulties of all such bodies in maintaining sufficient strength and interest in its constituent parts.

Laboratory workers faced an additional obstacle in their effort to create a national organization of laboratory workers, because of the diversity of those who laboured at the bench. Nurses, laboratory workers and combined technicians all found employment in the laboratory and, indeed, found

inclusion in the nascent CSLT. Membership was initially defined not through education or training, but through skills. For laboratory workers, a definition based on skills takes on new significance in the midst of diversity. There was no unifying education experience for laboratory workers. Nor was there a common labour process. In order to organize the bench, leaders had to construct common ground and the only way to accomplish this was through a description of characteristics. Precise enough to form common ground, but vague enough to be inclusive, the idealized laboratory worker could be a nurse, a university-educated technician or a hospital-trained laboratory worker. Laboratory workers reveal the limits of approaches that seek to explore only the creation of discrete occupational groups and fail to account for the social relations of work. The complex world of laboratory work renders the search for giants meaningless. The real explanatory power of studying laboratory workers is only revealed through the common experience of the many who were "just" bench workers, but first and foremost, workers.

Endnotes

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- ¹ REM, "King of Birds," Document (1986).
- ² *Annual Report of the Hotel Dieu Hospital* [Chatham, New Brunswick], August 1, 1927 to July 31, 1928.
- ³ Apologies to Daniel Samson for paraphrasing the eloquent opening to his edited collection. See Samson, "Introduction: Situating the Rural in Atlantic Canada," in Daniel Samson, ed., *Contested Countryside: Rural Workers and Modern Society in Atlantic Canada, 1800-1950*. Fredericton: Acadiensis Press, 1994, p. 1.
- ⁴ John Duffy, *The Sanitarians: A History of American Public Health*. Urbana: University of Illinois Press, 1990, pp. 195-96.
- ⁵ "A year of challenge -- A year of change," *Canadian Journal of Medical Laboratory Science*, 58 (1996), p. 133.
- ⁶ "On the Shoulders of Giants: A.R. (Archie Shearer)," *Canadian Journal of Medical Laboratory Science*, 58 (1996), p. 105.
- ⁷ "On the Shoulders of Giants: Norman Senn," *Canadian Journal of Medical*, 58 (1996), pp. 137-138. The CSLT re-ran a profile of Senn that it had previously published when Senn was completing his term as president of the society. Senn's comments are contained in the update to that original article.
- ⁸ In an unusual twist, Mallon began work during her second isolation. She began work in the hospital in 1918, first as a domestic worker in the hospital, then in 1922 she was termed a nurse and later as a "hospital helper." Beginning in 1925, she began to work in the hospital laboratory. Judith Walzer Leavitt, *Typhoid Mary: Captive to the Public's Health*. Boston: Beacon Press, 1996, p. 193.
- ⁹ "1998 Planning Guide," *Canadian Journal of Medical Laboratory Science*, 59 (1997), pp. 230-235.

¹⁰ "1998 Planning Guide," p. 230.

¹¹ The slogan was for National Medical Laboratory Week, April 13-19, 1986.

¹² For a local perspective, see "President's Message," *Nova Scotia Society of Medical Laboratory Technologists Newsletter*, 10 (1996), pp. 4-5.

¹³ Nova Scotia House of Assembly. *Debates and Proceedings*, April 27, 1995. The Institute of Technology's program also serviced students from Prince Edward Island. See also *NSGEU Newsletter*, 95 (Summer 1995), p. 6.

¹⁴ Ruth Pierce, "What's In a Name?," *Nova Scotia Society of Medical Laboratory Technologists News & Views*, December 1996, pp. 22-23.

¹⁵ Ruth Pierce, "What's In a Name?," *Nova Scotia Society of Medical Laboratory Technologists News & Views*, December 1996, p. 23.

¹⁶ "A year of challenge -- A year of change," *Canadian Journal of Medical Laboratory Science*, 58 (1996), p. 133.

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