Scientia Canadensis
Canadian Journal of the History of Science, Technology and Medicine
Revue canadienne d'histoire des sciences, des techniques et de la médecine

Education, Expertise, Experience and the Making of Hospital Workers in Canada, 1920-1960

Peter L. Twohig

Volume 29, Number 2, 2006

URI: https://id.erudit.org/iderudit/800522ar
DOI: https://doi.org/10.7202/800522ar

See table of contents

Publisher(s)

CSTHA/AHSTC

ISSN

0829-2507 (print)
1918-7750 (digital)

Explore this journal

Cite this article

Twohig, P. L. (2006). Education, Expertise, Experience and the Making of Hospital Workers in Canada, 1920-1960. *Scientia Canadensis*, *29*(2), 131–153. https://doi.org/10.7202/800522ar

Article abstract

Beginning in the 1920s, many Canadian hospitals underwent an extensive period of modernization. A wide variety of workers, generally termed "allied health professionals," began to work alongside physicians and nurses. This paper examines the history of two such groups, x-ray and laboratory technicians, paying particular attention to the ways in which technical education was transformed and, through this transformation, new occupational identities forged. Initially, those who staffed the laboratory and x-ray departments were given quick, practical instruction. In many cases, these workers continued to work in various settings across the hospital. The informal instruction of the 1920s and 1930s was displaced by formal, accredited training programs, replete with national examinations linked to a practice registry in the 1940s. Hospital administrators, the Canadian Medical Association and technicians themselves were all engaged in this transformation. At the same time, national organizations such as the Canadian Society of Laboratory Technologists or the Canadian Society of Radiological Technicians, founded in the late 1930s and early 1940s respectively, attempted to create a common professional identity with a clear scope of practice. Despite this, technical workers' professional identity remained malleable and highly dependent upon context long after the creation of supposedly national accreditation standards.

Education, Expertise, Experience and the Making of Hospital Workers in Canada, 1920-1960[1]

Peter L. Twohig

Saint Mary's University

Abstract: Beginning in the 1920s, many Canadian hospitals underwent an extensive period of modernization. A wide variety of workers, generally termed "allied health professionals," began to work alongside physicians and nurses. This paper examines the history of two such groups, x-ray and laboratory technicians, paying particular attention to the ways in which technical education was transformed and, through this transformation, new occupational identities forged. Initially, those who staffed the laboratory and x-ray departments were given quick, practical instruction. In many cases, these workers continued to work in various settings across the hospital. The informal instruction of the 1920s and 1930s was displaced by formal, accredited training programs, replete with national examinations linked to a practice registry in the 1940s. Hospital administrators, the Canadian Medical Association and technicians themselves were all engaged in this transformation. At the same time, national organizations such as the Canadian Society of Laboratory Technologists or the Canadian Society of Radiological Technicians, founded in the late 1930s and early 1940s respectively, attempted to create a common professional identity with a clear scope of practice. Despite this, technical workers' professional identity remained malleable and highly dependent upon context long after the creation of supposedly national accreditation standards.

Résumé: Les années 1920 marquent le début d'une longue phase de modernisation pour de nombreux hôpitaux canadiens. Un grand nombre d'employés, généralement qualifiés de « personnel paramédical », commencent à collaborer avec les médecins et le personnel infirmier. Cet article observe l'évolution de deux de ces deux groupes, soit les techniciens en radiologie et les techniciens de laboratoire. Il met l'accent sur le développement d'une formation technique et, à travers celle-ci, de l'établissement de nouvelles identités

1. This research has been funded in part through an AMS-Hannah / CIHR Grants in the History of Medicine. I gratefully welcome this financial support, as well as the helpful comments of the anonymous reviewers.

professionnelles. Au début, le personnel des laboratoires et des services de radiologie reçoit une formation rapide et pratique. Dans de nombreux cas, ces personnes poursuivent leur travail dans plusieurs autres services de l'hôpital. La formation informelle fournie dans les années 1920 et 1930 est ensuite remplacée par une formation formelle au moyen de programmes accrédités, complétés par des examens nationaux qui donnent lieu à l'établissement d'un registre des pratiques dans les années 1940. Les directeurs d'hôpitaux, l'Association médicale canadienne et les techniciens eux-mêmes participèrent à cette évolution. En même temps, les organisations nationales telles que la Société canadienne des technologistes de laboratoire ou la Société canadienne des techniciens en radiologie, fondées respectivement à la fin des années 1930 et au début des années 1940, tentent de créer une identité professionnelle commune ancrée dans un ensemble de pratiques clairement identifiables. Malgré cela, longtemps après la création des prétendues accréditations nationales, l'identité professionnelle des techniciens demeure flexible et extrêmement tributaire de l'environnement local.

Many occupational groups comprise the contemporary health care system. The most identifiable occupations are those widely recognized as "professionals" (physicians and nurses) and analyses of these groups also dominate the historiography of health care. "Support staff" (such as cleaners, porters, kitchen workers) rarely figure in analyses of health and medicine in twentieth century Canada,[2] while those workers who are considered "allied health professionals" (such as occupational therapy, physiotherapy, speech pathology) have only recently begun to attract the interest of historians of health and medicine.[3] While such studies have

2. Important exceptions would be Jerry P. White, *Hospital Strike: Women, Unions, and Public Sector Conflict* (Toronto: Thompson Educational Publishing, 1990) or, for the United States, Karen Brodkin Sacks, *Caring by the Hour: Women, Work and Organizing at Duke Medical Center* (Urbana: University of Illinois Press, 1988).

3. Ruby Heap, "Physiotherapy's Quest for Professional Status in Ontario, 1950-80," *Canadian Bulletin of Medical History* 12, 1 (1995): 69-99 and Heap, "Training Women for a New 'Women's Profession': Physiotherapy Education at the University of Toronto, 1917-40," *History of Education Quarterly* 35, 2 (1995): 135-158. In Québec, there have been studies of a number of allied health care workers. See, for example, Lucie Piché and Nadia Fahmy-Eid, "À la Recherche d'un Staut Professionnel dans le Champ Paramédical: le Cas de la Fiététique, de la Physiothérapie et de la Technologie Médicale," *Revue d'histoire de l'Amérique française* 45, 3 (1992): 375-401; Nadia Fahmy-Eid and Lucie Piché, "Le Savoir Négocié: les Stratégies des Associations de Technologie Médicale, de Physiothérapie et de Diététique pour l'Accès à une Meilleure Formation Professionnelle (1930-1970)," *Revue d'histoire de l'Amérique française* 43, 4 (1990): 509-534; 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 (1994): 377-408. For a broader discussion of health care workers in Québec, see Nadia-Fahmy-Eid, *Femmes, Santé et Professions: Histoire des Diététistes et des Physiothérapeutes au Québec et en Ontario, 1930-1980* (Saint-Laurent: Fides, 1997).

enriched our understanding of health services in Canada, the occupational group has, predictably, remained the focus of the analysis. This is entirely understandable, as many groups have membership records or publish journals that make them "natural" topics of inquiry. Nevertheless, an unintended and ironic effect of this professional gaze is to reinforce the notion that occupational groups were comprised of individuals doing discrete tasks in one area of clinical care. A further consequence of the professional gaze is that these same occupational groups have acquired what Gerald Larkin has described as an "aura of inevitable permanence."[4] In other words, the division of labour in health care seems to some to "make sense" and to be rational.

An analysis of technical work in hospitals presents an opportunity to disrupt notions of tightly-contained occupational groups and explore the shared, but contested, geography of the division of labour in health care. I have argued previously that health care historians need to transcend silos and build broader analyses of the organization and delivery of health care in Canada,[5] an argument that has been best advanced by nursing historians.[6] This paper presents an analysis of two groups of hospital workers, namely, the technical staff found in laboratories and x-ray departments, in an effort to challenge the idea of clear, permanent and immutable occupational boundaries in health care work. It focuses particularly on the question of regulating these emerging occupational groups, through an analysis of the effort to create accredited education programs and national registries. In this way, the history of technical workers in Canada offers important insights into the nature of hospital work.

While it is certainly possible to group workers together in analytically naïve ways, laboratory and x-ray workers can both be considered "technical workers" in the context of health care. This is because both groups generate symbolic representations of physical phenomena through the use of tools such as imaging technologies or laboratory assays (leading to "results"). Furthermore, these representations are interpreted by other health care professionals. Both groups, therefore, occupy the borderlands between patients and professionals, and both are responsible for manual-technical tasks, while being simultaneously alienated from the intellectual work of interpreting results. For the purposes of this analysis, technical

4. Gerald Larkin, *Occupational Monopoly and Modern Medicine* (London: Tavistock Publications, 1983), vi.

5. Peter L. Twohig, "Recent Writing on Health Care History in Canada," *Scientia Canadensis* 26 (2002): 26-7.

6. Cynthia Toman and Meryn Stuart, "Emerging Scholarship in Nursing History," *Canadian Bulletin of Medical History* 21, 2 (2004): 223-227.

workers are significant because their shared histories suggest that the theme of specialization, surely one of the dominant themes in both medical history and analyses of work during the twentieth century, is in need of reinterpretation. Specifically, we need to rethink some of our assumptions about specialization in health care and how workers were prepared for practice. There is, furthermore, a profound need to situate interpretations of professional and occupational groups within the historical and structural parameters of particular settings, because of the importance of local needs in shaping the hospital labour force. Most intriguing are the ways in which health care workers continued to work across services long after the presumed specialization of Canadian hospitals. Technical work in the hospital reveals more bridges than boundaries between occupational groups.

Laboratory Workers

In Canada, the infrastructure of health care took shape in the late nineteenth and early twentieth centuries and this included the development of laboratories small and large. Laboratories are, therefore, typically viewed as an important part of health care's "modernization."[7] Their development across Canada was much more prosaic, rooted in the efforts of the federal government to control the "venereal disease problem." Venereal disease control became an integral part of the federal health department when it was established in 1919 and this included a commitment of two hundred thousand dollars to help control the "secret plague."[8] The federal government would supply the funds in proportion to provincial population, while the provinces, most of which passed legislation that addressed VD in the years before 1920, would use the enhanced funding to expand laboratory services. At the practical level, this provided laboratories with federal dollars to support the development of diagnostic services for a number of venereal diseases, including syphilis and gonorrhoea. The impact was dramatic. From 1920 to the mid-1930s, for example, the number of syphilis tests conducted in Nova Scotia's laboratory increased sixteen-fold.[9]

---

7. A much fuller discussion of laboratory workers may be found in Peter L. Twohig, *Labour in the Laboratory: Medical Laboratory Workers in the Maritimes, 1900-1950* (Montreal and Kingston: McGill-Queen's University Press, 2005).

8. Jay Cassels, *The Secret Plague: Venereal Disease in Canada, 1838-1939* (Toronto: University of Toronto Press, 1987), 163-169.

9. Nova Scotia Department of Public Health *Annual Reports*, 1919-20 to 1929-40. 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

Accompanying the rise of venereal disease testing was a general expansion of laboratory work of all kinds through the 1920s. The total number of tests at the Pathological Laboratory in Halifax, including both public health and clinical laboratory tests for the Victoria General Hospital, increased from just 759 in 1914-15 to more than to 8,753 a decade later and exceeded twelve thousand tests by the end of the 1920s.[10] As insulin treatment grew more common at the Saint John General Hospital in the early 1920s, the number of urinalyses dramatically increased. During 1922-23, for example, an additional eleven hundred urinalyses were completed.[11] Such a dramatic expansion of laboratory work required more staff. In the Maritimes, as I have argued elsewhere, larger laboratories in Saint John and Halifax began to offer training in the 1920s but laboratory courses were informal until the later 1930s. These informal courses were practically-oriented and short, ranging from two- to eight-weeks in the 1920s, and nurses were among the earliest students.[12] After completing the course, nurses were familiar with basic laboratory techniques and could conduct a limited range of analyses. In addition to providing service in hospital laboratories, many nurses continued to provide nursing care, or work in other departments throughout the hospital.[13] The addition of new diagnostic services or other departments created a demand for competent and capable staff but limited financial resources meant that many hospitals needed inexpensive options.[14]

---

were conducted, topping 4000 in 1928-29, almost 7000 in 1930-31, 9000 in 1933-34 and reaching 10,000 in 1934-35.

10. These numbers are based upon data published in the Nova Scotia Department of Public Health *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.

11. "Annual Report of the Bureau of Laboratories," in New Brunswick, *Annual Report of the Medical Officer of Health*, Year Ending 31 October 1923, 3.

12. W.W. Kenney to Dr. W. Eagar, November 4, 1924 in Victoria General Hospital Letterbook (hereafter 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, 21 January 1924 in VGHL. This letterbook is part of the Victoria General Hospital collection, formerly housed at Nova Scotia Archives and Records Management. This rich collection was deaccessioned by the archives and returned to the Queen Elizabeth II Health Sciences Center, where it is housed in a basement storage vault.

13. This is developed more fully in Peter L. Twohig, "'Local Girls' and 'Lab Boys': Gender, Skill and medical Laboratories in Nova Scotia in the 1920s and 1930s," *Acadiensis* 31, 1 (2001): 55-75.

14. W.G. Godfrey has recently provided a stellar analysis of the complexities of funding municipal hospitals. Indeed he notes that "hospital funding is a major concern of this study, since too many hospital histories revel in grand opening ceremonies and ribbon-

Requiring nurses to assume responsibilities in these new departments was a pragmatic response to both rising expectations (of clinicians and of patients) and the limited financial resources of many hospitals.[15] In this way, nurses became a critical, and flexible, labour pool for the modernizing hospital.

Susan Reverby has argued that beginning in the 1910s, as hospitals underwent a transformation in the range of services offered, nurses could be found working as laboratory or x-ray technicians, social workers or physiotherapists.[16] While Margarete Sandelowski has described the nurses in these settings as "assistants,"[17] they often worked alone and were in charge of the day to day duties in these departments. For example, when Prince Edward Island appointed its first laboratory technician in the early 1930s, there was widespread agreement that she would work alone and would be largely unsupervised. After considering a number of candidates, it was agreed that a nurse should be sent to the Pathological Institute in Halifax to acquire skills in basic laboratory techniques. Relief and assistance in the new laboratory would be provided by the public health nurses.[18] The demands placed on nurses to staff different areas in the emerging health care matrix is a concrete illustration of their contribution to the "scientific and technological transformation of health care and medicine"[19] that occurred in the early twentieth century.

Nurses' laboratory labour also raises questions about exactly who was considered qualified to work in the new diagnostic services and the nature of that claim to expertise, questions at the heart of occupational identities within health care. The Canadian Medical Association (CMA) showed little interest in the question of laboratory workers and the Canadian

---

cutting celebrations ... yet ignore the evolving funding patterns that made such space and service extensions possible." See W.G. Godfrey, *The Struggle to Serve: A History of the Moncton Hospital, 1895-1953* (Montreal and Kingston: McGill-Queen's University Press, 2004), 8. It is worth noting that the process of shifting work from one group to another, to save money, unfolded in office work and other areas. See, for example, Graham Lowe, *The Administrative Revolution: The Feminization of Clerical Work* (Toronto: University of Toronto Press, 1987).

15. David Gagan and Rosemary Gagan, *For Patients of Moderate Means: A Social History of the Voluntary Public General Hospital in Canada, 1890-1950* (Montreal and Kingston: McGill-Queen's University Press, 2002), 46, 89; W.G. Godfrey, "Private and Government Funding: The Case of the Moncton Hospital, 1898-1953," *Acadiensis* 31 (2001): 22-23.

16. Susan M. Reverby, *Ordered to Care: The Dilemma of American Nursing, 1850-1945* (Cambridge: Cambridge University Press, 1987), 114.

17. Margarete Sandelowski, *Devices and Desires: Gender, Technology, and American Nursing* (Chapel Hill: University of North Carolina Press, 2000), 83.

18. For complete details see Twohig, *Labour in the Laboratory*, 116-119.

19. Sandelowski, 1.

Society of Laboratory Technologists (CSLT) was not founded until late 1936. Following its creation, membership in the CSLT was open to any person who worked in a laboratory, regardless of their education or training.[20] Such an open membership policy permitted the society to grow and reflected the diversity that prevailed within the laboratory labour force. Nevertheless, the nascent CSLT was interested in the question of qualifications and of professional status. Among the society's six stated objectives were improving the "qualifications and standing" of laboratory workers and, once this was achieved, to "promote a recognised professional status" for the workers. The founding members believed that establishing approved training facilities and national practical and theoretical examinations would provide a vehicle for professional uplift.[21] The imposition of exams, registration, and training schools are, of course, among the key hallmarks of "professionalism" in health care and beyond.

In early 1937, Mountain Sanatorium in Hamilton asked the American Medical Association (AMA) to approve its training program for laboratory workers.[22] The CMA did not have its own evaluation process, so it raised no concerns when contacted by the AMA. The request did, however, prompt the CMA to consider the issue of educating and registering laboratory workers in Canada and they subsequently established a committee to investigate laboratory training. Dr. W.J. Deadman, who became a prime mover in creating the Canadian Society of Laboratory Technologists, was appointed chair, Dr. G. Harvey Agnew was appointed secretary and the rest of the members were drawn from

---

20. It is not my intention to relate the history of the CSLT here. Readers interested in the details of the professional society will find a fuller account in Twohig, *Labour in the Laboratory*, especially chapters 5 and 6.

21. 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. The minutes, and other documents pertaining to the CSLT, are housed in the national office of the Canadian Society for Medical Laboratory Science, in Hamilton, Ontario. The executive of that society generously granted me access to this archival collection, and I am particularly grateful to Kurt Davis.

22. The movement of health care workers across the Canada-United States border merits some further attention. It is clear from many accounts that Canadian health care workers frequently acquired their education in the United States. Susan Reverby has noted that when the Somerville Hospital in Boston could not attract local women to its nursing school during the 1920s, it strategically advertised in newspapers in Halifax, Nova Scotia. See Reverby, *Ordered to Care*, 80. In another example, pioneer occupational therapist Mary Black, who could not earn a living in Nova Scotia, went to Boston where her Canadian credentials posed no impediment to employment. See Peter L. Twohig, "'Once a Therapist, Always a Therapist': The Early Career of Mary Black, Occupational Therapist," *Atlantis* 28, 1 (2003): 106-17.

across Canada.[23] The CMA wanted to ensure that students began laboratory courses with some knowledge of high school science and that training programs were accredited. For its part, the CSLT expressed its hope that the CMA would not let "every hospital train technicians."[24] When it reported it 1939, the CMA committee on laboratory technicians established thirteen requirements for approving laboratory programs, including laboratory size, the volume and nature of the tests performed, and the qualifications of the instructors. Schools were to be in "adequately organized" pathology departments in hospitals with at least four hundred beds or in provincial laboratories or "other laboratories providing comparable experience." The committee rejected outright any suggestion that private or commercial laboratories should train laboratory workers.[25]

Initially, course content remained the responsibility of the hospital and the laboratory director. The CMA prescribed a twelve-month training program and recommended that any specialty training should be preceded by twelve months of general training. The focus on general training ensured that all graduates would acquire core competencies in the areas of hematology, bacteriology, medical zoology, histology and pathological chemistry. Specialized training could include serology, bacteriology or biochemistry.[26] This proposal was further refined and was approved by the CSLT in February 1941. The official published syllabus[27] prescribed general training in the principal laboratory sections (bacteriology, biochemistry, hematology, serology, parasitology and histology) and outlined areas of specialization. As an illustration, general training in serology included topics such as the principles and methods of complement fixation tests, agglutination tests, blood grouping, pneumococcus typing and preparation of glassware. A person wishing to

23. Library and Archives of Canada (hereafter LAC), MG28-1343, Canadian Medical Association Minutes of the Executive Committee (hereafter CMA Executive Committee), 18-19 June 1937; *Canadian Journal of Medical Technology*, 1 (October 1938), 5; A.R. Shearer, ed., "Canadian Society of Laboratory Technologists," (Unpublished manuscript, [1983]), 2-3. The other members were Dr. Ralph P. Smith, Halifax, Dr. E.H. Mason, Montreal, Dr. James Miller, Kingston, Dr. George Shanks, Toronto, Dr. J.C. Patterson, Regina and Dr. J.J. Ower, Edmonton.

24. Annual General Meeting of the CSLT (hereafter AGM), 11 December 1937.

25. LAC, MG28-1343, "Report of the Committee on Laboratory Technicians," Canadian Medical Association Minutes of General Council (hereafter CMA General Council), 19-20 June 1939; CSLT Executive, 8 February 1941.

26. "Report of the Committee on Laboratory Technicians," CMA General Council, 19-20 June 1939; CSLT Executive, 8 February 1941.

27. CSLT Executive, 8 February 1941. This was published in the *Canadian Journal of Medical Technology* 3, 4 (1941): 158-159.

specialize in serology would learn how to prepare antigens and reagents, conduct paternity tests and other advanced techniques.[28]

With a curriculum agreed upon, the process of approving schools could begin. When the CMA executive met in Winnipeg in June 1941, four laboratories had been approved for training workers.[29] By March 1942, when the *Canadian Journal of Medical Technology* published its first list of approved schools, there were nine, most of which were located in eastern Canada.[30] Ultimately, a network of approved schools was created across the country.[31] 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. Although the result of using local hospitals to meet the labour force needs of an expanding health care system was decentralization, the process of approval was an attempt to impose some uniformity on what had been a complex and idiosyncratic training system for laboratory workers. The third component of this enhanced regulation was the creation of a national registry for laboratory workers. Recalling developments in 1941, Dr Harvey Agnew, noted that physicians believed that there was an "urgent need" for a "registry of qualified technicians," to be established under the auspices of the CSLT if the laboratory organization "could ... stiffen its admitting regulations."[32] While some physicians were happy with graduates from approved programs, others were less than enthusiastic. In 1948, the Registrar of the Ontario College of Physicians and Surgeons described how some physicians "won't have anything to do with those [workers] whom they have not trained themselves."[33] According to one laboratory student, a doctor declared: "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."[34] The attitudes of such physicians reflected the

28. "Official Registry of Technicians: A Syllabus of Studies," *Canadian Journal of Medical Technology* 3, 4 (1941): 159.

29. CMA Executive Committee, 20-21 June 1941. See also CMA Executive Committee, 14-15 March 1941.

30. *Canadian Journal of Medical Technology*, 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, 15-16 June 1942.

31. 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).

32. Harvey Agnew, "The Place of the Technologist in Modern Diagnosis," *Canadian Journal of Medical Technology* 3, 4 (1941): 154.

33. CSLT correspondence, Robert T. Noble to W.J. Deadman, March 29, 1948.

34. Mary W. O'Donnell, "O Pity the Poor Student—Or Should We?" *Canadian Journal of Medical Technology* 4 (1942): 41.

realpolitik of laboratory work—membership in the national society was not a condition of employment in many settings, so professional closure remained a distant goal for the CSLT. Nevertheless, the CSLT, with the active participation of the CMA, did much to organize Canadian laboratory workers and re-shape their training through the 1940s. By the 1940s there were approved education programs, a national curriculum, and a system of national examinations, all of which were linked to a registry of laboratory workers.

X-Ray Workers

The introduction of x-ray workers to hospitals followed a pattern similar to that of laboratory workers. Within months of their discovery in November 1895,[35] x-rays were recognized as a powerful tool for imaging and clinical treatment.[36] Roy Porter described x-rays as an "impressive diagnostic tool and a symbol of medical power,"[37] while in his recent

35. The date is provided by both Roy Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity* (New York: Norton, 1997), 604 and W.F. Bynum, *Science and the Practice of Medicine in the Nineteenth Century* (Cambridge: Cambridge University Press, 1994), 173.

36. The centenary of Röntgen's discovery prompted a spate of writing in journals such as *Journal of the American Medical Association, British Medical Journal, Canadian Medical Association Journal* and others. There are also several studies that focus on Canada. The fullest treatment is John E. Aldrich and Brian C. Lentle, eds., *A New Kind of Ray: The Radiological Sciences in Canada 1895-1995* (Vancouver: The Canadian Association of Radiologists, 1995). Other work includes Ruth Brecher and Edward Brecher, *The Rays: A History of Radiology in the United States in Canada* (Baltimore: Williams and Wilkins, 1969) and Edward A. Shorter, *A Century of Radiology in Toronto* (Toronto: Wald and Emerson, 1996). Chares Hayter has been the most prolific scholar, providing many detailed studies of aspects of x-ray work. His recent book, *An Element of Hope: Radium and the Response to Cancer in Canada, 1900*-1940 (Montreal and Kingston: McGill-Queen's University Press, 2005) provides essential context because of the overlapping histories of radium and x-ray departments. See also Hayter, "The Clinic as Laboratory: the Case of Radiation Therapy, 1896-1920," *Bulletin of the History of Medicine* 72 (1998): 663-688; Hayter, "Making Sense of Shadows: Dr. James Third and the Introduction of X-Rays, 1896 to 1902," *Canadian Medical Association Journal* 153 (1995): 1249-1256. Hayter has also examined Nova Scotia in "'To the Relief of Malignant Diseases of the Poor': The Acquisition of Radium for Halifax, 1916-1926," *Journal of the Royal Nova Scotia Historical Society* 1 (1998): 130-143.

37. Porter, 606. It is of course worth noting that the interest in and authority of x-rays quickly spawned a host of dubious x-ray "cures" and the widespread use of x-rays for such diverse purposes as the treatment of minor benign menstrual bleeding or appropriate sizing of feet. See Porter, 608 for the first example and Jacalyn Duffin and Charles Hayter, "Baring the Sole: The Rise and Fall of the Shoe-Fitting Fluroscope," *Isis* 91 (2000): 260-82 for the use of x-rays in shoe stores. Importantly, the use of x-rays was done with little regard to patients. One consequence of the therapeutic use of x-rays to treat benign menstrual bleeding, for example, was cervical cancer. Technical staff in particular was put

history of the Toronto General Hospital, J.T.H. Connor argues that the acquisition of x-ray technology (used first in November 1896) "serves as the best example of medicine reflecting modernity."[38] Despite the emphases of Porter and Connor on the meaning of x-rays for medicine, many different people operated x-ray equipment. In his formidable study of American hospitals, Charles Rosenberg has described how "photographers, clinicians, and technicians" ran x-ray departments in various settings.[39] Other settings show a similar diversity. In England, a dentist operated the x-ray apparatus at the Nottingham General Hospital.[40] In Canada, the prominent Nova Scotian radiologist Herbert Corbett noted that early x-ray work "was relegated to the physicist and photographers."[41] When the St. John Infirmary opened Saint John, New Brunswick in 1914, it was a local general practitioner who supervised the x-ray work.[42] Debates about who was qualified to operate x-ray equipment endured for decades.

As with laboratory work, nurses were often called upon to also serve as x-ray technicians. When Dr. William H. Eagar was appointed roentgenologist in Halifax's Victoria General Hospital in November 1919, he was promised that the hospital would supply "an assistant, not necessarily a so called technician, who shall be an employee of the nursing department."[43] 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.[44] When an early candidate declined the

---

in harms way, often with devastating consequences. Reiser also describes the widespread use of x-rays for "sentimental" photographs, showing lovers clasped hands or fashionable women's bejeweled fingers. Stanley Joel Reiser, *Medicine and the Reign of Technology* (Cambridge: Cambridge University Press, 1978), 60-63.

38. J.T.H. Connor, *Doing Good: The Life of Toronto's General Hospital* (Toronto: University of Toronto Press, 2000), 130. References to the early use of x-ray equipment are included in a chapter tellingly entitled "A Model Hospital."

39. Charles Rosenberg, *The Care of Strangers: The Rise of America's Hospital System* (Baltimore: Johns Hopkins University Press, 1995), 182-83. It is also worth noting that there were also competitors outside of the hospital.

40. Rosemary Stevens, *Medical Practice in Modern England: The Impact of Specialization and State Medicine* (New Haven: Yale University Press, 1966).

41. Herbert R. Corbett, "Inter-Relationships," *Focal Spot* 3 (1946): 132-33.

42. *75 Years of Caring: St. Joseph's Hospital* [Saint John, New Brunswick], n.p.

43. Minutes of the Victoria General Hospital Board of Commissioners (hereafter BOC), 16 May 1914 and Minutes of the Medical Board (hereafter MMB), 24 November 1919. Eager stayed in this position until 1926, see BOC, 13 August 1926.

44. W.W. Kenney to W.H. Eagar, 10 November 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, 26 November 1919 in VGHL.

position,[45] Eagar seconded a senior male nurse from the staff to train as a "technician" in late January 1920.[46] Recruiting staff to x-ray departments, either as assistants or to take charge of the service, was an important question as the departments were transformed during the 1920s from small services to important departments within hospitals, with huge volumes of work. Where once the x-ray department was the exclusive domain of individual physicians or even lay-people, the expanding role of x-rays in clinical care demanded additional staff.

As in the laboratory, nurses were considered to be an important source for labour in the nascent x-ray departments. Many recalled this aspect of their work in oral histories collected during the 1980s by nursing historian Barbara Keddy.[47] Greta MacPherson, who began her career at Glace Bay General Hospital in the summer of 1922, worked in both the x-ray department and the laboratory following her graduation, replacing another nurse. Both of the nurses took a "short course" in x-ray and lab work in Halifax. Young Greta, who gave up school teaching to become a nurse, was not enthusiastic about working in the diagnostic service departments, and worried that her duties there would interfere with her desire to nurse. She was, however, adept in x-ray and laboratory technique and the hospital superintendent assured her that she would continue to nurse patients. MacPherson recalled that the superintendent "was anxious for me to do this. Nobody would touch it. So I took instruction." Over the next ten years, her duties at Glace Bay General combined nursing with x-ray work, basic laboratory tests such as blood counts and urine samples, and administering anaesthetics. She came to particularly enjoy her work in the x-ray department. Probably echoing the opinion of small hospital administrators everywhere, 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."[48] Her ability to work across several departments and fill multiple roles permitted the hospital to undergo a degree of modernization, without the burden of adding

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

46. W.W. Kenney to Dr. A.F. Miller, Superintendent, Nova Scotia Sanatorium, 27 January 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, 2 June 1943.

47. This material is drawn from the Barbara Keddy Fonds, Series 018, Social History of Nursing in Nova Scotia in the 1930s, Nova Scotia Archives and Records Management. I am grateful to Dr Keddy for her permission to cite from this important collection.

48. Keddy Fonds, 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.

dedicated staff members to now-required departments such as laboratory or x-ray services. Many other nurses recounted similar stories.[49]

The volume of images grew to such an extent that full-time x-ray workers were needed in many departments. In late 1937, Halifax's Victoria General Hospital's radiologist, S.R. Johnston, requested that the hospital provide $720 to employ a "full time X-ray technician, who could be trained to do various types of work ... and thus liberate a pupil nurse, who, on account of her short time of service, is only partially satisfactory."[50] Here it is worth noting that it was the nurse's "short time of service" that was an issue for Johnston, who nevertheless did not request a more experienced nurse. Instead, he wished to acquire a full-time staff person to conduct all the necessary tests, which would also put a student nurse back into the nursing labour pool. In January 1938 Jennie Weir joined the x-ray department as a technician but her declining health forced the hospital to make a number of temporary appointments, including Mrs. Violet Toomey and Mr. W.P. Reynolds in the spring and autumn of 1938, respectively.[51] Finally, in early 1939, Winnie Flynn joined the x-ray department, eventually assuming a position on the permanent staff.[52] The path was now clear. In the largest hospital x-ray departments, such as Halifax's Victoria General Hospital, a full-time x-ray staff was necessary.

Alongside the growth in the number of x-ray departments and increasing numbers of technical staff during the 1920s and 1930s were nascent efforts to organize Canadian x-ray workers. Both the American Association of X-Ray Technicians (AAXRT) and the Society of Radiographers in the United Kingdom were founded in 1920. The first Canadian organization established was the Western Society of Radiographers, created in Manitoba in 1930. Claude J. Bodle, a Winnipeg x-ray worker was the Canadian representative at the AAXRT founding meeting, and he was a key leader in the Manitoba organization. It is therefore unsurprising to learn that the Western Society of Radiographers affiliated with the AAXRT. Individually, many Canadian x-ray workers also sought membership in the American society. In 1947, for example,

---

49. While nurses were obviously important to the operation of many x-ray departments, others continued to operate the equipment. In the early 1920s, Wendall Bain served as the maintenance man at the Yarmouth Hospital, before going to Halifax to take an x-ray course. He returned to the hospital and served as the head of the x-ray department for two and a half years. Evangeline R. Pothier, *Mary Ann Watson and the Yarmouth Hospital* (Yarmouth: s.n., [1986]).
50. MMB, 17 December 1937.
51. MMB, 9 May 1938 and 27 October 1938.
52. MMB, 2 December 1938, 23 January 1939 and 3 August 1939.

184 Canadians appeared on the American registry. Ontario's provincial organization was created in 1935 and by 1938, the Ontario society, together with the Canadian Medical Association and the Canadian Association of Radiologists turned their attention to the question of a national society. Provincial societies were established in Nova Scotia, New Brunswick, Quebec and Saskatchewan in 1940, and other provinces followed. The provincial societies subsequently co-operated to create a national organization, the Canadian Society of Radiological Technicians (CSRT). The first meeting, held in September 1942, extended membership to anyone who was a member of a provincial society before 1 July 1942. As with other professional societies, the CSRT's main issues concerned creating a national registry and raising the educational requirements. Provincial societies varied slightly in their membership rules, so at the CSRT's first annual meeting a decision was made to adopt the standards of the Ontario Society of Radiographers. The minimum period of training would become two years, though the question of approved schools did not emerge until 1946.[53]

Of the CSRT members registered before 1960, 14.4% (n=432) had some education beyond high school. Many, like Irene P., completed business, commercial or secretarial courses. Others listed laboratory training programs, teacher's colleges, nurses' training or university courses. Only 1.2% (n=35) of CSRT registrants were university graduates. Mary S.'s path to x-ray work was particularly circuitous, but captures the broad range of options available to some women. The Summerside, Prince Edward Island, native completed her grade 12 in 1939 and then went to St. Francis Xavier University in Antigonish, Nova Scotia for two years (September 1939 to May 1941), though she did not complete her B.Sc. In 1942, she took a commercial course at the Central Business College in Summerside. In January 1946, she renewed her education, this time undertaking x-ray training at St. Joseph's Hospital in Saint John, New Brunswick. She completed her course in June 1946 and in August that year, assumed her position at the Prince County Hospital, in

53. Sister Mary DeLellis Crowley, "Some Historical Considerations of the Canadian Society of Radiological Technicians," 1960. This article was originally submitted as part of Sister DeLellis' work for her BSc in Radiologic Technology, which she completed at Saint Louis University in 1948. The article also appeared in the CSRT's journal, the *Focal Spot*, that same year. It was recently republished and updated in Ron Wood and Brian Lentle, "The Canadian Association of Medical Radiation Technologists: Historical Aspects," in *A New Kind of Ray* (see note 36), 304. On the creation of the Nova Scotia Radiographers Society, see *Nova Scotia Medical Bulletin* 19, 10 (1940): 554 and *Nova Scotia Medical Bulletin* 20, 4 (1941): 188.

Summerside.[54] In another example, Sister Frances G., completed two years of laboratory training at the Halifax Infirmary in 1946, and immediately followed this with two years of x-ray training at the same hospital.[55] As the examples suggest, there remained many different paths to x-ray work, although all workers after 1942 had to complete a two-year training course and pass an exam.

Given the absence of approved schools and the many routes to working in an x-ray department, it is not surprising that the issue of education appeared in the first issue of the CSRT's journal, *The Focal Spot*. In his article, "The Future of the X-ray Technician," published in January 1944, Claude Bodle wrote:

> It has also been questioned if any elaborate scheme of education and training is necessary for technicians; that radiographic technique is a very simple matter, and that any extensive course of study and training is largely a waste of time and effort, and that the rapid development of equipment and automatic devices and gadgets have so simplified procedures that no very great degree of skill or knowledge is required to do technical work, and that the whole thing has become more or less automatic, like a "penny in the slot" machine, you press the button and the machine does the rest, and so on, and that there is no future for the technician.[56]

Nevertheless, Bodle believed that "too much emphasis has been placed on purely theoretical considerations, and not enough on the practical phases of the work."[57] There is ambivalence in Bodle's argumentation. On the one hand, he indicates that technicians were more than "button-pushers" and that they, in fact, possessed skills. But the skills were technical ones, rooted in practical education rather than, say, developing the "trained mind" that is usually associated with professional work.[58]

Education was also a prominent topic at the annual meetings of the CSRT throughout the 1940s and 1950s. There were a number of linked developments through the 1940s. In 1944, a motion was passed that established a national standard examination as a precondition for membership in the CSRT.[59] The next year, the Alberta Society of

---

54. Canadian Association of Medical Radiation Technologists (hereafter CAMRT) membership file, #298.
55. CAMRT membership file, #340.
56. C.J. Bodle, "The Future of the X-Ray Technician," *Focal Spot* 1, 1 (January 1944): 10-13.
57. Ibid.
58. This was also true of laboratory work. See Twohig, *Labour in the Laboratory*, 136-47. For a discussion of the contrast between technical skills and professional skills, and the implications of such definitions for women, see Nancy F. Cott, *The Grounding of Modern Feminism* (New Haven: Yale University Press, 1987) and Cynthia Cockburn, *Brothers: Male Dominance and Technological Change* (London: Pluto Press, 1983).
59. "Skirmish on the Home Front," *Focal Spot* 1, 4 (October 1944).

Radiological Technicians developed a resolution that would have the CMA and Canadian Association of Radiographers (CAR) endorse a policy that only registered technicians be employed.[60] In 1946, the CSRT broached the idea of approved training centres with both the CMA and CAR.[61] A first step to achieving this goal was the creation of a Syllabus of Training for Technicians, which was published in July 1946.[62] But an approved curriculum and the delivery of that curriculum were two different matters. An examination of St. Joseph's Hospital in Saint John, New Brunswick, reveals how the approved curriculum was implemented in one local hospital. In 1950, the first year curriculum in x-ray technique was divided into two semesters, each lasting sixteen weeks. The first year had a heavy focus on anatomy and physiology (110 hours), physics (32 hours), x-ray technique (32 hours), processing room technique (16 hours), nursing essentials (16 hours), and first aid (12 hours). Other topics received less than ten hours of instruction. The second year focused largely on refining technique and skill development in supervising and departmental administration (see appendix). In addition to the classroom work, each student was also required to work in the x-ray department at least thirty hours per week. While the curriculum was becoming standardized across Canada, the emphasis continued to be on practical experience.

The heavy emphasis on practical instruction created the conditions for exploitation, wherein students received only minimal instruction or supervision and were, in fact, treated as labour.[63] There was sufficient variation in the nature and quality of education in hospitals across the country that the CSRT felt that "until we have an approved teaching syllabus we cannot hope to make progress towards the establishing of approved training centres which will be our next major undertaking."[64] There were other problems with the training system. As with laboratory workers, marriage and mobility, particularly to the United States, exacted a heavy toll on the labour force.[65] Greta MacPherson, a nurse who also worked in the x-ray and laboratory departments at Glace Bay General Hospital, is an illustration. When she retired from her position as chief technician in 1951, a note in the *Focal Spot* commented that she had been

60. Resolutions Committee of the Canadian Society of Radiological Technicians *Focal Spot* 2, 2 (1945): 90-91, 98-99.
61. Minutes of Fourth Annual Meeting, *Focal Spot* 3, 4 (October 1946): 198-207.
62. Syllabus of Training for Technicians FS 3, 3 (July 1946), 158.
63. Focal Spot 7, 4 (Fall 1950): 185-86, 191-92, 206-07.
64. Ibid.
65. *Focal Spot* 8, 2 (Spring 1951): 76-77, 86-87. For a discussion on laboratory workers, see Twohig, *Labour in the Laboratory*, ch. 6.

"a loyal and tireless worker for our Society for many years ... however, we know husbands have to be looked after too."[66] Another issue was training capacity. Some large x-ray departments did not train students and the entire system produced only about 125 technicians each year, which was insufficient to meet the expanding needs of Canadian hospitals.[67] Within the CSRT, there was the general opinion that this training system was providing "adequate instruction"[68] for x-ray workers; while the training prepared x-ray workers for practice in hospitals across Canada, it fell short of the CSRT's goal of being a vehicle for professional uplift.

Shared Histories in the Contested Geography of Health Care Work

The limited training capacity and the demand for workers, particularly in small hospitals and rural areas, required innovative solutions. The most dramatic example emerged in Saskatchewan, where Dr. W.A. Riddell of Regina inaugurated a combined x-ray and laboratory course for hospital workers in 1946.[69] Riddell co-operated with the CSLT and the CSRT to create a corps of workers particularly for smaller hospitals to continue the rich tradition of multi-tasking, well-established by the mid-1940s.[70] The first class began on 6 October 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.[71] Students spent three months each on laboratory work and preparation for work in x-ray departments. The focus was on very basic tasks. The laboratory training, for example, concentrated on urinalysis and basic haematology (red and white blood cell counts, haemoglobin 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.[72] These workers, given the unwieldy name of "provisional laboratory and

66. *Focal Spot* 8, 1 (Winter 1951), 41.
67. *Focal Spot* 8, 3 (Summer 1951), 131-4.
68. *Focal Spot* 7, 4 (Fall 1950): 185-86, 191-92, 206-07.
69. AGM, 1 June 1946.
70. 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.
71. *Canadian Hospital* 23, 11 (November 1946), 84.
72. Ibid.

radiological technologists," would not become full members of the CSLT until completing further training.[73]

As the announcement in *Canadian Hospital* acknowledged, the program was not designed to train "fully qualified technicians" but rather to meet the "the immediate need" for workers, who could then take further preparation to qualify for registration either with the CSRT or the CSLT. Such combined programs became common in provinces with rural hospitals, where recruiting and retaining staff was particularly problematic. 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.[74]

There were other programs designed to meet the demand for a multitasking labour force. Dr J.C. McMillan, director of the Winnipeg General Hospital's radiology department, advertised a sixteen-month course approved by the American Registry of X-ray Technicians that was only open to nurses.[75] The reality was that many hospitals foisted multiple duties upon existing staff, as illustrated in this 1942 article in *Canadian Hospital*:

> Since in X-ray work so much depends upon the proper handling of sick people, it is reasonable to suppose that nurses would make good technicians, and it often works out that way. It is obvious that they have already had much of the professional attitude and responsibilities taught to them... It has become a common practice—which is working very well in many small hospitals—to have one person do both laboratory and X-ray work.[76]

---

73. Minutes of the CSLT Executive, 2 June 1946 and 5 October 1946.

74. Department of Labour. *Medical Laboratory Technologist*; Minutes of the CSLT Executive, 19-20 March 1955. It is worth noting that the Saskatchewan government re-instituted the combined x-ray and laboratory course in October 1953. See Shearer, 16.

75. This advertisement appeared in *Canadian Nurse* 36, 12 (1940). Further evidence can be found in advertisements from either hospitals or individual workers, which often referred to multiple skill sets, including some combination of nurses' training and x-ray experience or training in x-ray and laboratory work. See advertisements in *Canadian Nurse* 37, 5 (1941), 358 and *Canadian Nurse* 37, 7 (1941), 493. Kathryn McPherson has ably noted how nurses were encouraged to undertake training in many facets of hospital work, including x-ray technique. See Kathryn McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990* (Toronto: Oxford University Press, 1996), 221.

76. P.E. Hunt, "Better X-Ray Diagnosis in Small Hospitals," *Canadian Hospital* 19, 12 (1942): 48-49.

Hospital superintendents were acutely aware of their need for staff in the diagnostic service departments and focused on staffing issues at a 1952 roundtable. One nurse superintendent of a 30-bed hospital wanted to know whether a nurse could be sent for some basic x-ray training. Another participant thought that student nurses could be taught some x-ray technique and provide service. Still other solutions were discussed, including hiring an auxiliary person who could relieve the regular technician or having a manufacturer's representative provide basic instruction to an existing staff person so "that person could turn out diagnostic films." The CSRT held firm, rejecting the idea of short courses and adhering to the prescribed two-year training course. The minutes record that "Some who had experience in the technical field, said that x-ray and lab work do not combine well as to the time factor, as both services are usually busy at the same time." Moreover, some of the superintendents who were seeking alternatives to the two-year training period "reconsidered the matter after returning home, and wrote in requesting me to find them registered personnel."[77]

Clearly, the CSRT wanted to reinforce the idea that the modern hospital required workers with discrete areas of expertise. But read against the grain, it is equally clear that many hospitals wanted workers with combined skill sets. Evidence of the multiple roles of hospital workers may be gleaned from Canadian health care periodicals. Pearl Morrison wrote in *Canadian Nurse* in 1941 that graduate nurses often worked in the laboratory or x-ray departments.[78] Anne Wright, writing a year later, made the same point but also noted that "X-ray equipment has become so greatly simplified and reduced in cost that there are few of the smaller hospitals now with it, but its operation remains a problem. If the hospital can afford a technician and a part-time radiologist, or a part-time technician who may divide his or her time with other departments, the difficulty is overcome."[79]

Advertisements for jobs, or from individuals seeking work, provide further evidence. An unnamed eastern Canadian hospital advertised for a "Laboratory X-ray technician, able to do blood chemistry" in 1930.[80] The next year, a woman advertised that she spent eight years working as a "nurse-laboratorian" in a doctor's office, eighteen months as a combined x-ray and laboratory technician in a 75-bed hospital and another year

77. *Focal Spot* 9, 2 (1952), 56, 59, 67, 69-71.
78. Pearl L. Morrison, "The Nurses in Hospital Administration," *Canadian Nurse* 36, 10 (1940).
79. Anne Wright, "Administration in Small Hospitals," *Canadian Nurse* 37, 4 (1941), 230.
80. *Canadian Hospital* 7, 10 (1930), 36.

working exclusively in the x-ray department of a 350-bed hospital.[81] Early issues of the *Focal Spot*, the official journal of the Canadian Society of Radiological Technicians that began publishing in 1944, offer abundant evidence. A Manitoba woman seeking a position in a large urban hospital emphasized that she was a registered nurse and a member of both the Canadian and American x-ray societies. A nurse from Alberta, who worked first for five years performing lab tests, was now currently working as a combined x-ray and laboratory technician.[82] The St. Catharines General Hospital, in southern Ontario, sought an x-ray technician, though preference would be given to one with nurses' training. The Woodstock General Hospital, also in Ontario, preferred an individual who could work both in the laboratory and in the x-ray room.[83] One hospital wanted a nurse to work in the x-ray and laboratory departments, noting that the candidate would spend their "spare time" as a general duty nurse, while another advertised for a nurse technician who would maintain medical records in her spare time.[84] Focusing exclusively on a single aspect of an individual's labour, as many studies of health care professionals are wont to do, obscures the complex nature of hospital work, wherein many worked across disciplines and many employers demanded broad and flexible skills. Moreover, this was an enduring feature of hospital work. In Halifax, for example, the Tuberculosis Hospital employed a combined x-ray and laboratory technician as late as 1949.[85] Labouring across services was standard fare for x-ray workers and others in the interwar period and beyond, in rural and urban settings, in large and small facilities.[86]

Multitasking women played an integral role in the scientific and technological transformation of the hospital and, through it, of the health care system. That many of the earliest laboratory and x-ray workers were women is hardly surprising. Nurses use of new technologies in the diagnosis, management and, in the case of x-rays, treatment of patients were placed in the service of physicians and hospital administrators eager to bring the latest developments to their patient population. As Margarete Sandelowski recently wrote, doctors viewed nurses "much like stethoscopes and surgical instruments, as physical or bodily extensions of physicians."[87] Barbara Melosh's catchy phrase, "the physician's hand"

81. *Canadian Hospital* 8, 3 (1931), 42.
82. *Focal Spot* 2, 2 (1945), 98-99.
83. *Focal Spot* 2, 3 (1945), 104.
84. *Focal Spot* 3, 1 (1946), 52.
85. "News Notes," *Canadian Nurse* 45, 12 (1949), 943.
86. Twohig, "'Local Girls and Lab Boys'."
87. Sandelowski, *Devices and Desires*, 3.

captures this sense of extension, which was a familiar component of the development of health services across North America. When a North Carolina hospital faced a shortage of interns before World War I, a local physician suggested that tasks such as urinalyses, blood counts and medical histories be delegated instead to nurses.[88] "In order to harness the benefits of this new technology," Sandelowski argued, "physicians had to share its use with nurse (and eventually also with a host of new technicians whose jobs were created in response to it)."[89] In the new scientific hospital of the twentieth century, patients routinely experienced blood tests or urine samples and physicians now depended upon others to collect the samples, take the images, or prepare reports.

What they could not do was interpret the results or make diagnoses. Diagnosis, the mental component of clinical care, was separated from the manual aspects the underpinned that diagnosis and vested in the professional domain of physicians. Though many hospital workers were expected to assume responsibility for running the new services, often with little or no supervision, they did not derive much in the way of cultural or professional authority from the technology. Moreover, as Rosemary Stevens has argued, the multifaceted nature of nursing work further defined nursing as "all-purpose female service workers without a defined monopoly of scientific skills."[90] Her argument fits the experience of other multitasking women in health care. Physicians used stethoscopes to diagnose disease; nurses used them to collect information which was then passed to the physician for interpretation. Women's engagement with technology in the diagnostic services, rather than providing a fresh impetus to professional claims, served instead to blur their role, while concurrently confirming their subordinate position to physicians.

It is not entirely clear how nurses themselves felt about their use of technology and their new duties within the hospital. 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.[91] Rank and file nurses

88. Ibid., 85.
89. Ibid., 63-4, 72.
90. Rosemary Stevens, *In Sickness and in Wealth: American Hosptials in the Twentieth Century* (New York: Basic Books, 1989), 12.
91. Susan Reverby, "Neither for the Drawing Room nor the Kitchen," in *Sickness and Health America: Readings in the History of Medicine and Public Health*, eds. Judith

expressed ambivalence toward these new roles. 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.

Conclusion

The history of x-ray and laboratory work reveals a portrait of the multiple duties of hospital workers. Such patterns of work are revealed through detailed analysis of individual workers in particular settings. The technical workers who staffed hospitals across Canada suggest that we need to rethink our assumptions about specialization in health care and the "modernization" of hospitals, and look instead for linkages among workers. Such linkages have analytical potential because they force us to consider the many factors that shaped (and shape) the division of labour within health care. The Canadian health care system is comprised of a large number of often interdependent occupational groups, each of which makes an important contribution to health services and each with its own history, though there are shared elements, as the current analysis suggests. Yet, we know very little about such topics in part because we lack foundational studies on the division of labour within health care, in particular contexts. Susan Reverby has recently argued that "policy-makers at every level ... need a past as a touchstone," while Daniel Fox has highlighted how beliefs about the history of health care continue to shape public policy.[92] But the foundations of those beliefs may not be well laid, as Michael Bliss has recently suggested.[93] A re-examination of the social organization of health care, with due attention to the contested geography of health care work, offers the potential to complicate our ideas of occupational identity, notions of "expertise" and a range of other issues. At a time when the relationships among health care providers and between providers and patients are being actively reshaped in an effort to meet labour shortages, to economize, or to extend new services to new populations, such historical perspectives are particularly apt.

Walzer Leavitt and Ronald L. Numbers (Madison: University of Wisconsin Press, 1997), 260; Sandelowski, *Devices and Desires*, 83-6.

92. Susan Reverby, "Thinking through the Body and the Body Politic: Feminism, History, and Health-Care Policy in the United States," in *Women, Health and Nation*, eds. Georgina Feldberg, Molly Ladd-Taylor, Alison Li and Kathryn McPherson (Montreal and Kingston: McGill-Queen's University Press, 2003), 404-20; Daniel Fox, "History and Health Policy: An Autobiographical Note on the Decline of Historicism," *Journal of Social History* 18 (Spring 1986): 349-64.

93. Michael Bliss, "Health Care Without Hindrance: Medicare and the Canadian Identity," in *Better Medicine: Reforming Canadian Health Care*, ed. David Gratzer (Toronto: ECW Press, 2002), 31-43.

Appendix
X-ray course at St. Joseph's Hospital, Saint John, New Brunswick 1950.

First Year - First Semester	***Hours***
Anatomy and Physiology	50
Nursing Essentials	16
History and Roentgenology	6
Professional Ethics	8
Medical Terminology	8
Departmental Records and Office Administration	8
Processing Room Technique	16
Physics of Electricity and Radiation	16
Essential Factors in Roentgenology	8
Accessory X-Ray Equipment	8
Course A in Roentgenographic Technique	16
First Year - Second Semester	
Anatomy and Physiology	60 hours
Radiologic Physics	16
X-Ray Apparatus	8
Care and Preparation of Patient	4
X-Ray Protection and Fluoroscopy	8
Dental Roentgenography	8
Course B in Roentgenographic Technique	16
First Aid	12
Second Year - First Semester	
Course C in Roentgenographic Technique	16 hours
Roentgen Therapy Technique	16
Course D in Roentgenographic Technique	16
Roentgenographic Critique	16
Introduction to Radium Therapy	8
Introduction to Medical Science	16
Second Year - Second Semester	
Departmental Supervision	4
Practical Supervision	2 months
Character Formation	16
Journal Club	16
General Review	16
Elementary Clinical Photography	Optional

Source: Focal Spot *7, 3 (Summer 1950): 141.*