# A STUDY OF MEDICAL SPECIALIZATION: THE HISTORY OF THE DEPARTMENT OF PATHOLOGY OF THE WINNIPEG GENERAL HOSPITAL (1883-1957)

by

Guillermo Emilio Quinonez

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfillment of the requirements of the degree of

MASTER OF ARTS

Department of History

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**Dedication**

To

Zachary

Who was born at the beginning of this project

Joelito

Who was born at the completion of the project

And

Mariadela, Carlos, Rocio, Luicky and Miguelito

## Abstract

This thesis is designed to study the origin and development of medical specialization using the history of a department of pathology in a university affiliated hospital. The assumption is that events that occurred at the Department of Pathology of the Winnipeg General Hospital can explain the history of specialization in pathology in Manitoba.

Data for the study was obtained from the Nurses Alumni Association of the Winnipeg General Hospital and Health Sciences Archives, the Neil John Maclean Library of the University of Manitoba, and the Department of Pathology. The local literature was reviewed and complemented by selected readings.

This thesis argues that once institutional and professional interests determined the origin of the specialty, the fundamental explanation for the development of pathology in Manitoba was the social transformation of the Winnipeg General Hospital, as the forces that supported such a transformation also impacted on pathology.

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## Chapter I: Introduction

Contemporary medicine rests on the practice of specialties.[1] Medical specialization has been referred to as the historical response of modifying the practice of medicine as a result of local conditions (i.e., social environment, economic conditions and scientific-technological progress).[2] Pathology, understood as laboratory medicine, was one of the specialties that supported the transformation of medicine from "hospital medicine," based on the art of bedside observation to "laboratory medicine," based on the science of experimentation.[3] Before the contributions of Pasteur and Koch in the last quarter of the nineteenth century, the practice of the specialty of pathology was based on the autopsy. Pathology was the "science of the death."[4] By incorporating bacteriology, the specialty began rapidly evolving. After bacteriology, pathology evolved by incorporating initially new technology to anatomical pathology (i.e., frozen section and tissue biopsy) and later to hematology (i.e., blood banking) and microbiology (i.e., bacterial cultures). These technological advances were directed to support developments

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[1] The concept "specialization" is closely related to professionalization. Common sense would argue that a condition for specialization is the presence of professionalization. In other words, specialization cannot occur without professionalization. As a result of their interconnectedness, the terms are sometimes used as synonyms in historical writing. Conceptualisations on professionalization are found in Hannes Siegrist, "Professionalization as a process: patterns, progression and discontinuity," in *Professions in Theory and History: Rethinking the Study of Professions,* eds. Michael Burrage and Rolf Torstendahl (London: Sage, 1990), 177.

[2] George Weisz, "The Emergence of Medical Specialization in the Nineteenth Century," *Bulletin of the History of Medicine* 77 (2003): 536-575.

[3] A history of these terms is found in L.S. Jacyna, "The Laboratory and the Clinic: The Impact of Pathology on Surgical Diagnosis in the Glasgow Western Infirmary, 1875-1910;" *Bulletin of the History of Medicine* 62 (1988): 384-406.

[4] The origin of "Pathology," the 'study of disease,' blends with the origin of medicine in general and of anatomy in particular. The founders of modern pathology are Morgagni, Bichat and Virchow. The anatomist Giovanni Battista Morgagni (1682-1771) in his book *De Sedibus et Causis Morborum* (1761) systematized the correlation of symptoms of disease with post-mortem pathological findings. Marie-Francois-Xavier Bichat (1771-1802) in *Treatise on Membranes* moved the attention from organs to tissues as the site of disease. Rudolph Virchow (1821-1902) in *Cellular Pathologie* (1858) drew the attention to the cell as the primary site of disease by using the microscope. They established the principles on which pathology is practiced today. The logarithmic increase of knowledge in medicine by the end of the nineteenth century involved pathology as well. Classical pathology, so-called anatomical pathology, became integrated with other sciences such as physiology (the study of normal function), bacteriology (the study of micro-organisms), immunology (the study of the body defence mechanisms) and genetics (the study of the genome). As a result, pathology became divided into two large fields: anatomical and clinical pathology. See Esmond R. Long, *A History of Pathology* (1928; reprint, New York: Dover, 1965).

in medicine in general and in surgery in particular, transforming pathology from the "science of the death" to the "science of the living."[5]

In Manitoba, pathology contributed initially to resolve public health issues and to introduce the scientific practice of medicine at the Winnipeg General Hospital. Later, it contributed to revolutionize surgery through the application of technologies such as the frozen section and the surgical biopsy in the first third of the twentieth century, and blood transfusion and bacterial cultures in the second half of the century. This was made possible by the social transformation of the Winnipeg General Hospital supported by the socio-economic and scientific-technological conditions present in Manitoba.

In this thesis, institutional history (i.e., hospital department) and the histories of professional conflict, economics, and technology will support the history of specialization in pathology at the Winnipeg General Hospital. The approach of combining several varieties of history under a common related concept is a common practice in current medical history writing.[6] It will become clear that it is impossible to ignore anyone of them if one desires a more complete explanation of events.

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[5] The sub-divisions of anatomical pathology today respond to specific needs in medicine. Autopsy pathology is the post-mortem examination of bodies with the intention to determine the causes of death and to explain the mechanisms of disease in the living body. Closely associated with the latter is forensic pathology that is the scientific contribution to medico-legal investigations. Surgical pathology is the study of the specimens resected by surgeons. Clinical pathology includes microbiology, clinical chemistry and hematopathology. Basic and clinical research is an integral component of all of them when pathology is practised in a university hospital.

[6] John C. Burnham discusses the possibility of subsuming institutional history; the history of professions; the impact of technology; the existence of hierarchies; the exercise of power in economic, social, or gender terms; and the process of specialization, in terms of professional functioning. He does this based on his opinion that the concept of profession has been always present in the mind of medical historians independently of their field of studies; John C. Burnham, "How the Concept of Profession Evolved in the Work of Historians of Medicine," *Bulletin History of Medicine* 70 (1996): 1-24. Not judging if he is correct or not, empirically, this approach is useful, as the present study will illustrate.

**Presentation of the literature on medical specialization**

Professional historians and physician historians have written extensively on medical specialization.[7] Generally, the former use the analytical and the latter the narrative paradigms. Sociologists have also contributed meaningfully to the historiography of specialization.

George Rosen's *The Specialization of Medicine* is the seminal book on the subject of specialization.[8] The work is now more than sixty years old, and deals mainly with the nineteenth century origins of medical specialization. Rosen defined a medical specialty as "a field of medical activity organized about a focus of interest." According to Rosen, specialization in medicine was a social product influenced by medical and sociological factors. He grouped the medical factors into scientific (intellectual) and technological (technical achievements). The scientific factors gave a new understanding of diseases whereas the technological ones permitted the application of procedures indicated by particular problems. In his opinion, specialization resulted from different conceptions about the nature of disease that permitted the application of knowledge to particular areas

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[7] Daniel G. Morton, "The Changing Aspect of Specialization," *American Journal of Obstetrics and Gynecology* 102 (1968): 619-623; C. Rollins Hanlon, "Specialization in Medicine," *The Journal of Thoracic and Cardiovascular Surgery* 64 (1972): 179-185; Toby Gelfland, "The Origins of a Modern Concept of Medical Specialization: John Morgan's Discourse of 1765," *Bulletin of the History of Medicine* 50 (1976): 511-535; O. Swenson, "Specialization: What It Holds for the Future of Medicine," *The Canadian Journal of Surgery* 23 (1980): 154-156; B.E. Blustein, "New York Neurologists and the Specialization of American Medicine," *Bulletin of the History of Medicine* 53 (1979): 170-183; S.E.D. Shortt, "Physicians, Science, and Status: Issues in the Professionalization of Anglo-American Medicine in the Nineteenth Century," *Medical History* 27 (1983): 51-68; Audrey B. Davis, "Twentieth Century American Medicine and the Rise of Specialization: The Case of Anesthesiology," in *Technology in the Twentieth Century,* eds. F. J. Coppa and R. Hammond (Iowa: Kendall/Hunt, 1983), 73-88; Lester S. King, "XXI. Medical Practice: Specialization," *Journal of the American Medical Association* 251 (1984): 1333-1338; G. Weisz, "The Development of Medical Specialization in Nineteenth-Century Paris," in *French Medical Culture in the Nineteenth Century*, eds. Ann Le Burge and Mordechai Feingold (Amsterdam: Rodopi, 1994), 149-182; George Weisz, "Medical Directories and Medical Specialization in France, Britain, and the United States," *Bulletin History of Medicine* 71 (1997): 23-68; Davis Innes Williams, "The Acceptance of Specialization," *Journal of the Royal Society of Medicine* 93 (2000): 642-645; George Weisz, "The Emergence of Medical Specialization in the Nineteenth Century," *Bulletin of the History of Medicine*, 77 (2003): 536-575.

[8] George Rosen, *The Specialization of Medicine: With Particular Reference to Ophthalmology* (New York: Froben Press, 1944).

of the body. Its application required specialized experience and skills to carry out procedures indicated by particular problems. Technical achievements (i.e., instruments and techniques) were necessary to convert knowledge into action. This led to the appearance of completely new foci of interest or to the expansion of an already existing focus. For instance, Rosen used the example of the laryngoscope, the bronchoscope, and the gastroscope as developed from the ophthalmoscope, to show how an instrument introduced for diagnosis ended up being more useful for therapy (e.g., radiation therapy), and how some professionals started using a technical procedure utilized by other specialists. The end-result was a re-structuring of the specialties involved.

Rosen also concluded that medical specialization was the result of sociological factors within the profession and the society in which the specialist functioned. These factors favored or opposed specialization by promoting social interaction and cultural exchange. Among them, he included the economic, the demographic and the psychological. The first two are closely related since both are dependent on urban population growth that creates increased morbidity and mortality but also the economic conditions for attracting physicians to metropolitan areas. He illustrated them with the origin of ophthalmology in New York City.[9] The psychological factors refer to the

[9] Another example of economic factors is the free market practices that reflected the type of society emerging in the U.S. in the nineteenth century. Neurologists in New York, for instance, insisted that medicine was both a scientific and a commercial profit-making enterprise; Bonnie E. Blustein, "New York Neurologists and the Specialization of American Medicine," *Bulletin of the History of Medicine*, 53 (1979): 170-183. An example of demographics in the origin of specialization is the impact of cities' growth; Charles E. Rosenberg, introduction to *The Origins of Specialization in America Medicine: An Anthology of Sources,* ed. Charles E. Rosenberg (New York: Garland Publishing Inc., 1989).

beliefs, values and behavior of the medical profession as a group and of the public in general.[10]

Rosen set the basis for studying the history of medical specialization from a social perspective. Following him, and according to Burnham, sociologists, not historians, followed Rosen's lead at the middle of the twentieth century.[11] However, professional historians made the topic theirs from a perspective of social history in the last thirty years of the century.[12] Although their work is not directly connected to Rosen –he is only rarely quoted- his study established an outline of the topic and called attention to the forces that determined medical specialization. Nevertheless, sociologists have continued contributing to the literature in later years (e.g., on politics and authority).[13] In short, within the field of medical social history, historians have studied specialization from

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[10] Among the psychological factors, the mixed attitude of the public and general practitioners toward medical specialization is one example; Rosen, *Specialization of Medicine,* 47; whereas indoctrination through teaching as exemplified by the influence that British students brought back to London from Paris in the first half of the nineteenth century is another. The influence was crucial for the development of anatomical pathology in Britain; Russell C. Maulitz, *Morbid Appearances: The Anatomy of Pathology in the Early Nineteenth Century* (Cambridge: Cambridge University Press, 1987), 140-141.

[11] John C. Burnham, *How the Idea of Profession Changed the Writing of Medical History* (London: Wellcome Institute for the History of Medicine, 1998), 69-88.

[12] *Ibid.,* 98.

[13] Sociologists have studied specialization with the intention of developing social models using historical data. A historically oriented analysis is well represented by Rosen's book; Rosen, *Specialization of Medicine.* In the last third of the twentieth century, however, sociologists continued contributing analyses on medical specialization from a modern sociological perspective. An example is Rosemary Stevens who studied the effects of specialization in the political and professional aspects of medicine in the U.S.; Rosemary Stevens, *American Medicine and the Public Interest* (New Haven: Yale University Press, 1973). Another contribution is that of P. Starr about authority and how the medical profession obtained it; Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry* (New York: Basic Books, 1982). He successfully presented a historical analysis of the socioeconomic developments in medicine in terms of the historical patterns in culture, economy and politics in the U.S. in order to explain the raise of the medical profession.The work edited by Michael Burrage, a sociologist, and Rolf Torstendahl, a historian, is still another contribution of sociologists using historical data to review their models; Burrage and Torstendahl, *Professions in Theory and History.* The intention of the editors was to use history for a new approach to study the sociological concept of profession. However, they failed since the content of the book is basically sociology and not history. An important conclusion from this work, however, is the clear distinction made by sociologists between professionalization and specialization.

several points of view, as illustrated with the history of institutions,[14] medical specialties,[15] societies (e.g., French, British and American), feminism,[16] the idea of professions,[17] and technology.[18]

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[14] C.E. Rosenberg, a professional historian, wrote one of the first books dealing with medical specialization from an institutional context using the history of the American hospital; Charles E. Rosenberg, *The Care of Strangers: The Rise of America's Hospital System* (Baltimore: The John Hopkins University Press, 1987). Chapter seven, "A Marriage of Convenience: Hospital and Medical Careers," specifically addresses the issue of specialization. He also recognized a multiplicity of factors but, in contrast to Rosen, clearly established a hierarchy of importance, as not everything was equally relevant to explain specialization at the hospital. Rosenberg considered that nursing, administration and economics had shaped the modern hospital. However, all had been subordinated to the role played by the medical profession. Rosenberg also edited a second book; Rosenberg, *Origins of Specialization.* This is a collection of essays published at the end of the nineteenth and early twentieth century that present the controversy associated with specialization in the medical community at that time. In particular, some refer to the role of laboratory medicine in the evolution of specialization in general. Cheryl Krasnick Warsh also contributed a book on the history of specialized hospitals, a theme only mentioned briefly by Rosen and in keeping with Rosenberg's style; Cheryl Krasnick Warsh, *Moments of Unreason: The Practice of Canadian Psychiatry and the Homewood Retreat, 1883-1923* (Montreal: McGill-Queen's University Press, 1989). It is the history of the first large private mental asylum of Canada. As the author concludes, this asylum performed a necessary medical and social function for middle class patients.

[15] Jan Goldstein, in her book on the origin of psychiatry in France, incorporated intellectual, social and political history to focus on the historical roots of the specialty of psychiatry: the moral treatment and the diseases of monomania and hysteria; Jan Goldstein, *Console and Classify: The French Psychiatric Profession in the Nineteenth Century* (Cambridge: Cambridge University Press, 1987). Goldstein's style of writing medical history is much more advanced that Rosen's book that only covered a currently outdated sociological point of view.

[16] From a feminist and socialist historical perspective, Ornella Moscucci studied the origin and development of the specialty of gynecology in England since the creation of the modern medical theories of femininity to the establishment of the Royal College of Obstetrics and Gynaecologists; Ornella Moscucci, *The Science of Women: Gynaecology and Gender in England, 1800-1929* (Cambridge: Cambridge University Press, 1993). Moscucci researched the medical and social context of these events and concluded that medical specialization cannot be understood if professional rivalries (i.e., conflict) and the belief that women are dominated by their sexual functions are ignored. Moscucci illustrates the new style in writing social history distinct from Rosen's book. At this time, feminist history had become an important area of research.

[17] John C. Burnham, a professional historian, wrote a historiographical analysis about the way profession, a systematic concept, has affected the writing of medical history in the past and in the present; John C. Burnham, *How the Idea of Profession Changed*, 9. He supports the contention by demonstrating that the bio-bibliography literature from the 1690s to the 1900s was the study of professionals. By the early twentieth century the interest continued on physicians as professionals and not on the professional existence of physicians. At the middle of the twentieth century, sociologists took the lead by developing the sociology of professions. Rosen's book can be catalogued in this category. Later in the century, social historians incorporated and subordinated the work of sociologists and made it their own. Burnham has also made the contention explicit in another publication; Burnham, "How the Concept of Profession Evolved."

[18] S.J. Reiser, a physician historian, wrote a book in a modern style that illustrates the history of some specialized techniques, an issue emphasized by Rosen; Stanley Joel Reiser, *Medicine and the Reign of Technology* (Cambridge: Cambridge University Press, 1978). Reiser's intention, however, was different. His goal was to understand the transformation from the subjective to the objective practice of medicine as a result of technology. From this, he used the cognitive approach of physicians and patients in relation to the incorporation of technology that have converted the physician into the prototype of what he calls "a technological man." Furthermore, he analyzed the impact of technology in medical specialization and practice and in medical ethics.

**Presentation of the literature on specialization of pathology in North America and Great Britain**

Physician historians have used descriptive narrative to produce the literature on the history of specialization in pathology in North America and Great Britain.[19] For instance, Esmond R. Long, an academic pathologist, was one of the most prolific physician historians in the North American literature. His extensive bibliography written in a span of fifty years is only one indication of his scholarly interest. The monograph, *A History of Pathology*, is a chronological history of developments in pathology since antiquity to the middle of the twentieth century.[20] Since Long's intention was to create a book for medical students based on biographies and books produced by pathologists, he left out the social movements of concomitant historical development. The book was published in 1928 and is still one of the few systematic accounts of the subject. By the same author and in the same style, *A History of American Pathology* emphasizes teaching and research.[21] According to Long, the book stresses the growth of ideas. In reality, it is a chronological description of names, books, and institutions from the U.S. and Canada. Its

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[19] Single papers written in this style are found in medical journals. A few examples follow. In institutional history: Herbert Derman and Loyd R. Wagner, "The College of American Pathologist, 1946-1996: Anatomic and Consultative Pathology Practice," *Archives of Pathology and Laboratory Medicine* 121 (1997): 1214-1222. In pathology in general: Magnus Haines, "The Emergence of Pathology in Gynaecology," *Journal of Clinical Pathology* 24 (1971): 375-384; W.B. Ober, "American Pathology in the 19th Century: Notes for the Definition of a Specialty," *Bulletin of the New York Academy of Medicine* 52 (1976): 326-347; W.G. Rothstein, "Pathology: The Evolution of a Specialty in America," *Medical Care* 17 (1979): 975-988; William W. McLendon, "A Historical Perspective as a Compass for the Future of Pathology," *Archives of Pathology and Laboratory Medicine* 110 (1986): 284-288. In technology: S.J. Reiser, "Technology, Specialization, and the Allied Health Professions," *Journal of Allied Health* 12 (1983): 177-182; D.J. Lanska, "The Role of Technology in Neurologic Specialization in America," *Neurology* 48 (1997): 1722-1727. In surgical pathology: George Rosen, "Beginnings of Surgical Pathology," *The American Journal of Surgical Pathology* 1 (1997): 361-364; Anthony A. Gal, "In Search of the Origins of Modern Surgical Pathology," *Advances in Anatomic Pathology* 8 (2001): 1-13.

[20] Long, *History of Pathology*.

[21] Esmond R. Long, *A History of American Pathology* (Springfield: Charles C. Thomas, 1962).

emphasis is on academic pathology (i.e., autopsy and research). Only one chapter contains information relevant to the social factors involved in specialization.

Juan Rosai edited a collection of essays, *Guiding the Surgeon's Hand: The History of American Surgical Pathology*, dealing with the history of pathology in North America from the point of view of a practitioner.[22] In it, several contributors wrote the history of some departments of pathology in the United States. Rosai's book argued that surgical pathology resulted from the need created by surgeons at a time when knowledge and technology became available, as it would in Manitoba.

In Great Britain, two of the most influential books in the history of pathology are *The History of British Pathology* and *Pathology as a Profession in Great Britain and the Early History of the Royal College of Pathologists*.[23] Both works do not differ in style from their American counterparts. The first is a chronological description of events organized by topics. The second is a narrative on the origin of the events that culminated with the creation of the College of Pathologists, an organization of practitioners.

All these authors indicate that intra-professional conflict is an important factor in the evolution of pathology. In North America, Long notes the dichotomy between the academic and the practitioner.[24] Rosai is more explicit than Long in relation to professional interactions between specialists.[25] Rosai uses the history of the origin of pathology to explain the distinct professional tensions between academics and

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[22] Juan Rosai, ed., *Guiding the Surgeon's Hand: The History of American Surgical Pathology* (Washington: Armed Forces Institute of Pathology, 1997). Rosai is a leading practitioner and author of the most popular textbook of surgical pathology in North America today.
[23] George J. Cunningham and G. Kemp McGowan, *The History of British Pathology* (London: Royal College of Pathologists, 1992); W.D. Foster, *Pathology as a Profession in Great Britain and the Early History of the Royal College of Pathologists* (London: Royal College of Pathologists, n.d.).
[24] Long, *History of American Pathology*, 370.
[25] Rosai, *Guiding the Surgeon's Hand*, 3.

practitioners. Both Rosai and Long argue that the nature of knowledge has led to a professional division in pathology. According to Rosai, academic pathologists study the causes, mechanisms and consequences of disease as developed by the Germans. Practitioners, in contrast, answer clinically relevant questions.[26] Institutional location (i.e., university versus hospital) has also played a role here, providing a context for such professional conflict which is importantly not unique to North America and is also described in the history of pathology in Great Britain.[27]

The history of individual specialty societies is also dominated by the work of physician historians. As such, the style is that of narratives relying on common-sense interpretations of a description of sequential events. Examples include the history of professional Canadian and American Associations.[28]

Biography of specialists (i.e., bio-bibliography) is another genre frequently explored by physician historians. It has the limitation of the author becoming identified with the subject of the biography and losing, therefore, objectivity. It is also devoid of proper social context.[29]

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[26] *Ibid.*, 27.

[27] The origins of the Royal College of Pathologists was an enterprise initiated by the practitioners. However, time and time again the literature refers to the lack of support on the part of academicians to the creation of the College. It becomes clear in this literature that the lack of support was ideological, the result of fundamental conceptual differences. Academicians considered the type of work done by practitioners as being only routine examinations whereas they considered their mission to be the advancement of knowledge and teaching; Cunningham and McGowan, *History of British Pathology*, 312, 337; Foster, *History of the Royal College of Pathologists,* 21, 34.

[28] Harry Letts and John Jacques, *A History of the Canadian Association of Pathologists*, 2nd ed. (Kingston, Ontario: Allan Graphics, 1994); Esmond R. *Long, "History of the American Association of Pathologists and Bacteriologists," American Journal of Pathology 77 (sup.* No. 1) (1974): 1s-218s.

[29] Venita Jay, "The Legacy of Alexis Carrell," *Canadian Journal of Medical Laboratory Science* 61 (1999): 195-196; Amy V. Rapkiewicz, Alan Hawk, Adrienne Noe, David M. Berman, "Surgical Pathology in the Era of the Civil War: The Remarkable Life and Accomplishments of Joseph Janvier Woodward, MD," *Archives of Pathology and Laboratory Medicine* 129 (2005): 1313-1316.

In summary, the history of pathology in the British-North American literature is not extensive and has been written mainly by physician historians. As the traditional literature of specialization, it is based on the history of departments of pathology, professional institutions and individuals and ignores the prevalent social context. Its emphasis rests on the conflict between university and hospital based pathologists.[30]

**A summary of the argument**

This thesis utilizes the history of the Department of Pathology of the Winnipeg General Hospital to study the origin and development of medical specialization in pathology at the hospital.[31] One could argue that the introduction of a new technology, a scientific discovery, the prestige of an individual, or even the birth of a professional organization could be the only determinant in the origin of a medical specialty in an

[30] As an exception, R.C. Maulitz has written a book on intellectual history almost unique in this type of literature, because the author, being a physician, has used the style of a professional historian. This excellent work was originated in the doctoral thesis of Maulitz and focuses in the development of medical ideas (i.e., pathological anatomy) in the French culture and their transfer and unfolding in Great Britain. The book discusses the forces that moved ideas and technology across national boundaries. Specifically, it tells the history of the idea of anatomical pathology and the origins of the specialty in Paris, and its transfer to London by British students who came to France to study under the guidance of pioneers such as Bichat, Laennec and Bayle; R.C. Maulitz, *Morbid Appearances: The Anatomy of Pathology in the Early Nineteenth Century* (Cambridge: Cambridge University Press, 1987).

[31] The term "pathology" does imply pathologists only. Pathologists, medical technologists, technicians, clerical personnel and support staff share work performed at the laboratories. This thesis, however, addresses the pathologists only. It is not a study of the laboratory as a place of work, science or even medicine but of the idea of pathology as a medical specialty.

institution.[32] Yet this study will argue that the origin of the specialty in Manitoba involved broader more encompassing socio-economic and scientific-technological factors. For example, the conversion to a medical practice based on laboratory medicine, the sanitary conditions of the city, and the development of the hospital and the medical college were all factors determining the origin of the specialty of pathology in Manitoba. One result was the creation of a Chair in Pathology by the College, an event that itself has been described elsewhere as the hallmark for the origin of a specialty.[33] Simultaneously with this event, however, the factors represented by professional (i.e., physicians) and hospital interests further shaped the creation of the department, which continued to develop closely linked with the development of the specialty.

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[32] The local literature is focused on the Department of Pathology at the University of Manitoba, and is limited to three books, three journal papers, and two unpublished manuscripts. They are written from the point of view of the university and not of the affiliated hospital. Two of the three books are on the history of medicine in general with only occasional references to pathology. The first book written by Ross Mitchell and dealing with the beginnings of medicine in Manitoba was published in 1954; Ross Mitchell, *Medicine in Manitoba: The Story of its Beginnings* (Winnipeg: Manitoba Medical Association, 1954). Reference to pathology is made through brief biographies of the pioneers of pathology in the Province until the middle of the twentieth century. The second book, published in 1993, is a biography of William Boyd by Ian Carr; Ian Carr, *William Boyd: Silver Tongue and Golden Pen* (Markham: Association Medical Services, Fitzhenry & Whiteside, 1993). Some references to the history of pathology in Winnipeg are found in relation to Boyd's tenure at the university. The third book is on history of medicine in Manitoba by Ian Carr and Robert Beamish, and it was published in 1999; Ian Carr and Robert E. Beamish, *Manitoba Medicine: A Brief History* (Winnipeg: Manitoba University Press, 1999). The lack of reference to pathology in the first and third books is expected since pathology was not the focus of the authors.The three journal papers deal with particular aspects of the history of pathology at the University of Manitoba. One by L.C. Bartlett, a surgeon, tells us about the history of the museum in the pathology department; L.C. Bartlett, "The Changing Role of the Pathology Museum," *Manitoba Medical Review* 147 (1967): 197-200.The other two, by D.H. Bowden, describe the contributions of the department's heads from 1897 to 1980, and the concept of academic pathology as developed at the University of Manitoba from 1970 to 1990; Drumond H. Bowden, Pathology 100: 1890-1990," *Manitoba Medicine* 60(1990): 55-57; and *Idem*, "Academic Pathology in Manitoba," *Manitoba Medicine* 60 (1990): 54. Bowden also produced an unpublished manuscript in which he reflects on his tenure as head of the department of pathology from 1981 to 1991; Drumond H. Bowden, "University of Manitoba, Department of Pathology: A Personal Perspective" (Manuscript, Department of Pathology, Faculty of Medicine, University of Manitoba, 1993). Copies of this document are also located at the Neil John Maclean Health Sciences Library, University of Manitoba. It contains some historical information of relevance. Finally, J. Hoogstraten left the text of a lecture he delivered to the "Manitoba Medical History Club" on May 1st, 1985; J. Hoogstraten, Untitled, paper presented at the Manitoba Medicine History Club, Winnipeg, May 1987, Archives, Individual Files, Neil John Maclean Health Sciences Centre Library of the University of Manitoba. In it, he described the events and development of the pathology department during the tenure of William Boyd as Professor and Head.

[33] Cunningham and McGowan, *British Pathology*, 42.

Once institutional and professional interests initiated the formation of the pathology department, the social transformation of the Winnipeg General Hospital became the fundamental explanation for its expansion, and consequently, for the development of the specialty.[34] The forces that supported the hospital transformation also influenced the development of pathology given their close relationship. For instance, initially, it was middle-class patients and later hospital insurance and the provincial government that afforded the needed economic support for such a transformation. The approach taken by this thesis permitted the periodizing of the history of pathology according to the influence of the social transformation at different periods of time.[35]

Chapter II will offer an explanation on the origins and early development of the specialty in Winnipeg from 1883 to 1915. Before 1902, clinicians performed simple tests themselves and there was neither leadership nor a department of pathology. The specialty did not exist because the practice of medicine did not demand it. The return to Winnipeg from Europe of medical specialists with their own interests and knowledge in pathology and bacteriology, and the hospital's need to present a "scientific" image to the community as a means to attract paying patients, explain the prestige acquired by the specialty in the new century. Those were the years when medical care began to be transferred from home to hospital. Under these circumstances, the conditions were given

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[34] Hospitals are described in the literature as a crucial factor in the origin and development of a specialty since specialized departments are created in hospitals. Hospital development, consequently, is linked to the development of the respective specialties and it is not possible to evaluate the history of one ignoring the history of the other. The medical profession and the hospital have developed mutual socio-economic dependency. They are inextricably linked by convenience; David Gagan and Rosemary Gagan, *For Patients of Moderate Means: A Social History of the Voluntary Public General Hospital in Canada, 1890-1950* (Montreal & Kingston: McGill-Queen's University Press, 2002); Charles E. Rosenberg, *Care of Strangers;* Rosemary Stevens, *In Sickness and in Wealth: American Hospitals in the Twentieth Century* (New York: Basic Books Inc. Pub., 1989).

[35] This argument is not accepted by Andrew Cunningham and Perry Williams in the introduction of *The Laboratory Revolution in Medicine,* eds. Andrew Cunningham and Perry Williams (Cambridge: Cambridge University Press, 1992), 1-13. A discussion of their reasons is found in chapter V: Conclusions. See also Bruno Latour, "The Costry Ghastly Kitchen," in *Idem., Laboratory Revolution.*

for establishing a department of pathology at the Winnipeg General Hospital.[36] The department then contributed to the implementation of laboratory medicine at the hospital, its growth for the first 13 years largely determined by the growth of the hospital as this institution underwent its social transformation. To be sure, the rise of the hospital as the preferable site for treating illness was a social phenomenon mainly supported by the middle class. By 1915 the department had consolidated as a hospital institution under the philosophy of the hospital administration.

Chapter III addresses the development of specialization as it occurred at the Department of Pathology of the Winnipeg General Hospital from 1916 to 1937. In this period, the continued social transformation of the hospital was also the main force behind the growth of the department. Middle class patients continued to give the necessary economic support and by 1920, represented 58 percent of the hospital budget. However, by 1933, the Great Depression dropped contributions to 26 percent, creating a crisis in hospital care that also affected the department. In spite of these shifts in financial support, pathology developed as a result of an increment of 55 percent in the number of surgical procedures that brought as a consequence an increment on the number of surgical biopsies. The latter impacted not only in the expansion of pathological services but also heralded the beginnings of a fundamental transformation of the practice of the specialty

[36] The origin of the specialty responded to social (societal) and professional needs, the latter it appears presenting as the predominant factor. The sanitary conditions of the City of Winnipeg represented the societal needs whereas the introduction of the teaching of pathology at the Manitoba Medical College, international developments in laboratory medicine, and the foundation of the hospital created the professional needs. The social needs demanded immediate solutions by the authorities. They were critical as described in Alan F. J. Artibise, *Winnipeg: A Social History of Urban Growth, 1874-*1914 (Montreal: McGill-Queen's University Press, 1975), 223-245. The department, however, did not participate in the technical solution of the city's sanitary conditions since a provincial laboratory functioning independently and directed by the same individual addressed them; J.G. Fox and J.C. Wilt, "The History of Provincial Health Laboratory Services in Manitoba," *University of Manitoba Medical Journal* 49 (1979): 118-124. The professional needs stemmed from events that focussed medical practice on the laboratory, the so-called scientific medicine as practiced today.

from an emphasis on the autopsy to investigate the mechanisms of disease to an emphasis on the biopsy for immediate clinical application.

Importantly, 1916 signalled the beginnings of a new period in the history of the pathology department, since that year it became administratively dependent on the university.[37] That year, William Boyd was appointed Chairman of the Department of Pathology and Bacteriology at the Medical College.[38] This appointment created a conflict that has received unusual attention, confusing the history of the discipline of pathology at the Faculty of Medicine, with that of the history of the specialty as a clinical practice at the Winnipeg General Hospital.[39] Boyd's departure in 1937 occurred at a crucial time in the history of the hospital.The direct economic support by the middle class was collapsing as a result of the Depression, and when new sources of funding were necessary to maintain the hospital transformation and concomitantly, the development of the speciality.

Chapter IV continues with an analysis of the evolution of the speciality at the Winnipeg General Hospital from 1938 to 1957 as a consequence of the transformation of the General Hospital, this time supported by provincially non-profit pre-paid insurance

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[37] Teaching hospitals are highly specialized institutions that may belong to a faculty of medicine (i.e., university hospital) or may be affiliated to a university (i.e., an affiliated hospital). Affiliation is only an association. The Winnipeg General Hospital is one example of an affiliated university hospital. The importance of a teaching hospital resides in its function of service being closely linked to that of teaching and research. The aim of the university is learning and research; therefore, it complements the function of service of the other institution. See S.C. Martin and J.D. Howell, "Creating University Hospitals: Rationales and Realities," *Academic Medicine* 70 (1995): 1012-1016; this article on the history of medical education analyses and discusses the reasons for founding the three oldest university hospitals in the U.S., namely, the hospitals of the Universities of Michigan, Pennsylvania and Baltimore.

[38] Boyd eventually became the main figure of pathology in English Canada.

[39] The resulting conflict would be expressed in institutional agreements, authorities' perceptions, control of appointments, goals, and how hospital management related to the department. Fundamentally, the appointment serves to illustrate two distinct ideological conceptualizations of pathology, i.e., pathology as a basic science and pathology as a clinical science. R.J. Glasser has made this dilemma clear for an affiliated hospital. Historically, in his opinion, there are factors that have prevented or at least inhibited the relationship of academics and practitioners. They are the lack of academic orientation of the practitioners and the failure by hospital trustees to appreciate the advantages that teaching offers to service. Glasser specifically addresses common sources of difficulties such as control of staff appointments, cost of teaching and discordance in philosophical points of view; R.J. Glaser, "Medical Care, Education and Research: The Medical School and the Teaching Hospitals, " *The New England Journal of Medicine* 271 (1964): 1398-1403.

plans, private insurance companies, and by the Provincial government. This funding replaced the support of direct payments by the middle class that had collapsed as a result of the Great Depression. Third party funding became indispensable to support the technological advances in laboratory medicine that were contributing to the development of surgery at this time. These advances were in surgical pathology, hematology and microbiology. The biopsy progressively replaced the autopsy as the core of the practice of the speciality, whereas blood banking technology and bacterial sensitivity tests represented the beginnings of the therapeutic revolution that was initiated in World War II and transformed the practice of surgery in the second half of the twentieth century. All of these technological advances brought authority to hospital pathologists as specialists, creating the conditions for a renewed administrative independence from the Faculty of Medicine. They also advanced the evolution of pathology from the "science of the dead" to the "science of the living." At the end of the period, the new provincial sources of support became insufficient and the Federal government took responsibility to support the hospital transformation and consequently, the development of pathology. It represented a new chapter in the history of pathology in Manitoba.

To conclude, this thesis addresses the history of medical specialization in pathology from two perspectives: origin and development. The goal is accomplished by studying the conditions that gave raise to the specialty, and those conditions that determined its development in a department of pathology of a university-affiliated hospital. The study was designed from the point of view of local experience as distinct from the role of professional societies, patient-physician interaction, government, biographies, and so on, so commonly utilized to study the history of medical

specialization. The fundamental explanation for the development of pathology was the social transformation of the hospital, since both historical processes were influenced by the same events.

## Chapter II: From "bedside" to "laboratory medicine": The genesis and early development of pathology in Manitoba (1883-1915)

Interrelated developments played a role in creating the specialty of pathology in Manitoba. They were the sanitary conditions of the City of Winnipeg, the foundation of the Manitoba Medical College, the creation of the Winnipeg General Hospital and advances in laboratory sciences.[1] These developments created the social and professional needs that stimulated the establishment of a Chair of Pathology and Bacteriology at the Manitoba Medical College in 1897, which is often considered as the essential historical starting point for the development of a specialty.[2] The latter coincided with the arrival in Winnipeg of medical specialists trained in Europe knowledgeable about pathology and bacteriology, a common event for all specialists in the last quarter of the nineteenth century.[3] The historical explanation for the role played by these developments is incomplete without understanding their background.[4]

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[1] These factors are no different than the scientific-technological developments and the socio-economic needs postulated by George Rosen in *The Specialization of Medicine: With Particular Reference to Ophthalmology* (New York: Froben Press, 1944), 28. Following Rosen's conclusions, professional needs were more influencial than the needs of society. Gagan and Gagan make a similar claim grouping the factors in social and medical; David Gagan and Rosemary Gagan, *For Patients of Moderate Means: A Social History of the Voluntary Public General Hospital in Canada, 1890-1950* (Montreal & Kingston: McGill-Queen's University Press, 2002), 13-14, 31-32, 34-36.

[2] George J. Cunningham and G. Kemp McGowan, *The History of British Pathology* (London: Royal College of Pathologists, 1992), 42.

[3] One of the many examples of this trend was Gordon Bell, the founder of the Department of Pathology at the Winnipeg General Hospital. See biographical appendices.

[4] Similar developments were occurring in the U.S. and in England and Scotland, and one can only assume that events in Winnipeg were influenced by them. American anatomical pathology developed in the German tradition as an independent biological science concerned with deviations from normal structure and function; Alvin E. Rodin, *Oslerian Pathology: An Assessment and Annoted Atlas of Museum Specimens* (Kansas: Coronado Press, 1981), 17. It profited from the modifications in teaching at medical schools and from the association of these institutions with hospitals; Esmond R. Long, *A History of American Pathology* (Springfield: Charles C. Thomas, 1962), 179. The origin of modern pathology in Great Britain was similar to that in North America and followed the model practiced in Germany and Vienna. Scotland and Ireland saw pathology as an ancillary science to clinical medicine and surgery whereas the English provinces saw it as a basic science discipline. The first *Journal of Pathology and Bacteriology* was published in 1892; Cunningham and McGowan, *British Pathology*, 59-73, 96-115, 170-188.

The origin of pathology as a specialty coincided with the social transformation of the Winnipeg General Hospital which was characterized by the willingness of people to pay for medical care and the transfer of that care from home to hospital.[5] Between 1890 and 1915 the General Hospital evolved from an institution devoted mainly to treat the indigent, to a center dedicated to treat the middle class. This transformation changed the popular perception of the hospital from a place where only a certain segment of society could access care, to a place where all of society could access care. Scientific-technological developments were crucial for modifying such perceptions and, according to Gagan and Gagan, involved innovations in diagnosis and surgical interventions, medical specialization, institutional asepsis, and the emergence of nursing sciences.[6]

The social transformation of the Winnipeg General Hospital consequently demanded the creation of a department of pathology in order to place emphasis on the scientific practice of medicine. Once established, the department evolved as a direct consequence of the same phenomenon. The practice of laboratory medicine in Canada and the U.S. before all of these developments had consisted mainly of performing blood and urine tests.[7] By the end of the nineteenth century, bacteriology was the focus of the new medicine and the practice of pathology was closely associated with it. Therefore, the

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[5] Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: The Johns Hopkins University Press, 1995), 18.

[6] Gagan and Gagan, *Patients of Moderate Means*, 13-14, 40; Charles E. Rosenberg, *The Care of Strangers: The Rise of America's Hospital System* (Baltimore: Johns Hopkins University Press, 1987), 341-349; Kathryn McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990* (Ontario: Oxford University Press Canada, 1996). According to J.D. Howell, hospital transformation meant hospitals becoming self-consciously scientific institutions and central for medical education. It also meant an increase in the number of hospitals and hospital beds available and, consequently, an increase in the amount of money being spent. Through this transformation, technology became a prominent feature of medical care. Laboratory medicine was included in the latter; Howell, *Technology in the Hospital*, 17-18.

[7] Joseph Hirsh and Beka Doherty, *The First Hundred Years of The Mount Sinai Hospital of New York, 1852-1952* (New York: Random House, 1952), 123; Howell, *Technology in the Hospital.*

pathology department would play an important role in changing perceptions and consequently, in reciprocally supporting the transformation of the greater institution.[8]

Data taken from the records of the Winnipeg General Hospital and its department of pathology make this dynamic clear. Between 1878 and 1915 for example, the number of patients treated at the hospital increased from 79 to 9,234, and patient fees became the main source of income for the hospital. In fact, patient contributions between 1884 and 1915 increased from $668.40 to $251,098.25. Concomitantly, the number of tests performed in the pathology department increased tenfold from 1902, the first year recorded, to 1915.[9]

The first half of this chapter discusses the developments that introduced the specialty of pathology in Manitoba, whereas the second half deals with the first twelve years of the pathology department's existence, ending with its consolidation as a hospital entity in 1915. The consolidation, it will be argued, was the result of the need created by a new approach to medical practice based on laboratory medicine in the context of the social transformation of the Winnipeg General Hospital.

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[8] Howell, *Technology in the Hospital*, ix-x, 7. Chapter 6 of Rosenberg, *Care of Strangers*, makes the same argument. Other authors have reached a different conclusion. In their opinion, scientific factors were not crucial to patients for the transfer of care. For them, the social factors were the only determinant. There was nobody at home to take care of the individual and one of the examples of this situation was the move of birth to hospitals; Judith Walzer Leavitt, *Brought to Bed: Child-Bearing in America, 1750-1950* (New York: Oxford University Press, 1986), 171-195. The conditions, promoted by physicians, obliged the hospital to accommodate new practices and procedures.

[9] Between 1902 and 1915, the number of tests performed in the pathology department augmented from 2,449 to 24,238 (Table 1) (Figs. 1, 2).

Table 1. Tests most commonly performed in the hospital laboratory during Webster and Peirce's tenures (1902-1915). (Data taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | Diphtheria Cultures | Urine Exam. | Tissue Biopsies | Total No. Tests |
|---|---|---|---|---|
| 1902 | 1,775 | NR* | 66 | 2,449 |
| 1903 | 1,569 | NR | 124 | 2,533 |
| 1904 | 708 | NR | 87 | 1,793 |
| 1905 | 681 | NR | 79 | 2,143 |
| 1906 | 620 | NR | 88 | 2,378 |
| 1907 | 710 | 6,170 | 74 | 9,038 |
| 1908 | 1,164 | 6,274 | 243 | 10,396 |
| 1909 | 750 | 7,175 | 561 | 12,025 |
| 1910 | 1,414 | 9,135 | 801 | 14,146 |
| 1911 | 3,316 | 8,774 | 878 | 15,928 |
| 1912 | 3,271 | 8,240 | 1,038 | 16,233 |
| 1913 | 4,528 | 8,766 | 1,250 | 19,351 |
| 1914 | 7,445 | 10,954 | 1,571 | 26,236 |
| 1915 | 4,506 | 11,645 | 1,716 | 24,238 |

* = Not Reported

Figure 1 Number of laboratory tests, patients treated and surgical procedures at the Winnipeg General Hospital in the period 1902-1914. (Data taken from the Annual Reports of the hospital.)

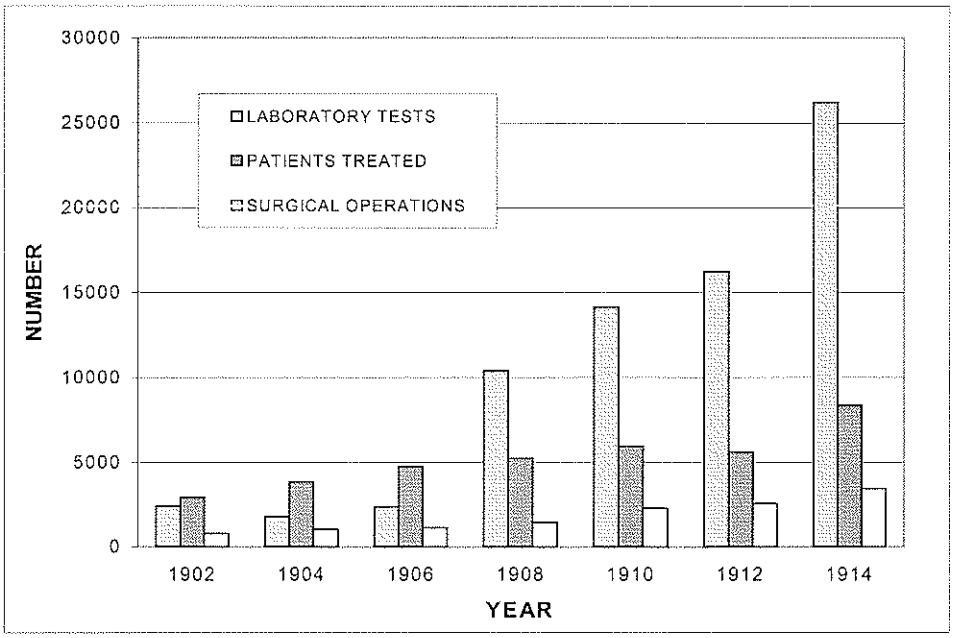
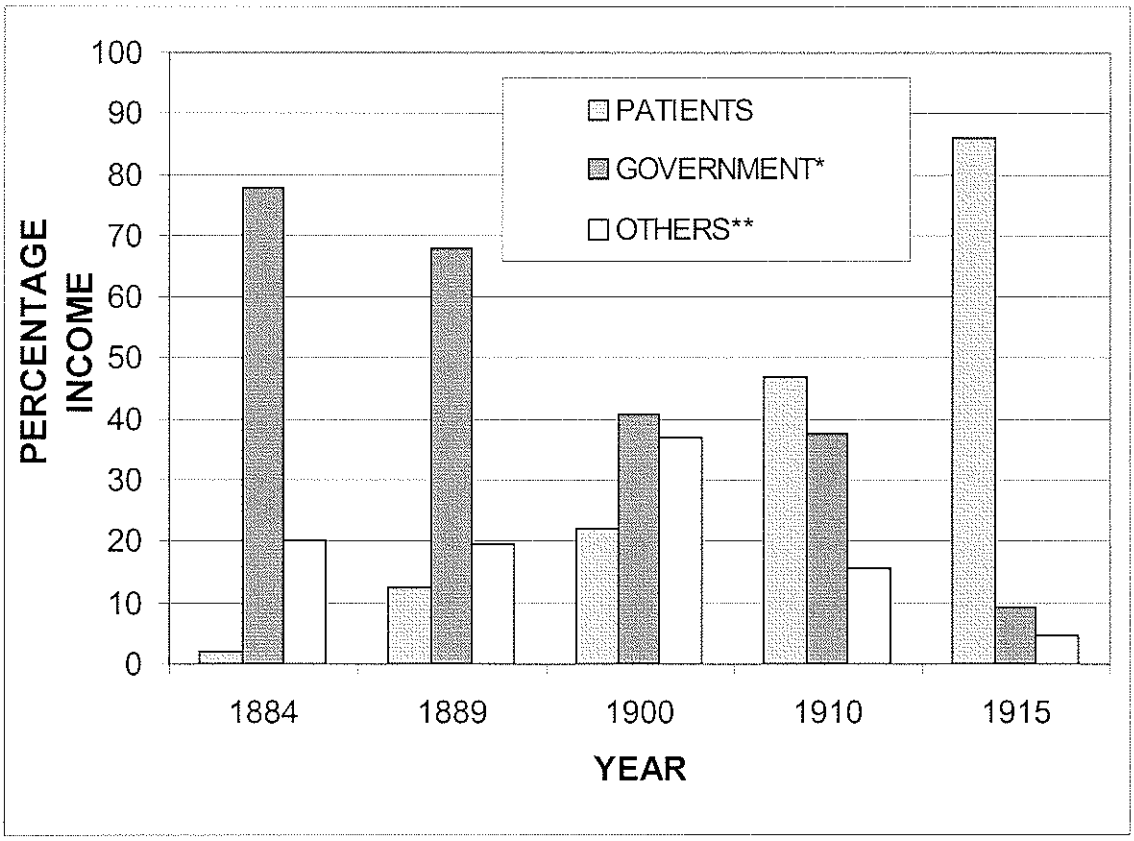


Figure 2 Sources of operating income of the Winnipeg General Hospital by percent (1884-1915). (Data taken from the Annual Reports of the hospital.)




* contributions made by three levels of government

** others include grants, donations, etc.

**The origins of pathology in Manitoba (1883-1902)**

The genesis of the specialty of pathology in Manitoba antedates the establishment of the department at the Winnipeg General Hospital. Winnipeg was in those days a frontier town with poor sanitary conditions that demanded a scientific approach to their solution. [10] The conditions in the city were intimately linked to economic phenomena prevalent in North America at that time. Populations were generally moving from rural to urban areas, further paralleled and augmented by the flow of new immigrants. These events created problems of housing and poor sanitary conditions with a resulting increase in morbidity and mortality.[11] Bacteriology, as part of pathology, help to provide the needed public health solutions. In 1899 the Winnipeg City Council, that until then had only employed a health officer on a part-time basis and whose only real responsibility was to provide an annual report, passed a comprehensive health By-law.[12] The legislation

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[10] The municipal direction of the City was determined by a socio-economic elite of businessmen to the exclusion of the vast majority of citizens. Since business was the philosophy for the city's public affairs, public health issues were neglected. Some degree of resentment was found in the local community about Ontario immigrants who controlled City Hall; "Winnipeg General Hospital," *The Manitoba & West Canada Lancet* 5 (1897): 121-122. Winnipeg was born a city. Its population grew from 1,500 in 1873 to 38,733 in 1897. Sanitary conditions were appalling indeed; only about 10 percent of the entire City had sewers and waterworks in 1890; Alan Artibise, *A Social History of Urban Growth, 1874-1914* (Montreal: McGill-Queen's University Press), 183-184, 224, 227-228. The City was divided into wards that reflected the good or bad conditions of the area. See *Idem*, *Winnipeg: An Illustrated History* (Toronto: James Lorimer & Co, 1977), 23, 28, 57; 78; *Idem*, *Gateway City: Documents on the City of Winnipeg, 1873-1919,* Publications of the Manitoba Record Society, ed. A.B. McKillop, vol. 5 (Winnipeg: The Manitoba Record Society in association with the University of Manitoba Press, 1979), 7, 8, 19. The north end, which relied on outdoor toilets draining directly into the streets and alleys, was the destiny of a rapidly growing population of immigrants who lived in poorly ventilated and overcrowded quarters; Artibise, *A Social History*, 229; *Idem*, *An Illustrated History*, 44. Tuberculosis, small pox, venereal diseases, scarlet fever and diphtheria were endemic and quarantines were not rare; Artibise, *A Social History*, 223; *Idem*, *Gateway City*, 188; Ian Carr and Robert E. Beamish, *Manitoba Medicine: A Brief History* (Winnipeg: The University of Manitoba Press, 1999), 24. Typhoid fever was epidemic and known as "Red-River-Fever," a name that illustrates the nature of the disease, as water was sometimes pumped directly from the rivers; Artibise, *Gateway City*, 179, 188; Carr and Beamish, *Manitoba Medicine*, 29. Infant mortality, which is commonly used as an index of sanitary conditions, was not surprisingly higher in the north end division when compared to the south; Carr and Beamish, *Manitoba Medicine*, 240-241; "Editorial," *The Northern Lancet & Pharmacist* 4 (1890): 277. See also Christopher Dafoe, *Winnipeg: Heart of the Continent* (Winnipeg: Great Plains Pub. Ltd., 2002). Similar conditions are described in Baltimore, Md., U.S.A. in 1891; Guenter B. Risse, *Mending Bodies, Saving Souls: A History of Hospitals* (New York: Oxford University Press, 1999), 399-402.

[11] According to Stevens, these were the years of change in the U.S. from an agricultural economy to industrial capitalism; Rosemary Stevens, *American Medicine and the Public Interest* (New York: Yale University Press, 1973), 34-35. In Manitoba, in contrast to the U.S., both agricultural and industrial economies were in the process of being introduced simultaneously.

[12] Artibise, *A Social History*, 225, 227.

ordered the appointment of a full-time medical officer of health and recommended the actions to be taken. His functions would be directed to provide a scientific solution to the sanitary problems and these actions were to be effectively coordinated with those of a recently created provincial laboratory at the Manitoba Medical College.[13]

Concomitant to the public health issue, the introduction of pathology into the medical curriculum was promoted as an avenue to fulfill the scientific aspiration of physicians, and, we can only suspect, their socio-economic interests as well. Pathology was contributing to the transformation of the practice of medicine from the observational bedside approach to a medical practice based on the laboratory. Such contribution required an institution for teaching it. The Manitoba Medical College would perform that function as it was the College where the new paradigms in medicine were introduced.[14] The Medical College had introduced the teaching of certain aspects of pathology from the very beginnings of its existence, but the science was disguised in the teaching of other

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[13] J.G. Fox and J.C. Wilt, "The History of Provincial Health Laboratory Services in Manitoba," *University of Manitoba Medical Journal* 49 (1979): 118-124.

[14] The Medical College, a private school, was founded and affiliated to the University of Manitoba in 1883. The affiliation consisted only on the latter being the examining body of the College and its degree granting body. For an outline of the history of the Manitoba Medical College before 1897 see: The Faculty of Medicine, The University of Manitoba, *Centennial Program*, 1983; Bruce Chown, "The Founding of Manitoba Medical College," *Manitoba Medical Bulletin* 67 (1927): 1-5; Bruce Chown, "The Story of the Medical College," *University of Manitoba Medical Journal* 5 (1933): 28-34. The facts provided by Dr. Chown were most likely based on information given directly to him by his father, Dean Harvey H. Chown. See also J.C. Wilt, "The History of Medical Education in Manitoba, *University of Manitoba Medical Journal* 39 (1968): 125-132; J.M. Bumsted, *The University of Manitoba: An Illustrated History* (Winnipeg: The University of Manitoba Press, 2001), 1, 8.

subjects.[15] Furthermore, the grades issued by the College were required by the College of Physicians and Surgeons of Manitoba to practice medicine in the province, and the requirements demanded pathology for registration.[16]

The Winnipeg General Hospital was also necessary for the genesis of pathology in the province. The hospital was the central site where the practice of new "scientific" medicine was developing in the city.[17] Therefore, it was only natural that the hospital

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[15] See Manitoba Medical College, "Annual Announcement, 1884-85." Tissue specimens obtained from surgery at the General Hospital and from private practice were utilized in teaching "Surgical Pathology," "Principles and Practice of Medicine," "Obstetric and Diseases of Women and Children," and "Medical Jurisprudence and Toxicology." Teaching "Histology" also included "Pathological Histology." Interestingly, there was an optional professional examination at the third year and a final examination called "Medical Pathology." The term "Surgical Pathology" referred to the study of specimens with the naked eye and was part of teaching "Principles and Practice of Surgery." Surgical pathology did not exist as understood today. The first freestanding pathology course was initiated in 1890 with the appointment of Aeneas J. MacDonnell, the first lecturer in the subject and a graduate of McGill University. The course was delivered in the form of lectures and demonstrations. In the Manitoba College Annual Announcement of 1890-91, it appears that teaching consisted of: "A course of lectures embracing *General and Special Pathology,* Outlines of Bacteriology in its relation to the causation of disease, will be delivered during the session. [*sic*] These *lectures will be fully demonstrated.* Attention will be paid to Clinical Microscopy, including the microscopy examination of the Blood, [*sic*] urine, sputum, pus, etc... The technique of the Microscope, the Cutting, Staining and Mounting of Pathological Specimens will be explained. Demonstration of post-mortem methods. [*sic*] Post-mortem examination will be performed by senior students in rotation, at the General Hospital, under competent direction." F.F. Wesbrook replaced A.J. MacDonnell in 1893. Wesbrook, who was a trained pathologist, taught only for 1 year. See biographical appendices. During his tenure as lecturer there was no change in the curriculum and recommended textbooks while MacDonnell continued as examiner; Medical College, "Annual Announcement, 1893-94." Gordon Bell, a local graduate and classmate of Wesbrook, replaced him in 1894; "M.D. degrees passed April 1890," *The Northern Lancet* 3 (1890): 226. There was again no change in the curriculum and in the recommended textbooks; Medical College, "Annual Announcement, 1894-96." W.S. England replaced Bell in 1895. See biographical appendices. Bell moved to be a Demonstrator of Anatomy but continued as examiner in Pathology. Again, there was no change in the curriculum and in the recommended textbooks; Medical College, "Annual Announcement, 1895-96."

[16] Bumsted, *The University of Manitoba*, 8. See also "Annual Announcement, 1884-85."

[17] There is no fully documented history of the institution up to this date. The following information is taken from the annual reports of the hospital (1884-1894) and A.S. Little, "The General': A History of the Winnipeg General Hospital," *Manitoba Medicine* 62, (1992): 55-57. The Winnipeg General Hospital was organized in December 3, 1872, and incorporated in May 14, 1875. It briefly occupied several locations. The fifth location was a building constructed on a lot donated by Mr. A.G.B. Bannatyne, who was the President of the Board of Directors of the hospital until his death in 1889 and was the son in law of Mr. McDermot, another prominent member of the community. The lot to the west of Olivia St. was acquired by exchanging the lot donated by Mr. Bannatyne. The building constructed in 1884 had capacity for forty-five beds and was connected to the sewer system of the city in 1885, the year that it was made the military hospital for the Riel's rebellion. In October 1887, the Winnipeg General Hospital Training School for Nurses was established with an initial class of five pupils. A building for the Maternity Hospital was added in 1888 and a new isolation ward only for the treatment of infectious diseases was opened on January 26, 1893. See also Table 2.

Table 2. Number and kind of appointments of Medical Staff at the Winnipeg General Hospital from 1882 to 1896. (Data taken from Annual Reports of the hospital.)

| | 82-83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consul. Phys. | 3 | 3 | - | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 |
| Att. Phys. | 6 | 6 | - | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | - |
| Nurses | 6 | - | - | - | - | 13 | - | - | - | - | 20 | - | 30 | 31 |
| Resid. | - | - | - | - | - | 1 | 2 | 2 | 2 | 2 | 3 | 4 | 3 | 3 |
| Matern. | - | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| EET* | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 2 | 2 |
| Inf. dis. | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 |
| Att. Phy + | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| Att. Surg. | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| | | | | | | | | | | | | | | |
| Total | 15 | 9 | - | 10 | 10 | 26 | 14 | 14 | 14 | 15 | 28 | 18 | 51 | 51 |

* = Eye, Ear & Throat
+ = Internal Medicine

administration looked to pathology to promote such an approach and increase revenues. As a result, the administration created a department of pathology whereas before then, the clinicians working themselves next to the wards performed the limited number of clinical laboratory tests and autopsies. The medical staff also benefited from this action as this facilitated the transfer of patients from home to hospital, creating a hospital-based practice.

In North America, hospitals had experienced great social change since the late nineteenth century, and the Winnipeg General Hospital was not an exception. These changes continued well into the second half of the twentieth century. According to Rosenberg and Gagan and Gagan, the introduction of germ theory, public health practices, and therapeutics reshaped the institution.[18] Its social organization also evolved as a result of developments in nursing, administration, teaching, clinical investigation and medical specialization.[19] From an institution created to treat only the indigent, hospitals were converting into institutions aiming to treat the middle class, the so-called "patient of moderate means."[20] Consequently, sources of support were also changing. Before the 1900s the federal, provincial and municipal governments as well as corporations and individual donors provided the main financial assistance. Such was the case of the Winnipeg General Hospital, whose support was the result of the intervention of prominent citizens, governments and corporations responding to the population's needs in the rapidly growing city. In 1884, the income from governments (i.e., federal,

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[18] Gagan and Gagan, *Patients of Moderate Means*, 13-14; Rosenberg, *Care of Strangers*, 288.

[19] Rosenberg, *Care of Strangers.*, 288-289. Risse also describe hospital transformation between 1900 and 1930, including socioeconomic, political and architectural aspects and the role of hospital boards, medical staff, administrators and nurses; Risse, *Mending Bodies*, 467-475.

[20] Gagan and Gagan, *Patients of Moderate Means*, 71; Rosenberg, *Care of Strangers*, 13-17.

provincial and municipal) was 77.92 percent and that generated by the private patients wards was only 2.01 percent of the total hospital income. By 1900, the government grants had decreased to 40.86 percent but that of the private ward had increased to 22.11 percent (Fig. 2). It was an era of reactive actions rather than responses by established programs.[21] The situation reflected the laissez-faire philosophy in matters of political economy characteristic of the Canadian society in those years.[22]

By 1900, Canada had suffered three economic recessions (1873-79, 1884-87 and 1893-96).[23] These recessions were simultaneous to the process of urbanization and industrialization, creating such problems as to induce hospitals to look for new sources of income. Conditions at the Winnipeg General Hospital reflected that reality. As stated in the annual report of 1900, "the Board finds as the result of the year's work, that the present ordinary revenue of the Hospital is insufficient to maintain it efficiently with its enlarged accommodation; and an effort must be made at once to insure a larger revenue for the future, as well as to raise funds to meet the present deficit." Consequently, after 1900, the financial support for the General Hospital was shifted to middle class patients. In 1915, the government contributed 9.35 percent whereas private patients contributed 86.09 percent of the total hospital income.[24]

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[21] In 1884, the government contributed $25,902.35 whereas the private wards income was $668.40. By 1900, the government support was $29,071.00 and that of the patients $15,732.80 (Table 3) (Fig. 2). See also Carl A. Mellicke and Janet L. Storch, introduction to *Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends* (Ann Arbor: Health Administration Press, 1980), 13.

[22] Elisabeth Wallace, "The Origin of the Social Welfare State in Canada, 1867-1900," in *Perspectives on Canada Health and Social Services Policy: History and Emerging Trends,* eds. Carl A. Mellicke and Janet L. Storch (Ann Arbor: Health Administration Press, 1980), 29. First published in *Canadian Journal of Economics and Political Science* 16 (1950): 383-393.

[23] *Ibid.*

[24] In 1915, the government gave $27,281.00 but the patients contributed with $251,098.25 (Table 3) (Fig. 2).

Table 3. Sources of income (dollars) of the Winnipeg General Hospital in figures and percentages (in brackets) between 1884 and 1915. (Data taken from the Annual Reports of the hospital.)

| | Patients | Government+ | Others* | Total |
|---|---|---|---|---|
| 1884 | 668.40 ( 2.01) | 25.902.35 (77.92) | 6,669 00 (20.07) | 33,240.51 |
| 1889 | 3,882.35 (12.48) | 21,163.38 (68.03) | 6,062.89 (19.50) | 31,108.62 |
| 1900 | 15,732.80 (22.11) | 29,071.58 (40,86) | 26,351.28 (37.03) | 71,155.66 |
| 1910 | 85,116.21 (46.84) | 68,220.00 (37.54) | 28,389.02 (15.62) | 181,725.23 |
| 1915 | 251,098.25 (86.09) | 27,281.00 (9.35) | 13,293.44 (4.56) | 291,672.69 |

+ = "Government" includes federal, provincial and municipal except by 1915 that the federal government did not contribute

* = "Others" include donations by individuals, corporations, community groups, church collections, etc.

Before the 1900s in the U.S., hospitals and medical schools were not associated in the manner that they are today, and in the majority of cases, access to wards for teaching purposes had to be carefully negotiated. Issues such as invasion of privacy to intransigence of lay hospital authorities, the lack of academic tradition, the resentment of medical practitioners who were not members of the faculty, and the great number of medical students were some of the factors that impeded such access.[25] In spite of the fact that the Manitoba Medical College was a proprietary school not affiliated to the Winnipeg General Hospital, the American situation was not reproduced completely in

[25] Rosenberg, *Care of Strangers*, 200-203.

Winnipeg.[26] A formal agreement between the Winnipeg General Hospital and the Medical School did not materialize until the second half of the twentieth century. However, association between both institutions had been informal but close since the early days, likely perhaps because the same individuals were in charge of both institutions.[27] This was the case in the common leadership present in pathology and bacteriology.

The other factor that played a role in the origin of the specialty of pathology in Manitoba was advances in laboratory sciences, in particular bacteriology. The conceptual impact of the latter in medicine depended upon the correct identification of the etiological cause of some infectious diseases for the first time.[28] While the Paris School of Medicine had contributed by relating symptoms to body lesions in order to reach a diagnosis, the third component in the natural history of disease –the cause- was missing. Following developments in bacteriology, medicine could provide accurate diagnoses, recognize the

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[26] Initially, the Medical College applied to the Legislative Assembly for permission to use the hospital facilities for clinical training of students; Winnipeg General Hospital, "Annual Report, 1882-83." Attendance was regulated by the By-Laws of the hospital and began as soon as the new building was opened in 1884; "Annual Report, 1882-83." A careful record was kept of the number of students attending the hospital and the fees so generated. The number of attending students was under twenty until 1888. By 1892, the number increased to sixty-five. Attendance at clinical lectures, to witness surgical procedures and to follow the physicians and House Surgeons during the visits required a fee ("students' tickets") of $10 per session. These fees generated a reportable income to the hospital that ranged from $110 in 1886 to $331 in 1889. Students had to behave with decency and piety, keeping their hats off at all times including in the operating theater. They were not allowed to express any opinion unless requested. Students had to wash their hands after dissections and before visiting the wards. They could not visit the wards except when accompanying the Attending Physicians or with the permission of the House Surgeon. On occasions, medical students were cause of concern for the Board of Directors. Such was the case of overcrowding in the operating theater; "Annual Report, 1890."

[27] For instance, in the Manitoba Medical College Annual Announcement of 1892-93 appeared an announcement indicating that the Winnipeg General Hospital was equipped with clinical and pathological laboratories, had an abundance of autopsy material, and had a dissecting room. The same year the names of Gordon Bell and W.S. England, members of the hospital staff, appeared in the announcement, the first as examiner in Medical Jurisprudence and Toxicology and the second as examiner in Pathology. Another example of the association is found in a letter by Dean Kerr to a local journal calling the attention to deficiencies at the hospital and with a plea for fund-raising; *Lancet*, 1887. The relationship also had its lows. In 1888, medical students protested house staff appointments at the hospital because they were not reserved for local graduates; *Manitoba Northwest & British Columbia Lancet*, 1 (1888): 151.

[28] Bacteriology developed along the lines of "pure" and "applied" sciences. It was the latter that gave scientific support to the practice of public health. Without ignoring Pasteur's contributions, it was Koch who set the technical advances for the practice of bacteriology, i.e., to obtain bacteria in pure cultures and to stain them. In addition, he elaborated his "postulates" that are no less than a methodological approach to the identification of the cause of a particular infectious disease; Long, *History of American Pathology*, 147-149.

sources of infection and identify the modes of disease transmission.[29] In this capacity, bacteriology became an important weapon not only for fighting the poor sanitary conditions that existed in Winnipeg but also for transforming medicine at the Winnipeg General Hospital into a scientific practice. By combining bacteriology with pathology, the first updated the second and kept it as a basic discipline for the understanding of disease.[30]

Another example was the developments in instrumentation necessary for the practice of the specialty, such as the perfection of the light microscope and improvements in tissue processing for microscopic examination that were already in place at the time of origin of pathology in Manitoba.[31] Nevertheless, their contribution should not be exclusively equated with the existence of machinery and methodology. Their impact could also be interpreted in terms of their meaning. Within the hospital walls pathology was one of the specialties that gave meaning to the introduction of technology to hospital medical practice, making medicine look "scientific" in the modern use of the term.[32] For instance, the use of the light microscope to analyze autopsy findings in contrast to the examination with the naked eye only enhanced the specificity of the clinical diagnosis. Also the use of the frozen section at the moment of the surgical intervention, improved operative results.[33]

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[29] As put it by Starr, "Microbiology for the first time permitted physicians to look causes, symptoms, and lesions systematically;" Starr, *Social Transformation of American Medicine*, 138.
[30] Long, *History of American Pathology*, 370.
[31] James R. Wright Jr., "Relationship of Surgical Oncology and Pathology in Early 20th Century America," in *History of Ideas in Surgery*, eds. Y. Kawakita, Shizu Sakai and Yasuo Otosuka (Japan: Ishiyaku EuroAmerica, 1992), 241-266.
[32] Howell, *Technology in the Hospital*, 2, 5, 11.
[33] A "Frozen section examination" consists on the study of tissue at the time of a surgical intervention. The procedure involves a rapid preparation of the material and a rapid examination by the pathologist. The report is communicated immediately to the surgeon who can modify or end the procedure according to the report. It is called "frozen" because the technique involves freezing the tissue to be examined as a preliminary step before staining it.

In summary, the sanitary conditions of the City of Winnipeg, the foundation of the Medical College and the Winnipeg General Hospital, and advances in laboratory sciences created the needs for the origin of the specialty of pathology in Manitoba. Bacteriology, as a public health measure, eventually provided solutions to the sanitary conditions when local authorities made the decision to address them. On the other hand, pathology, as a contributor to the "scientific" practice of medicine, became a reality when the College and the hospital offered institutional support and the practicing physicians demanded implementation of European scientific advances. The interplay of these conditions explains not only the origin but also set the bases for the future development of the specialty in the province.

**The department of pathology & bacteriology becomes a hospital entity at the Winnipeg General Hospital (1903-1915)**

Pathology as a specialty was not practiced at the Winnipeg General Hospital prior to 1902. The main reason for its absence was that medical practice up to that date was based on observation only. Yet with the introduction of the laboratory in patient care, pathology became an integral part of medical practice. The needs that explain the origin of the specialty in Manitoba also contributed to the creation of a department of pathology at the Winnipeg General Hospital. By the academic session 1896-97, Gordon Bell was appointed "Professor of Pathology, Bacteriology and Histology."[34] His appointment was simultaneous with that of provincial bacteriologist, strongly suggesting that both

[34] In the annual announcement of the Medical College of 1896-97, a new paragraph illustrated the importance of bacteriology and immunology in the teaching and practice of pathology in those days. It read, "Practical instruction will be given in the recognition, staining and mounting of the various disease germs, also methods employed in separating and growing pure cultures, preparation of toxin serums, production of immunity, etc."

initiatives resulted from an attempt to resolve local sanitary and professional needs. Since the same individuals were active at the College and at the General Hospital, it is only logical to conclude that these professionals were the promoters for the creation of a department at the hospital. Its existence would satisfy the scientific needs of the specialists and we can infer that it also fulfilled their socioeconomic aspirations.[35]

The creation of the hospital department ("laboratories") corresponded to similar creations in other hospitals in Canada and abroad in the late nineteenth century.[36] In the Maritimes, public health and hospital work were initially performed at the same institutions.[37] In Winnipeg, however, the separation of both specialties occurred very early. In Germany, clinical laboratories were the offspring of research laboratories devoted to the development of new methodologies to study disease. Since the 1880s, there was a proliferation of laboratories in Germany and the U.S. that offered diagnostic services to clinicians. Physicians who devoted their energy to these functional endeavors were known as "clinical pathologists" and complemented the activities of those that studied disease morphologically, known as "anatomical pathologists." Hospitals became the site of these new services.[38]

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[35] They may represent what Rosenberg has called "a marriage of convenience" between the specialist and the hospital. Rosenberg introduced the term in chapter seven of his work; Rosenberg, *Care of Strangers*, 166-189. In it, this author used the term referring to physicians that benefited from hospital positions not only for immediate professional recognition but also from the hospital as the site to make professional contacts for having access to the pool of indigent patients that became the subject of scholarly work and publications. Physicians taking advantage of a similar situation is described in Philadelphia, U.S.A.; Edward T. Morman, "Clinical Pathology in America, 1865-1915: Philadelphia as a Test Case," *Bulletin of the History of Medicine* 58 (1984): 198-214. An extreme example of this situation is described in Boston, Mass. by Morris J. Vogel in *The Invention of the Modern Hospital: Boston, 1870-1930* (Chicago: Chicago University Press, 1980), 5-28.

[36] "Laboratories" is the name used in the hospital's jargon that refers to a department of pathology. I will use both terms interchangeably. This entity, however, is different from the Department of Pathology at the Medical College although, at certain times in the history of pathology in Winnipeg, both departments have been amalgamated administratively.

[37] For the experience in the Maritimes see Peter L. Twohig, *Labour in the Laboratory: Medical Laboratory Workers in the Maritimes, 1900-1950* (McGill-Queen's University Press, 2005), 19-29.

[38] For the experience in Germany see Stanley Joel Reiser, *Medicine and the Reign of Technology* (New York: Cambridge University Press, 1999), 139-140.

The Winnipeg General Hospital followed the British trend.[39] In England, medical students, young physicians and/or senior physicians and surgeons performed laboratory tests and autopsies as necessary. Some of them were appointed curators of pathological museums, mainly young physicians pursuing future careers as clinicians.[40] The laboratory tests consisted of a few chemical examinations of body fluids and secretions, whereas the practice of autopsies was limited to finding the explanation of the patient's symptoms and the cause of death. The introduction of bacteriology and the light microscope in the last quarter of the nineteenth century expanded the opportunity for new tests. Yet, no full time positions were available at the hospitals for those performing these functions, because demand was low.

The first reference to the creation of the hospital department at the Winnipeg General Hospital is found in the minutes of the Hospital Board of Directors dated October 18, 1897, in which Gordon Bell was appointed pathologist to the hospital.[41] In the hospital's annual report of 1897, the Medical Superintendent, A.W. Moody, recommended that the Board facilitate the work of the new department by providing the necessary resources to accomplish its mission, including the provision of constant water supply for the morgue.[42] It is in this report that the term "department" is used for the first time in an official hospital document.

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[39] Drumond H. Bowden, "Pathology 100: 1890-1990," *Manitoba Medicine* 60 (1990): 55-57.

[40] Cunningham & McGowan, *British Pathology*, 170; W.D. Foster, *Pathology as a Profession in Great Britain and the Early History of the Royal College of Pathologists* (London: Royal College of Pathologists, 1972), 1-15.

[41] See biographical appendices. H Coppinger, Superintendent of the Winnipeg General Hospital between 1941 and 1956, wrote the following report, "Buildings and City Property Owned by the Winnipeg General Hospital," 32. The document was found in the nurses' archives without note on the year of publication. A reference to the appointment is found in this document. Bell accepted the appointment in a letter directed to the Board dated November 8 of the same year.

[42] The hospital conditions were primitive, indeed. For instance, there was no separation of patients between medical and surgical cases until one year before the creation of the department "Annual Report, 1896." Facilities for performing limited clinical tests were already existent at the hospital; Medical College, "Annual Announcement, 1892-93."

The hospital pathology department was not responsible for dealing with the sanitary problems of the city. Instead, the Provincial Government appointed Bell "Bacteriologist" and erected a fully equipped building on the Medical College's grounds for him to do his work, not only for the Province, but also for the College and the hospital. [43] In other words, the Winnipeg's sanitary conditions created one of the needs for originating the specialty of pathology, but the hospital departmental facilities were not utilized for this purpose because it dealt only with hospitalized patients.

During his tenure as director of the hospital department, Bell appears to have been the only official pathologist to the hospital and the College, and the only bacteriologist to the Provincial Government. His office and laboratory were physically located at the College. Evidently, he was a very busy man. There was no annual report issued at the hospital and, it seems that besides him, the Post-Mortem Clerks and perhaps W. Webster were the only other members of the department.[44] Many years later, D. Penner described the practice of laboratory medicine during Bell's tenure. He wrote that "the few simple laboratory tests done were performed by doctors and residents."[45]

The hospital grew in size and complexity during Bell's tenure, reflecting the beginnings of its transformation. The number of patients treated continued its steady rise, reaching close to 2000 per year. The predominant diseases treated on the wards were infectious, again reflecting the sanitary conditions in the city. Numerous cases of typhoid

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[43] "Annual Report, 1898-99." This kind of arrangement was not unusual for dealing with public health work in those years; W.D. Foster, "The Early History of Clinical Pathology in Great Britain," *Medical History* 3 (1959): 173-187. The laboratory became to be known as the "Bell laboratory" and would evolve into the "Cadham Provincial Laboratory" of today; Fox and Wilt, "History of Provincial Health Laboratory."

[44] The House Surgeon of the hospital appointed Post-Mortem Clerks since 1889 and in his biography W. Webster is referred as practicing pathology at the Winnipeg General Hospital since 1898. See also Christopher F. Wolkenstein, "History of Canadian Anaesthesia. Dr. William Webster. Pioneer Manitoba Anaesthetist," *Canadian Journal of Anaesthesia* 37 (1990): 348. Bell was also performing histopathological examinations at the provincial laboratory; Fox and Wilt, "History of Provincial Health Laboratory."

[45] "Annual Report, 1972." See biographical appendices.

fever, diphtheria, measles, scarlet fever and erysipela were treated, and an epidemic of diphtheria and an outbreak of smallpox occurred in 1900.[46] From 1898 to 1901, the number of patients attended increased by 47 percent. The number of surgical operations also increased by the same proportion, 47 percent. Deaths due to surgical procedures, however, decreased from 4 to 2.89 percent in the same period.[47] To deal with increased patient load, the "Victoria Jubilee Wing" was added to the building in 1899. The Medical Staff was also increasing in number and new specialties made their appearance. In 1898, the hospital had a staff of twenty-three physicians, which increased to twenty-nine in 1901. The difference of six members was due to the addition of one consultant, two residents, one anesthetist and two gynecologists.

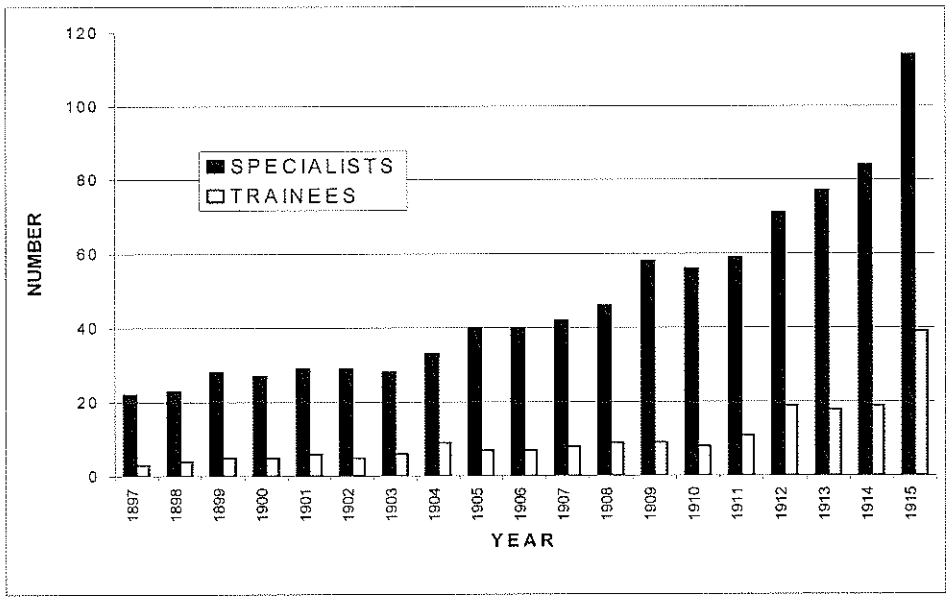
[46] "Annual Report, 1897,1899, 1900."

[47] From 1891 patients attended in 1898, the number had augmented to 2773 in 1901. The number of surgical operations also increased from 589 in 1898 to 864 in 1901 (Table 4).

Table 4. Winnipeg General Hospital statistics for the years 1897-1915. (Data taken from Annual Reports of the Winnipeg General Hospital.)

| | No. pt. | No. | % | No. | Surg. | % surg. |
|---|---|---|---|---|---|---|
| 1897 | 1,976 | 116 | 5.87 | 534 | 22 | 4 |
| 1898 | 1,891 | 111 | 5.87 | 589 | 21 | 4 |
| 1899 | 2,088 | 153 | 7.32 | 503 | 24 | 4.77 |
| 1900 | 2,649 | 156 | 5.89 | 813 | 36 | 4.42 |
| 1901 | 2,773 | 177 | 6.38 | 864 | 25 | 2.89 |
| 1902 | 2,928 | 177 | 6.04 | 787 | 20 | 2.54 |
| 1903 | 3,354 | 252 | 7.51 | 993 | 31 | 3.12 |
| 1904 | 3,868 | 271 | 7.0 | 1,042 | 46 | 4.4 |
| 1905 | 4,366 | 332 | 7.6 | 879 | 65 | 7.39 |
| 1906 | 4,741 | 317 | 6.68 | 1,124 | 44 | 3.9 |
| 1907 | 5,133 | 387 | 7.54 | - | - | - |
| 1908 | 5,229 | 329 | 6.29 | 1,451 | 63 | 4.34 |
| 1909 | 5,371 | 356 | 6.63 | 1,616 | 57 | 3.53 |
| 1910 | 5,935 | 405 | 6.82 | 2,295 | 89 | 3.88 |
| 1911 | 6,101 | 436 | 7.14 | 2,507 | 82 | 3.27 |
| 1912 | 5,599 | 283 | 6.84 | 2,574 | 97 | 3.77 |
| 1913 | 6,105 | 348 | 5.7 | 3,433 | - | - |
| 1914 | 8,361 | 384 | 4.6 | 3,473 | - | - |
| 1915 | 9,234 | 334 | 3.6 | 4,100 | - | - |

Figure 3 Number of specialists and trainees (interns and residents) appointed to the Winnipeg General Hospital (1897-1915).



The department reflected developments at the hospital. In the budget, equipment for the department ('Pathological Appliances') was purchased under "Surgery and Dispensary." The budget ranged from a low of $5.65 in 1899, the lowest, to a high of $61.10 in 1900, the highest during Bell's tenure.[48] However, there was optimism. The Medical Superintendent in his annual report of 1900 expressed the belief that the hospital was fully equipped to enter a new century. In particular, he emphasized the facilities for pathological and bacteriological work, indicating the importance that these disciplines represented for the administration. The next year, the new superintendent described the effort of hospital management to improve the efficiency of bacteriology with newly donated equipment. At the same time, he deplored that facilities were inadequate for post-mortem work.[49] As part of the transformation of the hospital in North America from charity to for-profit institution, such statements were commonly made to impress the community about the new image of hospitals as "temples of science."[50] Pathology was one of the most prestigious arguments justifying such statements since it identified the laboratory with the image of science also invoked by X-rays, anesthesia and asepsis.[51] However, the hospital department of pathology was still a poorly characterized institution as confirmed by Penner's comments years later and by the lack of annual reports.[52]

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[48] "Annual Report, 1898, 1899, 1900, 1901."

[49] "Annual Report, 1901."

[50] Rosenberg, *Care of Strangers*, 333. At the Winnipeg General Hospital, other specialties made their appearance in this time as well. Before pathology, four others were already reported by the hospital (i.e., obstetrics; eye, ear & throat; internal medicine and general surgery) (Table 5). Between 1897 and 1914, seven others were added. They were infectious diseases, anesthesia, gynecology, radiology, orthopedics, ophthalmology and pediatrics (Tables 5, 6 and 7).

[51] *Ibid.*, 335, 342.

[52] See reference 48. "Annual Report, 1899, 1900, 1901, 1972."

Table 5. Number and kind of appointments of Medical Staff at the Winnipeg General Hospital from 1897 to 1901. (Data taken from Annual Reports of the hospital.)

| | 1897 | 1898 | 1899 | 1900 | 1901 |
|---|---|---|---|---|---|
| Consultants | 5 | 5 | 6 | 6 | 6 |
| Att. Phys. | 3 | 4 | 4 | 4 | 4 |
| Att. Surg. | 4 | 4 | 4 | 3 | 3 |
| E E N & T* | 2 | 2 | 3 | 2 | 2 |
| Inf. Diseases | 2 | 2 | 2 | 2 | 2 |
| Maternity | 2 | 1 | 2w | 2 | 2 |
| Pathologist | 1 | 1 | 1 | 1 | 1 |
| Residents | 3 | 4 | 5 | 5 | 6 |
| Anesthetist | - | - | 1 | - | 1 |
| Gynecol. | - | - | - | 2 | 2 |
| Total | 22 | 23 | 28 | 27 | 29 |

* = Eye, Ear, Nose & Throat
w = One of the appointees was William Webster

Table 6. Number and kind of appointments of Medical Staff at the Winnipeg General Hospital from 1902 to 1907. (Data taken from Annual Reports of the hospital.)

| | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 |
|---|---|---|---|---|---|---|
| Consultants | 6 | 4 | 3 | 5 | 5 | 5 |
| Att. Phys. | 4 | 4 | 4 | 9 | 9 | 9 |
| Surgeons | 3 | 3 | 3 | 4 | 4 | 4 |
| Gynecol. | 2 | 2 | 2 | 2 | 2 | 2 |
| E.E.N.& T | 2 | 2 | 2 | 2 | 2 | 2 |
| Inf. Dis. | 2 | 2 | 2 | 2 | 2 | 2 |
| Maternity | 2 | 2 | 2 | 2 | 2 | 2 |
| Pathol. | 2 | 2 | 2 | 2 | 2 | 2 |
| Anesthetists | 1 | 1w | 1w | 1w | 1w | 1w |
| Residents | 5 | 6 | 9* | 7 | 7 | 8 |
| Dispensary+ | - | - | 3 | 3 | 3 | 4 |
| X-Ray spec. | - | - | - | 1 | 1 | 1 |
| | | | | | | |
| Total | 29 | 28 | 33 | 40 | 40 | 42 |

w = Webster was the one apointed
* = some of them for only a few months
+ = Out patient Service

Table 7. Number and kind of appointments of Medical Staff at the Winnipeg General Hospital from 1908 to 1915. (Data taken from Annual Reports of the hospital.)

| | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 |
|---|---|---|---|---|---|---|---|---|
| Consultants | 6 | 5 | 5 | 5 | 7 | 7 | 8 | 6 |
| Medicine | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 9 |
| Tb. Ward@ | 1 | 3 | 3 | - | - | - | - | - |
| Contagious diseases | 2 | 2 | 2 | 4 | 4 | 4 | 4 | - |
| Obstetrics | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| Surgeons | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 6 |
| Gynecologists | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| Orthopedists | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| E.E.N & T | 2 | 2 | 2 | 2 | - | - | - | - |
| Pathologists | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Anesthetists | 1w | 1w | 1w | 1w | 1w | 1w | 2w | 2w |
| X-Ray specialists | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| Dispensary | 4 | 13 | 12 | 13 | 13 | 18 | 21 | 27 |
| Director Path. Laboratory* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Bacteriologist+ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Interns | 9 | 9 | 8 | 11 | 19 | 18 | 19 | 39 |
| Dis. Eyes | - | - | - | - | 2 | 2 | 3 | 3 |
| E.N.T. | - | - | - | - | 2 | 2 | 2 | 3 |
| Pediatrics | - | - | - | - | 1 | 1 | 1 | 1 |
| | | | | | | | | |
| Total | 46 | 58 | 56 | 59 | 71 | 77 | 84 | 114 |

@ = Tuberculosis
w = Webster was the one appointed
* = In 1908 and 1909 this position was labeled "Resident Pathologist."
+ = In 1908 and 1909 this position was labeled "Assistant Pathologist." In 1914 it was changed to "Clinical Microscopist."

Bell occupied the first Chair of Pathology at the College and was consequently the one who undeniably introduced the specialty in Manitoba.[53] However, he was only the nominal head of the laboratories at the hospital records. The necessary examinations in bacteriology and pathology were performed in the provincial laboratory located at the Medical College under his direction.[54] Having three appointments, he evidently had limited time to fulfill his duties as the pathologist of the Winnipeg General Hospital as confirmed by the appointment of W. Webster as Assistant Pathologist in 1902.[55] Given the importance that laboratory medicine represented for the hospital in terms of image and income, one can only imagine that the Board of Trustees was particularly interested in the local development of the specialty.

William Webster[56] was only a transitional figure in the existence of the pathology department between the terms of Gordon Bell who devoted minimum time, and S.J.S. Peirce who was the first full time pathologist to the hospital. Webster selected the best educational opportunities offered by the University of Manchester, England, to train as a pathologist, making him competitive for a position at the Winnipeg General Hospital. Specialization, therefore, was the avenue in his quest for professional success in Manitoba.[57]

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[53] Bowden, "Pathology 100," *Centennial Program*, 44; Ross Mitchell, *Medicine in Manitoba: The Story of its Beginnings* (Winnipeg: Manitoba Medical Association, 1954), 70.

[54] "Annual Report, 1897, 1898, 1899, 1900, 1901;"Carr & Beamish, *Manitoba Medicine*, 63. The first clinical laboratory in the U.S. was founded in Michigan only 4 years previously; Morman, "Clinical Pathology in America."

[55] In the hospital annual report of 1902, J. Halpenny, Medical Superintendent, stated that, "The bacteriological department as re-organized under Dr. Webster..."

[56] See biographical appendices.

[57] Geo J. Maulson, the Acting Honorary Secretary-Treasurer, praised Webster for attending the laboratory daily, for issuing his reports without unnecessary delay and for submitting an annual report. Similarly, J. Halpenny, the Medical Superintendent, mentioned that the laboratory re-organization under Webster had proven very satisfactory; General Hospital, "Annual Report, 1902." H. Coppinger, in his report on the City property owned by the Winnipeg General Hospital, also expressed his opinion that "Beyond doubt it [the annual report] represents the first such record of laboratory performance tendered to the Board of Trustees;" Coppinger, "Buildings and City Property," 32. See also: Rosenberg, *Care of Strangers*, 166-167.

The General Hospital further expanded its activities during Webster's tenure between 1903 and 1907. By transforming into a specialized institution, it could claim scientific prestige to the general public and in this manner influence medical specialization, as well as support its continuing expansion as a productive (financial, social, and otherwise) health care institution. The number of patients treated during this period increased by about another 2,000, although proportionally, the number of deaths persisted at around 7 percent of total hospital admissions. The number of hospital beds and average number of patients treated each day also rose significantly, both almost doubling in number in this period. The number of surgical operations increased by more than 100, but surgical mortality continued at around 4 percent.[58] Staff physician numbers also increased as more of them worked as internists, surgeons, X-ray specialists, residents and physicians in the Out Patient (Dispensary) Clinic.[59] Except for the X-ray specialist, no other specialists were added to the staff in this period, indicating the importance of X-ray for the new image of the hospital.[60] Since 1903, nursing administration also expanded, initially with an assistant to the Lady Superintendent and then with a Night Superintendent. A Pharmacist was appointed for the first time in 1905.[61]

The first pathology departmental report was issued by Webster in 1902 and consisted only of a list of the kind and number of examinations performed during the year

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[58] Between 1903 and 1907, the number of patients treated increased from 3,354 to 5,133 and the average of patients treated per day increased from 171.7 to 298.63. Between 1903 and 1906, the number of surgical operations increased from 993 to 1,124 and the number of beds from 215 to 400 (Table 4).

[59] Development of specialization by appointment at hospital dispensaries appeared not to have occurred at the Winnipeg General Hospital as in other jurisdictions; Vogel, *Invention of the Modern Hospital*, 88-96; Hirsh and Doherty, *First Hundred Years of the Mount Sinai Hospital*, 60-64.

[60] See Table 6; Howell, *Technology in the Hospital*, 103-132.

[61] "Annual Report, 1905." In the *Nurses Alumnae Annual of the Winnipeg General Hospital* from 1936, (pp. 6-8) Frank Appleby from the Accounting Department described the hospital conditions around 1901. He makes comments about the X-Ray department, the operating room, the ambulance, the nurses, the interns, and the pathology department. The document exists in the Nurses's archives of the Hospital.

in the laboratory.[62] Those examinations fell into three categories - bacteriological, pathological and hematological. Bacteriology was the area that received most attention as indicated by the number of tests performed every year (in particular diphtheria cultures), the importance of bacteriology at that time, and the kind of diseases most commonly admitted to the hospital (i.e., infectious diseases). The number of tests performed in anatomical pathology was reduced to the examination of tumors obtained in surgical procedures, and its low number likely reflects the practice of pathology and surgery as well as the personal interest of the pathologist in those days. The work performed in hematology consisted predominantly of examining peripheral blood smears as was the standard practice.[63]

Progressively, the medical staff increasingly utilized the laboratory after 1900. Although this practice could be ascribed to scientific developments, the appeal to science in society was an important factor as well. Society believed that the body of knowledge and technology called "science" could benefit all people.[64] It is not possible to ignore the recognized optimism about science that existed at the beginnings of the century (e.g., the airplane, ships, the discovery of sulfa and arsenical drugs, etc.). Technology in the hospital, exemplified by the use of the laboratory, became a prominent feature of patient-

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[62] Winnipeg General Hospital, Department of Pathology, "Annual Report, 1902," 47.

[63] In 1902 the total number of tests was 2,449, diphtheria cultures being the most frequent test performed (1,775). Sixty-six surgical specimens (tumors) were examined and the hematology specimens consisted of peripheral blood examinations only (Table 1 and 8). See Hirsh and Doherty, *First Hundred Years of the Mount Sinai Hospital*, 123.

[64] Howell, *Technology in the Hospital*, 2, 9, 30.

care. This development translated into more hospital beds and admission of patients that were able to pay. Hospitals became scientific centers and centers of medical education. Slowly but inexorably, home care was disappearing.[65]

The period between 1902-1907 saw the beginnings of recognition of the department as a discernable entity at the Winnipeg General Hospital. The hospital assigned the laboratories a budget for supplies, salaries and wages. The department also began issuing a report of its activities every year, and expanded the number and variety of tests performed.[66] It appears that G. Bell acted as a figurehead. Every reference to him in the documents of those years is related to his role teaching at the Medical College and as the provincial bacteriologist. Webster was clearly the man in charge at the hospital and the one recognized by its administration as such, yet he performed his duties as pathologist on a part-time basis working an hour or so a day without an assistant.[67]

Table 8. Pathologist (Webster) Annual Reports (1902-1907). (Data taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 |
|---|---|---|---|---|---|---|
| Bacteriology | 2,345 | 2,206 | 1,371 | 1,801 | 1,853 | 8,470 |
| Pathology | 66 | 124 | 87 | 79 | 88 | 74 |
| Hematology | 38 | 203 | 335 | 263 | 437 | 494 |
| Biochemistry | - | - | - | - | - | - |
| | | | | | | |
| Total | 2,449 | 2,533 | 1,793 | 2,143 | 2,378 | 9,038 |

[65] *Ibid.*, 18, 121.

[66] The number of tests had increased from 2,449 in 1902 to 9,038 in 1907. The main increment occurred in 1907 and was the result of the inclusion of urinalysis in the annual report of that year. Before Pierce arrival, urinalysis was not reported most likely because medical students and staff performed them on the wards. The number of tissue biopsies was kept more or less constant during the same period (Table 1 and 8).

[67] Frank Appleby, "1901-1936," *Manitoba Nurses Alumnae Annual* (1936): 6-8.

Table 9. Pathologist (Peirce) Annual Reports (1908-1915). (Data taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 |
|---|---|---|---|---|---|---|---|---|
| Bacteriol | 9,829 | 10,731 | 12,711 | 14,165 | 13,844 | 16,514 | 22,539 | 20,157 |
| Biopsies | 243 | 561 | 801 | 878 | 1,038 | 1,250 | 1,571 | 1,716 |
| Autopsies | - | 51 | 43 | 47 | 46 | 50 | 44 | 29 |
| Hematol | 324 | 497 | 330 | 489 | 922 | 1,245 | 1,651 | 1,791 |
| Biochem | 289 | 110 | 107 | 112 | 128 | 139 | 139 | 60 |
| Misc | - | 75 | 154 | 237 | 255 | 153 | 292 | 372 |
| | | | | | | | | |
| Total | 10,685 | 12,025 | 14,146 | 15,928 | 16,233 | 19,351 | 26,236 | 24,238 |

Bell still acted as a consultant for difficult cases and such consultations were given in his laboratory at the College.[68] Webster issued his final annual report in 1907, retiring from the pathological department that year because he could not provide it appropriate time and devoted all of his energies to the department of anesthesia. Webster's interest, evidently, was not pathology. Dr. S.J.S. Peirce filled his position, now called "Permanent Resident Pathologist."[69]

Between 1908 and 1915, the laboratories became consolidated as an entity at the General Hospital under the leadership of Sidney J.S. Peirce, a local graduate of the Class of 1904 who made pathology his career.[70] He replaced Webster in 1908; Alfred J. Long was appointed as "Pathological Extern" a few months later.[71] Peirce, the first full time appointed pathologist, radically altered the scope of the department. Under his leadership, the total number of tests performed by the department increased substantially (Fig. 1). A

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[68] *Centennial Program*, 1983, 44.

[69] In anesthesia, Webster would excel and become the pioneer of this specialty in Western Canada. See "Annual Report, 1907, 1908."

[70] See biographical appendices. Peirce will be a player in the first documented professional conflict between the hospital and the university components of the department years later.

[71] "Annual Report, 1908, 1909." Bell and Webster continued appearing as "Pathologist" to the hospital that year, but the next year only Bell was appointed "Visiting Pathologist," a title that reflected his limited contribution to the every day running of the department; "Annual Report, 1909."

recent trainee at the Mayo Clinic, he introduced new technology, and initiated clinical chemistry at the hospital. As such, he had the support of the hospital administration because his actions were in keeping with the transformation of the hospital. This is evident in the statement of J.A. Gunn, Medical Superintendent, who at the end of the first year of Peirce's tenure, wrote, "Advancement in the work of the pathological department has been one of the most noticeable features in the progress of the hospital during 1908... it is expected that this department will become one of the leading features in the work of the hospital."[72] By 1909 and 1910, Peirce's title was now reported as "Director" and that of A. Long as "Bacteriologist."

Peirce made important contributions to the department that directly linked technological advances to the developing specialty. He introduced the intra-operative frozen section examination, a novelty at that time. Frozen sections were introduced in North America in the early 1890s but were popularized by Louis B. Wilson of the Mayo Clinic who published his results in 1905.[73] This examination is considered one of the fundamental techniques that made possible the development of pathology as a clinical discipline in the twentieth century.[74] It is also an example of the impact of the specialty by facilitating surgery. Pathology before this was essentially a subject based on the performance of autopsies and experimental work whose goal was the scientific study

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[72] "Annual Report, 1908." The argument was evidently created to attract other sources of income to support hospital's activities.

[73] Antonio A. Gal and Philip T. Cagle, "The 100-Year Anniversary of the Description of the Frozen Section Procedure," *Journal of the American Medical Association* 294 (2005): 3135-3137.

[74] As a result, the number of tissue biopsies examined during his tenure increased by twenty-three times, from 74 in 1907, the year Webster left, to 1,716 in 1915 (Table 1).

of disease.[75] Peirce introduced frozen section in 1908, only three years later than Wilson's publication. In fact, Peirce had been a student of Wilson.[76]

Another of Peirce's contributions was the preparation, mounting and photographing of specimens. This activity was most likely his responsibility as a "Demonstrator" at the Medical College. Exhibited at the "Industrial Exhibition" held in July of 1910 as part of the campaign by the "Anti-tuberculosis Society," such work would have not been possible if not for the loan of a camera from a city physician. The hospital did not have photographic facilities.[77] This year also represented the beginning of the departmental pathology museum that became well known in Canada years later.[78]

Pierce's appointment by the Board of Trustees, therefore, represented an important change for the department. In spite of the absence of pertinent archival documentation, several conclusions can be drawn. Pierce was a local graduate with close connections to the Medical College since he had trained with Bell before going to Mayo Clinic where he qualified as a pathologist. Consequently, Peirce was a strong candidate for the position. His initial appointment was "Permanent Resident Pathologist" but soon it was changed to 'Director,' indicating that Peirce demonstrated his abilities as a trained pathologist. Peirce's impact was evident as indicated by the increment in the number of tests reported in his first annual report of 1908 and all his other accomplishments afterwards. It is only reasonable to conclude that he was the true architect of the department and the first full-time hospital pathologist in the Province.

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[75] Wright, "Pathology in Early 20th Century."

[76] Lester E. Wold, *Mayo Clinic Pathology: The First 100 Years* (Rochester: Mayo Foundation for Medical Education and Research, 2005), 138.

[77] Department of Pathology, "Annual Report, 1910," 83-84.

[78] In 1913 Mrs. Davis, a graduate from the "Winnipeg General Hospital Training School for Nurses," was employed as part time stenographer of the hospital department and as the assistant curator of the pathological museum at the College; "Annual Report, 1913."

In the annual hospital reports, the Medical Superintendent and the Honorary Secretary Treasurer of the Board continued their references to the need, now urgent, for a proper morgue and a pathological laboratory, recommending a separate building for those facilities. They justified the recommendation on the revolutionary role that bacteriology and pathology played in the "modern hospital" and to the experience of other hospitals in New York and Philadelphia where departments of pathology occupied entire separate buildings and were fully equipped. They stated, "We can scarcely hope that this hospital [the Winnipeg General Hospital] can be so liberally supplied, but these figures [the work performed in pathology] give some idea of the great importance of this department of [*sic*] hospital work."[79] Some of the limitations of the service (e.g., low number of autopsies) were attributed to the poor physical facilities in place.[80] So in 1911, as a result of the continuous complaints by Peirce, the Secretary Treasurer and the Medical Superintendent, the laboratory was temporarily moved to one of the sections of the "isolating" building that was vacated for such purposes. Construction of new facilities began in 1908.[81]

The pathology laboratory performed the functions of service, teaching and clinical research for the hospital. The total number of tests performed in the department rose during Peirce's tenure by 127 percent, far outstripping the increment in the number of patients (Fig. 1). Bacteriology was the busiest section, since their numbers increased by more than 105 percent. Urinalysis was the most commonly performed test in this

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[79] They based their opinion on a letter written to the hospital by D.A. Steward, a former Senior House Physician working then as a resident staff at the Riverside Hospital in New York;"Annual Report, 1908."

[80] Department of Pathology, "Annual Report, 1910," 83-84.

[81] "Annual Report, 1911."

section.[82] This finding is not unexpected, as similar trends were observed in other North American institutions.[83] Urinalysis is considered one of the first innovations in technology introduced in the hospital. Although urine examination with the naked eye had been performed for several centuries, this time the urine sample was examined with chemical techniques introduced by the Germans in the second half of the nineteenth century. The new approach was taught at medical schools and was utilized by medical students and staff as diagnostic and monitoring devices. They represented, along with X-rays, a new kind of medical care based on science.[84]

Other services offered by the department are nowadays provided by public health facilities such as the production and inoculation of anti-typhoid vaccines and the production and performance of tuberculin tests.[85] Salvarsan was also administered to patients diagnosed with syphilis. Further, in 1908, a small room was dedicated exclusively to the 'chemical laboratory,' a decision made in response to the need generated by developments in the application of chemical tests to body fluids, a technique introduced in the second half of the nineteenth century. It was the beginning of what is now known as clinical biochemistry, physiological chemistry or clinical chemistry.[86] The department also offered its facilities for teaching pathology. Similarly, Peirce and Long

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[82] The total number of tests rose from around 10,685 in 1908 to more than 24,238 in 1915. Bacteriological tests increased from 9,829 to 20,157. Biopsies and hematological tests also had a significant increase in number rising from 243 to 1716 and from 324 to 1791 in the eight years period respectively (Table 9) (Fig. 1). Yet autopsies were always less than fifty per year.

[83] Howell, *Technology in the Hospital*, 72; Wold, *Mayo Clinic Pathology*, 17.

[84] Howell, *Technology in the Hospital*, 69-79, 89-94; Foster, "Early History of Clinical Pathology."

[85] The typhoid vaccine was administered to nurses, house staff and medical students and was supplied to other hospitals in the Province, the Canadian Pacific Railway and the Army. Vaccine therapy was an important contribution of pathology departments in those years; Foster, "Early History of Pathology;" Wold, *Mayo Clinic Pathology*, 13.

[86] See Reiser, *Medicine and the Reign of Technology*, 135, 138. Department of Pathology, "Annual Report, 1909," 84.

were active participants in scientific meetings and published papers on applied clinical research.[87]

The revised and amended "Rules and Regulations of the Winnipeg General Hospital" in 1912 formally incorporated service, teaching and research as well as the internal organization of the laboratory. The laboratory consisted of a Director and Staff who were given the responsibility of promoting original investigation in the medical sciences, and of generating funds from work done to non-resident patients. Yet there was no reference in the rules and regulations to the connection of the laboratory with the Medical College, most likely reflecting the attitude of the members of the Board of Trustees who were most concerned with the hospital transformation. The document also demonstrated that pathology, like most other medical practices, was gaining social power through institutionalization (i.e., the advance of the profession through knowledge claims in the context of the hospitals' agenda for transformation, or a "marriage of convenience").

Hospital pathology at the General Hospital essentially evolved as a subsidized specialty.[88] The hospital owned the physical facilities, paid for the expenses of the department, and supported the salaries of the pathologists, technologists and clerical personnel. Accordingly, complaints about costs started appearing in 1913. The Secretary-

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[87] "Annual Report, 1910, 1911." In the winter of 1911-12, Peirce spend time in Freiburg doing post-graduate work in pathology and physiological chemistry with Prof. L. Ashoff, the great German pathologist. He also presented a paper on frozen section at the meeting of the American Association of Pathologists and Bacteriologists held in Toronto in 1914. The paper was published in Sidney J.S. Peirce, "On the Technique of Producing Frozen Sections for Rapid Diagnosis," *International Association of Medical Museums Bulletin* 5 (1915): 106-108, quoted in James R. Wright Jr., "The Development of the Frozen Section Technique, the Evolution of Surgical Biopsy, and the Origins of Surgical Pathology," *Bulletin of the History of Medicine* 59 (1985): 295-326; Department of Pathology, "Annual Report, 1915," 44. See also Long, *History of Pathology*, 164.

[88] The budget of the department increased from slightly more than $1,000 in 1908 to almost $5,000 in 1915. Only part of this money was recovered by the hospital for services provided by the department to the community. The budget was distributed between salary and wages and supplies, being the main expenses the payment of salaries and wages (Table 10).

Treasurer, in his annual report, deplored the lack of financial support to the hospital. He based his comments on the number of medical students (i.e., 195) receiving instruction and concluded that the hospital was a provincial institution since the majority of them were from different parts of the province. He also implied that several departments, including pathology, increased the cost of patient care, notwithstanding the fact that the hospital proudly advertised pathology as a department competent for the investigation of all forms of disease.[89] It appears that these statements were made to at least partially explain why the hospital had been "in the red" for some years. Similar complaints were expressed in other hospitals in Canada.[90] The department, however, did provide some modest yearly income to the hospital as reported in the annual reports.[91]

Gagan and Gagan explain the economic situation of the Winnipeg General Hospital at this time.[92] They argue that the increased demand in service was insufficiently supported by the community and was not matched by in kind contributions from the government of Manitoba (Fig. 2). Members of the hospital board had to support the bank debts incurred by the hospital with personal notes. At the time of the previous statement about pathology made by the Secretary-Treasurer, the hospital had actually converted private wards to public ones, experiencing even a more drastic reduction in income.

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[89] "Annual Report, 1914."

[90] It became a common statement in the reports by the Secretary-Treasurer of the board the lack of correspondence between the annual expenses and the income of the hospital. The provincial and municipal governments, in the form of grants, always supplemented the difference; "Annual Report, 1913;" Annual Report of the Hotel Dieu Hospital, Chatham, New Brunswick, 1 August 1927 to 31 July 1928, quoted in Twohig, *Labour in the Laboratory*, 8.

[91] For instance, as part of Peirce's responsibilities, anti-typhoid vaccines were prepared and administered to some 3,000 troops who had been mobilized in Winnipeg due to World War I producing a unique annual income to the hospital of more than $12,000 in 1915 (Table 10).

[92] Gagan and Gagan, *Patients of Moderate Means*, 42-70.

Table 10. Annual budget of the Department of Pathology (1908-1915). (Data taken from Annual Reports of the Winnipeg General Hospital.)*

| | Salary & Wages | Supplies | Total expenditure | Revenues |
|---|---|---|---|---|
| 1907 | 686.62 | 79.08 | 765.70 | - |
| 1908 | 1,104.31 | 96.87 | 1,201.18 | - |
| 1909 | 1,837.00 | 570.71 | 2,408.16 | - |
| 1910 | 2,649.12 | 408.61 | 3,057.73 | 107.75 |
| 1911 | 3,213.23 | 552.13 | 3,765.36 | 793.45 |
| 1912 | 3,657.47 | 1,108.39 | 4,765.86 | 1,214.30 |
| 1913 | 4,417.15 | 1,086.93 | 5,504.08 | 3,117.27 |
| 1914 | 5,029.13 | 1,666.37 | 6,695.50 | 2,939.20 |
| 1915 | 4,336.24 | 391.16 | 4,727.40 | 12,211.40 |

* = Before 1907 the budget of the department was combined with Roentgen Ray supplies. Figures are in dollars.

Nonetheless, the Winnipeg General Hospital continued growing in size and complexity during Peirce's tenure.[93] It was advertised as "the only teaching hospital in Canada for medical students west of Toronto."[94] In 1908, it had a staff of 46 physicians. This number had increased to 114 by 1915. Again, the increment was due mainly to interns and to physicians working in the Dispensary (Out Patient Service). The number of specialists had also increased (Fig 3) and new specialties appeared including Orthopedics and Pediatrics. Ophthalmology appeared for the first time as a separate specialty from Ear, Nose and Throat in 1912 (Table 7). The number of patients treated almost doubled from 1908 to 1915 (Fig. 1). The number of deaths decreased proportionally from 6.29 to 3.6 percent, and surgical operations increased by 183 percent. Percentage of surgical

[93] An indication of the growth of the Winnipeg General Hospital is the number of specialists appointed during those years (Table 11) (Fig. 3).
[94] "Annual Report, 1914."

deaths, however, was maintained steady during the eight years period between 3 and 4 percent.[95]

Table 11. Number of specialists appointed to the Winnipeg General Hospital (1897-1915). (Data taken from Annual Reports of the hospital.)

| | No. of specialists |
|---|---|
| 1897 | 22 |
| 1898 | 23 |
| 1899 | 28 |
| 1900 | 27 |
| 1901 | 29 |
| 1902 | 29 |
| 1903 | 28 |
| 1904 | 33 |
| 1905 | 40 |
| 1906 | 40 |
| 1907 | 42 |
| 1908 | 46 |
| 1909 | 58 |
| 1910 | 56 |
| 1911 | 59 |
| 1912 | 71 |
| 1913 | 77 |
| 1914 | 84 |
| 1915 | 114 |

Conditions at the Medical College and the hospital department around 1914 preceded radical changes that would come to affect pathology locally. Until then both departments were functioning totally independently. Pierce's limited participation in teaching and provision of teaching facilities appeared to be the only contributions of the laboratories to the department at the Medical College. The latter reciprocated by

[95] From 1908 to 1915, the number of patients treated increased from 5,229 to 9,234; the number of deaths changed from 329 to 334; and the number of surgical operations increased from 1,451 to 4,100 (Table 4) (Fig. 1).

appointing "Post-Mortem Clerks" among 4th year medical students to perform autopsies at the hospital.[96] Starting in 1914, "a University Professor in the Manitoba Medical College," was announced to be the only one to give instruction in pathology and its practical components, subordinating in this manner any other participant in instruction.[97] Peirce continued his appointment at the College only as "Lecturer." Long, the hospital's bacteriologist never had an appointment with the College. Bell continued as Professor but at the General Hospital his title continued to change from "Visiting Pathologist" to "Pathologist" to "Consulting Pathologist," the latter present by 1915. This indicates his progressively diminishing role at the hospital department, which by this time appeared to be totally under Peirce's control.

The origin of the specialty of pathology in Manitoba resulted from local socio-economic conditions and internationally based but locally felt scientific-technological developments. The first was represented by the living conditions in the city of Winnipeg and by professional and institutional interests whereas the second corresponded to larger developments in laboratory sciences (e.g., bacteriology) and to advances in instrumentation. These developments eventually led to the creation of a Chair of Pathology and Bacteriology at the Manitoba Medical College. As a related development, a department of pathology and bacteriology was founded at the Winnipeg General Hospital becoming the site where the scientific-technological developments were applied to patient care. But the department did not contribute to the resolution of the sanitary conditions in the city because its activities were directed to in-hospital patients. Its

[96] Medical College, "Annual Announcement, 1902-03."
[97] Medical College, "Annual Announcement, 1914-15."

foundation related more primarily to the beginnings of the social transformation of the hospital and secondarily to the social and scientific aspiration of specialists. Since pathology is an institutionalized specialty, however, the department really served the interests of the hospital, which was transforming into a modern scientific center looking for the economic support of the middle class. This transformation responded to social changes created by rapid urbanization and industrialization that brought as a result transfer of patient care from home to hospital. It was this transformation that explains the initial expansion of the department. By 1915, the department not only had been converted into a well-established institution according to the philosophy of the Winnipeg General Hospital but also was the site where the specialty of pathology was evolving in Manitoba.

## Chapter III: Rise and collapse of support by the middle class: Pathology at the Winnipeg General Hospital (1916-1937)

The development of a specialty is a dynamic process. Several factors at different times play a role in the explanation of its history. Some of them are of short duration while others have a long lasting effect. Some are ignored and others receive unusual attention. In the history of pathology in Winnipeg, the appointment of William Boyd as Chairman of the Department of Pathology and Bacteriology in 1914 has received unusual attention as a result of the prominence that Boyd acquired in the North American pathology community years later. Unquestionably, the appointment had a lasting effect on the department. However, the emphasis of the local literature on Boyd's appointment has obscured the explanation of the reasons responsible for the development of the clinical specialty in this period; in particular the role played by the social transformation of the Winnipeg General Hospital and the related roles of surgery and collapse of economic support from the middle class has been largely ignored.

Boyd's appointment was, at best, an interesting event which local authors have addressed from the point of view of the Faculty of Medicine.[1] As will be demonstrated, the reaction to the appointment by the hospital's staff offers an ideological perspective that may play a role in the development of pathology in certain periods in the history of

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[1] Drumond H. Bowden, "Pathology 100: 1890-1990," *Manitoba Medicine* 60 (1990): 55-57; *Idem.*, "University of Manitoba, Department of Pathology: A Personal Perspective" (Manuscript, Department of Pathology, Faculty of Medicine, University of Manitoba, 1993); Ian Carr, *William Boyd: Silver Tongue and Golden Pen* (Ontario: Association Medical Services, Fitzhenry & Whiteside, 1993); Ian Carr & Robert Beamish, *Manitoba Medicine: A Brief History* (Winnipeg: Manitoba University Press, 1999); Ross Mitchell, *Medicine in Manitoba: The Story of its Beginnings* (Winnipeg: Manitoba Medical Association, 1954).

the specialty.[2] Rosai, for example, uses the origin of pathology to explain the distinct professional identities between medical academics and practitioners.[3] Professional conflicts generated between practitioner (hospital) and basic science scientist (university) have been present since the nineteenth century when teaching in the laboratory was introduced into the medical curriculum.[4]

Once the controversy over Boyd's appointment was over, the social transformation of the Winnipeg General Hospital continued as the leading force for the development of the specialty of pathology in the City for the next twenty-one years, not his appointment. With the support of the middle class, the hospital expanded its services as demonstrated by the 18 percent increment of patients treated in this period. Concomitantly, the department increased the tests performed in the same period by 23 percent. The hospital transformation, represented by a 55 percent increment in the

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[2] George Rosen, *The Specialization of Medicine: With Particular Reference to Ophthalmology* (New York: Froben Press, 1944). Rosen called the attention to the role of political conflict in favoring and/or hampering the development of specialization. He used as an example the German revolution of 1848 that favored the development of psychiatry, dermatology and pediatrics.

[3] Juan Rosai, ed., *Guiding the Surgeon's Hand: The History of American Surgical Pathology* (Washington: American Registry of Pathology, 1997), 3-4. Rosai argues that even since modern pathology arose in Germany in the second half of the nineteenth century as the science that studied the cause, mechanism and consequences of diseases, pathologists considered themselves as the bearers of scientific medicine. Their conceptualization consisted of considering pathology as a basic science discipline that only studies disease. In North America, however, surgical pathology arose in hospital departments of surgery outside of academic departments. In Rosai's opinion, this gap has molded the relationship between both disciplines because the American experience has generated another conceptualization of pathology that has been at the core of the frictions and misunderstandings between academics and practitioners. The latter consider pathology a clinical discipline that supports the practice of medicine.

[4] Thomas Neville Bonner, *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945* (Baltimore: Johns Hopkins University Press, 1995), 269-279. In North America, E. Long, an academic pathologist and a recognized medical historian, noted the dichotomy between "the academic or institutional full time men, on the one hand, whose teaching, research and administrative responsibilities steadily increased, and pathologists, [the practitioner] on the other hand, who met the dilemma of a divided interest in academic and service pathology, with a frank choice of the latter as a career....This dichotomy in the development of pathology as a basic medical discipline has been of great concern to many educators and pathologists....This school of pathologists [the practitioners] has come to consider the hospital rather than the classroom as the optimum medium (*sic*) for teaching pathology;" Esmond Long, *A History of American Pathology* (Springfield: Charles C. Thomas, 1962). The professional conflict is not unique to North America and is also described in the history of pathology in Great Britain, as illustrated in the origins of the Royal College of Pathologists; George J. Cunningham and G. Kemp McGowan, *The History of British Pathology* (Bristol: White Tree Books, 1992). This was an enterprise initiated by the practitioners, with time and time again, the literature referring to the lack of support on the part of scientists towards the creation of the College. It becomes clear in these publications that the lack of support was the result of fundamental conceptual differences. Basic science scientists considered the type of work done by practitioners as only routine examinations and considered their mission to be the advancement of knowledge and teaching.

number of surgical procedures, is an even better indicator of the quantitative and qualitative expansion of the department. Quantitatively, the surgical procedures demanded more biopsies and this is exactly what the data reflect. Surgical biopsies increased by 105 percent.[5] Qualitatively, this data also reflect the beginnings of a somewhat radical departure in the practice of the specialty from an emphasis on the autopsy to one based on the biopsy. This change substantially and permanently modified the practice of pathology.

Table 12. Patients treated, surgical operations, and laboratory tests at the Winnipeg General Hospital (1916-1940). (Data taken from Annual Reports of the hospital.)

| | Patients treated | Surgical procedures | Laboratory tests |
|---|---|---|---|
| 1916 | 12,500 | 5,512 | 26,898 |
| 1920 | 13,180 | 7,504 | 29,808 |
| 1924 | 12,408 | 6,464 | 26,464 |
| 1928 | 14,118 | 7,313 | 32,807 |
| 1932 | 14,814 | 7,271 | 43,728 |
| 1936 | 14,857 | 8,545 | 31,850 |
| 1940 | 15,414 | 8,746 | 35,028 |

The first part of the chapter deals with Boyd's appointment and its immediate consequences. Although an interlude in the history of the department, Boyd's appointment had an important lasting effect that cannot be ignored. It resulted in the

[5] Between 1916 and 1937, the number of patients treated at the hospital increased from 12,500 to 14,771 whereas the number of tests performed at the laboratories went from 26,898 to 33,122. Between 1916 and 1936 (not reported in 1937), the number of surgical operations increased from 5,512 to 8,545 (Table 12). Between 1916 and 1937 the number of surgical biopsies went from 1,778 to 3,640.

laboratories coming under the administrative control of the Medical College, a situation that lasted until 1954 and that impacted on the functioning of the hospital department. The second part of the chapter argues that one central reason for the expansion of the department was the continued social transformation of the Winnipeg General Hospital. As an outcome of the latter, an increment in surgical activities in turn impacted on the laboratories. These events were closely connected to the economic conditions of the hospital, in particular in the decade of the Depression.

**William Boyd's appointment: an interlude (1916-1918)**

Specialization is a political process that may move in a series of conflicts and compromises suited to particular times.[6] In Winnipeg, the conceptualization of pathology as a basic science and as a clinical discipline initiated a conflict that played a role in the local history of the specialty. As will be shown, this conflict was produced by the Flexner report in medical education, which demanded action by Harvey Havelock Chown, the Dean of the Manitoba Medical College.[7] The action consisted of the appointment of William Boyd as Professor of Pathology and Bacteriology at the University of Manitoba and as Director of the Laboratories of the Winnipeg General Hospital on September 11,

[6] Rosemary Stevens, *American Medicine and the Public Interest* (New Haven: Yale University Press, 1973), 32.
[7] Abraham Flexner, *Medical Education in the United States and Canada. A Report to the Carnegie Foundation for the Advancement of Teaching,* Bulletin Number Four (New York: The Foundation, 1910); Flexner set the standards for medical education in the U.S. and Canada. In so doing, he contributed to the introduction of laboratory medicine in the practice of medicine in North America; Bonner, *Becoming a Physician*, 298-306.

1914. Boyd later became the leading pathologist in English Canada.[8] The conflict between the view that the main responsibility of a pathologist is teaching and research with patient care as an ancillary activity, and the view that the main responsibility is patient care with teaching and research as only ancillary was clearly expressed in this appointment.[9] Understanding this conflict requires a consideration of the contextual educational demands that were evolving in those years.

The origin of such appointment can be understood in terms of the conditions of medical education in North America at the beginning of the twentieth century, which were exactly the same years of Chown's tenure as Dean of the Medical College (1900-1917). In the U.S., proprietary medical colleges had proliferated with negative consequences for the medical profession. There was an excessive production of poorly qualified, lower middle class physicians that threatened the limited market for patients.[10] To address the problem, in 1902, the American Medical Association appointed the "A.M.A. Council on Medical Education." Three years later the Council set the minimum standards for medical training: four years of high school for admission, a four-year medical course, and satisfactory performance in a state licensing examination. Based on

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[8] The history of Boyd's appointment and its consequences is amply documented in a lecture given by J. Hoogstraten; J. Hoogstraten, Untitled, paper presented at the Manitoba Medicine History Club, Winnipeg, May 1987, Archives, Individual Files, Neil John Maclean Health Sciences Library of the University of Manitoba. In it, he deplored the sources of his material as "fragmentary, incomplete and varied" due to the fact that a large portion of the College's archives were lost after a major flood in Winnipeg in 1950. My personal research confirmed that the records do not exist. Carr's *William Boyd* also deals with the same topic but, being Boyd's biography, it also expands on his life before arriving and after leaving Winnipeg. The works focus on Sidney J.S. Peirce as well. Both authors attempt to be fair in their narrative, but Carr, as Boyd's biographer, was sympathetic to him in this publication whereas Hoogstraten was not.

[9] Chown was responsible for the appointment. The suggestion in the literature that Boyd's appointment was only the result of a recommendation to the Dean by a friend of Boyd's, Alexander Gibson, is simplistic and does not fully explain the reason for the appointment.

[10] Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry* (New York: Basic Books, 1982), 116-117. In Winnipeg, the Manitoba Medical College, a proprietary school, was affiliated to the University of Manitoba and associated with the Winnipeg General Hospital since its inception.

medical school inspections in the U.S., the Council also categorized the institutions in class A, B and C. Simultaneously, "The Carnegie Foundation for the Advancement of Teaching" was organized in 1906. Both organizations joined forces, with Abraham Flexner of the Carnegie Foundation and Nathan P. Colwell of the American Medical Association further inspecting American and Canadian medical schools. The model for their report, published in 1910, was the Johns Hopkins educational model that included full-time staff, laboratories and hospital facilities.[11] It responded to a new concept of medicine following the German model, and was distinct from the French model of clinico-pathological correlation based on the autopsy. The new approach sought to introduce experimental medicine and the laboratory into every day practice in urban hospitals.[12] Medical education was considered a university function. As such, the Carnegie Foundation was ready to provide monetary subsidies for schools' infrastructure, for fostering relationships between medical schools and hospitals, and for establishing salaried full-time professorships.[13]

The impact of the Flexner report in the U.S. is very well known.[14] Flexner unveiled the discrepancy between the development of scientific knowledge and the lack of development of medical education. Although he has been blamed for the closure of many proprietary medical schools, in reality such closure was likely a result of economic exigencies set by the state licensing boards. But Flexner's *Bulletin Number Four* combined with that economic pressure favored the amalgamation of many of those

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[11] Flexner, *Medical Education*.
[12] The difficulties created by clinicians for introducing laboratory medicine into the medical curriculum in Europe and North America began in the nineteenth century and are extensively explained in Bonner, *Becoming a Physician*, 269-279, 298-306. This is another example of the different conceptualization of medicine by academics and clinicians.
[13] Stevens, *American Medicine,*, 63-69.
[14] *Ibid.*, 66-73.

schools with established universities.[15] From then on medical education became the teaching of specialties by specialists. And pathology was one of them.

The impact of the Flexner report in Canada was far less striking. Actually, the report on the Manitoba Medical College and the Winnipeg General Hospital was kind.[16] Flexner visited Winnipeg in May of 1909 and reported that the Medical College had 115 students and a teaching staff of 41. The only source of income for the College was student fees that amounted to $14,000 per year. When referring to pathology, he mentioned that the University of Manitoba competently gave instruction in this subject and that there was a well-kept collection of several hundred wet specimens. He called the Winnipeg General Hospital "excellent." The school faculty also served as medical staff on the hospital and the relationship between both institutions was "admirable." Students worked at the hospital's premises. He did not categorize the College as A, B or C (he actually never used this system), but grouped it with Kingston under the University of Toronto and McGill and rated it higher than the medical schools at Laval and Halifax.[17]

In spite of Flexner's comments, Chown had to have known the real conditions of the College in relation to the direction that medical education was taking in North America. He knew that he had to reinforce the teaching of basic sciences in order to promote teaching and basic research. Chown followed the general recommendations given by Flexner in his report and took the initiative of creating basic science departments within the Medical College directed by full time university professors. The decision was understandable and the decisive action not totally unexpected for an

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[15] *Ibid.*
[16] Marianne P. Fedunkiw, *Rockefeller Foundation and Medical Education in Toronto, Montreal, and Halifax* (Montreal & Kingston: McGill-Queen's University Press, 2005), 8, 41; Flexner, *Medical Education*, 320.
[17] *Ibid.*, 325.

individual with a somewhat authoritarian personality as described by his son.[18] An additional factor that motivated Chown was the fact that in 1913 the American Medical Association had rated the College Class B in part due to inadequate physical facilities and few full-time professors.[19]

A notification in the Manitoba Medical College announcement for the 1914-1915 session announced Chown's decision and heralded the beginning of William Boyd's tenure. It reads, "The University has decided to appoint a Professor of Pathology, who will devote his whole time to this department. As the various hospitals furnish abundant material for the study of Pathology, this will give every opportunity for research as well as for didactic work."[20] According to Hoogstraten and Carr, this decision was made in a Faculty meeting in May of 1913.[21] The notification brought attention to the fact that the General Hospital was not only the focus for the decision, but also that the future Professor would control the pathological material generated in all Winnipeg hospitals for purpose of research and teaching. In practice, the Winnipeg General Hospital became the only institution in the City coming under such proposed control.

Evidently Peirce, the director of the General Hospital's laboratories, did not fit into Chown's plan for the Medical College's Professor of Pathology. As an Edinburgh trained surgeon and a citizen of the Empire, Dean Chown looked to Great Britain for recruits. He already had appointed R.J. Evatt, a graduate from Durham, England, as full-time Professor of Anatomy in 1909, the year of Flexner's visit. Alexander Gibson, a

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[18] Bruce Chown, "The Story of the Medical College," *University of Manitoba Medical Journal* 5 (1933): 28-34.
[19] Faculty of Medicine, The University of Manitoba, *Centennial Program*, 1983, 45.
[20] The University of Manitoba, "Manitoba Medical College Annual Announcement, 1914, 1915."
[21] The first of the relevant Faculty minutes is given by both Hoogstraten's and Carr's publications and reads, "moved by Dr. Popham and seconded by Dr. Webster, that the Registrar be instructed to write the University requesting that a Professor of Pathology be appointed at the earliest possible date, said Professor to be paid by the University;" Hoogstraten, Untitled, 3; Carr, *William Boyd*, 77.

graduate from Edinburgh, replaced Evatt in 1913.[22] The next recruit was William Boyd.[23] On June 9, 1914, Gibson, a classmate and close friend of Boyd who had arrived in Winnipeg six months earlier, wrote to Boyd inviting and encouraging him to apply for the Professorship of Pathology.[24] Two months later, on August 18, Dean Chown reported to the Faculty about the negotiations, and on September 11, 1914, he announced that the university had appointed William Boyd Professor of Pathology and Bacteriology. Boyd arrived in Winnipeg a year later on November 1915.[25]

Negative reactions to Boyd's appointment were not unexpected. Immediately before Boyd's arrival, Peirce presented his resignation as Lecturer in Pathology at the Faculty meeting on October 8, 1915. There is no information about his resignation at the hospital. Peirce was the recognized pathologist not only at the General Hospital but also in the Province. It is safe to conclude that the resignation was the result of his frustrations by not being appointed Professor. Responding to his resignation, the Faculty Council appointed a committee to consult with Peirce and the hospital's administration about the work and the pathological material at the hospital, but not deal with the issue of his

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[22] *Centennial Program*, 35-36. One can only speculate that by the time of Flexner's visit the idea to recruit full time faculty was already popular following the German model of medical education and as demonstrated by Evatt's appointment; Bonner, *Becoming a Physician*, 232-235.

[23] For anyone interested in Boyd, Carr, *William Boyd* contains robust research on his personal and professional life including publications by and about him.

[24] The partial text of a letter addressed to Boyd by his friend Gibson and taken from Hoogstraten's presentation (p. 3) and Carr's book (p. 28) said, "My dear Will, I received your welcome letter about two weeks ago, and now hasten to reply to it. First of all, the Dean came to me yesterday, and asked if I knew anyone who would do the post of first Professor of Pathology, in this University. I said I did, and ask the terms. Subjects to be taught – Pathology and Histology. Remuneration: Pathology $3,000; Histology $1,000 – Total $4,000. Put that under your tongue. The authorities are writing to Osler at Oxford and Sims Woodhead at Cambridge, but I could help a whole lot here, I think..." In those years, the average annual salary for an operating room head nurse was $600 and a medical superintendent could expect a salary of $1,000; David Gagan and Rosemary Gagan, *For Patients of Moderate Means: A Social History of the Voluntary Public General Hospital in Canada, 1890-1950* (Montreal: McGill-Queen's University Press, 2002), 55.

[25] Carr, *William Boyd*, 72.

resignation. However, Peirce withdrew his resignation and continued working at the hospital and at the College.[26]

The outcome of Boyd's appointment also held consequences for the Dean. Chown resigned the deanship in November 1915 but, like Peirce one month before him, was convinced to withdraw his resignation one month later.[27] There is no record of the reasons for this sudden and unexpected action, yet it is not difficult to conclude that it was related to Boyd's appointment. The negative reaction by the medical staff of the hospital, of which Chown was a member as a successful surgeon, was the most likely explanation. Peirce was also a member of the staff and worked closely with clinicians of all specialties as a consultant. This conclusion about the Dean's resignation is further supported by events in the following years, where Peirce's daily autopsy presentations were well attended with the same not being true of Boyd's. At the beginning of his tenure Boyd's autopsies were attended by no one except occasionally by Chown. Peirce was clearly a sympathetic figure in the hospital representing a different conceptualization for the practice of medicine.

The plan for re-structuring teaching and research in pathology continued to be implemented by Dean Chown and the authorities of the College. In January 1916, a committee was appointed constituted by Chown, Boyd and Prowse (the future Dean of Medicine) to integrate the department of pathology of the General Hospital with that of

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[26] Hoogstraten, Untitled; 5; Carr, *William Boyd*, 78.

[27] The minutes of the Faculty Council from November 11, 1915, as reported by Hoogstraten, (p. 5) read, "The Dean explained that he had resigned his connection with the Winnipeg General Hospital, thus leaving him without a position on the Faculty, and stated that under such conditions he could no longer be a member of the Faculty nor Dean of the College. On Motion of Drs. Halpenny and Prowse, a committee consisting of Dr.Harvey Smith, Dr. Popham and Dr. McKenty was appointed to look into this matter and suggest some re-arrangement of subjects by which the Dean's position on the Faculty would not be compromised, and to report at a subsequent meeting." One month later, in the Faculty Council meeting on December 10, 1915, (p. 5) it was reported that, "The committee appointed to look after the question of the resignation of the Dean reported that Dr. Chown's resignation from the Hospital had been withdrawn, and consequently the Medical College work would go on as usual."

the College under the control of the Professor of Pathology.[28] In another meeting of the Faculty Council on February 11 a motion reinforcing the same issue was introduced.[29] The motion also recognized that before Boyd's arrival the departments of pathology in both institutions were separate entities. Their amalgamation would have an impact on the future of the department at the General Hospital. A Memo attached to the Faculty Council minutes and dated March 10, 1916, stated that both departments would be amalgamated under the authority of the Professor of Pathology (i.e., Boyd) and the new responsibilities of the hospital and the College were clearly spelled out.[30] In essence, the memo can be interpreted as the hospital department becoming "the little brother" of the university department at the medical school.

The existing historiography says little about the internal circumstances experienced in the department following Boyd's appointment.[31] In the first three years of Boyd's tenure the department of pathology, now constituted by the hospital laboratories

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[28] On January 26, 1916, another minute from the Faculty Council is transcribed by Hoogstraten (p. 5) and reads: "Moved by Dr. McCalman, seconded by Dr. Davidson, and carried, that a committee consisting of Doctors Chown, Prowse and Boyd be appointed to look into the whole matter of the *taking over of the Pathological Department of the Hospital by the Medical College* and to report to the Faculty." Italics are mine.

[29] The motion read, "that the report of the committee on amalgamation of the Departments of Pathology of the Hospital and the College be adopted, and that the Committee be authorized to proceed further and complete negotiations;" Hoogstraten, Untitled, 6.

[30] Given that this Memo, collected by Hoogstraten, gives a clear picture of the intentions of Chown and the Faculty authorities about the future of the department at the General Hospital, it is transcribed in almost its entirety: "The following MEMO regarding the Pathological Department, is recorded in the Minutes of the Faculty Council Dated March 10, 1916. MEMO regarding Pathological Department. March 10, 1916. The pathological work of the Hospital and the College to be united under one head and the work to be carried on in the College. A. (1) The College to furnish all necessary rooms and equipment (except as mentioned below - (B.1) (2) The College to control all appointments (except in case of B3) and to provide all assistants to carry out the work promptly and efficiently. (3) That the Professor of Pathology shall be the active head of the work and be accountable for the proper prosecution and supervision of the work in the Hospital and College. B. (1) That the Hospital transfer to the College building their present equipment, the ownership to remain in the Hospital and the equipment to be returned in good order at the termination of this agreement. (2) That such portions of the work as can be more advantageously performed in the Hospital shall be carried out there by Internes under the direction of the Professor of Pathology. (3) That the Medical Superintendent, Senior Physician of the Hospital, and Professor of Pathology be a committee to decide what portion of the work shall be performed in the Hospital by the Internes; (4) That the Hospital furnish [*sic*] two interns to work in the Pathological Department. (5) That the Hospital pays the College the sum of $6,500.00 per annum, with an annual adjustment if necessary. (6) That this agreement be for the term of five years;" *Ibid.*, 6.

[31] External events are much better dealt with, such as World War I and the influenza epidemic of 1918.

and the department at the College, became consolidated. It was during this period that the Manitoba Medical College was transformed into the Faculty of Medicine of the University of Manitoba.[32] In the hospital's annual reports, Boyd was listed as "Pathologist" and "Director of Laboratories."[33]As part of the support given by the hospital administration, the department was moved to new facilities, new equipment was added and the budget continued with annual increments as in Peirce's times.[34] It is curious to find that in the 1917 annual report, in the same paragraph in which he praises the use of the laboratory facilities for teaching by Peirce and the need for a close collaboration between the hospital and the College, Boyd added, "when the normal conditions of peace again prevail it is intended to develop this aspect of the work."[35]

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[32] The Manitoba Medical College had been affiliated to the University since 1883 acting as the degree-granting body; J.M. Bumsted, *The University of Manitoba: An Illustrated History* (Winnipeg: The University of Manitoba Press, 2001). The change was an aspiration of the faculty and became possible when the Provincial Government passed "The University of Manitoba Amendment Act" in 1917; *Centennial Program,* 42. A local movement had started around 1900 with the objective to transform the University of Manitoba from a federation of art and theology colleges to an institution that could give instruction in sciences. It was a debate between "traditionalists" and "modernists;" *Ibid.*, 35. The debate was not only a local one, and reflected the conflict in North America between those who believed that education was a matter of moral and mental discipline (the traditionalists) and those who believed that education was a vehicle to adapt students to the expanding economy. The latter was utilitarian and already expressed the North American culture as has evolved in the twentieth century. Medical education epitomized the debate. In 1917 the Provincial Government took full financial responsibility for the university and Chown resigned as Dean and as Chief Surgeon of the Winnipeg General Hospital to become member of the new Board of Governors of the University. The Medical College transformed into the Faculty of Medicine in 1919; Bumsted, *University of Manitoba*, 41, 46.

[33] In October of 1916, A.J. Long left for the U.S. to be in charge of a branch laboratory of the State Board of Health at Mankato, Minnesota; Hoogstraten, Untitled, 7.

[34] In reality, the construction had started in 1908 during Peirce's tenure. The department moved to its new location in March of 1917. The building was formerly the nurses' residence of the isolation wing of the hospital, alongside McDermot Ave. It had three floors. Surgical pathology and Boyd's office were located in the first floor. Histology, bacteriology and urinalysis occupied one half of the second floor. The other half was to be converted into the biochemistry laboratory in 1918. Half of the third floor was the sleeping quarters of the Chinese cooks while the other half was empty; *Ibid.*, 7-8. The new accommodations also incorporated the autopsy room and were at that moment connected to the main building of the hospital by a recently constructed tunnel; Winnipeg General Hospital, "Annual Report, 1917." Compare Tables 10 and 13.

[35] Winnipeg General Hospital, Department of Pathology, "Annual Report, 1917," 44.

Table 13. Budget of the Hospital Department of Pathology in dollars (1916-1918). (Data taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | 1916 | 1917 | 1918 |
|---|---|---|---|
| Salaries | 5,396.61 | 5,824.61 | 5,949.92 |
| Supplies | 266.03 | 398.18 | 474.90 |
| Total | 5,662.31 | 6,222.79 | 6,424.82 |
| | | | |
| Revenues | 2,192.85 | 1,846.90 | 4,129.00 |

What became of Peirce during this period? He appeared in the annual report of the hospital in 1916 but in the next two years his name did not show up again. He was only mentioned in the corresponding reports of the department written by Boyd and in the annual announcements of the College.[36] Peirce's activities, as described by Boyd, were focused in the areas of clinical pathology and teaching. He stopped doing autopsies, except during Boyd's absences; did some clinical research; and taught clinical pathology to medical students at the hospital. Peirce was promoted from Lecturer to Associate Professor at the College. It may be that Boyd's intentions were to assign clinical pathology to Peirce while keeping anatomical pathology for himself.

Peirce left for Brandon, Manitoba, at the beginning of 1918 perhaps with

[36] Teaching pathology to the undergraduate students was expanded by increasing hours of instruction and by separately identifying the teaching of clinical pathology. This distribution followed the Hopkins' model but, curiously, also followed the Edinburgh curriculum; Carr, *William Boyd*, 29. Pathology and histology were also segregated from bacteriology. Pathology was divided into general pathology and special (anatomical) pathology.

bitterness.[37] When he left, there was no one who could teach clinical pathology to medical students. Nonetheless, Peirce left a legacy that cannot be ignored. Two of his contributions are worthy of mention. One was the consolidation of the laboratories as a significant institution at the hospital at the time of Boyd's arrival. The other was his effort to collect and preserve the anatomical specimens that enabled Boyd to expand and create the College's pathology museum, one of Boyd legacies to pathology.[38] Boyd himself recognized Peirce's contributions when, in the departmental annual report of 1918, he wrote, "It is unnecessary to remark that the development of the Laboratory from its very beginning, and of the Pathological work of the Hospital generally, is entirely due to Dr. Peirce's energy and scientific attainments."[39]

With Peirce gone, Boyd was now free to enable his plans for the department. The relationship between the Winnipeg General Hospital and the Faculty of Medicine was harmonious, and there was an emphasis on stressing this working relationship. Repeatedly in the hospital's annual reports, the Medical Superintendent G.F. Stephens, stated that despite the fact that no formal agreement existed, the situation was almost

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[37] W.A. Bigelow, director of the Bigelow Clinic, a surgical clinic established in Brandon, Manitoba, dictated his memoirs when he was 85 years old. The book was published after his death by his family; Wilfred A. Bigelow, *Forceps, Fin and Feather* (Altona, Manitoba: Friesen & Sons, 1969), 15-16. He remembered that, "By the Fall of 1917, we felt we had made progress, but we still did not have a clinic in the true sense of the word. We were in need of another leg, a combined biochemist and pathologist. We talked this over, and fortunately there came along the opportunity we were looking for. A drug traveler visited my office and told me that Dr. S. J. Peirce was considering resigning from the University of Manitoba…About 20 minutes after a hurried consultation with my associate, Dr. Sharpe and I boarded a train for Winnipeg to see Dr. Peirce. He was also a colleague mate of ours. To make the story short, I said, "Sid, we want you to bring your wife and come to Brandon and see what we are doing. If it is not what Dr. Sharpe and I represent, we will pay your way back to Winnipeg. We have come here to ask you to join us and make our clinic complete. We will double your present pay." He and his wife said, "We will go." They looked us over, decided to join our organization, and went back to Winnipeg to clear up their affairs. They very soon moved to Brandon and joined our clinic, taking over all the laboratory work…" Peirce resigned from the hospital and the College on March 1918.

[38] In the College's announcement of 1917-1918, information on an anatomical and pathological museum under the direction of Professors Gibson and Boyd appeared for the first time; Faculty of Medicine, "Annual Announcement, 1917-1918." It indicated that there was already a museum in existence (the one developed by Peirce) and that it had been re-organized. Specimens were now systematically grouped and carefully classified and identified.

[39] Department of Pathology, "Annual Report, 1918," 49.

unique since "there has not been a point of friction that has not been readily adjusted without reference to higher authority."[40] The hospital administration stressed that these harmonious relations were possible because the hospital protected the patient's interests, and because it was a matter of education. Representatives of the University of Manitoba on the Board of Directors of the hospital included Professors, the Dean of the Faculty of Medicine and the President of the University.[41]

Did Dean Chown make the right decision by selecting Boyd, an external candidate, instead of Peirce? It can be concluded that Chown's essential reason was related to the Flexner report. Recall that the report itself had been kind to the Medical College and to the Winnipeg General Hospital. But, by calling attention to the conditions of medical education in North America, Chown knew that, in reality, the Manitoba Medical College was not an exception to Flexner's criticisms. The College lacked strong basic sciences under the direction of full-time professors, one of the main demands of the new conceptualization of medical education introduced by Flexner. The other events emphasized in the historiography are likely incidental. Chown's background as a surgeon trained in Edinburgh made him looks there for a candidate. The other was the direct influence of the anatomist Gibson who originally referred Boyd. Although Gibson had been in the faculty only for six months, the Dean was evidently looking for suggestions, and he could not ignore the advice. Judging by the results of the conflict, we must conclude that Chown's decision was only partially correct. Boyd became the leader of English pathology in Canada and brought fame to the Medical School and, indirectly,

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[40] "Annual Report, 1925, 1926." The negotiating power of hospital superintendents is well explained in Rosenberg, *Care of Strangers,* 278-282.
[41] "Annual Report, 1916."

to the hospital laboratories. However, he only implemented the teaching component of Chown's vision, and his contribution to research was very limited.[42] The latter was perhaps not Boyd's flaw alone. Basic research was not in the agenda in Winnipeg and most university hospitals in those years.[43]

**The practice of the specialty, the continued transformation of the hospital, and the role of surgery (1916-1937)**

Boyd's future successes as a writer and speaker may explain the evolution of teaching at the university branch of the department but they do not explain the development of pathology as a clinical discipline at the Winnipeg General Hospital. The internal conditions at the hospital provide a more satisfactory explanation. For instance, World War I directly influenced the conditions at the hospital between 1916 and 1918. Thirty-six percent of Manitoba physicians and 50 percent of medical students went to the battlefield in Europe.[44] The shortage of human resources affected the number of appointments to the medical staff; their number decreased by 13 percent. The Provincial Government's contributions to the hospital-operating budget also decreased by 55 percent.[45] In consequence, the General Hospital transformation was also impacted.

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[42] Carr and Beamish made the following comment about Boyd's professional activities: "Boyd had invested much time and ability in building up his own reputation while leaning considerably on others and had spent less time in cultivating research than in teaching;" Carr & Beamish, *Manitoba Medicine*, 167.
[43] Bowden, "Pathology 100."
[44] According to Carr and Beamish, 36 percent represented 219 physicians and 50 percent correspond to 66 students. These authors expand on the contribution of Manitoba to the war effort; Carr and Beamish, *Manitoba Medicine*, 75-77.
[45] The numbers of the medical staff decreased from 114 in 1916 to 101 in 1918 (Table 14). A rise in the numbers of the medical staff in 1916 was due to the appointment of more interns and more physicians to the Outdoor (Emergency Room) department (Fig. 4). The contributions by the Provincial Government decreased from $34,559.50 to $22,204.50 (Table 15) (Fig. 5).

Table 14. Number and kind of appointments of Medical Staff at the Winnipeg General Hospital from 1916 to 1918. (Data taken from Annual Reports of the Winnipeg General Hospital.)

| | 1916 | 1917 | 1918 | | 1916 | 1917 | 1918 |
|---|---|---|---|---|---|---|---|
| Consulting | 7 | 6 | 7 | X-Ray | 2 | 2 | 2 |
| General Medicine | 11 | 22 | 29 | Pathology | 2 | 1 | 1 |
| Surgery | 9 | 14 | 15 | Outdoor Department | 32 | - | - |
| Gynecology | 4 | 4 | 4 | Interns | 31 | 16 | 14 |
| Ophthalmology | 3 | 3 | 3 | Residents | 3 | 2 | - |
| E.N.T | 3 | 3 | 5 | Dentist | 1 | - | - |
| Pediatrics | 1 | 2 | 3 | Tuberculosis | - | 5 | 5 |
| Orthopedics | 3 | 4 | 4 | Dermatologists | - | 2 | 2 |
| Obstetrics | 2 | 2 | 2 | Genitourinary | - | 1 | 1 |
| Anesthesia | 1 | 1 | 3 | Psychopathic | - | - | 1 |
| | | | | | | | |
| | | | | | | | |
| | | | | Total | 114 | 90 | 101 |

Figure 4 Number of specialists, including residents and interns, appointed to the Winnipeg General Hospital from 1916 to 1938.

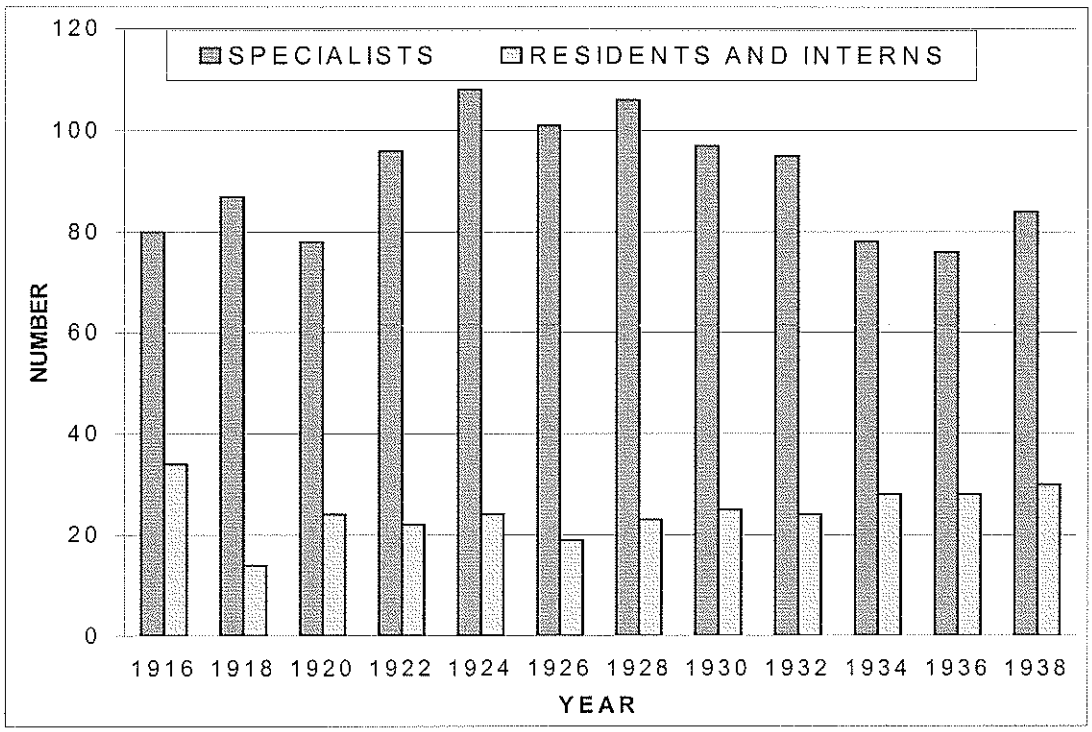
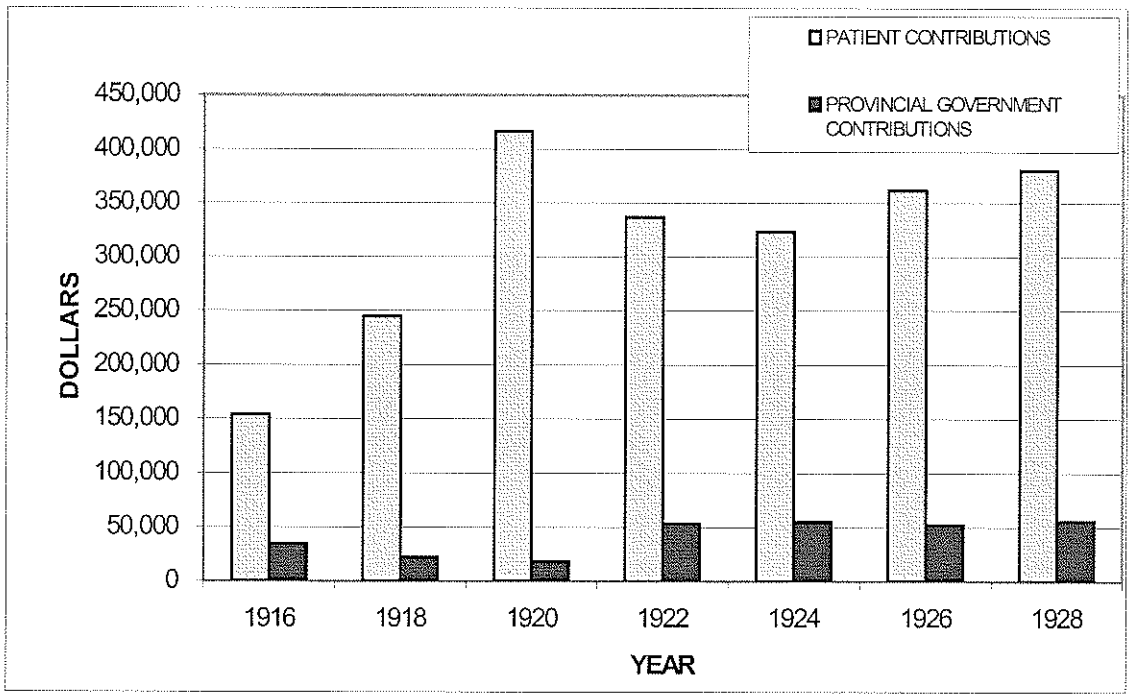


Table 15. Ward earnings, provincial government contributions, total hospital expenses and the percentage of ward earnings over the budget of the Winnipeg General Hospital (1916-1937). (Data taken from Annual Reports of the Winnipeg General Hospital and detailed in dollars.)

| | Ward earnings | Provincial government | Hospital budget | % |
|---|---|---|---|---|
| 1916 | 154,123.00 | 34,559.50 | 396,030.05 | 39 |
| 1917 | 199,594.50 | 30,478.50 | 476,507.00 | 42 |
| 1918 | 244,955.20 | 22,204.50 | 505,349.93 | 48 |
| 1919 | 290,701.65 | 16,809.25 | 500,820.77 | 58 |
| 1920 | 417,017.33 | 18,149.50 | 719,956.19 | 58 |
| 1921 | 362,567.32 | 44,136.00 | 705,879.86 | 51 |
| 1922 | 337,061.00 | 53,544.50 | 652,619.36 | 52 |
| 1923 | 258,856.50 | 43,383.00 | 536,458.09 | 48 |
| 1924 | 323,550.09 | 55,124.50 | 718,405.23 | 45 |
| 1925 | 334,604.25 | 57,184.00 | 656,208.20 | 51 |
| 1926 | 362,252.80 | 52,381.00 | 718,045.56 | 50 |
| 1927 | 388,709.25 | 53,455.50 | 751,002.69 | 52 |
| 1928 | 380,756.97 | 55,870.50 | 761,886.49 | 50 |
| 1929 | 410,117.85 | 57,969.00 | 796,625.54 | 51 |
| 1930 | 338,110.25 | 60,744.50 | 815,491.01 | 41 |
| 1931 | 310,988.80 | 65,500.50 | 740,284.71 | 42 |
| 1932 | 248,293.98 | 68,195.00 | 674,425.23 | 37 |
| 1933 | 153,294.55 | 58,732.00 | 590,583.98 | 26 |
| 1934 | 165,183.65 | 50,235.80 | 584,324.87 | 28 |
| 1935 | 183,994.47 | 60,069.80 | 643,453.01 | 29 |
| 1936 | 179,679.66 | 222,834.71 | 672,484.30 | 27 |
| 1937 | 191,466.08 | 58,792.00 | 675,915.11 | 28 |

Figure 5 Patient and provincial government contributions in dollars to the operating budget of the Winnipeg General Hospital (1916-1928). (Data taken from the Annual Reports of the hospital.)




The number of patients treated in this period increased only slightly and there was an increment of 1.27 percent in the number of deaths in 1918, most likely due to the influenza epidemic. Nevertheless, the number of surgical procedures increased by 25 percent which, consequently, demanded more pathology services. There was also inclusion of new specialties in 1917 and 1918 when dermatologists, urologists and psychiatrists were added to the list of the hospital's specialties.[46]

[46] The number of patients treated increased by only 535 but the number of deaths reached a percentage of 4.3 in 1918 compared to 3.03 percent the previous year representing a difference of 125 deaths. Surgical procedures rose by more than 1,000 from 5,512 in 1916 to 6,866 in 1918 (Table 16) (Fig. 4).

Table 16. Winnipeg General Hospital statistics for the years 1916-1918. (Data taken from Annual Reports of the Winnipeg General Hospital.)

| | No. Pts. Tx | No. deaths | % deaths | No. Surg. Op. | Beds |
|---|---|---|---|---|---|
| 1916 | 12,500 | 436 | 3.45 | 5512 | 600 |
| 1917 | 13,151 | 438 | 3.03 | 7198 | 600 |
| 1918 | 13,035 | 561 | 4.30 | 6866 | - |

The conditions at the hospital were reflected in the department. The number of tests performed at the laboratories increased only by about 14% from 1916 to 1918. Bacteriology was the area that performed the most tests and the one responsible for the increment.[47] There was no biochemistry section yet that could contribute significantly to the workload of the department.[48] The number of tissue biopsies stayed constant at around 1,850 per year but the number of autopsies decreased by almost half (56 percent).[49] The latter more likely reflected the internal conditions of the hospital department, mainly Long's departure to the U.S., Pierce's displacement to clinical

[47] The war effort brought an increment of work in this section in 1917. Wasermann's reaction for investigating syphilis was partly responsible. The section also contributed to combat the influenza epidemic by producing a vaccine in cooperation with the Provincial Board of Health; "Annual Report 1917, 1918."

[48] The section of biochemistry began in a small room assigned by Peirce in 1908 to perform simple chemical tests in body fluids; Department of Pathology, "Annual Report, 1909," 84. In 1918, Boyd reported that, "for the first time, investigations on the chemistry of the blood had been seriously taken by the laboratory. In 1920, Professor A. T. Cameron was appointed Associate Biochemist to the hospital; "Annual Report, 1920." Under his direction, the section performed more and more blood chemistry tests such as in 1929 it became a new department under Cameron; "Annual Report, 1929."

[49] Fourteen percent represents 3,653 from 26,898 in 1916 to 30,551 in 1918; 56 percent corresponds to 22 autopsies from 39 in 1916 to 17 in 1918.

pathology, and the subsequent failure to replace them.[50]

After the war, expansion of the department and its role in the hospital's evolution demanded, not only replacement but also an increment in personnel. The hospital and the department administrations were concerned about the high turnover of young physicians who came to pathology only to leave later for another specialty.[51] This was a common trend during this era since pathology offered, and still does, a basic knowledge useful to understand disease, thus becoming a fundamental discipline for practicing any specialty. In response to this problem, they directed their energies to recruiting candidates who wanted to become pathologists. This action was further supported by salary increases.[52] Pathology was not a popular profession. It had (and has) an image problem that made it less attractive to young doctors. Pathology is a salaried profession and pathologists are not in direct contact with patients, making the field less attractive to recent graduates who preferred to specialize in clinical medicine for income and prestige reasons.[53]

The first recruit was Daniel Nicholson, who replaced Peirce in May of 1919 and was initially appointed "Assistant Pathologist."[54] Nicholson would replace Boyd years

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[50] W. Boyd performed his first autopsy at the Winnipeg General Hospital on June 17, 1916, at 11:30 a.m. It was a case of "acute lobar pneumonia." He did a good gross description and a microscopic examination of the lung and the right kidney only as was the routine in those days. Pierce was present. Neither summary of clinical history nor clinico-pathological correlation was done. In 1918 Boyd began introducing physio-pathological explanations of anatomical findings. In 1924 he started making more comprehensive anatomical descriptions, introducing a list of anatomical diagnoses, doing clinico-pathological correlations and using photographs to illustrate findings, as it is the practice today. When Boyd was in need of consultation regarding a difficult case, usually tumors, he sent it to Ewing at Memorial Hospital in New York, or to the Massachusetts General Hospital in Boston.

[51] In 1918, Dr. Fred Orok was appointed "Assistant Pathologist" to replace Peirce, but he died of influenza the month of his appointment. At the beginning of 1919, his position was still unfilled. See also "Annual Report, 1927, 1928."

[52] This action was taken later in 1928 and 1929.

[53] Rosenberg, *Care of Strangers*, 182; Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: The Johns Hopkins University Press, 1995), 184.

[54] See biographical appendices. "Annual Report, 1919." This appointment was equivalent to today's "Resident" and was a hospital, not a university position; Hoogstraten, Untitled, 9. However, Nicholson resigned in June 1920 to take the post of "Lecturer" in pathology at the Faculty of Medicine.

later. Interestingly, his interest was clinical pathology, the same area that Boyd had apparently assigned to Peirce. In 1919, positions in medicine were difficult to find in Winnipeg since many physicians who fought in World War I were now returning, and incorporating themselves back into civilian life. The hospital staff was even reorganized to give opportunity to the newcomers. This included twenty-six new appointments.[55]

The second recruit was Sara Meltzer, the first female pathologist in the Province of Manitoba who was appointed in 1926.[56] She was locally trained and played an important role in the development of the department, leaving a strong impact during the subsequent fifteen years. As a pathologist, Meltzer carried out the service load of the department for most or all of those years, indicating the small amount of time Boyd dedicated to patient care. The extent and detail of her autopsies is a testimony to her scientific capacity.

These appointments were necessary because the expansion of surgical procedures at the Winnipeg General Hospital demanded a concomitant expansion of pathology services, in particular surgical pathology. The demand was not unexpected since surgery

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[55] "Annual Report, 1919, 1920."

[56] See biographical appendices. Women in North America generally had limited or no access to medical education before World War I; Lauder Brunton, "Some Women in Medicine," *Canadian Medical Association Journal* 146 (1992): 955-961; C.M. Godfrey, "The Origins of Medical Education of Women in Ontario," *Medical History* 17 (1973): 89-94; Starr, *Social Transformation of American Medicine,* 117, 124. Yet the war created a need for physicians that was satisfied by women, notwithstanding women's struggle for equal rights. Medical coeducation was strongly opposed; Godfrey, "Origins of Medical Education;" Starr, *Social Transformation of American Medicine,* 339. The difficulties encountered in the admission of women into medical schools were consequently reflected in post-graduate education. Slowly, however, hospitals began accepting women as interns; Margaret Nitychoruk and Lindsay Nicolle, "A Brief History of Women in Medicine in Manitoba," *Prairie Medical Journal* 64 (1994): 6-10; Starr, *Social Transformation of American Medicine.,* 340.

and the medical specialties, but particularly surgery, became the key to hospital growth and status in the 1920s.[57] Between 1916 and 1938, surgical procedures increased by 65 percent while the number of surgical biopsies increased by 94 percent. Although hospital activities measured by the number of patients treated grew in a proportion of 13 percent in the same period of twenty-two years, the number of surgical procedures and biopsies far outstripped this rate of patient growth.[58] In effect, it was the expansion of surgery within the context of the hospital transformation that specifically determined the activities of the hospital department.

Surgery had expanded since the introduction of anesthesia, asepsis, and anti-sepsis in the previous century.[59] Risse explains the impact of such expansion on the hospital transformation, "Public expectations about the hospital's healing capacities had already been changing, especially the promise of surgical success based on antiseptic and aseptic methods. New skill and abilities to penetrate body cavities such as the chest and abdomen vastly increased the scope of surgical interventions. Appendectomies, removal of tonsils and adenoids, and, later, caesarean sections constituted a sizable percentage of admissions."[60] Consequently, surgery played an important role in generating revenues for

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[57] Charles E. Rosenberg, *The Care of Strangers: The Rise of American Hospital System* (Baltimore: The Johns Hopkins University Press, 1987), 343. In 1918 the American College of Surgeons introduced minimum standards for hospitals in order to improve surgical practice. The Canadian Medical Association endorsed those standards in 1921; Gagan and Gagan, *Patients of Moderate Means*, 62-65; James R. Wright Jr., "The Development of the Frozen Section Technique, the Evolution of Surgical Biopsy, and the Origins of Surgical Pathology," *Bulletin of the History of Medicine* 59 (1985): 295-326. See also Fig. 4.

[58] The increment in surgical procedures was steady. They rose by around 2,000 from 5,512 in 1916 to 7,504 in 1920. Between 1920 and 1932 the number of surgical operations was kept constant, but by 1938 they had increased by another 1,847 to 9,118. The expansion of laboratory services followed the same trend (Fig. 6). Concomitantly, the number of surgical biopsies, increased from 1,778 in 1916 to 2,029 in 1919. By 1932 their number was 2,663, and by 1938 it was 3,445 (Table 17). The number of patients treated at the hospital per year between 1916 and 1938 went from 12,500 to 14,166 (Table 12, 18) (Fig. 6).

[59] Bigelow, *Forceps, Fin & Feather,* 18-33; N.T. McPhedran, "The Development of Surgery in Western Canada," *Prairie Medical Journal* 67 (1997): 55-59; give an account of the practice of surgery in rural Manitoba outside the hospital in those years.

[60] Guenter B. Risse, *Mending Bodies, Saving Souls: A History of Hospitals* (New York: Oxford University Press, 1999), 469.

Figure 6 Number of patients treated, surgical procedures and laboratory tests at the Winnipeg General Hospital in the period 1016-1936. (Data taken from the Annual Reports of the hospital.)

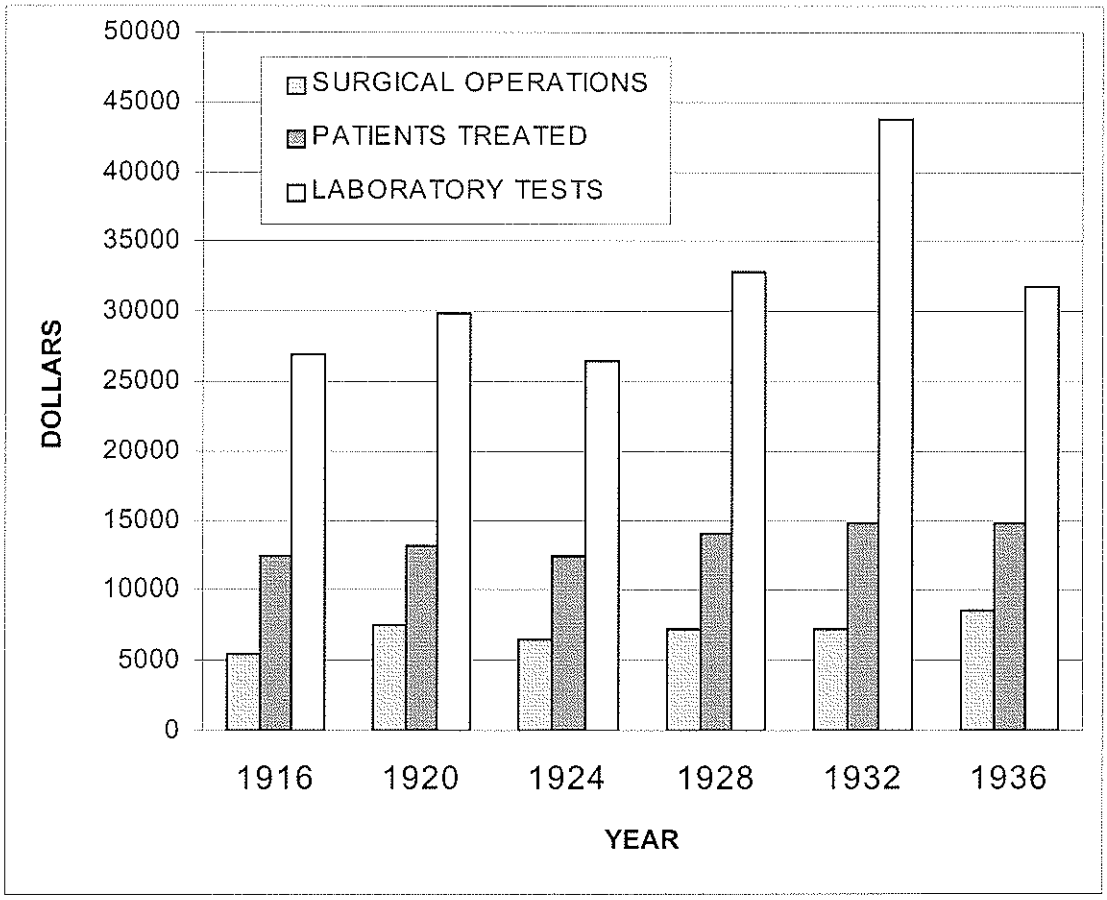

Table 17. Pathologist (Boyd) annual reports (1926-1937). (Taken from Annual Reports of the Department of Pathology of the Winnipeg General Hospital.

| | Bacter | Biops | Autops | Hemato | Bioche | Miscel | Total |
|---|---|---|---|---|---|---|---|
| 1926 | 22,811 | 2,278 | 132 | 1,111 | 3,571 | 658 | 30,561 |
| 1927 | 25,961 | 2,411 | 128 | 1,116 | 4,128 | 623 | 34,407 |
| 1928 | 24,723 | 2,239 | 140 | 1,123 | 3,782 | 710 | 32,807 |
| 1929 | 26,381 | 2,579 | 163 | 988 | 4,535 | 757 | 35,403 |
| 1930 | 24,563 | 2,451 | 177 | 1,192 | 6,596 | 763 | 35,742 |
| 1931 | 27,160 | 2,443 | 189 | 1,289 | 6,289 | 1,215 | 38,585 |
| 1932 | 32,908 | 2,663 | 273 | 1,309 | - | 1,133 | 43,728 |
| 1933 | 22,425 | 2,623 | 266 | 1,504 | - | 728 | 27,546 |
| 1934 | 20,266 | 3,124 | 246 | 2,182 | - | 1,135 | 26,953 |
| 1935 | 24,374 | 3,482 | 287 | 1,824 | - | 1,293 | 31,260 |
| 1936 | 24,428 | 3,605 | 306 | 1,931 | - | 1,580 | 31,850 |
| 1937 | 26,296 | 3,640 | 304 | 1,702 | - | 1,180 | 33,122 |

Table 18. Winnipeg General Hospital statistics for the years 1937-1952. (Data taken from Annual Reports of the hospital.)

| | No. pt. Tx. | No. deaths | % deaths | Surg. Op. | % autopsies |
|---|---|---|---|---|---|
| 1937 | 14,771 | 611 | 4.20 | - | - |
| 1938 | 14,166 | 626 | 3.26 | 9,118 | - |
| 1939 | 14,709 | 574 | 3.00 | 8,630 | - |
| 1940 | 15,414 | 615 | 3.06 | 8,746 | - |
| 1941 | 15,438 | 638 | 4.13 | 9,859 | - |
| 1942 | 15,733 | 538 | 2.76 | 9,604 | - |
| 1943 | 16,112 | 622 | 2.81 | 8,833 | - |
| 1944 | 16,032 | 691 | 3.45 | 9,027 | - |
| 1945 | 15,730 | 627 | 2.98 | 9,203 | - |
| 1946 | 16,744 | 655 | 2.91 | 9,930 | |
| 1947 | 17,646 | 640 | 2.67 | 9,969 | - |
| 1948 | 17,301 | 625 | 2.73 | 10,124 | 52.96 |
| 1949 | 17,946 | 661 | 2.51 | 10,390 | 51.06 |
| 1950 | 19,426 | 718 | 3.40 | 10,098 | 51.90 |
| 1951 | 22,360 | 622 | 2.09 | 10,635 | 50.60 |
| 1952 | 23,544 | 666 | 2.10 | 10,772 | 50.90 |

the hospital.[61] Surgeons benefited from the surgical demand, influencing in this manner the development of laboratory medicine. One example of this phenomenon was the success of the Mayo brothers in Rochester, Minnesota. They innovated health care practice management and the organization and development of medical specialties by introducing the first private group practice. The Mayo Clinic became a model for other clinics in the U.S.[62] The most important ones were the "Cleveland Clinic" in Cleveland, Ohio; the "Lahey Clinic" in Boston, Massachusetts, the "Ochsner Clinic" in New Orleans, Louisiana; the "Ford Hospital and Clinic" in Detroit, Michigan; and the "Lovelace Clinic" in Albuquerque, New Mexico. Private practitioners founded some of these clinics, while university professors created others. What they had in common was a highly skilled surgeon as the leader (e.g., the Mayo brothers, Alton Ochsner).[63] These Clinics functioned under a centralized record system, one billing system and a central

[61] Starr, *Social Transformation of American Medicine,* 156-158.
[62] Helen Clapesattle, *The Doctors Mayo* (Rochester: Mayo Foundation for Medical Education & Research, 1969), 309-310, 324, 346, 368-369; Prathibha Varkey and Vidush P. Athyal, "Service Delivery Innovations at Mayo Clinic," *Minnesota Medicine* 88 (2005): 39-42.
[63] Guy A. Caldwell, *Early History of the Ochsner Medical Center: The First Twenty-two Years* (Springfield: Charles C. Thomas Pub), 1965, 3-4, 12-13, 82; Stevens, *American Medicine,* 50.

appointment office. They eventually created a non-profit foundation to support research and education and expanded by building a hospital.[64]

In Manitoba, several clinics were opened following the Mayo Clinic model.[65] Two deserve particular mention. The first is the "Bigelow Clinic" in Brandon. It was the first group practice institution in Canada and was established with the following concepts in mind: diagnosis and treatment by specialists working together, a common account, and honesty and respect.[66] With the recruitment of S.J. Peirce following his departure from the Medical College in 1918, the medical staff of the clinic was considered complete for the needs of the community and consisted of 5 surgeons and 7 nurses and clerical personnel.[67] The second is the "Winnipeg Clinic" founded by the surgeon P.H.T. Thorlakson in 1938. This institution had more specialists on the staff and went a step further by creating a foundation to advance post-graduate education and research in a manner similar to the American clinics.[68]

Surgical expansion underlay the growth of surgical pathology. As one of the most extensive sub-specialties of pathology, it arose in the U.S. in hospital departments of surgery rather than as divisions of academic departments of pathology. Initially, surgeons

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[64] Caldwell, *History of the Ochsner*, 15, 18, 22.
[65] Carr and Beamish list the clinics from Winnipeg: Winnipeg, Manitoba, Abbott, Hollenberg and Kobrinsky Clinics. In particular, the first two were most influential controlling the appointment of the staff at the Winnipeg General Hospital for many years; Carr and Beamish, *Manitoba Medicine*, 88. A similar statement to the latter is found in Norman C. Delarue, *Thoracic Surgery in Canada: A Story of People, Places, and Events. The Evolution of a Surgical Specialty* (Toronto: B.C. Deaker Inc., 1989), 432.
[66] In those days splitting of fees was a common practice; Bigelow, *Forceps, Fin & Feather*, 16-17.
[67] *Ibid.*, 18-33.
[68] T.K. Thorlakson, "The Winnipeg Clinic – How an Idea Became a Reality." *Manitoba Medicine* 62 (1992): 139-142.

developed expertise in examining specimens.[69] When this responsibility required more time due to the accumulation of knowledge, some surgeons stopped performing operative procedures and devoted themselves fully or partially to the discipline of pathology.[70] Divisions of surgical pathology were further created in departments of surgery. It was only in the second half of the twentieth century that pathology departments absorbed all such divisions.[71] This was not exactly the case at the Winnipeg General Hospital, as surgical pathology was a component of the laboratories since the department's inception in the early twentieth century. In fact, Boyd contributed to the development of this sub-specialty with the publication of his book, *Surgical Pathology* in 1925.[72] At the hospital, Meltzer was the pathologist most responsible for this practice from the time of her appointment.

The practice of hospital pathology between 1925 and 1938 was characterized by a change in focus from infectious to neoplastic and cardiovascular diseases thus favoring

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[69] Anthony A. Gal, "In Search of the Origins of Modern Surgical Pathology," *Advances in Anatomic Pathology* 8 (2001): 1-13; James R. Wright, Jr., "The Development of the Frozen Section Technique, the Evolution of Surgical Biopsy, and the Origins of Surgical Pathology," *Bulletin of the History of Medicine* 59 (1985): 295-326. With the introduction of the microscope and the proper preparation of tissue specimens, the biopsy became part of the surgical practice; Robert E. Fetcher, "The Birth and Evolution of American Surgical Pathology," in Rosai, *Guiding the Surgeon's Hand,* 7-21. The term "biopsy" refers to the examination of a small piece of tissue taken from a living body. J. Wright argues that the predecessor of the biopsy was the frozen section examination of tissues. He supports the thesis that although the biopsy originated in Europe, its wide use in North America converted it into an American technique. The latter was in part determined by the resolution of the American College of Surgeons passed in 1926 that demanded it as a common standard of practice; Wright, "Development of the Frozen Section;" James R. Wright, Jr. "Relationship of Surgical Oncology and Pathology in Early 20th Century America," in *History of Ideas in Surgery*, ed. Yosio Kawakita, Shizu Sakai and Yasuo Otsuka (Japan: Ishiyaku EuroAmerica, 1992), 241-266. In addition to these factors, however, cultural differences between Europe and America may also explain why the surgical pathology based on the biopsy flourished in the new world. The lack of interest in formal academia and theory, the free-market mentality, the desire for innovation, among others, were factors that could contribute to explain such practice; Gall, "In Search of the Origins."

[70] Louis P. Dehner and John M. Kissane, "Surgical Pathology at the Washington University Medical Center and Barnes Hospital," in *Guiding the Surgeon's Hand,* 111, 129-130.

[71] Raffaele Lattes. "Surgical Pathology at the College of Physicians and Surgeons of Columbia University," in Rosai, *Guiding the Surgeon's Hand*, 46; Robert E. Fechner. "The Birth and Evolution of American Surgical Pathology," in *Idem., Guiding the Surgeon's Hand*, 17.

[72] Carr, *William Boyd*, 118-120. Boyd was not alone. The same year, a similar work was also published: C. Jennings Marshall and Alfred Piney, *Text-Book of Surgical Pathology* (New York: D. Appleton and Co., 1925).

developments in surgical pathology.[73] Control of the former by public health measures and new drugs such as sulfas and arsenicals brought the beginnings of the rise of the latter.[74] Neoplastic and cardiovascular diseases also became frequent as a result of changes in life style (e.g., diet, lack of exercise) as society was transforming in North America due to the success of capitalism. Follow-up clinics were organized and textbooks reflecting new advances in oncological pathology were published. William Boyd was actually one of the most popular authors.[75] However, the practice of pathology in large hospital centers in those years was not just restricted to surgical pathology. The increase in cardiovascular and other medical diseases made the long established performance of autopsies still popular for improving patient care.

The practice of autopsies has always had different connotations for the lay public and to the medical profession.[76] To the latter, autopsies were crucial for the practice of medicine, the verification of diagnoses and the identification of errors. Autopsy results were the basis for clinicians acquiring experience. They were an indication of the improved developing quality of services provided by a hospital and the important role that departments of pathology were playing in creating these improvements. In those years, autopsies rather than biopsies were the great contribution made by pathology to the scientific practice of medicine. The visible interaction between pathologists and clinicians was centered around autopsies, not only at the morgue where clinicians came to discuss findings and to correlate them with their diagnoses but also in well attended clinicopathological conferences in which interesting cases were discussed (e.g., "Group

[73] Arthur Purdy Stout, "Notes on the Education of an Oncological' Surgical Pathologist: The Autobiography of Arthur Purdy Stout," in Rosai, *Guiding the Surgeon's Hand*, 218-221, 228-229, 231-235.
[74] Stevens, *American Medicine*, 179-180.
[75] See the list of Boyd's books in Carr, *William Boyd*, 183.
[76] Rosenberg, *Care of Strangers*, 275-276.

Luncheon Clinics," "Clinics.").[77] In North America at least, medicine was still under the influence of Osler who was a strong proponent of autopsies. He was even sometimes quoted on this issue in the annual reports of the hospital.[78]

Pathology continued evolving in the second quarter of the twentieth century as a laboratory discipline that played a crucial role as ancillary to the practice of medicine, although without the status it had enjoyed in the previous century. E. Long has properly documented this contribution.[79] He describes how developments in scientific knowledge and social aspects of the profession contributed to maintaining the role of pathology in medical practice.[80] In scientific developments, Long specifically discusses advances in inflammation, infections and parasitic diseases, viruses, nutritional and toxic diseases, immunology, cancer and organ diseases (i.e., sub-specialization). With respect to social developments, he describes pathology societies and journals as examples of professional development, particularizing them in American and Canadian institutions.[81]

Scientific developments at the Winnipeg General Hospital were no different to those described by Long. In fact, he mentions Boyd's contributions to clinical research and teaching.[82] It is evident that pathology was establishing itself as an important ancillary instrument for the practice of the new scientific medicine. Therefore, it was not surprising that a policy for increasing the number of autopsies was instituted with the support of the hospital administration and the intention to expand the role of the

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[77] "Annual Report, 1934, 1935, 1936."
[78] Alvin E. Rodin, *Oslerian Pathology* (Kansas: Coronado Press, 1981), 5-34; "Annual Report, 1931."
[79] Esmond R. Long, *A History of Pathology* (1928; reprint, New York: Dover, 1965); Long, *American Pathology*.
[80] Long, *History of Pathology*, 171-187.
[81] Long, *American Pathology*, 301-368.
[82] *Ibid.*, 231-232, 244, 364.

department.[83] Their numbers had declined after 1916 but Nicholson's appointment to the department restored their numbers to those existing before.[84] There was also an effort to improve the quality of autopsies and this was Meltzer's contribution years later. She was the first pathologist to introduce detailed macro and microscopic descriptions, offer good clinico-pathologic correlations, and illustrate the cases with photographs of the organs. Boyd followed her style of writing autopsy reports. In the last years of Boyd's tenure, however, interns performed the autopsies and collected all the pertinent information. Boyd only reviewed them and wrote the clinico-pathologic correlations. He was not often physically present at the morgue due to the time that he devoted to writing books and to attending invitations as a speaker.[85] The role of the autopsy in improving patient care and its numbers were frequently used as two of the arguments supporting the requests for

[83] In the Annual Report of 1928, George I. Stephens, the Medical Superintendent of the Winnipeg General Hospital, stated, "Autopsies, as a mean of investigation, of instruction, and of raising the standards of clinical work, are extremely important. A condition may be frequently revealed, which hitherto has been unsuspected. It is noteworthy that relatives and friends frequently ask for an autopsy where there appears to be doubt as to the exact medical conditions existing."

[84] The decline probably was the result of Peirce moving to clinical pathology during the last 4 months of 1919, immediately after Nicholson's appointment, autopsies numbers increased from 17 to 40; Department of Pathology, "Annual Report, 1920," 36.

[85] Years later, D. Bowden quoted Georgina Hogg, a pathologist and a student of Boyd, with the following statement: "As I recall, he gave all the lectures and he was a superb teacher. People have said, and I guess it is true, that Dr. Boyd was not a particularly good pathologist. However, he was one of the best professors I ever had. And style he had! – lots of it – he enjoyed giving his lectures, almost like an actor savoring his role;" Bowden, "Pathology 100."

more departmental space.[86]

The economic depression of the 1930s had a curious impact on the medical practice in the Winnipeg General Hospital.[87] Between 1931 and 1938, in spite of the fact that the number of patients treated remained approximately the same, surgical procedures increased by 32 percent.[88] The economic impact was different. The unemployed looked for free services and the hospital again became primarily a charity institution. This was not unexpected, since the main source of hospital income was patients' fees (Fig. 7). Before 1920 the monetary contributions to the hospital budget by patients increased by 58 percent (Fig. 5). The percentage dropped to 26 percent in 1933 because of the increase in patients receiving charity care. In 1931, for instance, around 60 percent of admissions were unemployed patients. These figures were even higher in the Outpatient Department.[89] As a direct result, physicians in Winnipeg withdrew all but emergency

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[86] The university department moved to new facilities at the Faculty of Medicine in 1922 to a building constructed with the support of the Rockefeller Foundation; Faculty of Medicine, "Annual Announcement, 1922-1923;" Daniel P. Snidal, "Faculty of Medicine Development Fund, *Manitoba Medicine* 57 (1987): 1-6; "Annual Report, 1932, 1935." The Rockefeller's donation was part of a U.S. 5-million gift announced in 1919 for aiding to Canadian medical education. The Faculty of Medicine received $500,000; Fedunkiw, *Rockefeller Foundation Funding,* 54, 135. It appeared that pathology was one of the specialties that received special support by the Foundation; *Ibid.*, 56, 93, 125-126, 136.

[87] A detailed account of the economic impact of the Great Depression on Canadian hospitals in general and on the Winnipeg General Hospital in particular is given in Gagan and Gagan, *Patients of Moderate* Means, 79-85. The Great Depression also impacted the Faculty of Medicine; Terence Moore, "Crumbling Foundation: The Medical School and the Depression," *Manitoba Medicine* 58 (1988-9): 139-144.

[88] The number of patients treated in 1931 and 1938 were 14,211 and 14,166 respectively. The volume of surgical procedures went from 6,899 in 1931 to 9,118 in 1938 (Table 19).

[89] "Annual Report, 1932." The provincial government gave an annual contribution directed to support the public wards. With two exceptions, it was always less than $61,000. The federal government did the same thing for that end only in 1920, 1921 and 1922 to support immigrants. The amounts, however, were minimal (i.e., $232, $858 and $309 respectively) (See Table 15) (Fig. 5). The three levels of government, nevertheless, contributed every year with grants and special donations for other hospital necessities such as land acquisition, building constructions and for covering the deficit. See for example "Annual Report, 1917, 1921, 1925, 1932."

Figure 7 Patient and provincial government contributions in dollars to the operating budget of the Winnipeg General Hospital (1929-1937). (Data taken from the Annual Reports of the hospital.)

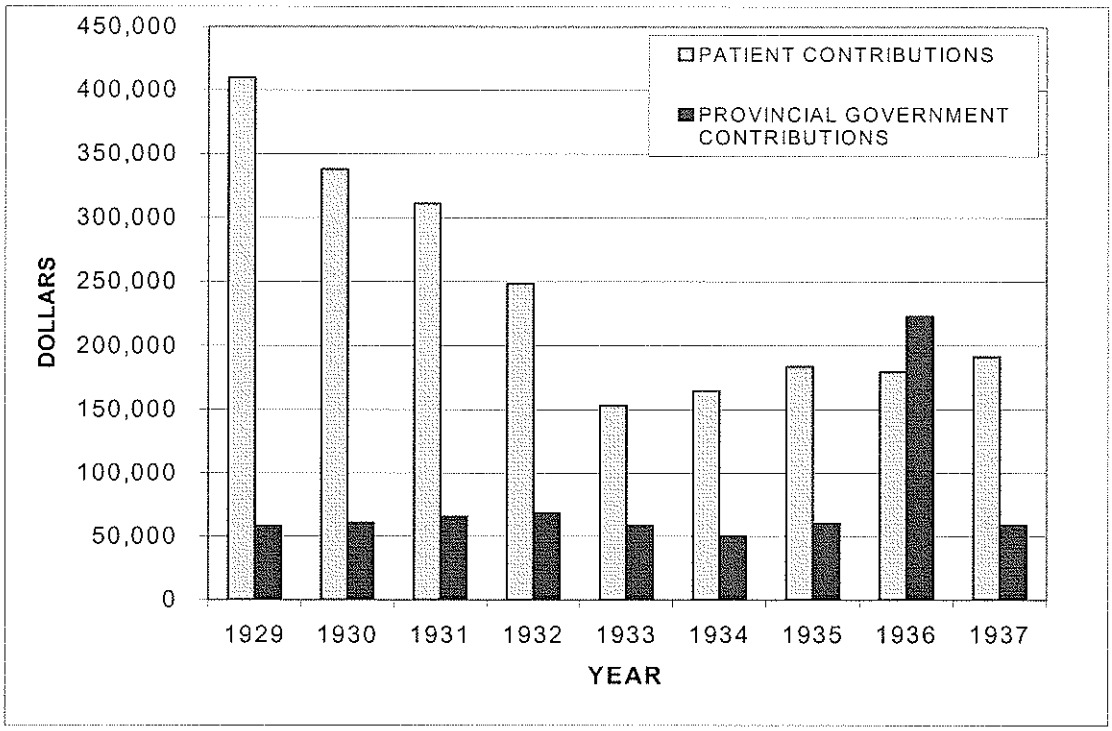


Table 19. Winnipeg General Hospital statistics for the years 1926-1937. (Data taken from Annual Reports of the Winnipeg General Hospital.)

| | No. pts. Tx/year | No. deaths | % deaths | No. surg. operations |
|---|---|---|---|---|
| 1926 | 13,489 | 492 | 3.87 | 6,393 |
| 1927 | 13,467 | 517 | 4.09 | 7,123 |
| 1928 | 14,118 | 518 | 3.92 | 7,313 |
| 1929 | 14,320 | 544 | 4.03 | 7,600 |
| 1930 | 14,273 | 532 | 3.80 | - |
| 1931 | 14,211 | 497 | 3.74 | 6,899 |
| 1932 | 14,814 | 501 | 3.60 | 7,271 |
| 1933 | 12,835 | 512 | 4.22 | 6,875 |
| 1934 | - | - | - | - |
| 1935 | 14,381 | 604 | 4.58 | 8,570 |
| 1936 | 14,857 | 639 | 4.58 | 8,545 |
| 1937 | 14,771 | 611 | 4.20 | - |

services to patients in receipt of municipal relief setting the first doctor's strike in Canadian history.[90]

The most direct impact of the economic depression on the pathology department was in its budget. The strike had a negligible effect because pathologists do not treat patients.[91] Salary cuts were implemented and by 1936 expenditures in salaries had gone down to the level of 1928. Annual revenues by the department also went down by almost half to the levels of 1926. G. I. Stephens, in the annual report of 1933, mentioned specifically that the laboratories were working efficiently in spite of the fact that its budget had been "considerably curtailed." Between 1930 and 1937 the number of laboratory tests had decreased by 7 percent but biopsies had increased by 49 percent in accordance with the expansion of surgery that was not abated by the Depression.[92]

Response by society to the economic woes of medical care made acute by the recession started as early as 1933.[93] Direct support to the Winnipeg General Hospital by the middle class was not possible anymore. Although municipal hospital plans had existed in Manitoba since 1920, city and provincial governments were at this time

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[90] The history of the strike is found in C. David Naylor, "Canada's First Doctors' Strike: Medical Relief in Winnipeg, 1932-34," *Canadian Historical Review* 67 (1986): 151-180. Naylor analyses the origin, development and consequences of the work-action. It appeared to be a "peculiar" event. According to Naylor, the strike committee membership consisted of the Dean of the Faculty of Medicine, the Superintendent of the Winnipeg General Hospital, the Deputy Minister of Health and the Past-President of the Canadian and British Medical Associations. The strike had the support of the media and the population of about 50,000 citizens affected by the event. It lasted almost eight months and the results were favorable to the profession.

[91] Due to lack of support by the City Council, the hospital closed the Out-Door department in 1933 resulting in a reduction of the number of tests performed in the laboratories from 43,728 in 1932 to 27,546 in 1933 (37 percent) (Table 17). The number of patients treated decreased from 14,814 in 1932 to 12,835 in 1933 (13 percent) (Table 19).

[92] Seven percent corresponds to 2,620 tests while 49 percent means 1189 procedures (Tables 17).

[93] The similar impact of the Depression on American hospitals is described in Risse, *Mending Bodies*, 482-488.

incapable of offering assistance.[94] As a result, discussions about hospital and medical insurance programs were held for the first time at the Manitoba Medical Association in 1934. A medical plan similar to one implemented in the State of Washington, U.S.A., was also considered in 1936. The Federal government briefly promoted a national health insurance plan in 1935 but it was abandoned for two reasons: change of government and constitutionality. Health care is a provincial and not a federal responsibility.[95] All of these events, nevertheless, heralded the appearance of provincial programs and later of a national health insurance plan strongly financed by the Federal government. It became the beginnings of social security policy and programs that transformed Canada into a Welfare State.

In spite of its economic limitations, the laboratories, now administratively united with the university department, enjoyed a peaceful atmosphere. In several departmental annual reports Boyd thanked Meltzer, the technicians and the secretaries for their collaboration, support and hard work. Indeed, Meltzer had all the service responsibilities. Gone were the days of disgruntled individuals inside and outside of the department, as a

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[94] Carl A. Mellicke and Janet L. Storch, introduction to *Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends* (Ann Arbor: Health Administration Press, 1980), 4. The chronological history of health insurance in the provinces before 1938 is found in Sylva M. Gelber, "The Path to Health Insurance," J.E.F. Hasting, "Federal-Provincial Insurance for Hospital and Physician's Care in Canada," both in *Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends*, eds. Carl A. Mellicke and Janet L. Storch (Ann Arbor: Health Administration Press, 1980), 156-160, 200-201. First published in *Canadian Public Administration* 9 (1966): 211-220. The first Municipal Hospital and Medical Care Plans were enacted in Saskatchewan in 1916. Alberta and British Columbia followed. After 1919, Workmen's Compensation Boards administered by provincial commissions provided hospital and medical care under public programs in all provinces. It was not until the pressure produced by the Depression of the 1930s that the provincial governments of Ontario and Newfoundland joined the Western provinces offering assistance to municipalities. In those years, Newfoundland was administered by Great Britain.

[95] Terence Moore, "Manitoba Medical Service: How Doctors Invented Health Insurance and Why it didn't Work," *Prairie Medical Journal* 67 (1997): 45-50; Lee Sage, *The Evolution of a Commitment: 25 Years of Caring for Manitobans* (Winnipeg: Friesens, 1998). Both publications deal with these local issues as occurring in Winnipeg in the 1930s. The second one is a historical document published by the Manitoba Blue Cross on occasion of its twenty-fifth anniversary. Moore also participated in the elaboration of the document. The Federal government did not participate in any plan until 1957; Malcolm G. Taylor, "The Canadian Health Insurance Program," in *Perspectives on Canadian Health and Social Services Policy*, 183-189. In the U.S., the response to the depression in relation to hospitalization (Blue Cross) and physician's fees (Blue Shield) is found in Starr, *Transformation of American Medicine,* 295-310; Risse, *Mending Bodies*, 503.

result of the Dean's decision to appoint Boyd. Boyd's reputation made him "untouchable" and there was only one natural candidate to succeed him as chairman, and that was Nicholson. These conditions resulted in a smooth transition in leadership when, in 1937, W. Boyd left for Toronto to become Professor and Chairman of the Department of Pathology at the University of Toronto. D. Nicholson succeeded him as Chairman of the Department of Pathology at the University of Manitoba and as Director of the Pathological Laboratories of the Winnipeg General Hospital.[96]

The university department shared that peaceful atmosphere. Undergraduate teaching was the main responsibility. The pathology museum created with hospital material became one of the strength of the Faculty of Medicine. Boyd and Nicholson were the faculty responsible for teaching; Meltzer was only a sessional demonstrator. Boyd, as chairman, was the only representative of the department to the "General Faculty Council" and the "Medical Faculty Council Executive."[97] Published research was also carried out with material generated in the hospital department.[98]

Under the control of the Faculty of Medicine, the specialty of pathology evolved at the Winnipeg General Hospital, supporting the needs of medical practice during this period of twenty-one years. Recruitment of new professional pathologists, including the first female pathologist in the province, improved such practice. Surgical pathology was expanded but without ignoring the traditional activities of the specialty, that is,

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[96] "Annual Report, 1937."

[97] See "Annual Announcement, 1936-37."

[98] Boyd was the only member of the department publishing extensively. According to Carr, he published forty-seven papers and ten books between 1916 and 1937. However, almost all papers were on clinical (not basic sciences) research and books were text-books; Car, *William Boyd*, 181, 184-186. I found only four papers and two books written by Nicholson in the same period of time; "Annual Report 1921, 1937."

performance of autopsies. The cooperation of the personnel of the department and the strong support by the hospital administration moved standards of practice in pathology to the expected levels of quality and efficiency. The departmental activities became one of the main supporters for the practice of the new scientific medicine at the Winnipeg General Hospital.

Local historiography has focused extensively in Boyd from the point of view of the Faculty of Medicine while leaving other areas of the history of pathology in Winnipeg uncovered. This situation has the limitation of missing the bigger picture in the history of the specialty locally. Without negating Boyd's contributions to teaching, the history of pathology is better explained by recognizing the social transformation of the General Hospital and the expansion in the practice of surgery as the leading causes of the development of the specialty. In the early years of this period, the source of income of the hospital had been shifted to middle-class patients by attracting medical treatment from home to hospital. This pattern continued until the 1930s when the effect of the economic Depression made this financing model insufficient for supporting the functioning of the hospital. New sources of revenue were discussed in those years leading to the introduction of hospital and medical insurance. They became, in future years, the new economic support for the hospital's transformation and, consequently, for the expansion of surgery and pathology services at the hospital. The latter played a key supportive role as demonstrated by comments made by the administration in the annual reports of the hospital. The increase in the number of surgical procedures increased the demand for pathological services. Such demand created the beginnings of a change of emphasis in the practice of the specialty from one based on the autopsy (i.e., autopsy pathology) to

another based on the biopsy (i.e., surgical pathology). Pathology, then, began to evolve from the "science of the dead" to the "science of the living."

## Chapter IV: New provincial sources of economic support: Conversion of pathology from the "science of dead bodies" to the "science of living beings" (1938-1957)

Pathology slowly evolved from the science of death to the science of life.[1] Initially, the autopsy was made the backbone of medical practice by the Paris School of Medicine. Hospital autopsy suites were the "death house" of the institution. Virchow's use of the microscope and the introduction of the cell theory in the 1850s only expanded this practice. In the next decade, the contributions of experimental medicine (i.e., physiology) by Claude Bernard resulted in the development of physio-pathology. The new science, however, was still based on the autopsy and on animal experimentation.[2] By the late 1880s pathology -the hospital practice of autopsy- was in decline until the discoveries of Pasteur and Koch. Bacteriology, for the first time, brought the attention of the practice of pathology towards the living body. As stated by E.T. Morman, "It was the advent of bacteriology which was used, finally, to transform the hospital morgue and museum into a clinical laboratory."[3]

Developments in the practice of pathology continued in the early twentieth century with the introduction of the frozen section technique and consequently of the

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[1] A practice of pathology based on the autopsy is here called "science of dead bodies" and "science of death." A practice based on tissue biopsy and the application of technology to body fluids and secretions is here called "science of living beings" and "science of life." The first deals with cadavers and the latter with living patients.

[2] L.J. Henderson, introduction to *Introduction to the Study of Experimental Medicine,* by Claude Bernard (1927; reprint, New York: Dover Pub., 1957), v-xii. New discoveries in experimental medicine were also incorporated in hospital practice under the new label of laboratory medicine; L.S. Jacyna, "The Laboratory and the Clinic: The Impact of Pathology on Surgical Diagnosis in the Glasgow Western Infirmary, 1875-1910," *Bulletin of the History of Medicine* 62 (1988): 384-406.

[3] Edward T. Morman, "Clinical Pathology in America, 1865-1915: Philadelphia as a Test Case," *Bulletin of the History of Medicine* 58 (1984): 198-214. Bacteriology eventually gained its own identity in the 1920s and departed from pathology. A general description of the evolution of pathology (i.e., clinical pathology) is found in W.D. Foster, "The Early History of Clinical Pathology in Great Britain," *Medical History* 3 (1959): 173-187.

surgical biopsy.[4] Now energized by the biopsy, pathology slowly made new inroads into the science of life by supporting surgical practice. Although the specialty had already included simple hematological and biochemical tests, pathology really only began to incorporate more advanced technology in these fields in the 1930s, switching its focus even more toward living beings.[5] In contrast, the practice of autopsies continued a slow but steady decline in importance after World War II.

Developments in pathology were not isolated events. In effect, they evolved over time forming part of the social transformation of the hospital and the conversion of home-based medical care to hospital care. At the Winnipeg General Hospital, institutional transformation was associated not only with the expansion of pathology but also of surgery. Data taken from hospital and departmental records support this observation. For example, the number of patients treated increased by 77 percent between 1938 and 1957. In the same period, there was a 20 percent increment in surgical procedures and a 25 percent increase in the number of surgeons. Also linked to the growth of the hospital in general, and to the practice of surgery in particular, the number of laboratory tests was incremented. For instance, hematological and bacteriological tests increased, the former by 2000 percent between 1938 and 1957 and the latter by more than 200 percent between 1938 and 1954. After 1954, the section of bacteriology ceased to exist as a component of the department of pathology. Surgical biopsies increased almost four-fold during the

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[4] James R. Wright Jr., "Development of the Frozen Section Technique, the Evolution of Surgical Biopsy, and the Origins of Surgical Pathology," *Bulletin of the History of Medicine* 59 (1985): 295-326. The thesis of this publication is that the frozen section and the biopsy were responsible for the origin of surgical pathology, a sub-specialty of pathology.

[5] Following Foucault, the change on emphasis represents a new *gaze* over living tissues as opposed to the *gaze* over dead bodies. The change would give pathologists new knowledge and, therefore, more power; Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception*, trans. A.M. Sheridan Smith (New York: Vintage Books, 1994).

same time period indicating the more direct contribution of the department of pathology to the practice of surgery.[6]

Hospital transformation needed the economic support provided by the middle class. Middle class paying patients also became sources of scientific information, with a subsequent increase in the hospital's significance as a centre for medical research and education.[7] In the 1930s, the economic Depression sharply curtailed that support and hospital beds became occupied mainly by non-paying patients. New sources of income were necessary for the hospital transformation to continue.[8]

In this chapter, the evolution of the specialty of pathology is analyzed within the context of the new provincial economic support for the General Hospital. It is argued that the main reason for the evolution of pathology was its continued technological contributions for resolving surgical limitations. The contribution of the laboratories included blood-banking techniques, microbiological tests and the surgical biopsy, all

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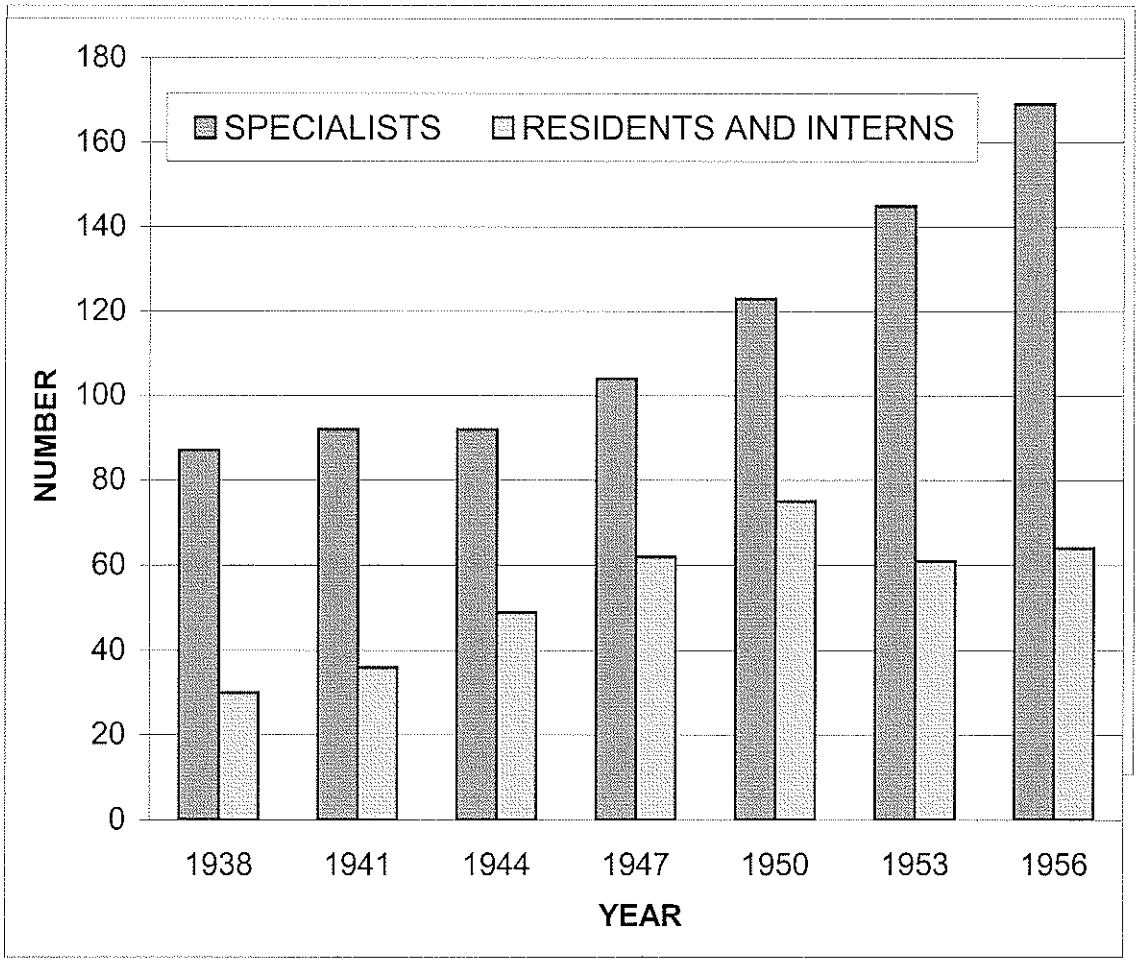
[6] Between 1938 and 1957, the number of patients treated went from 14,166 to 25,008 while the number of surgical operations increased from 9,118 to 10,951 (Fig. 8). The number of surgeons appointed to the hospital went from 12 to 15 in the same period. Laboratory test numbers went from 32,042 in 1938 to 123,804 in 1957 (Table 20, 21). In the same number of years, surgical biopsies increased from 3,445 to 12,195 and hematological tests from 2,988 to 70,459 (Fig. 8). Bacteriological tests went from 24,842 to 84,571 between 1938 and 1954 (Table 20, 22). Clinical chemistry, the third component of the department responsible for diagnosis and treatment, had not been part of the department since 1929.

[7] J.T.H. Connor, "Hospital History in Canada and the United States," *Canadian Bulletin of Medical History* 7 (1990): 93-104.

[8] City Hall and the Manitoba Medical Association responded with the formation of pre-payment plans for hospital and medical services respectively. A description of these events are found in three local publications: Lee Sage, *The Evolution of a Commitment: 25 Years of Caring for Manitobans* (Winnipeg: Friesens, 1998); Terence Moore, "Manitoba Medical Service: How Doctors Invented Health Insurance and Why it didn't Work," *Prairie Medical Journal* 67 (1997): 45-50; D.L. Kippen, "Prepayment for Medical Services in Manitoba," *Manitoba Medicine* 63 (1993): 142-144. Sage's book describes the events related to both plans. Kippen's comments demonstrate dissatisfaction with the medical plan and with Medicare. Moore describes both plans; his analysis explains why the medical plan failed. The leader of the hospital plan was the Alderman Margaret Stovel Williams and the leader of the medical plan was E.S. Moorhead.

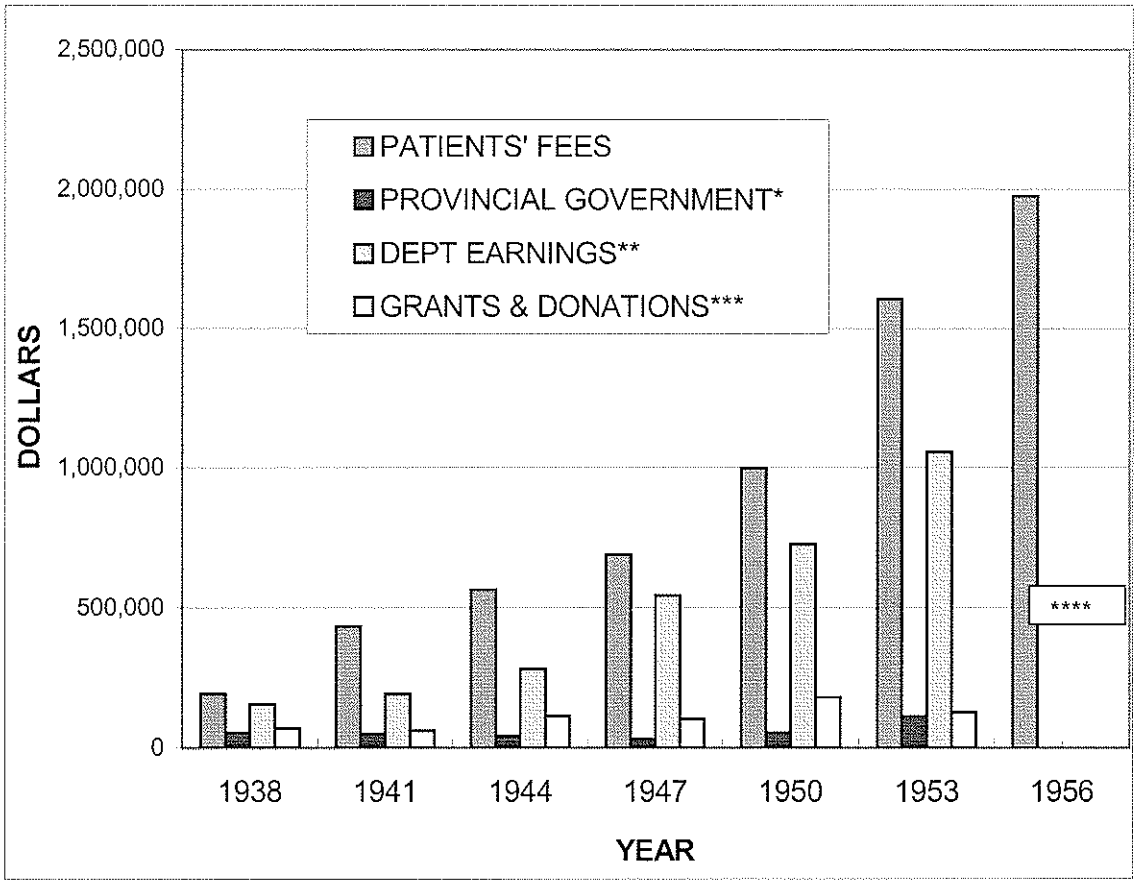
supported through pre-payment hospital plans rather than by direct patient payments.[9]

Figure 8 Number of patients treated, number of surgical procedures and number of laboratory tests performed at the Department of Pathology of the Winnipeg General Hospital (1938-1957). (Data taken from the Annual Reports of the hospital.)




[9] Between 1938 and 1955, the combined contributions by pre-payment plans (e.g., Blue Cross, commercial insurance and cooperatives) to the Winnipeg General Hospital increased by almost nine-fold whereas that of the provincial government increased only by a little more than two-fold. Support by pre-payment plans for wards' functioning (includes patient fees and departmental earnings) went from $345,918.43 in 1938 to $3,002,835.70 in 1955. Similarly, contributions by the provincial government exclusively for wards' functioning increased from $53,718.30 in 1938 to $118,077.50 in 1955 (Table 23) (Fig. 9). The support of the provinces to general hospitals in Canada is summarized in G. Harvey Agnew, *Canadian Hospitals, 1920 to 1970: A Dramatic Half Century* (Toronto: University of Toronto Press, 1974), 50-52. Essentially it consisted on granting per diem grants, enacting laws requiring municipalities to bear hospitalization costs of indigents, sponsoring hospital-service programs to combat communicable diseases and licensing of health-care personnel. See also Moore, "Manitoba Medical Service;" Le Sage, *Evolution of a Commitment*, 11-23.

Figure 9 Patients, departmental earnings, grants and donations and provincial government contributions to the Winnipeg General Hospital (1938-1956). (Data taken from the Annual Reports of the hospital and given in dollars.)




* exclusively for wards' functioning

** includes, for example, x-rays, operating room surgical and medical supplies, pharmacy, pathology, etc.

*** federal government not reporting as contributing in 1951

**** not reported

Table 20. Pathologist (Nicholson) annual reports (1938-1952). (Data taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | Bacter | Biops | Autop | Hemato | Bl. Bank | Misc | Total |
|---|---|---|---|---|---|---|---|
| 1938 | 24,842 | 3,445 | 288 | 2,988 | - | 479 | 32,042 |
| 1939 | 25,378 | 3,954 | 267 | 3,839 | - | 171 | 33,609 |
| 1940 | 26,004 | 3,761 | 283 | 4,832 | - | 148 | 35,028 |
| 1941 | 26,386 | 4,048 | 377 | 5,852 | - | 112 | 36,775 |
| 1942 | 25,435 | 3,972 | 317 | 6,444 | - | 115 | 36,283 |
| 1943 | 23,746 | 4,626 | 324 | 3,774 | 3,707 | 102 | 36,279 |
| 1944 | 25,019 | 4,537 | 352 | 4,614 | 5,126 | 101 | 39,748 |
| 1945 | 26,537 | 4,836 | 379 | 5,823 | 6,883 | 113 | 44,571 |
| 1946 | 28,179 | 5,225 | 508 | 6,680 | 11,768 | 66 | 52,969 |
| 1947 | 29,135 | 5,588 | 500 | 8,044 | 13,638 | 160 | 57,065 |
| 1948 | 29,961 | 6,197 | 472 | 8,714 | 16,056 | 283 | 61,683 |
| 1949 | 33,881 | 5,987 | 465 | 10,655 | 17,040 | 288 | 68,316 |
| 1950 | 38,566 | 6,299 | 480 | 12,744 | 1,241* | 365 | 59,695 |
| 1951 | 44,313 | 8,387 | 539 | 15,587 | - | 387 | 69,213 |
| 1952 | 45,868 | 8,786 | 588 | 18,258 | - | 275 | 73,775 |

*= includes January and February only

Table 21. Pathologist (Penner) annual reports (1955-1957). (Taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | 1955 | 1956 | 1957 |
|---|---|---|---|
| Autopsies+ | 655 | 731 | 847 |
| Biopsies | 10,016 | 10,489 | 12,195 |
| Cytology | 787 | 1,081 | 1,819 |
| Hematology | 27,246 | 66,616 | 70,459 |
| Urinalysis | 27,749 | 31,182 | 33,976 |
| Miscelan. | 197 | - | - |
| Frozen Sec. | - | - | 487 |
| | | | |
| Total | 66,560 | 111,639 | 123,804 |

+= only hospital autopsies

Table 22. Pathologist (Penner) annual reports (1953-1954). (Taken from Annual Reports of the Department of Pathology, Winnipeg General Hospital.)

| | 1953 | 1954 |
|---|---|---|
| Bacteriology | 80,453 | 84,571 |
| Biopsies | 9,644 | 10,249 |
| Autopsies | 654 | 721 |
| Hematology | 21,228 | 23,814 |
| | | |
| Total | 111,979 | 119,355 |

Table 23. Patients, departmental earnings, grants and donations, and provincial government contributions to the Winnipeg General Hospital (1938-1957). (Data taken from Annual Reports of the Winnipeg General Hospital and given in dollars.)

| | Patients' fees | Prov. Gov.+ | Departmental earnings@ | Grants, Donations* |
|---|---|---|---|---|
| 1938 | 191,164.96 | 53,718.30 | 154,753.47 | 67,868.82 |
| 1939 | 198,521.97 | 56,273.10 | 155,475.62 | 71,587.06 |
| 1940 | 414,186.59 | 58,300.90 | 172,651.59 | 71,377.29 |
| 1941 | 433,643.13 | 51,196.50 | 190,925.95 | 60,537.44 |
| 1942 | 144,043.14 | 16,056.40 | 24,966.61 | 24,966.61 |
| 1943 | 536,075.26 | 45,450.90 | 241,783.69 | 93,501.34 |
| 1944 | 565,163.47 | 40,782.30 | 280,324.56 | 113,955.88 |
| 1945 | 593,411.43 | 41,415.74 | 341,160.31 | 103,166.97 |
| 1946 | 637,286.31 | 29,264.75 | 473,118.63 | 75,272.16 |
| 1947 | 691,460.11 | 30,829.25 | 543,338.91 | 101,973.60 |
| 1948 | 735,250.33 | 29,455.25 | 614,337.75 | 120,304.45 |
| 1949 | 876,882.75 | 47,347.75 | 688,889.07 | 127,382.46 |
| 1950 | 997,243.07 | 52,801.00 | 728,498.03 | 180,303.79 |
| 1951 | 1,321,570.00 | 79,409.50 | 914,297.52 | 113,189.24 |
| 1952 | 1,492,969.90 | 93,841.25 | 973,984.77 | - |
| 1953 | 1,606,633.60 | 112,168.00 | 1,055,888.23 | 126,424.95 |
| 1954 | 1,758,336.30 | 117,636.00 | 1,148,015.78 | 179,359.53 |
| 1955 | 1,788,836.00 | 118,077.50 | 1,213,999.77 | 200,979.82 |
| 1956 | 1,976,312.50 | - | - | - |
| 1957 | 218,760.21 | - | - | - |

+ = exclusively for wards' functioning

@ = includes, for example, X-rays, operating room, surgical and medical supplies, pharmacy, pathology, etc.

* = Federal government not reporting as contributing in 1951

**Consequences of the economic Depression on the department**

After Boyd's departure in 1937, the hospital department changed little for the next four or five years. It appeared that in spite of so many years of amalgamation, its identity remained distinct from the university pathology department. The pathology staff was stable and consisted of Nicholson, Meltzer and a new recruit, John M. Lederman.[10] The same was true of the technical and clerical staffs. Senior interns rotated through the department for periods of one year but none were incorporated permanently. The same types of laboratory tests were offered. Publications were dramatically reduced to one in this period of time. Working conditions, however, seemed to be satisfactory for everybody.[11]

The economic resources created by the Depression, however, were reflected in the Winnipeg General Hospital's departmental facilities. For instance, in 1936, Nicholson complained in his annual report to the Faculty of Medicine about the crowded conditions for teaching clinical pathology to medical students at the General Hospital. He also commented that a recently purchased autopsy table was "more hygienic than the old one" and hoped for the room to be ventilated in the near future. Four years later, the situation had changed little. Hoogstraten described that in 1940-1941, the year he was a junior rotating intern, instruments for performing autopsies were materials discarded by the operating room, including rubber gloves that were patched and without elasticity. There were also no photographic facilities and, if photographs were needed, the specimens had to be transported to the Medical School. There were also chronic complaints about

[10] See biographical appendices.

inadequate laboratory space. Hoogstraten also confirmed that the pathology staff of the whole department, - the hospital and the university - consisted of three individuals (i.e., Nicholson, Lederman and Meltzer) apparently working from 8 a.m. to 4 p.m., Monday to Friday.[12]

Pathology, therefore, suffered the same economic limitations of the Winnipeg General Hospital, and a hospital pre-payment plan (Blue Cross) was the response. In 1937, the Central Council of Social Agencies asked Winnipeg Alderman Margaret Stovel McWilliams to lead an inquiry for establishing a hospital insurance plan. With the collaboration of members of the community and under the technical expertise of Albert Livingstone Crossin, the "Manitoba Hospital Service Association" was established on January 1, 1939. Laboratory procedures were included in the plan.[13]

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[11]Working conditions for technologists appeared not to be different than those described in the Maritimes in Peter L. Twogig, *Labour in the Laboratory: Medical Laboratory Workers in the Maritimes, 1900-1950* (Montreal: McGill-Queen's University Press, 2005).

[12] Jan Hoogstraten, "History of the Department of Pathology" (paper presented to the Manitoba Medical History Club, Winnipeg, Manitoba, February 1987 and located at the Neil John Maclean Health Sciences Library). In 1942 Nicholson complained about requests for tests coming late in the afternoon or during weekends. As a solution, he considered desirable and necessary to have one technician working until 6 p.m. every day, including Saturdays and Sundays; Winnipeg General Hospital, Department of Pathology, "Annual Report, 1942," 34. There is no evidence that the system was implemented immediately, although some members of the staff were voluntarily available for evenings and night requirements throughout the year.

[13] For comparison, the experience in Saskatchewan, British Columbia, Alberta, Newfoundland and Ontario are described in Malcom G. Taylor, *Health Insurance and Canadian Public Policy: The Seven Decisions that Created the Canadian Health Insurance System and their Outcomes*, 2nd ed. (Kingston and Montreal: McGill-Queen's University Press, 1987), 69-159, 167-170.

As confirmed by the President of the Hospital Board of Directors in 1940, the budget in those years was provided by the provincial and municipal governments and by private sources (i.e., by pre-paid and by insurance companies). Nevertheless, the hospital still functioned largely as a private institution delivering a public service and, in contrast to the early years, without federal funds.[14]

Yet the new sources of income did make possible the incorporation of new staff to the hospital department.[15] From 1938 to 1945, the number of departmental members (pathologists, technicians and secretaries) grew three-fold. The number of

[14] Winnipeg General Hospital, "Annual Report, 1940." At the end of WW II, the rates charged to patients were less than $7.50/day in private wards, less than $4.00 in semi-private wards and less than $2.50 in public wards (Table 24). Pre-paid plans (Manitoba Blue Cross), private insurances and the patients themselves covered these fees. By 1945 the fees were generating almost $600,000 per year. The provincial government was also contributing specifically for wards' functioning. Provincial contributions, therefore, do not refer to those coming from the government only. Departmental earnings (that included income generated by the department of pathology), grants and other donations also had become an important source of income for the hospital (Table 22).

[15] Between 1941 and 1942 the only permanent staff were Nicholson and Lederman. Meltzer's illness kept her away for long periods of time. D. Penner was promoted to resident in 1942. As a result, Penner and Lederman, as Assistant Pathologist, carried out the workload of the department. Meltzer died in October of 1942 after fifteen years of service to the hospital. T.Harry Williams replaced her as "Associate Pathologist" the same year. See bibliographic appendices. He was an expert in parasitology who taught this subject in order to prepare future physicians for an eventual enlistment in the army; The University of Manitoba, "Faculty of Medicine Annual Announcement, 1943-44." In March 1943, Penner left for New York for a one year of training at Memorial Hospital. He returned to Winnipeg in April 1944 and was appointed Assistant Pathologist to the hospital and demonstrator to the Faculty of Medicine; "Annual Report, 1944;" "Annual Announcement, 1944-45." For his entire career, Penner was a hospital pathologist. Georgina Hogg came in 1943 as a junior rotating intern. She devoted her professional life entirely to the department following closely the steps of S. Meltzer. In 1945, she was still a resident. See biographical appendices.

Table 24. Rates in dollars charged to patients in hospital wards each year compared with total number of patients treated (1938-1957). (Taken from Annual Reports, Winnipeg General Hospital.)

| | Private wards | Semi-priv. wards | Public wards | No. patients treated |
|---|---|---|---|---|
| 1938 | 4.50-6.50 | 2.75-3.50 | 1.50-2.00 | 14,166 |
| 1939 | 4.50-6.50 | 2.75-3.50 | 1.50-2.00 | 14,709 |
| 1940 | 4.50-6.50 | 2.75-3.50 | 1.50-2.00 | 15,414 |
| 1941 | 4.50-6.50 | 2.75-3.50 | 1.50-2.00 | 15,438 |
| 1942 | 6.50-7.50 | 2.75-4.00 | 1.75-2.25 | 15,733 |
| 1943 | 6.50-7.50 | 2.75-4.00 | 1.75-2.25 | 16,112 |
| 1944 | 6.50-7.50 | 2.75-4.00 | 2.00-2.50 | 16,032 |
| 1945 | 6.50-7.50 | 3.25-4.00 | 2.00-2.50 | 15,730 |
| 1946 | 8.50-9.50 | 4.00-5.00 | 2.00-2.50 | 16,744 |
| 1947 | 9.00-10.00 | 4.50-5.50 | By statute* | 17,646 |
| 1948 | 9.00-11.00 | 4.50-5.50 | By statute | 17,301 |
| 1949 | 10.00-11.00 | 5.00-6.00 | By statute | 17,946 |
| 1950 | 11.00-12.00 | 5.50-6.50 | By statute | 19,426 |
| 1951 | 11.00-14.00 | 6.50-7.50 | By statute | 22,360 |
| 1952 | 12.00-15.00 | 7.50-8.50 | By statute | 23,544 |
| 1953 | 12.00-15.00 | 8.00-9.00 | By statute | 25,102 |
| 1954 | 12.00-15.00 | 8.00-9.00 | By statute | 24,934 |
| 1955 | 12.00-15.00 | 8.00-9.00 | By statute | 25,153 |
| 1956+ | 20.25-23.25 | 16.25-17.25 | 13.40 | 24,768 |
| 1957 | 24.00-25.50 | 18.00-21.50 | 18.00 | 25,008 |

+ = New rates were less for periods after 30 days of care
* = The term refers to a low-priced plan introduced by Manitoba Blue Cross

technicians almost doubled in 1943.[16] The budgetary support for such growth was undeniably a consequence of the new sources of hospital income that by this time included private donations[17] (Fig. 8).

Table 25. Budget of the Hospital Department of Pathology (1937-1945). (Data taken from Annual Reports of the Winnipeg General Hospital and given in dollars.)

| | Salaries | Supplies | Total | Revenues |
|---|---|---|---|---|
| 1937 | 13,300.83 | 1,606.09 | 14,906.92 | 6,981.97 |
| 1938 | 12,996.38 | 1,800.81 | 14,797.19 | 7,604.07 |
| 1939* | 12,208.87 | 1,972.87 | 15,181.12 | 8,171.41 |
| 1940* | 13,933.77 | 1,978.43 | 15,912.20 | 10,474.95 |
| 1941* | 14,948.48 | 1,588.33 | 16,536.81 | 12,735.81 |
| 1942 | 16,887.56 | 2,636.92 | 19,514.48 | 17,385.79 |
| 1943 | - | - | 23,898.51 | 23,663.37 |
| 1944 | 24,538.68 | 6,879.78 | 31,418.46 | 27,845.58 |
| 1945 | 31,426.42 | 6,664.38 | 38,426.42 | 29,138.31 |

*= the budget of the Departments of Pathology and Biochemistry is reported as one

[16] From 1938 to 1945, the personnel of the department increased from 8 to 25. By 1943 the number of technicians grew from 4 to 7. The relationship between pathologists and the hospital administration was well illustrated. The support given by the administration to the activities of the department and the integration of the pathologists as specialists to the functions of the hospital demonstrates such a relationship. The latter need to be seen in the context of the nature of pathology as a specialty. Hospital pathologists are salaried physicians who provide ancillary services to medical practitioners. In Canada, they do not work on a fee-for-service basis but negotiate their salaries with the provincial health authorities. Equipment and auxiliary staff are an integral component of the hospital; Stevens, *American Medicine,* 225, 227. For instance, pathologists were not participating in the fee-for-service benefits paid by the Manitoba Medical Service plan.

[17] The annual budgets of the department are found in Table 25. The hospital income in the same period is presented in Table 22. See also Agnew, *Canadian Hospitals,* 73. New equipment was frequently obtained through private donations. Very occasionally, the Department of Pathology of the Faculty of Medicine became a donor to its hospital counterpart; Winnipeg General Hospital, "Annual Report, 1940." Such is the case of a large centrifuge donated to one of the peripheral laboratories, the F Flat, in 1940. Since medical students that performed many bedside tests used this facility, the immediate educational value of the equipment played an important role in the donation. The conditions created by World War II also made it difficult to obtain replacement equipment from manufacturers, making the skillful repair by the engineer's department indispensable for maintaining old equipment.

**Creation of a blood bank, control of infection and expansion of surgical pathology**

Pathology has always been recognized as the specialty that links the basic sciences with clinical medicine.[18] In the laboratory, the knowledge obtained from pathology finds application in the etiology, diagnosis, prognosis and treatment of disease. In the Department of Pathology of the Winnipeg General Hospital after 1940, technical advances in the microscopic examination of tissues and scientific discoveries in blood banking and bacterial sensitivity tests for antibiotics were applied in order to support specific needs in surgery. The microscopic examination of tissues provided assistance to diagnosis. Blood banking and bacterial sensitivity tests improved treatment by offering control of bleeding and infection respectively. These complications were the main causes of morbidity and mortality associated with surgery in those days. Bacterial sensitivity tests to antibiotics also assisted to establish the etiology of infectious diseases.

Those technologic-scientific developments were a component of the continuing social transformation of the General Hospital. As a result, they contributed to elevate the authority of surgeons to their patients, and also to legitimize pathologists as specialists in front of the medical community. These developments transformed the hospital into a modern institution.[19] R. Stevens clearly supports this when declaring, "World War II

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[18] "Scientific" medicine refers to the practice of medicine based on laboratory sciences. The term laboratory is used here as synonymous of pathology and does not apply to the direct application of basic sciences to medicine if not through the practice of pathology. It includes the whole spectrum of the specialty, that is, anatomical pathology and clinical pathology. The latter includes bacteriology, hematology, and clinical chemistry (biochemistry). The term "scientific medicine" has become wider in the second half of the twentieth century to include areas that were part of pathology but have now separated from it such as immunology, blood banking, genetics, transplantation, infectious diseases, etc.

[19] John Harley Warner, "The Fall and Rise of Professional Mystery: Epistemology, Authority and the Emergence of Laboratory Medicine in Nineteenth-Century America," in *The Laboratory Revolution in Medicine*, eds., Andrew Cunningham and Perry Williams (Cambridge: Cambridge University Press, 1992), 136-139.

affirmed the importance of medicine as a science based on careful laboratory techniques."[20]

Surgical needs were addressed accordingly.[21] The introduction of anesthesia and antisepsis previously had decreased surgical mortality, as these advances allow to introduce better operative techniques, yet the central nervous and the cardiovascular systems were still inaccessible and birth delivery by cesarean section remained risky due to bleeding and infection.[22] The conditions demanded solutions: appropriate blood replacement[23] and control of post-operative infections. The civilian effort of World WarII created the necessary knowledge for making solutions to both problems a reality.[24]

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[20] Rosemary Stevens, *In Sickness and in Wealth: American Hospitals in the Twentieth Century* (New York: Basic Books Inc. Pub., 1989), 201-202. She confirms the statement by giving as specific examples the use of penicillin and improved blood replacement techniques. These developments correspond to a model of diagnosis based on laboratory sciences; *Ibid.,* 204. A word of caution is important. When comparing the Canadian to the U.S. health care system, one has to be careful in extrapolating from one system into the other. Rosemary Stevens in her book (pp. 8-13) identifies the characteristic of the American Hospital System. Among them, social stratification and money standard of success clearly indicate the differences with the Canadian system. See also Rosenberg, *Care of Strangers*, 267-271.

[21] Stevens, *In Sickness and in Wealth,* 14, 202-203. By "surgery" it is understood general surgery, its subspecialties, and obstetrics and gynecology. Thoracic surgery exemplified these limitations. The three areas included under the latter are the lung, esophagus and heart. As an offspring of general surgey, this specialty began its advances between the two Great Wars with the treatment of lung diseases, specifically the surgical treatment of tuberculosis and cancer. The procedures were limited this time, not by anesthesia and manual dexterity, but by frequent bleeding and post-operative infections and by technical problems. Simultaneous attempts to operate on the esophagus were followed by the introduction of cardiac surgery in 1948; Andreas P. Naef, *The Story of Thoracic Surgery: Milestones and Pioneers* (Toronto: Hogrefe & Huber Pub., 1990), 13-15, 31, 37, 39, 82, 141. In reality the whole book is a testimony to the role that bleeding and infection played in advancing thoracic surgery. Naef considers that the era of rapid development was between 1938 and 1953. See also Norman C. Delarue, *Thoracic Surgery in Canada: A Story of People, Places, and Events. The Evolution of a Surgical Specialty* (Toronto: B.C. Decker Inc., 1989), 15-17, 20, 633-637; in addition to the general history of thoracic surgery in Canada, Delarue addresses directly such history in Winnipeg; *Ibid.*, 431-450.

[22] Ian Carr and Robert E. Beamish, *Manitoba Medicine: A Brief History* (Winnipeg: Manitoba University Press, 1999), 183, 191; Gagan and Gagan, *Patients of Moderate Means*, 87; Delarue, *Thoracic Surgery in Canada*, 8, 633; Naef, *Story of Thoracic Surgery*, 31, 37, 39.

[23] Blood transfusion has a long history, evolving from mysticism to present day therapy. This history had and still has a direct social impact in the practice of surgery, as is the case of refusal to accept transfusion due to religious grounds. A summarized version of the history of blood transfusion in medicine is found in Lawrence D. Petz, Scott N. Swisher, Steven Kleinman, Richard K. Spencer and Ronald G. Strauss, *Clinical Practice of Transfusion in Medicine,* 3rd ed. (New York: Churchill Livingstone, 1996), 11.

[24] Stevens, *In Sickness and in Wealth*, 202.

Locally the hospital department, by developing and applying technology, participated in finding the solution for controlling surgical bleeding.[25] A blood bank was established under the leadership of D. Penner and J. Lederman, under the guidance of Nicholson. [26] The strong support of private companies, community organizations and hospital authorities were also necessary.[27] The function of the blood bank was to collect, process and administer blood to patients in need.

Blood transfusions actually were practiced since antiquity with unsuccessful results. They were performed by connecting directly one artery of a donor to an artery of the recipient. Results were disastrous. Transfusions were only attempted again after the discovery of anticoagulants, also with poor results given the incompatibility of the donor's blood with that of the recipient.[28] Carr and Beamish describe the practice of

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[25] Bacteriological investigations initiated at the end of the nineteenth century had uncovered a new field of research in laboratory sciences-the defense mechanisms of the body- known as immunology. For the first time, vaccines and anti-sera became part of the armamentarium of practitioners. One area that would benefit from this research was the transfusion of blood because this procedure is based on immunological principles; Roy Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity* (New York: W.W. Norton & Co., 1997), 589-591. The contributions of the Noble Laureate Karl Landsteiner who discovered the ABO and Rh blood groups, the introduction of anticoagulants, and techniques for blood preservation are the three developments that made possible a scientific approach to blood transfusion.

[26] Blood banking represents a sub-specialty of pathology in the domain of hematology that requires sophistication not only of knowledge but also of bench techniques. The consequences of not having this capacity were disastrous for patient care. Before the creation of blood banks, transfusion services were non-existent and blood grouping was unreliable; Agnew, *Canadian Hospitals,* 11-12. An untoward blood transfusion reaction could be powerful enough to kill a person. One can only imagine the conditions before the science of immunology developed to the point of providing the necessary knowledge to be put in practice for handling blood transfusions. It is only based on these considerations that the foundation of a blood bank in Winnipeg must to be assessed. The logical conclusion is that in the early 1940s, the department of pathology had that level of knowledge and the technical expertise to implement such a project. It became a symbol of modernity as understood today; Department of Pathology, "Annual Report, 1941," 36.

[27] The "Central Voluntary Bureau," the "Rotary Club," Nicholson, and the hospital administration all strongly supported the project. The hospital's management undertook the renovation and extension of the ground floor and the renovation of the 3rd floor of the department. The blood bank was located at the ground floor and facilities were possible by a donation of $2,000 by the Rotary Club; "Annual Report, 1942. Activities at the blood bank increased very rapidly and the number of tests performed almost doubled between 1943 and 1945 (Table 20). The number of blood donors rose from 80 in 1941 to 1,690 in 1944. In 1943, testing for the Rh factor started; Department of Pathology, "Annual Report, 1943," 33. Plasma could now be stored in the hospital refrigerator at the "North Star Cold Storage Plant," a private company located at the corner of Adelaide and William Ave. J.M. Lederman was the supervisor and at the same time the technical director of the "Red Cross Blood Donor Clinic;" *Ibid.* However, the success of the blood bank meant an increment in needs. By 1944, a part time nurse-technician and a part time secretary were added to the personnel. Miss F. Melville, a technician who was already a member of the department, occupied the first position. Mrs. Frances Kieley occupied the second. By 1945, additional space was completed.

[28] Richard Hardaway Meade, *An Introduction to the History of General Surgery* (Philadelphia: W.B. Saunders, 1968), 94-97, 99-101.

blood transfusion in Manitoba early in the century before the existence of blood banks. The choice of donors was simple. From those individuals accompanying the patient, the fittest was selected. There was no previous investigation on the compatibility of blood and blood was taken from the donor in small quantities of fifty cubic centimeters at a time.[29]

The hematology section of the department had for years performed limited blood grouping and matching previous to transfusions.[30] These procedures followed the bleeding of relatives or professional donors in order to prepare blood in case of need at surgery and in cases of acute trauma. There was no proper blood storage and only a whole blood transfusion was possible. With the establishment of a blood bank, the services provided by the section improved significantly.[31]

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[29] Carr and Beamish, *Manitoba Medicine*, 71. In some centers, members of the hospital staff were volunteers for blood donations in similar circumstances; Guenter B. Risse, *Mending Bodies, Saving Souls: A History of Hospitals* (New York: Oxford University Press, 1999), 464.

[30] Blood grouping and matching are two bench techniques performed in order to identify compatibility between donor and recipient. In those years, blood grouping consisted on determining the type of blood (i.e., ABO and Rh). Blood matching referred to mixing red blood cell and plasma of donor and recipient to detect compatibility or not.

[31] "Annual Report, 1941." Penner has always been named as the founder of the first blood bank in Western Canada; "Untitled," *Winnipeg Free Press*, 2 April, 2004. His thesis, *Problems of Establishing a Blood Bank*, that was awarded the "Prowse Prize" and is located at the Neil John Mcaclean Health Sciences library of the University of Manitoba, confirms it. But, was he alone fully responsible for such an enterprise? What was the role of Lederman for example who was senior to Penner and whose area of interest was hematology? See The University of Manitoba, Faculty of Medicine, *The Centennial Program*, 1983, 69. In fact, as soon as the bank opened, Lederman appeared in the annual reports as its supervisor. Yet Lederman, in the annual report of 1942 to the Faculty of Medicine wrote that Penner, then a student demonstrator, had written his thesis that same year. Similarly, Nicholson, in his annual report to the hospital in 1950 wrote, "After a series of experiments on methods by Dr. D.W. Penner in 1941 the Winnipeg General Hospital Blood Bank was established with the assistance of a gift from the Rotary Club in 1942." Nicholson also praised Penner's methodology, stating that "during its eight years of operation it was not necessary to change the methods which had been selected. This closed system gave rise to exceedingly few bacterial contaminations even when surrounding conditions were unfavorable;" Department of Pathology, "Annual Report," 1950," 38. In the thesis, there is record of the blood transfusion practices in Penner's times. Curiously, in the acknowledgements of the thesis there is no mention of Lederman, only of Coppinger and Nicholson. Similar conditions in the U.S. around 1940 are described in Louis K. Diamond, "History of Blood Banking in the United States," *Journal of the American Medical Association* 193 (1965): 128-132.

Blood banks were founded in Canada shortly before 1939 due to the impending war and the subsequent threat of civilian casualties. The first blood bank in North America was established at the Cook County Hospital in Chicago in 1937.[32] It was now possible to store blood, avoiding the urgency of bleeding relatives in emergency conditions. It allowed for separation of blood components into red blood cells and plasma, decreasing the likelihood of unwanted transfusion reactions. It also made possible the ability to not rely on so-called professional donors, limiting in this manner the risk of disease transmission.[33]

The foundation of the blood bank at the Winnipeg General Hospital, however, created new demands for the department.[34] Blood collected was not only used at surgery performed in the General Hospital but was also given to other hospitals in Winnipeg and the Province. The workload at the bank increased approximately five-fold from 1943 to 1949.[35] Consequently, physical facilities, resources and personnel became insufficient to fulfill patient's needs.

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[32] Meade, *History of General Surgery*, 180; Diamond, "History of Blood Banking." The first successful blood transfusion was performed at Mt. Sinai Hospital of New York in 1914; Joseph Hirsh and Beka Doherty, *The First Hundred Years of the Mount Sinai Hospital of New York, 1852-1952* (New York: Random House, 1952), 166-170.

[33] In Winnipeg, donors were recruited through the 'Central Volunteer Bureau,' and during these years, women were many among them. Some women were registered nurses, who also became voluntary assistants in caring for blood donors. Middle-class women have a tradition of service participation in hospitals. Rosenberg has detailed their role and position in American hospitals and has emphasized their contribution in fund-raising and other sponsorship provisions. Blood donor recruitment can therefore also be catalogued to their efforts. On critical shortage of blood donors and, in order to fulfill need, donors from the Headingly Jail and the Stony Mountain Penitentiary were used in the summer months. This is totally unacceptable by today's standards not only in terms of human rights, but also due to the high incidence of transmissible diseases in such population.

[34] Advances in blood banking, although useful to substantial number of hospitalized patients, were also creating a new population of acute-care surgical patients as illustrated in the admissions and operative procedures at the Winnipeg General Hospital. In 1897 the number of patients treated at the hospital were 1,976 (Table 4). By 1940 they were 15,414, and by 1952, they amounted to 23,544 (Table 18). Surgical operations had increased in parallel, from 534 in 1897 (Table 4) to 8,746 in 1940 to 10,772 in 1952 (Table 18), representing an increment of twenty times. Introduction of thoracic surgery is also a well-recognized consequence of those advances.

[35] The bank handled 3,707 units of blood in 1943 vs. 17,040 units in 1949 (Table 20). Blood grouping and matching, bleeding of donors, and plasma and red cell separation were also performed.

The shortage of blood donors was another factor that led eventually to the closure of the blood bank. The Canadian Red Cross began a campaign for recruiting donors in 1949. This had a negative impact on the blood bank, which by that year had to rely on medical students in order to alleviate the donor shortage.[36] The critical situation made it such that the "Canadian Red Cross Blood Donor Service" took control of the blood supply for the Manitoba hospitals.[37] This transfer coincided with the creation of a voluntary donor system by the Federal government in 1947-1948 run by the Red Cross. Following this action, the hospital blood bank was closed on January 30, 1950. Nonetheless, by then, the department had clearly demonstrated its contributions to developments in surgery through the daily activities of the blood bank between 1943 and 1949, helping with the 18 percent increment of surgical procedures at the General Hospital.[38] The Medical Superintendent recognized that the success of the blood bank was a success for the hospital.[39]

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[36] Department of Pathology, "Annual Report 1949," 30.
[37] Richard W. Kapp, "Charles H. Best, the Canadian Red Cross Society, and Canada's First National Blood Donation Program," *Canadian Bulletin of Medical History* 12 (1995): 27-46.
[38] See Table 26. The record left by the blood bank was acceptable. During eight years of operation, 26,750 blood donations were processed with only a few cases of bacterial contamination. No fatal transfusion reactions were reported; Department of Pathology, "Annual Report 1950." In fact, D.C. Aikenhead, head of the department of anesthesia, praised Nicholson and Penner for the successful running of the blood bank during those years. He did not mention Lederman and there is no reason for his omission; "Annual Report 1952."
[39] Department of Pathology, "Annual Report, 1943," 33.

Table 26. Correlation between the annual number of surgical procedures and the number of surgical deaths expressed as the Crude Mortality Rate (CMR) (1941-1953). (Data taken from Annual Reports of the Winnipeg General Hospital.)

| | No. deaths | No.operations | CMR |
|---|---|---|---|
| 1938 | 217 | 9,118 | |
| 1939 | 219 | 8,630 | |
| 1940 | 241 | 8,746 | 2.76 |
| 1941 | 248 | 9,859 | 2.52 |
| 1942 | 212 | 9,604 | 2.21 |
| 1943 | 241 | 8,833 | 2.73 |
| 1944 | 268 | 9,027 | 2.97 |
| 1945 | 226 | 9,203 | 2.46 |
| 1946 | 247 | 9,930 | 2.49 |
| 1947 | 236 | 9,969 | 2.37 |
| 1948 | 243 | 10,124 | 2.40 |
| 1949 | 223 | 10,390 | 2.94 |
| 1950 | 256 | 10,098 | 2.54 |
| 1951 | 241 | 10,635 | 2.27 |
| 1952 | 253 | 10,772 | 2.35 |
| 1953 | 294 | 11,413 | 2.58 |
| 1954 | 123 | NR | NR |
| 1955 | 138 | 11,305 | 3.50 |
| 1956 | 120 | 11,213 | 3.60 |
| 1957 | 141 | 10,951 | 4.00 |

The bacteriology section of the hospital department of pathology played a further role by contributing to the control of hospital infection.[40] It was part of the so-called "therapeutic revolution" that emerged after the end of World War II.[41] Bacteriology had been traditionally the section of the department that produced the highest number of tests every year. But during this period, the increment appeared exponential. Previously the majority of tests had been technically simple (e.g., urinalysis) but now the examinations became more elaborate (e.g., bacterial cultures). Cultures and tests for bacterial sensitivity to antibiotics represented the greatest portion of the increment in tests performed by the bacteriology section.[42] This of course coincided with antibiotics coming to the market as the new paradigm in the practice of medicine. Simultaneously, new techniques to culture bacteria were constantly introduced. For the first time, samples taken directly from patients could be tested to determine the sensitivity of particular bacteria to one specific antibiotic. Moreover, for the first time in the history of humankind, there was specific therapy for bacterial infections. Attention was also

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[40] The field of this revolution really started with the introduction of the arsenical compound *Salvarsan* by Paul Erlich in 1907 for the treatment of syphilis; Porter, *The Greatest Benefit to Mankind*, 452; Vogel and Rosenberg, *The Therapeutic Revolution,* 248. *Salvarsan* was followed by *Sulphonamide* that, although synthesized the same year of 1907, was clinically used only until the mid 1930s; Porter, *The Greatest Benefit to Mankind*, 453. By 1943, *Penicillin*, a drug that kills bacteria, was produced in sufficient quantities to be successfully administered to human patients; *Ibid.,* 457. By the end of the decade, *Streptomycin*, that also killed bacteria, was isolated from another fungi; *Ibid.,* 457-458. The antibiotic revolution, so successful for controlling post-operative infections had arrived, adding the dimension of specificity to therapy; Vogel and Rosenberg, *The Therapeutic Revolution*, 252. A good description of the history of the management of infection in surgery is given in Meade, *History of General Surgery,* 29-39.

[41] The term "therapeutic revolution" also embraces many surgical advances that define modern medicine in addition to the control of infection by antibiotics. It also includes procedures such as open-heart surgery and organ transplantation. The enthusiasm created by these advances, nevertheless, frequently ignores the concomitant effects on society. The latter paradoxes are well identified by James Le Fanu in the introduction to his book, *The Rise and Fall of Modern Medicine.* They are: disillusioned doctors as reported in Great Britain; what he calls "the worried well" referring to the current phenomenon of people being more worried about death today than in the past; the popularity of alternative medicine; and the spiraling costs of health care; James Le Fanu, *The Rise and Fall of Modern Medicine* (New York: Carroll & Graf Pub., 2000), xv-xxi. The existence of a therapeutic revolution with its social, cultural, economic and demographic consequences is a well-accepted reality; Morris J. Vogel and Charles E. Rosenberg, eds., *The Therapeutic Revolution: Essays in the Social History of American Medicine* (Pennsylvania: University of Pennsylvania Press, 1979), vii-x, 245-246. Our intention in using the term is limited to the use of such concept for explaining the evolution of pathology as a specialty at the Winnipeg General Hospital.

[42] See Table 20; Department of Pathology, "Annual Report 1950," 39.

directed to the culture of viruses. Infection control, therefore, became one of the main responsibilities of the department.[43]

The impact of the new hematological and bacteriological technology on the safety of surgical interventions was evident and created a new paradigm in the patient-physician relationship of which laboratory medicine was an important constituent. J. D. Howell discusses the role of medical technology in the patient-physician relationship indicating the participation that the laboratory machinery has played in this relationship.[44] Although pathologists, as opposed to surgeons, do not deal directly with patients, he mentions specifically the use of the microscope and supports the argument that technology has helped to define the hospital's new role in health care, that is, the hospital transformation.[45] But technology does not mean only machinery but also the human activity around it and the application of the knowledge so generated.[46] It reflects an interaction between the scientific and the social. The new role of technology created the so-called "clinical science" that, unfortunately, has contributed to the degradation of the bond between patient and physician.[47]

In a different manner, the introduction of the surgical biopsy and of cytology has contributed not only to developments in surgery but also to change the focus of pathology

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[43] In Manitoba, the epidemics of encephalitis and poliomyelitis demanded such a response; Carr and Beamish, *Manitoba Medicine*, 83, 123, 149-152, 166. J.C. Wilt played a strong leadership role contributing to the success of service and teaching in the section of bacteriology. Nicholson made this issue clear in his annual reports; Department of Pathology, "Annual Report 1948, 1949, 1950, 1951, 1952." See biographical appendices.

[44] Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: The Johns Hopkins University Press, 1995).

[45] *Ibid.*, 5.

[46] *Ibid.*, 8.

[47] This new paradigm, when scrutinized carefully, has had a negative impact on the philosophy of medical practice. It moved the focus away from the patient toward a new focus called "disease;" Le Fanu, *Modern Medicine*, 164-165, 171. Rather than being a mediator in a cultural value system, physicians more and more become strangers to patients; Vogel and Rosenberg, *The Therapeutic Revolution,* 259-261; Risse, *Mending Bodies*, 470.

from dead bodies to living beings.[48] Surgical pathology supports diagnosis rather than treatment. The biopsy technique, although originated in Europe, has developed as a North American style of practice leading to an emphasis on surgical pathology to the detriment of anatomical pathology.[49] Wright has documented the reasons for such occurrences. According to him, "Because traditional pathologists like Virchow were resistant to study surgical specimens, the center of excellence in pathology, based on Austria and Germany during the mid- to late 19th century, moved to the United States."[50] Wright also considers the frozen section as the technique that promoted the introduction of the biopsy in North America. This resulted into a new specialty, surgical pathology, following the conceptual historical explanation offered by George Rosen.

At the Winnipeg General Hospital, the history of the surgical biopsy began in 1908 when Peirce introduced the frozen section technique, only three years after the original publication by Wilson in 1905.[51] Peirce trained with Wilson. However, examination of surgical specimens was reported as early as 1902 in the first annual report of the department.[52] When Peirce arrived in Winnipeg, the number of biopsies rose

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[48] Pathology based on the biopsy is known as surgical pathology and that based on the autopsy as pathological anatomy.

[49] Juan Rosai, ed., *Guiding the Surgeon's Hand: The History of American Surgical Pathology* (Washington: Armed Forces Institute of Pathology, 1977), 3.

[50] The history of the surgical biopsy is well described by James R. Wright Jr. in "Relationship of Surgical Oncology and Pathology in Early 20th Century America," in *History of Ideas in Surgery*, eds. Yosio Kawakita, Shizu Sakai and Yasuo Otosuka (Japan: Ishiyaku EuroAmerica, 1992), 246-252. According to him, the origins of the surgical biopsy can be traced to Europe in the nineteenth century. E. Besnier, a French dematologist, introduced the term as an "autopsy of the living," but it was Carl Ruge from Berlin, Germany, the first one who used the technique in a routine basis. In those years, pathology was the study of the mechanisms of disease based on the autopsy and its practice did not have immediate clinical application. L. B. Wilson and the Mayo brothers from the Mayo Clinic popularized frozen section in the U.S. In other publications, Wright expands on the topic; *Idem,* "The Development of the Frozen Section Technique, the Evolution of Surgical Biopsy, and the Origins of Surgical Pathology," *Bulletin of the History of Medicine* 59 (1985): 295-326; *Idem*, "The 1917 New York Biopsy Controversy: A Question of Surgical Incision and the Promotion of Metastases," *Bulletin of the History of Medicine* 62 (1988): 546-562). See also George Rosen, *The Specialization of Medicine: With Particular Reference to Ophthalmology* (New York: Froben Press, 1944).

[51] Antonio A. Gal and Philip T. Cagle, "The 100-Year Anniversary of the Description of the Frozen Section Procedure," *Journal of the American Medical Association* 294 (2005): 3135-3137.

[52] "Annual Report, 1902," 47.

abruptly from 74 in 1907 to 243 in 1908, indicating not only Peirce's background but also the role of the frozen technique in promoting the biopsy in North America as postulated by Wright.[53] Between 1902 and 1915, the number of biopsies increased twenty-six times. That tendency continued during Boyd's tenure. Boyd also wrote one of the first textbooks on surgical pathology in 1925 although Meltzer was the pathologist responsible for this practice at the hospital. Between 1916 and 1937 the number of biopsies increased by 104 percent. With the arrival of D. Penner in 1943, the quality of reporting was significantly improved. Biopsies directed to patient care were now reported within forty-eight hours. By 1957, the surgical biopsy was a standard practice as demonstrated by the progressive annual increment of their numbers. Certainly, between 1938 and 1957 the number of biopsies increased by 254 percent.[54]

In contrast to the biopsy, the fate of the autopsy was clear at the General Hospital. Autopsies were not promptly finalized due to a reduced number of pathologists. They were in this manner loosing their educational value that eventually became the main reason for their performance.[55] Autopsies, however, were also important for monitoring the quality of medical practice. In the department and up to 1957, the numbers of autopsies were increasing. In spite of this, they were slowly losing relevance for the

[53] Wright, "Development of the Frozen Section."
[54] Between 1902 and 1915, the numbers of biopsies increased from 66 to 1,716 (Table 1). Between 1916 and 1937, the numbers increased from 1778 to 3,640 (Tables 17, 27) and between 1938 and 1957 the numbers went from 3,445 to 12,195 (Tables 20, 21).
[55] "Annual Report, 1944," 31.

practice of medicine as evident by the effort of hospital accreditation agencies. In an attempt to stop their decline, autopsies were demanded as necessary for hospital's accreditation.[56]

Table 27. Pathologist (Boyd) annual reports (1916-1919). (Data taken from Annual Reports of the Department of Pathology of the Winnipeg General Hospital.)

| | 1916 | 1917 | 1918 | 1919 |
|---|---|---|---|---|
| Bacteriology | 23,238 | 30,277 | 26,751 | 21,885 |
| Biopsies | 1,778 | 1,898 | 1,793 | 2,029 |
| Autopsies | 39 | 13 | 17 | 40 |
| Hematology | 1,266 | 1,369 | 1,571 | 1,556 |
| Biochemistry | 31 | - | - | 38 |
| Miscellaneous | 546 | 542 | 439 | 86 |
| | | | | |
| Total | 26,898 | 34,009 | 30,551 | 23,634 |

Cytopathology is the other technique that supported advances in surgery and contributed to change the focus of the practice of pathology. Cytopathology is the study of disease by examining cells from living patients either aspirated from any body site or exfoliated from body cavities. The technique to obtain the first material is known as Fine-Needle-Aspiration-Biopsy and the second one as exfoliate cytology. Examples of

[56] D. Sclater Lewis, *Royal College of Physicians and Surgeons of Canada, 1920-1960* (Montreal: McGill University Press, 1962), 119-122. Autopsies began to be reported in 1909. They were kept under 50 until 1919 (Table 9, 27). From 1926, when S. Meltzer was incorporated in the department until 1937, their numbers increased from 132 to 304 (Table 17). From 1938 to 1957, hospital autopsies increased from 288 to 847 (Table 20, 21). The numbers reflected the pathologists' effort to maintain their importance, but future trends demonstrated that such efforts were unsuccessful. In my opinion, the main reason for this event rested on the private practice of health care in the U.S. There was no body that would pay for their performances. Such attitude was taken by the Canadian establishment of those years uncritical in spite of the fact that in Canada the health care system is public and, up to this day, health is a right and not a business.

exfoliate cytology are identification of tumor cells in sputa, urine, body fluids, etc. At the Winnipeg General Hospital, Penner introduced both techniques at his return from Memorial Hospital in the mid-1940s at a time when there was skepticism in the medical community about its value as a diagnostic procedure.[57] The practice of cytopathology, nevertheless, expanded rapidly due to its simplicity and efficacy. The number of cytological examinations increased by 131 percent between 1955, the first year reported, and 1957.[58]

By the 1950s, the hospital department had made local laboratory medicine a contributor to advances in surgery within the context of the social transformation of the Winnipeg General Hospital.[59] In addition to anesthesia and asepsis, safe blood transfusion and antibiotics were necessary to reduce morbidity and mortality favoring at the same time the development of more complex surgical procedures. [60] Surgical advances were also assisted by the diagnostic techniques of cytology and biopsy.

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[57] The section of cytopathology was organized in 1956. Before that year pathologists did the cytological examination without technical screeners. Miss Ruth McAndrew became the first technical screener; Department of Pathology, "Annual Report, 1956," 35, 36. Slowly the section acquired more technical personnel according to the increase in the volume of work and extended its services to non-gynecological pathology.

[58] The number of cytological examinations increased from 787 in 1955 to 1,819 in 1957 (Table 21).

[59] The Winnipeg General Hospital, from 1946 to 1954, continued growing steadily not only quantitatively but also qualitatively. The services provided became more numerous and more complex according to the transformation of the Canadian hospital in general; Gagan and Gagan, *Patients of Moderate Means*. The economic conditions of the country after the Second World War favored this development. Medical staff numbers increased mainly due to interns, residents and fellows reflecting a stronger role for the hospital as a teaching institution of specialists, although no new specialties were added to the staff. The number of patients treated during this period also increased in larger numbers than previously. The number of medical staff went from 140 in 1946 to 218 in 1954 (Table 28, 29) (Fig. 10) while the number of treated patients increased by around 8,000. Mortality rate was maintained at the lower level reached in 1945 (under 3 percent); surgical operations increased by a few hundreds (Table 18).

[60] Le Fanu, *Modern Medicine*, 72; Lester E. Wold, *Mayo Clinic: The First 100 Years* (Rochester: Mayo Foundation for Medical Education and Research, 2005), 67; mention specifically advances in cardiac surgery.

Table 28. Appointments to the Medical Staff of the Winnipeg General Hospital (1946-1952). (Data taken from Annual Reports of the hospital.)

| | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 |
|---|---|---|---|---|---|---|---|
| Consultants* | 19 | 21 | 19 | 15 | 16 | 17 | 16 |
| Medicine | 14 | 17 | 17 | 17 | 17 | 16 | 18 |
| Neuro-Psych@ | 5 | 5 | 5 | 3 | 6 | 6 | 5 |
| Pediatrics | 2 | 4 | 4 | 4 | 5 | 5 | 5 |
| Derm & Syphil | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| Surgeons | 12 | 12# | 12 | 15 | 15 | 15 | 15 |
| Urology | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| Orthopedics | 3 | 3 | 11 | 3 | 3 | 3 | 3 |
| Ob & Gyn | 7 | 8 | - | 12 | 11 | 10 | 10 |
| Ophthalmology | 4 | 3 | 3 | 4 | 5 | 4 | 4 |
| Oto-Rhino-Laryngology+ | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Research | 1 | 5 | 5 | 5 | 5 | 4 | 5 |
| Dentists | 2 | 2 | 2 | 2 | 5 | 5 | 5 |
| Pathologists | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| Biochemist | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Radiologists | 4 | 4 | 4 | 3 | 3 | 3 | 7 |
| Anesthesia | 5 | 5 | 6 | 4 | 6 | 8 | 8 |
| EEC$ | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Residents | 11 | 13 | 7 | 8 | 8 | 5 | 6 |
| Interns | 37 | 48 | 37 | 50 | 55 | 50 | 47 |
| Fellows | - | - | 9 | 14 | 12 | 6 | 2 |
| Preceptors | - | - | 7 | 14 | - | 5 | - |
| Registrars | - | - | 6 | 1 | 10 | 7 | 6 |
| | | | | | | | |
| Total | 140 | 166 | 169 | 190 | 198 | 185 | 181 |

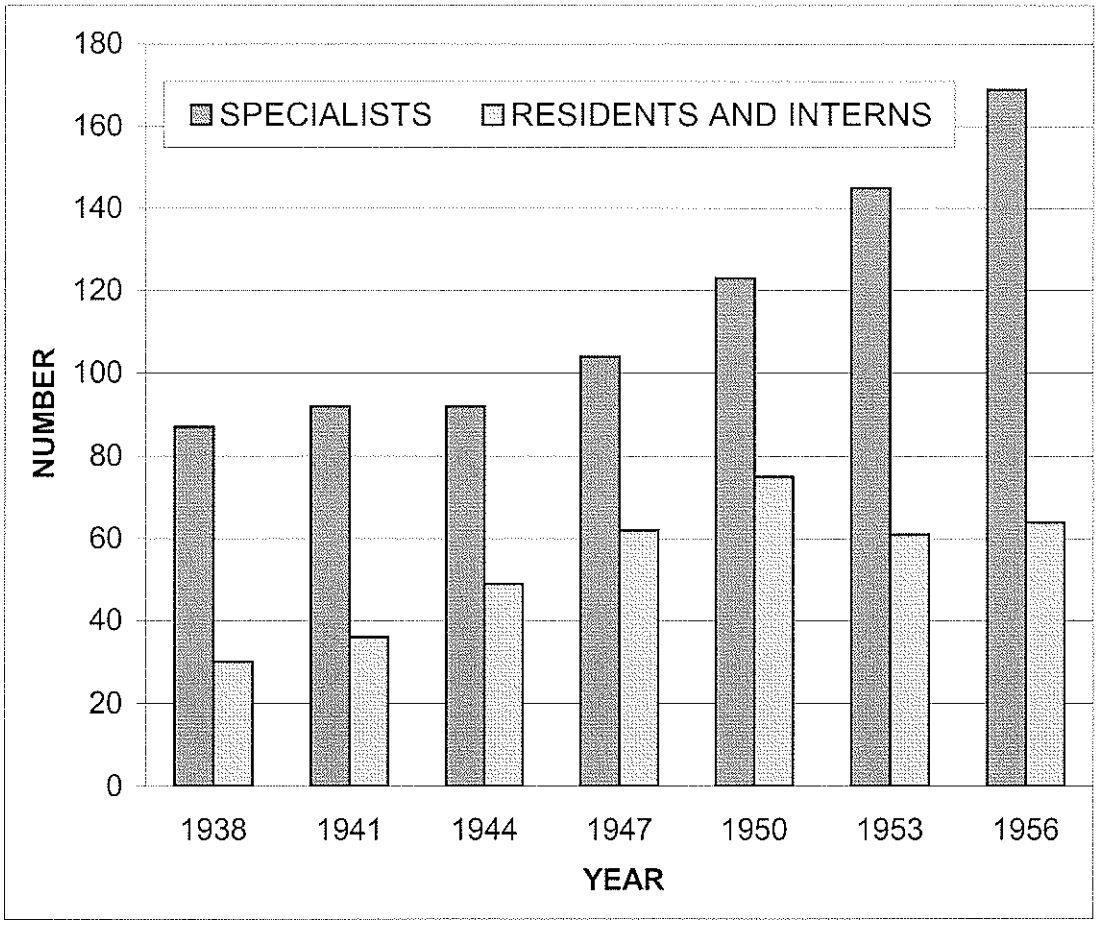
* = consultants are divided in Emeritus and Honorary
@ = combined practice of neurology and psychiatry
# = including neurosurgery and plastic surgery
+ = call like this by the first time
$ = ElectroEnCephalographer

Table 29. Appointments at the Winnipeg General Hospital (1953-1957). (Data taken from Annual Reports of the Winnipeg General Hospital.)

| | 1953 | 1954 | 1955 | 1956 | 1957 |
|---|---|---|---|---|---|
| Consultants | 18 | 21 | 22 | 27 | 27 |
| Medicine | 24 | 22 | 21 | 29 | 28 |
| Neuro-Psychiatry | 6 | - | - | - | - |
| Dermatol/syphilology | 4 | 4 | 3 | 3 | 3 |
| Pediatrics | 9 | 8 | 8 | 8 | 8 |
| Surgery | 18 | 17 | 19 | 15 | 15 |
| Urology | 5 | 4 | 4 | 4 | 4 |
| Orthopedics | 3 | 9 | 9 | 9 | 9 |
| Obst/Gynecology | 11 | 12 | 14 | 15 | 15 |
| Ophthalmology | 6 | 7 | 7 | 8 | 8 |
| Oto/Rhin/laryngology | 4 | 4 | 4 | 5 | 5 |
| Research | 5 | 2 | 2 | 6 | 6 |
| Dentistry | 5 | 5 | 5 | 4 | 5 |
| Psychology | - | - | - | - | 1 |
| Pathology | 6 | 5 | 5 | 4 | 5 |
| Bacteriology | - | 1 | 1 | 2 | 2 |
| Biochem | 2 | 2 | 2 | 2 | 2 |
| Radiology | 7 | 6 | 5 | 9 | 8 |
| Anesthesia | 4 | 4 | 4 | 4 | 7 |
| E.E.G.$ | 1 | 3 | 3 | 4 | 4 |
| Resident | 9 | 7 | 36 | 36 | 36 |
| Interns | 51 | 61 | 23 | 27 | 28 |
| Fellows | 1 | - | - | 1 | 4 |
| Registrar | 7 | 8 | 9 | - | - |
| Neurol | - | 2 | 2 | 2 | 2 |
| Psychology | - | 4 | 5 | 5 | 6 |
| Radiotherapy | - | - | 4 | - | - |
| Thoracic Surgery | - | - | - | 2 | 2 |
| Neurosurgery | - | - | - | 2 | 1 |
| | | | | | |
| Total | 206 | 218 | 217 | 233 | 241 |

$= ElectroEnCephalography

Figure 10 Number of specialists and trainees (including residents and interns), appointed to the Winnipeg General Hospital (1938 – 1956). (Data taken from the Annual Reports of the hospital.)



They ultimately represent major contributions associated with the growth of pathology and the transformation of the General Hospital as an institution of care. All of them were supported by provincial sources and moved the focus of attention of pathology from the dead to living beings.

**Final expansion of the department and the new orientation of pathology**

Optimism prevailed in the department in the early 1950s. A peaceful atmosphere is described at the Medical College in part because the core of activities was carried out at the hospital. Events were not evolving with the same dynamic at the Faculty of Medicine.[61] Teaching pathology to medical students was essentially unchanged from the curriculum introduced by Boyd, including his text-books, except by a new short course in Tropical Medicine taught by Williams.[62] Nicholson and Lederman were Professors and William was Associate Professor. Lederman was Secretary of the Faculty, member of the "Medical Faculty Council Executive" and representative of the Faculty to the university senate. Meanwhile Penner was Assistant Professor and Hogg was Demonstrator. Clearly there was an inversion in importance on the category of appointments of these individuals that reflected the relationship between both departments.

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[61] H. Coppinger, the Medical Superintendent, frequently praised the relationship of the hospital with the Faculty of Medicine in the annual reports. For instance since 1942, Coppinger lectured medical students in "Hospital Relations" and in 1943 Dean Mathers joined him lecturing on the same topic. The lectures were announced in the annual announcements of the university. Unquestionably Nicholson's personality contributed to keep this atmosphere of cooperation.

[62] Lizetta Nason, who had been Boyd's right hand in the clerical work associated with his books, continued performing her functions as secretary and in charge of the museum until retirement in 1964. W. Coad became curator of the museum from 1938 to 1952; Anonymous, "William Edwin Raymond Coad," *Manitoba Medical Review* 34 (1954): 373.

At the laboratories, the work volume had expanded by 100 percent between 1950 and 1954, with bacteriology constituting the bulk of this activity[63] (Fig. 8). The latter would eventually have further consequences for the department as a whole. Improvements developed during World War II were now incorporated into the civilian practice of medicine. Support for biomedical research was directed to university affiliated hospitals. According to Stevens, hospitals were becoming "the symbols of the success of scientific medicine" and led, in the U.S., to the upsurge of federal grants for research.[64] Optimism evidently was the result of the transformation of the hospital and resulting expansion in surgery. Both events clearly reflected on the evolution of pathology.[65]

Pre-payment plans, private insurances and the Provincial government now directly supported the transformation of the Winnipeg General Hospital. Before 1934 there were some twenty-five pre-payment plans in Canada sponsored by hospitals, service clubs and mutual benefit societies.[66] Locally Manitoba Blue Cross, the first official Blue Cross plan in Canada, was partially but effectively contributing to support the events.[67] In 1947, Blue Cross introduced a low-priced plan for public wards that lasted until 1955. These rates generated enough revenues for the expansion of services

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[63] In 1950 the total number of tests performed in the laboratories was 59,695 whereas in 1954 was 119,355. In the same four years, bacteriological tests went from 38,566 to 84,571 (Table 20, 21).
[64] Stevens, *In Sickness and in Wealth,* 202-203. In 1953, the Canadian Federal Government almost doubled the money assigned to grants for laboratories and radiological services from $4,329,000 to $7,000,000; Taylor, *Health Insurance and Canadian Public Policy*, 205.
[65] *Ibid., 203.* One can only speculate that the post-war winning mentality was part of the optimism.
[66] Agnew, *Canadian Hospitals,* 155-156. At the General Hospital between 1946 and 1954, the plans supported the daily rates for private wards that went from less than $10.00 to $15.00 and the rates for semi-private wards than went from $5.00 to $9.00 (Table 24).
[67] *Ibid.*, 158-159.

and other programs. Between 1946 and 1955, total patients' fees paid by the insurance companies rose by 181 percent. At the same time, fees from hospital services (i.e., X-rays, operating room, surgical and medical supplies, pharmacy, pathology) increased by 157 percent. The Provincial government also increased its contributions by 303 percent.[68]

The Federal government, although not contributing directly to supporting the wards, made a solid contribution to expand the hospital's infrastructure. It also supported other activities not directly relevant to general hospitals, but which had an indirect effect on hospital services (e.g., care of war veterans and Inuit, quarantine services).[69]

Unexpected events in the department then dampened the optimism. In April of 1953, Nicholson took a leave of absence due to illness.[70] The consequences of his departure would affect the department for the next twenty years in part due to personalities. Penner was promoted to Acting Director of the hospital's laboratories. In 1954 the section of bacteriology became an independent department under the leadership of Wilt.[71] In this manner, the hospital pathology department was reduced to anatomical pathology and hematology, a unique combination resulting from local circumstances. The

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[68] See Table 24. In this ten years period, contributions by patients' fees increased from $637,286.31 to $1,788,836.00; departmental earnings went from $473,118.63 to $1,213,999.77; and those by the provincial government increased from $29,264.75 to $118,077.50 (Table 23) (Fig. 9).

[69] J.E.F. Hastings, "Federal-Provincial Insurance for Hospital and Physician's Care in Canada," in *Perspectives on Canadian Health and Social Services Policy: History and Emerging Trends* (Ann Arbor: Health Administration Press, 1980), 202; "Our Handicapped Hospital: 20th Century Congestion in 19th Century Space," *Winnipeg Free Pres*, 1954. New facilities for the hospital department were ready not until 1958; Department of Pathology, "Annual Report, 1958," 66. The support of the Federal government on Canadian general hospitals before 1957 is summarized in Agnew, *Canadian Hospitals*, 53-57, 169; Taylor, *Health Insurance and Canadian Public Policy*, 163. It provided grants to stimulate the physical expansion of hospitals and to help health teaching facilities.

[70] Department of Pathology, "Annual Report 1953," 37. Following Nicholson's absence, Lederman was appointed Acting Chairman of the university department from September 1, 1953 to August 31, 1954.

[71] In those days, the hospital department, as any other in North America, had two divisions, anatomical pathology and clinical pathology. The clinical pathology division consisted of bacteriology and hematology; the third section, biochemistry, had separated as an independent department in 1929. Hematology was under the supervision of Lederman and bacteriology under the direction of Wilt. Penner oversaw anatomical pathology. The fact that Wilt was by then Chairman of bacteriology at the Faculty of Medicine, his research and development activities, and the administrative vacuum in leadership created by Nicholson's illness, evidently favored that the section of bacteriology became a separate department the following year; Annual Report, 1954.

same year, Lederman was appointed Chairman of the university pathology department replacing Nicholson, who resigned at the end of his term. In the Faculty of Medicine's annual report of 1955, Lederman is mentioned as retiring from the active staff of the Winnipeg General Hospital and was appointed "Honorary Consultant Pathologist." Lederman was ready to devote more time to university administration. The promotions were the natural consequence of the efforts by these three individuals in their respective areas of interest in the previous decade. The most important consequence of these events was a reversion of the department's administration, now becoming autonomous as in Peirce's times.

In the following three years -1955-1957- the hospital department of pathology established itself as a strong and independent entity in an affiliated teaching hospital that fulfilled the functions of service, clinical research and teaching. This was possible in part by the collaboration of a group of pathologists under the leadership of D. Penner.[72] The clinical (i.e., patient) orientation of the department was undeniably clear. The team was working within the framework of the hospital transformation under the support of new provincial economic contributions.[73]

Health issues in Winnipeg by this time were different than the ones that drove the initial creation of the department.[74] Bacteriology was no longer a component of

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[72] The pathologists were G. Hogg, H.M. Ross, H.T.G. Strawbridge and Bodan Wolanskyj. J. Lederman and Thomas Henry Williams acted as Consultants in hematology and parasitology respectively.

[73] The Federal government was to become the main patron of the hospital only by 1958. In 1955, five provinces (not Manitoba) that had universal hospital-insurance plans pressed the Federal government to honor its 1945 hospital insurance offer to cost-share hospital costs. As a result, the "Hospital Insurance and Diagnostic Services Act" was passed and adopted by Manitoba in 1958; Eugene Vayda and Raisa B. Deber, "The Canadian Health-Care System: A Developmental Overview," in *Canadian Health Care and the State: A Century of Evolution*, ed. C. David Naylor (Montreal & Kingston: McGill-Queen's University Press, 1992), 126.

[74] The number of patients treated and the number of surgical operations at the hospital in 1954 was more or less the same by 1957 (Table 24, 26). However, sophistication of services was becoming evident. For instance, in 1954 what was called neuro-psychiatry appeared for the first time as two different specialties, neurology and psychiatry. In 1956 thoracic- and neuro-surgery appeared listed as new specialties and in 1957 psychologists started forming part of the staff (Table 29). See also Delarue, *Thoracic Surgery in Canada*, 431-450.

pathology and chronic (i.e., cancer and cardiovascular) diseases, not acute (i.e., infectious) diseases, were the number one killer in the City and the province. The pathology department had adapted to this situation. Programs such as the cervical cancer screening program and research in cardiovascular diseases exemplified the adjustment. Longitudinal studies in perinatal mortality were also contributing to understanding the new causes of death at this age in Manitoba.[75] On less visible contribution to the public, but relevant internally to the hospital, was the effective accommodation of the department to an increased demand for tissue biopsies and frozen section examinations.[76] The introduction of new laboratory tests to facilitate direct patient care by the hematology laboratory also cannot be ignored.[77] Without abandoning the practice of autopsies, these functions impacted on the evolution of pathology as a specialty because they were more oriented to living patients.

The history of the specialty of pathology as practiced in hospital departments in the 1940s and 50s can be explained by the role played by the social transformation of the hospital. The traditional affiliated teaching hospital was converting into the "academic health sciences center." Now these hospitals were becoming the center, rather than the

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[75] Hogg participated in the extensive investigation in collaboration with the departments of pediatrics and obstetrics. This project, with the initial participation of Lederman, focused on peri-natal mortality, lasted several years and generated several interdisciplinary publications; Department of Pathology "Annual Report, 1955," 36. The project was introduced in April 1954 and had as goal to study causes of death with the intention to determine if the death was preventable and, consequently, to learn how to lower the mortality rate; "Annual Report, 1955, 1962." At certain years, the autopsy rate of these cases was as high as 90 percent. As part of her training in neo-natal pathology, Hogg spent one month with Edith Potter, an authority in the subject; Department of Pathology, "Annual Report, 1954," 35.

[76] Between 1953 and 1957, the percentage of autopsies and biopsies rose by 30 percent (from 654 to 847) and 26 percent (from 9,644 to 12,195) respectively. Number of frozen sections was reported for the first time in 1957 (487) (Table 21, 22). The incorporation of Mr. John Suddaby as an efficient coordinator of the department in 1957 contributed significantly to maintaining stability in spite of continuous limitations of ancillary personnel; Department of Pathology, "Annual Report, 1957," 38.

[77] "Annual Report, 1955, 1956."

periphery, of academic activities diminishing as a result the influence of the university.[78] The conversion, as the name indicates, facilitated the contribution of laboratory sciences to the practice of medicine. As a result, pathology advanced through an evolution from the German type of science practiced at university departments and based on the autopsy to clinical pathology practiced at hospitals. The advances in hematology, bacteriology and anatomical pathology that occurred during and after World War II made this evolution possible and were the result of complex technological advances. The impact was greater because it changed the practice not only of pathology but also of surgery. Pathology evolved from morbid pathology into living pathology whereas surgery went from organ removals to organ restoration and replacement.[79]

In general, conditions that were shaping the evolution of pathology as a specialty at the Winnipeg General Hospital in the 1940s and 50s were similar to other centers in North America. In particular, however, the local development of the specialty brought on board those pathologists that, following their own interests, determined the direction of the laboratories in line with Peirce's times so closing a circle that began in 1915. These changes were in keeping with the explosion of specialty training, research and patient care that were occurring in North America after World War II. Such expansion demanded

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[78] Thomas Neville Bonner, *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945* (Baltimore: Johns Hopkins University Press, 1995), 344; Stevens, *In Sickness and in Wealth*, 13.
[79] Arthur Purdy Stout, "Notes on the Education of an "Oncological" Surgical Pathologist: The Autobiography of Arthur Purdy Stout," in *Guiding the Surgeon's Hand: The History of American Surgical Pathology*, ed. Juan Rosai (Washington: American Registry of Pathology, 1997), 197-274; William Boyd, *Surgical Pathology,* 2nd ed. (Philadelphia: W.B. Saunders Co., 1930), 19; Porter, *The Greatest Benefit to Mankind*, 625.

more economic resources that, by being beyond the existent provincial support provided to the General Hospital, eventually produced a political response by the Federal government that would dominate health care for the rest of the twentieth century in Canada.

## Chapter V: Conclusions

In this thesis, events around the history of the Department of Pathology at the Winnipeg General Hospital, an affiliated hospital to the University of Manitoba, have been utilized to understand the origin of pathology in Manitoba and development of the specialty at the Winnipeg General Hospital. The histories of the hospital as an institution, of professional conflicts, and of technology are all combined to attempt an explanation of the history of specialization at a local level. Importantly though, since the very beginnings in Winnipeg, specialization in pathology appeared to be a direct consequence of the social transformation of the hospital.

A. Cunningham and P. Williams do not accept the argument that the evolution of the hospital explains the history of laboratory medicine in the twentieth century.[1] By accepting Ackerknecht's division of the history of medicine in three stages (i.e., bedside, hospital and laboratory medicine), they reverse the argument. In their own words, "By thus identifying modern medicine's origins with the rise of hospital medicine, historians have inadvertently minimized and obscured from view the later change from hospital medicine to laboratory medicine.... What we are now appreciating is that the claim that medicine should be based on the laboratory actually involved demoting the importance of the hospital."[2] This argument is supported by a claim made by Claude Bernard in 1865[3] and by a second statement made by them in that document, "the decision as to whether you are ill or not, and if you are, what disease you have, will be primarily taken not by

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[1] Andrew Cunningham and Perry Williams, introduction to *The Laboratory Revolution in Medicine*, eds. Andrew Cunningham and Perry Williams (Cambridge: Cambridge University Press, 1992), 1-13.
[2] *Ibid.*, 3
[3] *Ibid.*

your doctor but by a laboratory test."[4] Bernard's claim is arguably outdated. Many things have happened in 140 years. Their second statement is simply not correct. Laboratory tests in clinical medicine are ancillary techniques that, as their name indicates, only assist to the mental process of diagnosis. They do not make diagnoses. Unquestionably, the laboratory application to medicine created a revolution at the turn of the century as that book demonstrated, but the argument cannot be used as the only explanation of the further evolution of medicine in the twentieth century. Publications by Rosenberg, Reiser and Howell based on actual data strongly support the opposite argument.[5] As stated by Howell, "the technology that we use...reflect [s] the underlying social concerns and beliefs of a society." According to Rosenberg, the latter is exactly what the hospital represents.[6] This thesis also concurs with the conclusion of these authors.

The social transformation of the hospital in Canada was maintained by a change in economic support for the institution, evolving from a charity enterprise supported by local benevolent groups and individuals to an enterprise depending on direct payment by the middle class. Then, by the 1930s, the sources of support collapsed as a result of the Depression bringing into place indirect payments by non-profit and profit-driven insurance companies. The new sources of support for the hospital also affected physician's payments, an issue not relevant to our thesis because pathologists are salaried, not fee-for-service, physicians.

All of these events are well illustrated in the evolution of the Winnipeg General

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[4] *Ibid.*, 1

[5] Charles E. Rosenberg, *The Care of Strangers: The Rise of America's Hospital System* (Baltimore: The Johns Hopkins University Press, 1987), 154-165, 337-352; Stanley Joel Reiser, *Medicine and the Reign of Technology* (Cambridge: Cambridge University Press, 1978); 151-153, 197; Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: The Johns Hopkins University Press, 1995), 16-19, 57-59.

[6] Howell, *Technology in the Hospital*, 248-249; Rosenberg, *Care of Strangers*, 3-11.

Hospital. The beginnings of the hospital's social transformation at the early twentieth century coincided with scientific-technologic advances in medicine. Scientific-technological advances of the last half of the nineteenth century included discoveries of anti-sepsis and asepsis, identification of pathogenic organisms, discoveries in physiology, and developments in nursing. They were followed by events in the first twenty years of the twentieth century such as advances in preventive medicine, control of typhoid fever and diphtheria, improvements in medical and nursing education, technological discoveries (e.g., X-rays, laboratory medicine) and the introduction of new techniques in surgery (e.g., debridement).[7] By the middle of the twentieth century, the hospital transformation was well advanced becoming by then the "center of scientific medicine."[8]

The General Hospital used these advances in an effort to attract the middle-class to use its facilities in order to increase revenues. At the same time, physicians were using their ability to transfer patients from home to hospital as a way to increase their social authority. The hospital, therefore, fulfilled the professional and scientific aspirations of the local medical community, as socio-economic demands and European scientific-technological developments influenced their aspirations.

The transformation of the Winnipeg General Hospital was closely connected to the specialty of pathology since pathology is a supporting specialty for medicine and surgery. Local events culminated in the creation of a Chair in Pathology by the Medical College followed by the foundation of the hospital department as both institutions were

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[7] C. Harvey Agnew, *Canadian Hospitals, 1920 to 1970: A Dramatic Half Century* (Toronto: University of Toronto Press, 1974), xiv. These advances contributed to re-shape the hospital from a place of charity to one that emphasized scientific medicine.

[8] The price, however, has been high because, by becoming the centre of modern medical sciences, the hospital as an institution shares responsibility for patients' dehumanization and medicalization of life and by creating a false promise for technological resolution of disease; Morris J. Vogel, *The Invention of the Modern Hospital: Boston, 1870-1930* (Chicago: Chicago University Press, 1980), 133.

closely associated from the very beginnings. They shared the same staff. Creation of a Chair has been used to explain the origin of medical specialties in general, and events in Manitoba were not an exception.

Since the origins of the department in 1902, pathology incorporated international advances in laboratory medicine as applied to medicine in general and surgery in particular. Early on, the support consisted of the introduction of bacteriology and of the surgical biopsy. However, the increasing complexity of the practice of medicine demanded similar complexities in laboratory tests as exemplified by blood banking and bacterial sensitivity tests at the times of the World War II. The latter contributed to the expansion of surgery by controlling bleeding and infection, but from our perspective, the most important aspect was that technology supported a change in the evolution of pathology from the "science of death" to the "science of life." As a result, pathologists acquired authority in the hospital community not as basic science scientists but as clinical specialists.

Clearly, the development of a specialty represents a dynamic process affected by different factors at various times. Pathology in Winnipeg was no exception. Early, by 1915, once the specialty was established at the General Hospital, close association of the hospital with the Medical College brought a conflict of conceptualizations between the authorities of the latter and the practitioners of the former. The event, although short in duration, brought consequences that lasted thirty-nine years as the hospital department came under the administrative control of the Faculty of Medicine.

Later, advances in laboratory medicine made possible the expansion of the hospital department on activities in patient care, post-graduate training and clinical

research. Patient care improved as a result of an emphasis on the surgical biopsy, blood banking and microbiology, eventually displacing the prior emphasis on the autopsy. The practice shifted from an emphasis on understanding the mechanisms of disease to the immediate application of knowledge to diagnosis and prognosis, a radical change in the practice of the specialty. Research was also implemented with an emphasis in resolving clinical problems reflecting the new orientation in the practice of the specialty at the General Hospital. All these activities were consistent with the conversion of the practice of medicine after World War II into a "scientific" kind of practice.[9] By the late 1950s, therefore, the social transformation of the General Hospital had brought changes in medical technology, improvements in standards and regulations, and demanded more qualified personnel. The changes affected pathology directly and were responsible for the development of the specialty. They were supporting the beginnings of the eventual transformation of the Winnipeg General Hospital into the Health Sciences Center one-decade later.

[9] David Gagan and Rosemary Gagan, *For Patients of Moderate Means: A Social History of the Voluntary Public General Hospital in Canada, 1890-1950* (Montreal: McGill-Queen's University Press, 2002), 85-87, 89-90, 126; they make a summary of the hospital conditions and practice of medicine in the 1950s.

## Biographical Appendices

### Gordon Bell

Gordon Bell was an Ontarian who graduated from the Manitoba Medical College in 1890. He left for Vienna in 1893 to study ophthalmology and it was there that he became fascinated with bacteriology and pathology, the dominant medical paradigms of the second half of the nineteenth century. However, he was so fascinated with bacteriology that at his return to Winnipeg in 1894, he left the profitable practice of ophthalmology to become a member of the "Provincial Board of Health" in 1897, the same year the Department of Pathology and Bacteriology was founded at the Winnipeg General Hospital (See The University of Manitoba, Faculty of Medicine, *Centennial Program*, 1893, 44). His passion was public health, not pathology. Bell became an unofficial consultant to other colleagues given his erudition in medicine. Consultations, preferably on Sunday mornings, included problem cases in pathology. He was also the Provincial Coroner. Bell was described as a human being who always taught lessons of humility, modesty and dignity. Information about Gordon Bell is extensive. The following sources give a picture of the life of the founder of the pathology department at the Winnipeg General Hospital: Obituary, "Gordon Bell," *Canadian Medical Association Journal* 13 (1923): 701; E.W. Montgomery, *The Gordon Bell Memorial Lecture* (n.p., 1931); F.T. Cadham, "Memorable Personalities – II, Gordon Bell – A Friend of the World," *University of Manitoba Medical Journal* 21 (1949): 61-67; R.M. Mitchell, "Dr. Gordon Bell 1863-1923," *Manitoba Medical Review* 39 (1959): 521-523; and Lennox Gordon Bell, "My Father – Gordon Bell," *Winnipeg Clinic Quarterly* 23 (1970): 77-93. There are only seven manuscripts attributed to him. In a series of surgical specimens that were

examined by Bell see: *The Manitoba & West Canada Lancet* 5 (1898): 210-214, 229-230; Gordon Bell, "Pathological Specimens of Interest Recently Collected," *Lancet* 5 (1898): 233-235; on Bell participation in other aspects of pathology see: Gordon Bell, "Taenia Echinococcus," *The Manitoba & West Canada Lancet* 13 (1899): 131; Gordon Bell, "Serum Treatment of Glanders," *Canadian Medical Association Journal* 13 (1923): 200-201; a letter to the editor on acne treatment published in the same journal; and a report commissioned by the government on the typhoid epidemic of 1904.

**W.S. England**

England, a McGill graduate, was Medical Superintendent of the Winnipeg General Hospital from 1890 to 1892 and a general practitioner in the city. (Ross Mitchell, "A Teacher of Anatomy, Dr. W.S. England," *Manitoba Medical Review* 57 (1957): 575-576).

**John Fawcett**

A profile of Fawcett is found in I.I. Mayba, "John Fawcett – The Fourteenth Man," *Prairie Medical Journal* 66 (1996): 73-4; The Faculty of Medicine, The University of Manitoba, *Centennial Program*, 1983, 20.

**Georgina Ruth Hogg**

References on Georgina Ruth Hogg are found in "Department of Pathology," *Manitoba Medicine* 60 (1990): 91 when she, along with J. Hoogstraten and D. Penner, were promoted to Emeritus Professors; and in *Globe & Mail*, Saturday, 27 April 2002, in an obituary. She was born in Saskatchewan in 1916 and obtained her medical degree at the

University of Manitoba in 1945 joining the hospital department the same year. Her whole professional life was dedicated to pathology and when Dr. Hogg retired she had been a senior pathologist and director of surgical pathology at the Winnipeg General Hospital, by then an institution forming part of the Health Sciences Centre. At the Faculty of Medicine, she was appointed Demonstrator on September 1, 1953 and Lecturer on September 1, 1964. Her promotions at the professorship level occurred after 1972. G. Hogg published twenty-four papers in clinical and basic sciences, three as a sole author and the rest in multi-author publications.

**Jan Hoogstraten**

Biographic data on Jan Hoogstraten is found in "Jan Hoogstraten MD (Manitoba) PhD (Cantab), FRCPC 1917-1998," *Winnipeg Free Press*, 14 December 1998; "Nine Retired Staff Members Given Emeritus/Emerita Titles," *University of Manitoba Bulletin* 24 (1990): 10; *Manitoba Medicine* 24 (1990): 91. Hoogstraten was born in Winnipeg and was also a local graduate of the Class of 1941. After doing a year in pathology at the Winnipeg General Hospital, he enrolled in the Royal Canadian Navy. After completing his years of service, he pursued post-doctoral studies in Cambridge, England, returning to Winnipeg in 1949 with a PhD degree to become Chief Pathologist at the Children and Grace Hospitals. Hoogstraten was never a member of the Winnipeg General Hospital but was the "dean" of pediatric pathology and a respected member of the pathology community in Manitoba. He had teaching appointments in pathology at the university department during those years and brought the first electron microscope to Winnipeg in 1967. Hoogstraten died in December 11, 1998, in Gimli, Manitoba.

**John McDonald Lederman**

Fair biographical data for John McDonald Lederman is found in The University of Manitoba, Faculty of Medicine, *Centennial Program*, 69; and his obituary published in the *Manitoba Medical Review* 42 (1962): 728. Lederman was born in Saskatchewan, the son of a practicing dentist, in 1912. He obtained his M.D. degree from the University of Manitoba in 1936 followed by a career in general pathology at the Faculty of Medicine and the Winnipeg General Hospital. Lederman did not do any post-graduate work outside of the department except for six weeks of training in bacteriology at the John Hopkins University in 1938. However, his local experience made him a respected anatomical pathologist and a hematopathologist. He obtained the Canadian Fellowship in Pathology in 1955. It is in the sub-specialty of hematopathology that he was recognized as an expert. From Demonstrator (1936-38) to Lecturer (1938), he was promoted to Assistant Professor in 1943, to Associate Professor in 1950 and to full Professor in 1952. In 1954, Lederman became Professor and Head of Pathology. Since 1949 until near the end of his term as chairman, he also was Secretary of the Faculty of Medicine. Well liked by his students, he addressed the welcoming seventy-fourth session to new medical students, an honor conferred to him by the "Manitoba Students Association." The address was published in the *University of Manitoba Medical Journal* 29 (1957): 4-5. Lederman died at the age of fifty years in October 28, 1962.

**Sara Meltzer**

Biographical data on Sara Meltzer is found in her obituary published in the *Manitoba Medical Review* 22 (1942): 229; Report on Historical Medicine and Necrology, "Dr. Sara

Meltzer," *Manitoba Medical Review* 23 (1943): 255; and in the *University of Manitoba Medical Journal* 44 (1974): 19. Meltzer was born and trained in Winnipeg. She died on October 11, 1942, at the age of forty-two years. For some years, a memorial was established by the "Manitoba Women Student's Association" for a medical student "who has established the best all round record in the first four years of the course."

**Daniel Nicholson**

Information on Daniel Nicholson is found in his obituary published in the *Winnipeg Tribune,* 7 February 1970; Obituary, "Daniel Nicholson," *Canadian Medical Association Journal* 102 (1970): 877; The University of Manitoba, Faculty of Medicine, *Centennial Program*, 1983, 58. Nicholson was born in PEI. From 1938 to 1954, he was the Professor and Head of the department (College and hospital). The last year of his tenure, he was on leave of absence due to illness. From 1954 to 1970, he was promoted to Professor Emeritus. Nicholson published two books: *Practical Lessons in Clinical Pathology* in 1922 and *Laboratory Medicine* in 1930. In addition, he published over twenty papers in clinical pathology. Nicholson, a qualified pathologist in Great Britain (1923) and in Canada (1951), was described as a kindly and generous man. He was respected for his scientific approach to problems, an approach based on only using the facts he could gather from primary sources. He was a true friend of everybody including medical students and colleagues, taking a personal interest on each individual. Nicholson died in San Francisco, California, on January 26, 1970.

**Sidney James Shepard Peirce**

As found in his obituary published in the *Canadian Association Medical Journal* 65(1951): 277, Sidney James Shepard Peirce was born in England and educated in Winnipeg. He graduated M.D. from the University of Manitoba in the Class of 1904. After his career at the Winnipeg General Hospital, he left for Brandon as a member of the Bigelow Clinic. During his tenure at the Clinic, Peirce made a career in the Manitoba Medical Association. In 1921 he was appointed Treasurer and in 1923 he was elected to President. The same year, Peirce and Boyd appeared as members of the Editorial Board of the *Manitoba Medical Association Bulletin.* His publications dealt with problems in anatomical pathology and public health. The pathology papers testified to his strong background as a pathologist. Evidently he was also interested in intellectual aspects other than pathology. In 1937 he addressed the Manitoba Sanatorium under the title "Caesar and Robinson Crusoe," reflecting in this presentation about peace in the world and including three poems. In 1947 he published, "Hobbies," *Manitoba Medical Review* 27 (1947): 187-190. Peirce died on June 15, 1951.

**Donald Willis Penner**

Bibliography about Donald Willis Penner is extensive and includes several interviews given by him to newspapers. Penner was born in Saskatchewan in 1918 and died in Winnipeg in 2004. He credited D. Nicholson for early guidance and help. The following publications explain Penner's contributions to pathology and social issues: "School-Opening Slated," *Winnipeg Free* Press, 7 December 1976; "A Man 'Ahead of his Time.' Pioneering City Pathologist Earns High Award for Achievements," *Winnipeg Free Press*,

7 May 1977; "A Case of Physicians Healing Themselves. Who Said These Two Were Fitness Fools?" *Winnipeg Free Press*, 7 May 1977; "Exercise Goes To School; It's Fun, The Penner Way," *Winnipeg Free Press*, 21 November 1978; "Non Conformist Doctor, Detective and Hero,"*Winnipeg Free Press*, January 1981; Charlote Gray, "Dr. Donald Penner," *University of Manitoba Medical Journal* 56 (1986): 59; "Dr. Don Penner Named to Order of the Buffalo Hunt," *Manitoba Medical Association Inter-Communication*, no. 150 (1989): 5; "Long Time HSC Physician Receives Manitoba Highest Honor," *HSC Chronicle* 2 (1989): 4; "Doctor's Crusade. Winnipeg MD Off of Africa to Train Pathologists. *Winnipeg Free Press*, 19 September 1989; "Department of Pathology," *Manitoba Medicine* 60 (1990): 91; "Nine Retired Staff Members Given Emeritus/Emerita Titles," *University of Manitoba Bulletin* 24 (1990):10; Marjorie Gillies, "Frontier Pathologist," *Alumni Journal* 54 (1994): 24; "Sharing, Caring is Canada's Way," *Winnipeg Free Press*, 21 December 1994; "1995 Winner of the FNG Starr Award," *Praire Medical Journal* 65 (1995):85; *Winnipeg Free Press,* 27 August 1995; "Pathologist Devoted Life to Medicine and Society," *Winnipeg Free Press*, 2 April, 2004; a summary of Penner's professional career, his social contributions and the honors he received are found in William Orr and Guillermo Quinonez, "Donald W. Penner," *Canadian Association of Pathologists Newsletter* 47 (2004): 20-21.

**William Webster**

William Webster arrived in Manitoba from England in 1888 as a high school teacher. After saving enough money, he enrolled at the Manitoba Medical College in 1891, graduating four years later. After two years of general practice, Webster returned to

Manchester, England, for one year to study pathology, not anesthesia, at the Owen's College. Then from 1898 to 1906, he practiced pathology at the Winnipeg General Hospital on a part time basis. During the tenure of G. Bell as director of the laboratories, he was performing service functions prior to assuming the directorship in 1902. In 1907, he made the unusual decision of renouncing pathology to become the first full time anesthetist in Western Canada. At the Medical College, he never had an appointment teaching pathology but was Lecturer in anesthesia in 1905 and Associate Professor by 1919. He never abandoned his roots in pathology; for six months in 1910 he conducted experimental research in physiology and pharmacology under the direction of George Adami at McGill, a prominent Canadian pathologist. Moreover, in his book on anesthesia addressed to nurses, *The Science and Art of Anesthesia* (St. Louis: C.V. Mosby, 1924), Webster refers to himself as a pathologist. For information about Webster see: "Obituary," *Manitoba Medical Association Review* 14 (1934): 23; H.P.H. Galloway, "Obituaries," *Canadian Medical Association Journal* 31 (1934): 691; D.C. Aikenhead, "William Webster, M.D., Anesthetist: An Appreciation," *Anesthesia and Analgesia* 16 (1937): n.p.; M. Minuck, "Recent Advances in Anesthesia in Manitoba," *Manitoba Medical Review* 47 (1967): 146-148; M. Minuck, "Pioneers of Canadian Anaesthesia, Dr. William Webster," *Canadian Anaesthesia Society Journal* 19 (1972): 322-326.

**Frank Fairchild Westbrook**

Information on Frank Fairchild Westbrook, an illustrious Manitoba graduate, is found in "Obituary," *Canadian Medical Association Journal* 8 (1918): 1122-1123; "Obituary," *The Canadian Lancet* 52 (1919): 226-227; Carleton W. Gibson, "Frank Fairchild

Westbrook (1868-1918); A Pioneer Medical Educator in Minnesota and British Columbia," *Journal History Medicine & Allied Sciences* 22 (1967): 357-379).

**Thomas Harry Williams**

Information about Thomas Harry Williams is found in Jim Lamb, "Personality – Dr. Williams," *University of Manitoba Medical Journal* 22 (1959): 58-59; and in the biographical records kept at the Neil John McLean library, Faculty of Medicine, University of Manitoba, under Collection No. 21.9, Department of Pathology, Individual Files. Williams was born in Michigan, U.S.A. in 1888 but immigrated very young to Winnipeg where he graduated M.D. in the Class of 1916. He went to Europe as a Captain in the Royal Canadian Army Corpus in 1917. After the war, Williams went to China to do missionary work until 1942. He interrupted this work in 1933-34 to spend one year at the London School of Tropical Medicine where he obtained a Diploma in Tropical Medicine and Hygiene. Williams taught pathology, bacteriology and parasitology at West China Union University from 1939 to 1942 when he came to John Hopkins to take a three months course in parasitology. The same year, he returned to the Winnipeg General Hospital as an Assistant Pathologist and one year later accepted the position of Director of the Deer Lodge Military Hospital but retaining the position of Consultant at the hospital until 1958 and his faculty position until one year before his death in 1965. At the Faculty of Medicine, Williams was appointed Assistant Professor in 1943 and was promoted to Associate Professor in 1952.

**John Charles Wilt**

John Charles Wilt's professional life is documented in J. Gerald Fox, "Dr. John Charles Wilt – A Remembrance," *Manitoba Health Newsletter* 7 (1989): n.p.; Arnold Naimark, "In Remembrance of John C. ('Jack') Wilt," *Manitoba Medicine* 49 (1989): 67. Wilt was born in Moose Jaw, Saskatchewan, in 1920. He graduated M.D. at the University of Manitoba in 1945 and after one year enrolment in the Royal Canadian Army Medical Corps took graduate training in pathology with special interest in bacteriology at the Winnipeg General Hospital. After one year as a resident (1946) he was appointed Assistant Pathologist from 1947 to 1950 and Pathologist from 1951 to 1952 in charge of the section of bacteriology. Initially Wilt did some research in experimental pathology, (Department of Pathology, "Annual Report, 1947," 37) but very soon his area of interest became bacteriology. In 1948 Wilt began taking more direct responsibility for the every day running of the section. Problems such as the proper collection of samples (Department of Pathology, "Annual Report, 1948," 31), the kind of tests for bacterial sensitivity to antibiotics (*Ibid.*, 1949, 30), and the clinico-pathological correlation with physicians (*Ibid.)* were addressed directly by him. In 1949 an epidemic of pustules at the nurseries was resolved by his "outstanding" work according to H. Medovy, a pediatrician ("Annual Report, 1949"). Residents did small projects on antibiotic sensitivity under his supervision, and he himself carried out experiments in this area investigating the most suitable methodology (Department of Pathology, "Annual Report, 1950," 39). At the College, he was appointed Demonstrator from 1946 to 1950 and Lecturer from 1951 to 1952. In 1950 Wilt successfully received his Fellowship by the Royal College of Physician and Surgeons of Canada, approved the examinations of the American Boards

of Anatomical and Clinical Pathology and graduated MS in bacteriology from the University of Manitoba. In 1952 Wilt resigned from pathology and was promoted to Associate Professor and Head, Department of Bacteriology and Immunology at the Faculty of Medicine and to Bacteriologist at the Winnipeg General Hospital. His appointment at the Faculty of Medicine took him away from the hospital department of pathology at least half of the time (*Ibid.*, 1952, 33). Wilt continued his professional accomplishments as Associate Dean of Post-Graduate Studies, Director of the Cadham Laboratory, Assistant Deputy Minister of Health and Professor Emeritus. He published 129 papers including two historical ones: J.C. Wilt, "The History of Medical Education in Manitoba," *University of Manitoba Medical Journal* 39 (1968): 125-132; J.C. Wilt, "Medical Microbiology; A Historical Update, 1970 to the Present, 1987," *Manitoba Medicine* 57 (1987): 140-143. Wilt died in 1989.

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