Breathing Room(s): The Development of Respiratory Medicine at the MUHC

Annmarie Adams, PhD
William C. Macdonald Professor
Director, School of Architecture
McGill University

James Martin MD, DSc
Harry Webster Thorp Professor of Medicine
Physician-in-Chief, MUHC
Chair, Department of Medicine
McGill University

Kevin Schwartzman MD, MPH
Associate Professor of Medicine
Director, Respiratory Division
MUHC and McGill University

MUHC Medical Grand Rounds
April 15, 2014

Disclosures

- None of the speakers has any conflicts of interest to declare

Objectives

- To share some important milestones, developments and accomplishments in the evolution of adult respiratory medicine and research at the MUHC
- To place these in the context of broader intellectual, social, architectural, and historical change
- To highlight future plans for respiratory patient care, education and research

Respirology in the early 20th century

- Largely concerned with diagnosis, treatment and prevention of tuberculosis [pthisiology]
- The roots of current respiratory professional and health organizations lie in TB, and strong links continue to this day
  - American Lung Association founded in 1904 as National Association for the Study and Prevention of Tuberculosis; Edward Trudeau was president and William Osler vice-president[1]
  - American Thoracic Society founded in 1905 as the American Sanatorium Association, “to prevent, control, and treat TB”[2]
  - Canadian Lung Association founded in 1900 as the National Anti-Tuberculosis Association; at that time, TB was Canada’s leading cause of death[3]

[1] Tobin, *AJRCCM* 2004
[2] Murray, Du Melle & Hopewell, *AJRCCM* 2012
[3] http://www.lung.ca/about-propos/who-qui/historicalvideo-videohistorique/index_e.php

The Royal Edward Institute

- Opened on October 21, 1909, in Belmont Park on present-day site of Central Station
- “For the study, prevention and cure of Tuberculosis”
- Opened by telegraphic signal from England by King Edward VII

The Royal Edward Institute

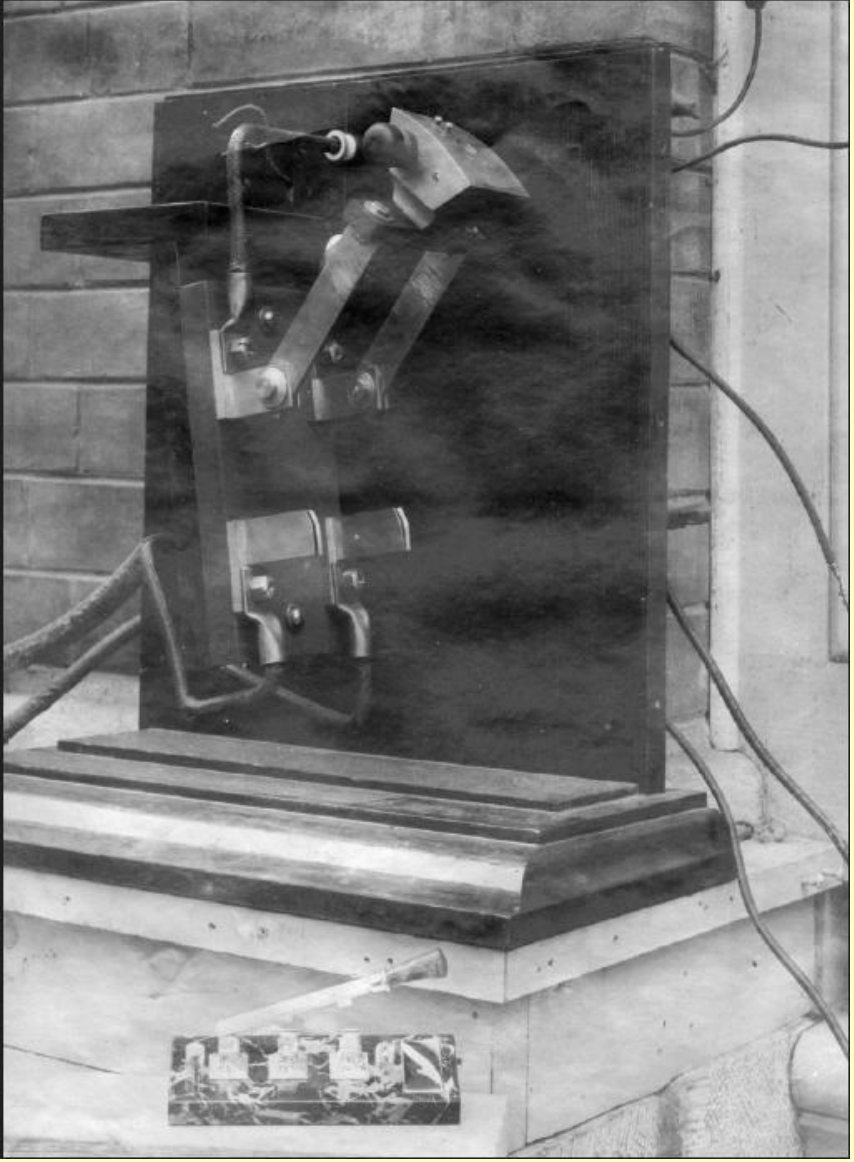
- “The Institute is a place where sick persons will obtain information as to the best line to be followed in their particular case…[it] will constitute a “receiving house” from which…they will be distributed severally to the suitable hospitals. Many patients will be found unsuitable for hospital treatment…and these will remain under the immediate surveillance and direction of the doctors and nurses of the Institute. By the visits of the doctors to the homes, early cases will be frequently discovered in addition to the patient primarily concerned.”

Dr. R.W. Philip of Edinburgh, speaking at the opening ceremony on behalf of the National Association for the Prevention of Tuberculosis in England

The Opening

- “Obedient to the Royal touch on the instrument over-seas, the little brass bar on which the attention of the hundreds of spectators was focussed dropped from its place. A soft, whirring sound announced that the attached motor was at work. On the instant, the Royal Standard was seen running up the mast, the doors of the Institute swung open, and from roof to cellar the building was brilliantly illuminated.”

R. Lloyd Jones, Report of the Opening of the Royal Edward Institute (for the study, prevention and cure of Tuberculosis) by His Majesty King Edward VII (by cable)—Reproduced by the MCI Foundation



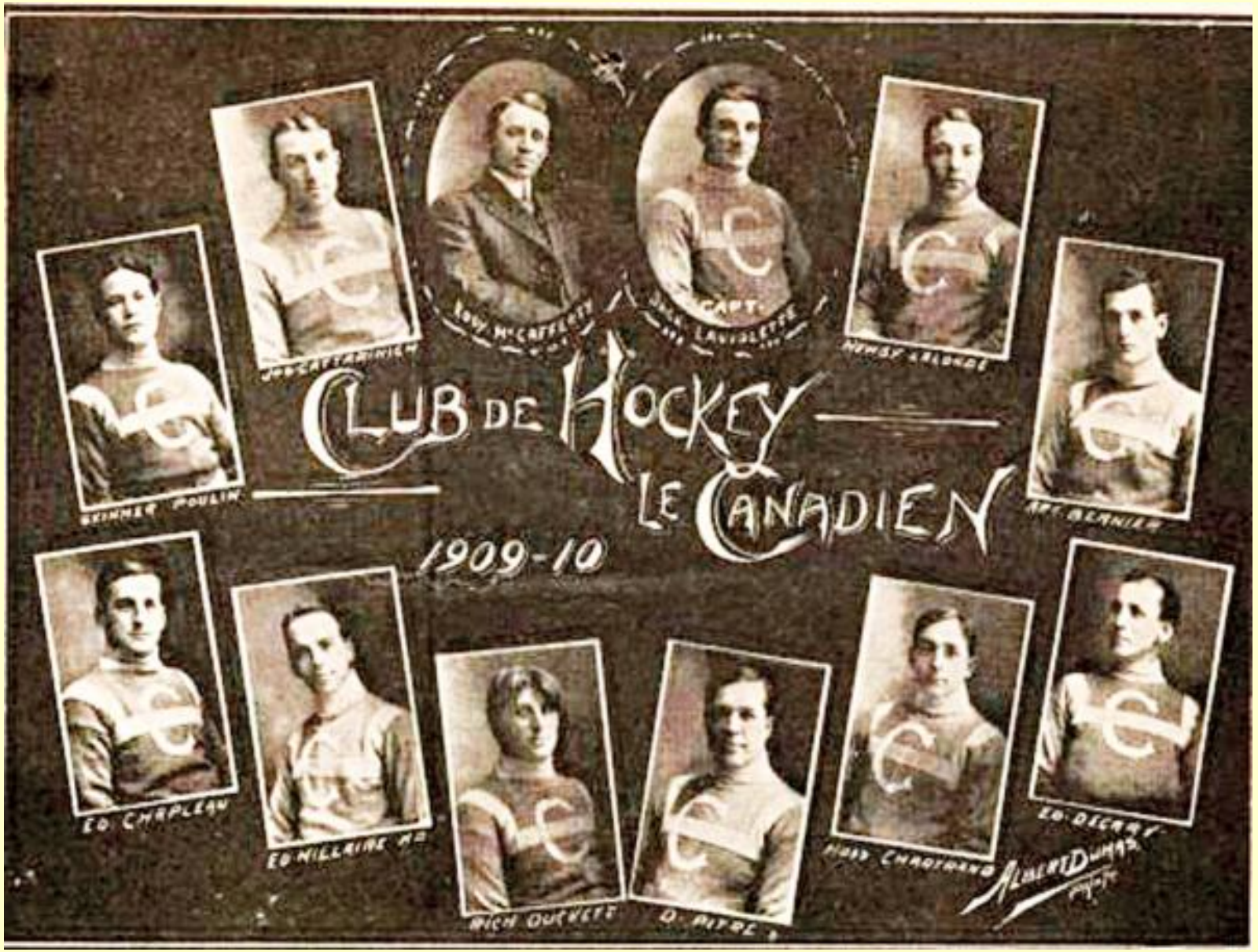
Adams, Schwartzman, Theodore:
Technology and Culture, 2008

From Report of the Opening…

Doors Opening and Flag Mounting Flag-mast.

Question

- Other than the Royal Edward Institute, what other key Montreal institution was established in 1909?



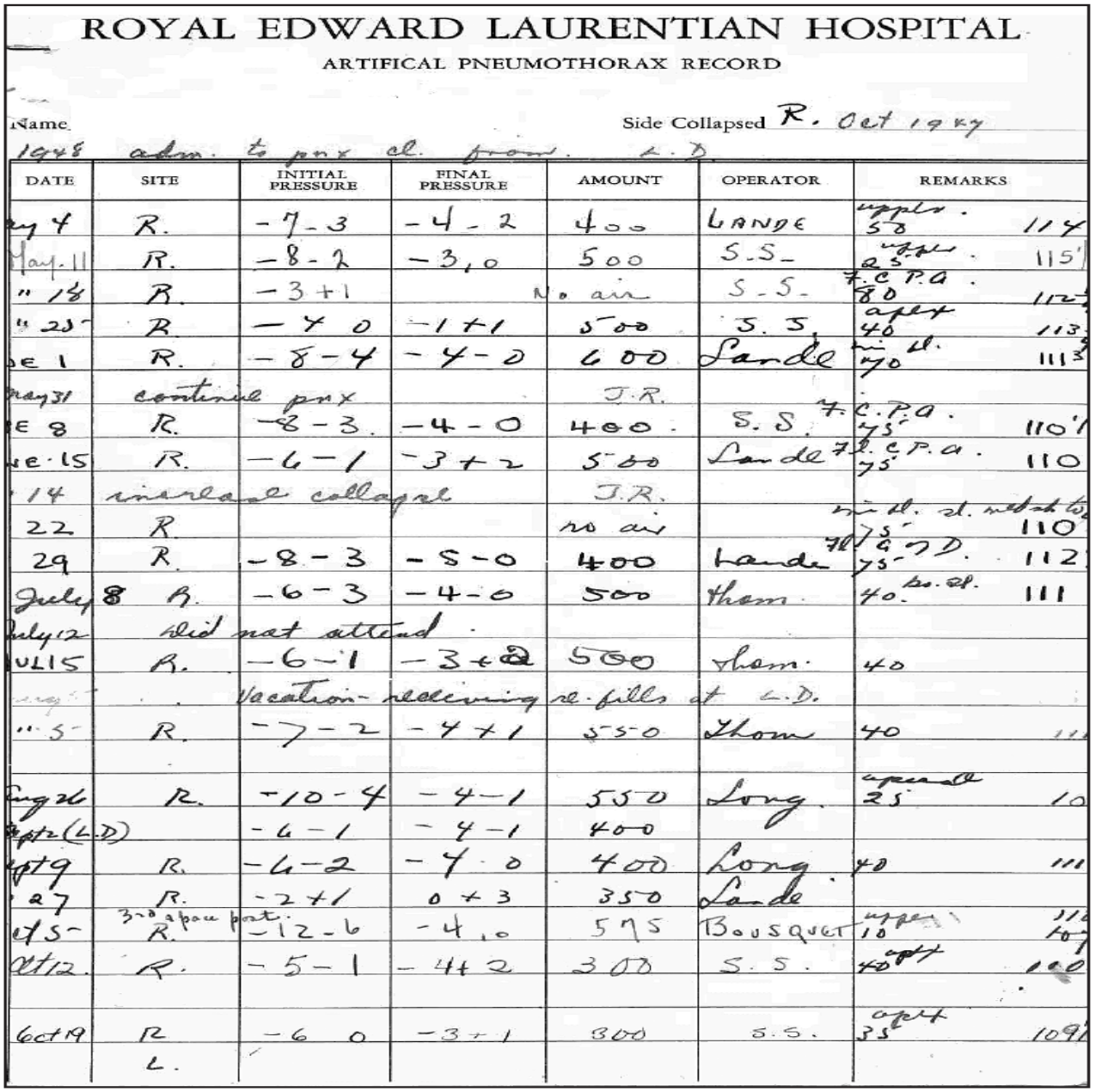
http://ourhistory.canadiens.com/season/1909-1910

1930s – 1940s

- Increasing emphasis on collapse therapies for TB
  - Pneumothorax
  - Foreign material
  - Phrenic nerve crush
  - Thoracoplasty
    - Introduced to North America by Dr. E. Archibald of McGill
- Move of Royal Edward Institute to St. Urbain in 1933
- In 1941, all McGill TB thoracic surgery moved to Royal Edward
- 1942 merger of Royal Edward Institute and Laurentian Sanatorium Association to form Royal Edward Laurentian Hospital

FIG. 7 Pneumothorax machine designed by Norman Bethune. (Reproduced courtesy of the Osler Library of the History of Medicine, McGill University.)

Adams, Schwartzman, Theodore: *Technology and Culture*, 2008



ROYAL EDWARD LAURENTIAN HOSPITAL

ARTIFICAL PNEUMOTHORAX RECORD

Name

Side Collapsed R. Oct 19 ky

1948 adm. to pnx cl. from L.D.

DATE	SITE	INITIAL PRESSURE	FINAL PRESSURE	AMOUNT	OPERATOR	REMARKS	
y 4	R.	-7-3	-4-2	400	LANDE	upper. 5s	114
May. 11	R.	-8-2	-3,0	500	S.S.	upper. 2s	115
" 18	R.	-3+1	No air		S.S.	F.C.P.A. 80	112
" 25	R.	-4 0	-1+1	500	S.S.	apex 40	113
E 1	R.	-8-4	-4-0	600	Lande	in ll. 40	111
ray 31	continue pnx			J.R.			
E 8	R.	-8-3	-4-0	400	S.S.	F.C.P.A. 7s	110
E 15	R.	-6-1	-3+2	500	Lande	F.C.P.A. 7s	110
14	increase collapse			J.R.			
22	R			no air		in ll. st. not to 7s	110
29	R.	-8-3	-5-0	400	Lande	F.C.P.A. 7s	112
July 8	R.	-6-3	-4-0	500	Thom.	40 ll. st.	111
July 12	did not attend.						
JUL 15	R.	-6-1	-3+2	500	Thom.	40	
	Vacation- receiving re-fills at L.D.						
" 5	R.	-7-2	-4+1	500	Thom	40	
ug 26	R.	-10-4	-4-1	550	Long.	upper 2s	10
pt 2 (L.D)		-6-1	-4-1	400			
pt 9	R.	-6-2	-4 0	400	Long.	40	111
27	R.	-2+1	0+3	350	Lande		
t 5	3rd apex pat. R.	-12-6	-4,0	575	Bousquet	upper 10	110
t 12	R.	-5-1	-4+2	300	S.S.	40 apex	100
Oct 19	R	-6 0	-3+1	300	S.S.	apex 3s	109
	L.						

FIG. 8 Record of treatment with artificial pneumothorax notations for a patient admitted in 1948. (Reproduced courtesy of the Montreal Chest Institute.)

Adams, Schwartzman, Theodore: *Technology and Culture*, 2008

Advent of antibiotic treatment for TB

- Streptomycin first administered to humans in 1944 in Minnesota
- Administered at Royal Edward as early as 1947
- Para-aminosalicylic acid 1944
- Isoniazid 1952
- Concurrent growth of surgical resection for TB, first introduced in 1934 by Archibald
  - 10 resections in 1948, 42 in 1953[1]

[1]Annual Report, Royal Edward Laurentian Hospital, 1953

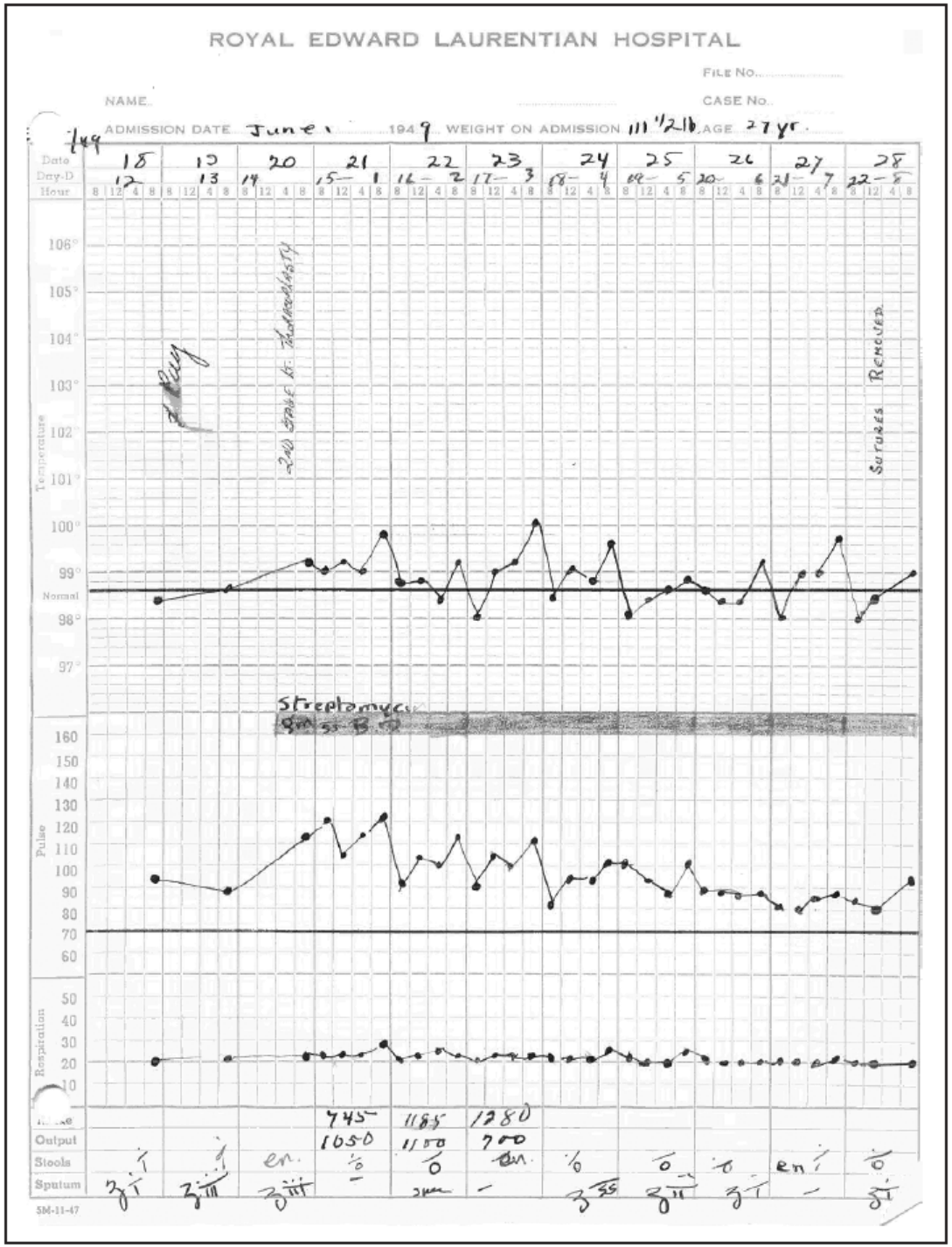
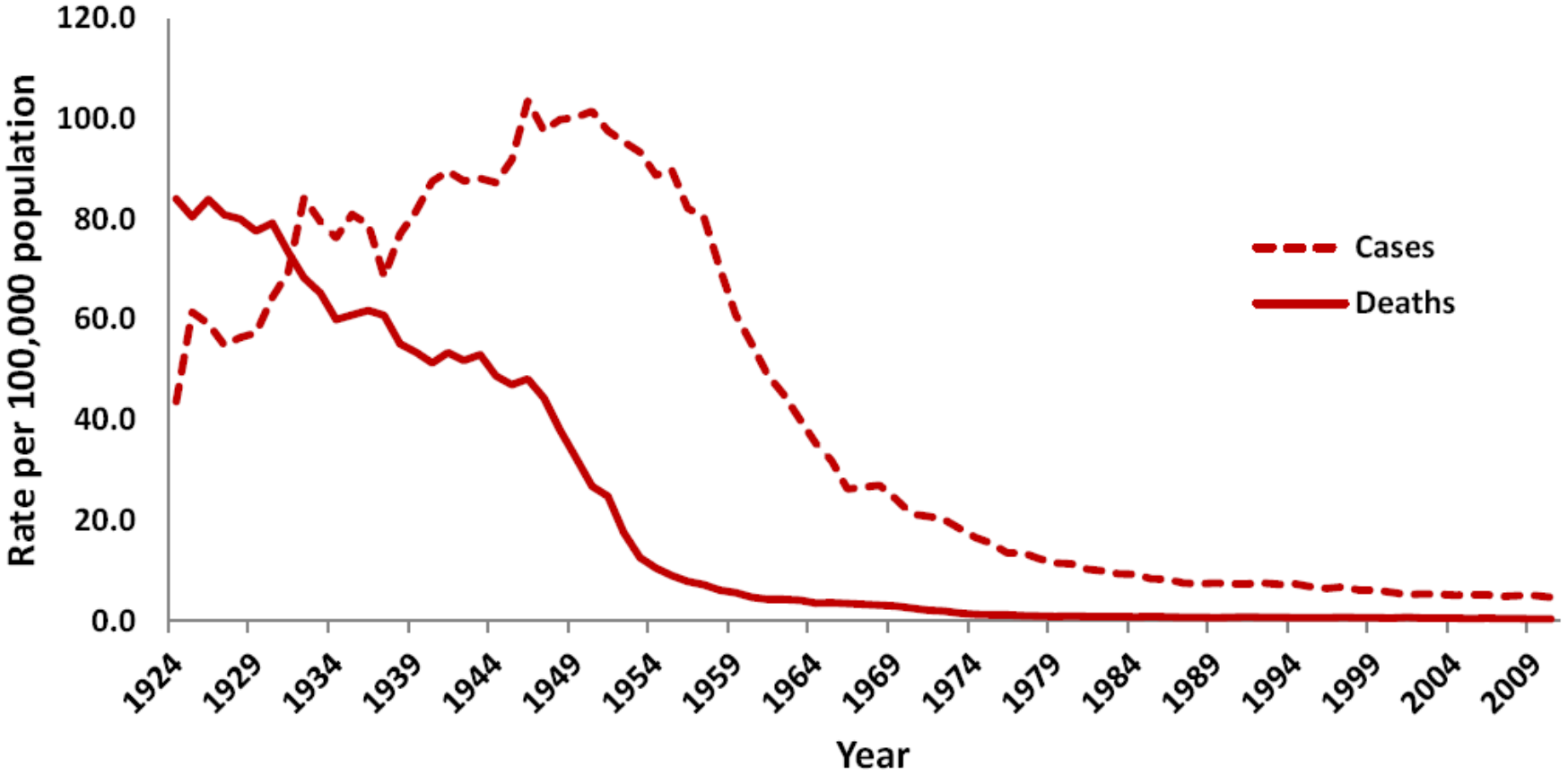


FIG. 11 Chart showing administration of streptomycin immediately after a second-stage thoracoplasty, 1949. (Reproduced courtesy of the Montreal Chest Institute.)

Adams, Schwartzman, Theodore: *Technology and Culture*, 2008

Figure 1: Reported tuberculosis incidence and mortality rates in Canada, 1924-2010



Halverson, Ellis, Gallant and Archibald: *Canadian Tuberculosis Standards* 2013

http://www2.cedarcrest.edu/academic/bio/hale/bioT_EID/lectures/poliomanironlung.jpg

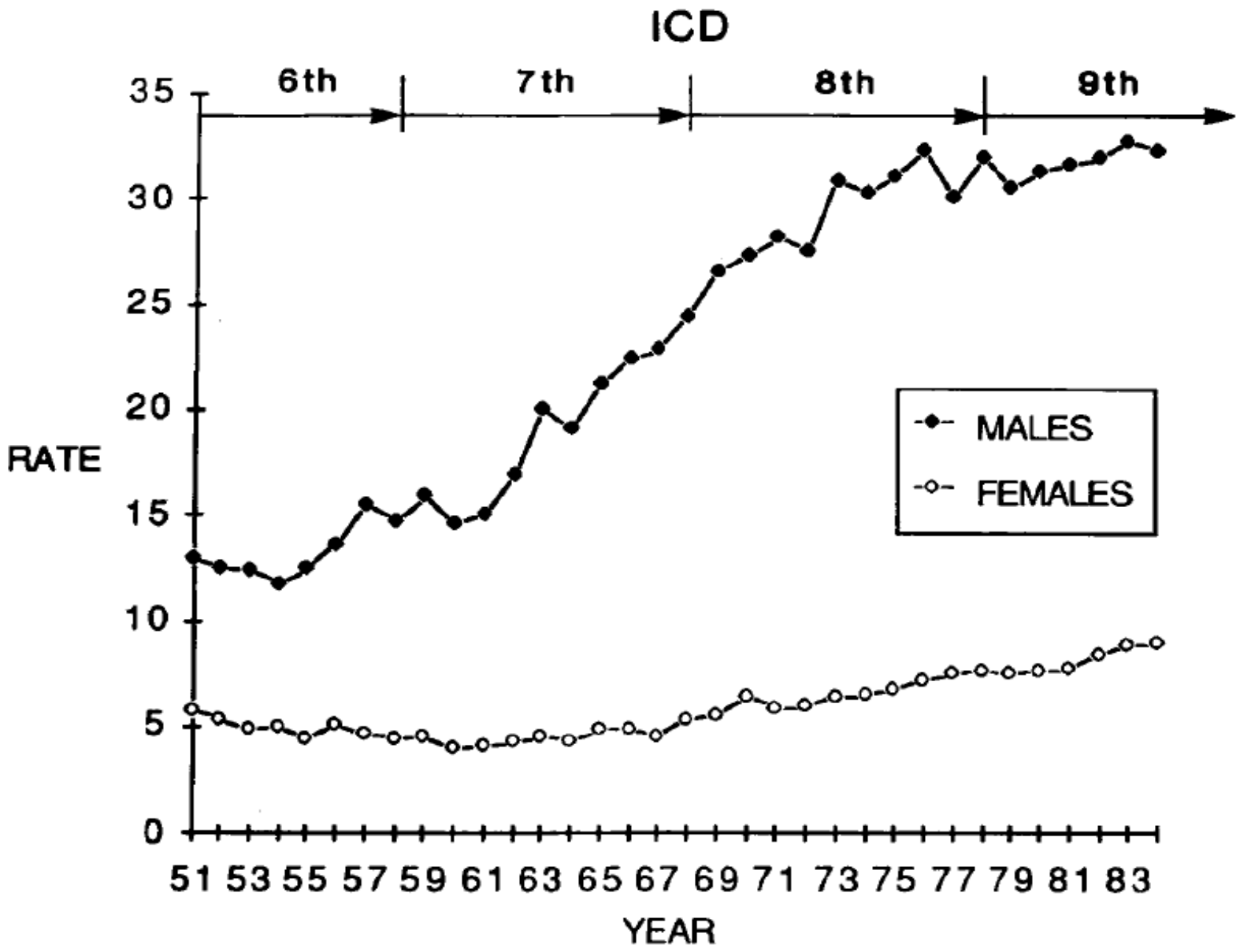
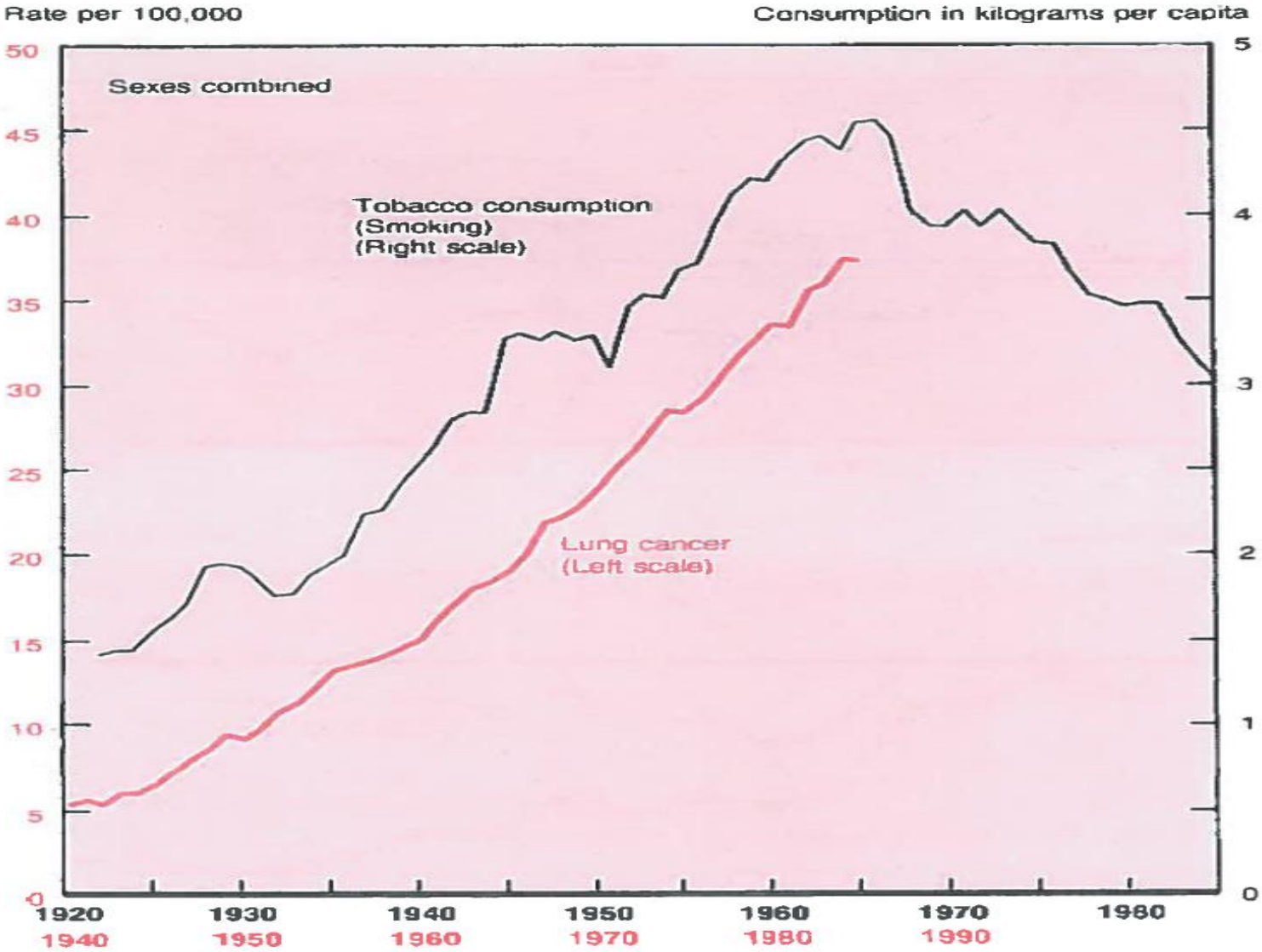


Fig. 1. COPD: age-standardized mortality rate per 100,000 population, Canada, 1951 to 1984. Age standardized to 1971 Canadian population.

Manfreda et al, *Am Rev Respir Dis* 1989

Figure 12

Tobacco Consumption from Smoking, (1) 1920-1985, and Lung Cancer Mortality Rates, (2) Canada, 1940-1985



(1) Tobacco consumption from smoking was calculated in kilograms per capita (based on population 15 +) and excludes snuff and chewing tobacco.

(2) Mortality rates are age-standardized to the 1971 Canadian population, and include deaths for all age groups.

Source: Health Division, Statistics Canada, and Surveillance and Risk Assessment Division, Health and Welfare Canada.

Hill et al, *Canadian Cancer Statistics* 1988

1950s

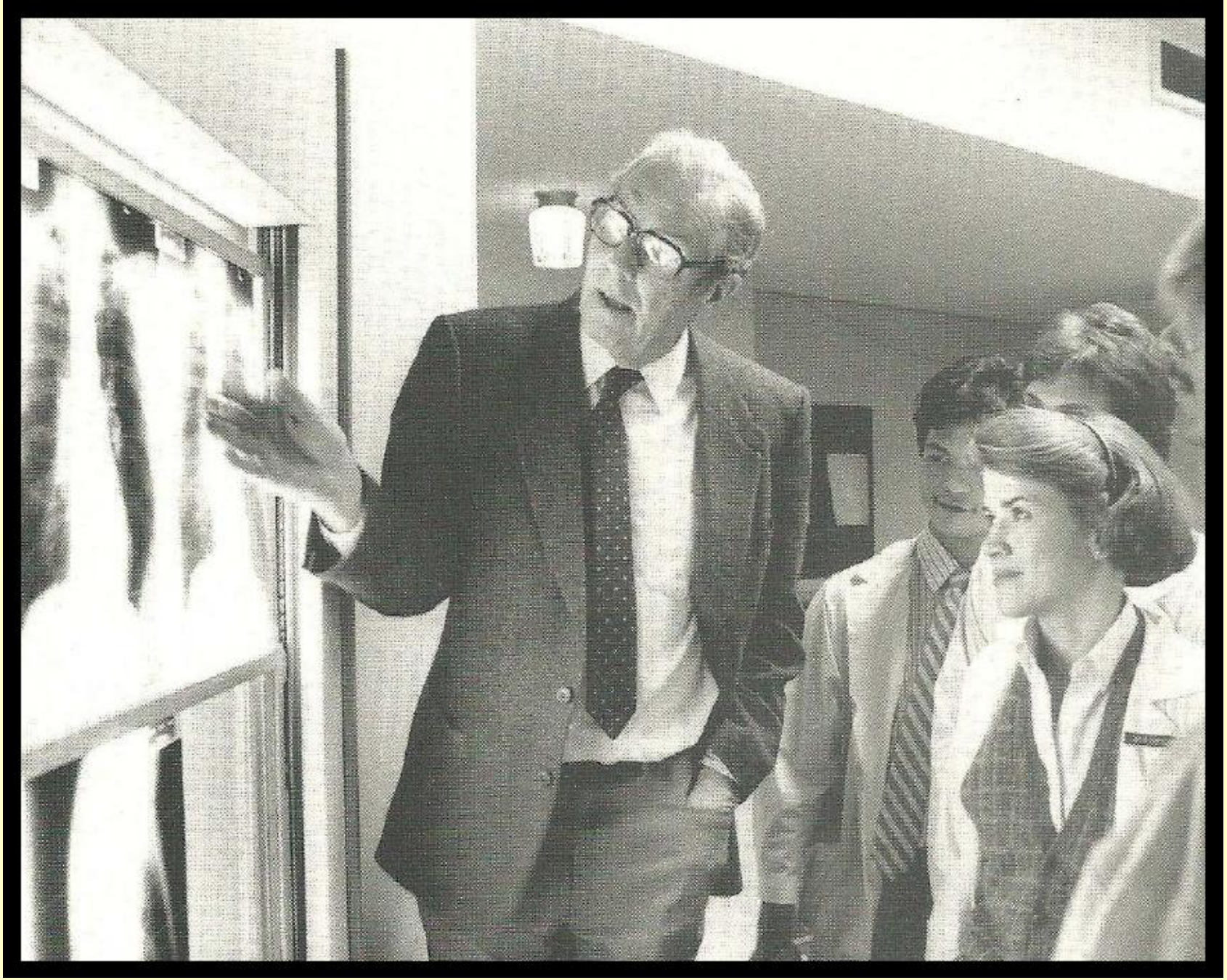
- Increasing use of anti-TB antibiotics, and home treatment
- Broadened mandate of Royal Edward to address other respiratory diseases
  - By 1960, 582 patients admitted for non-TB respiratory disease, including 78 for lung cancer
  - In 1961, 195 “major operations,” including 57 lung resections for non-TB conditions

Who is this man?

Bonus points: Who is the baby?

And what is their connection to this woman?

www.usmagazine.com



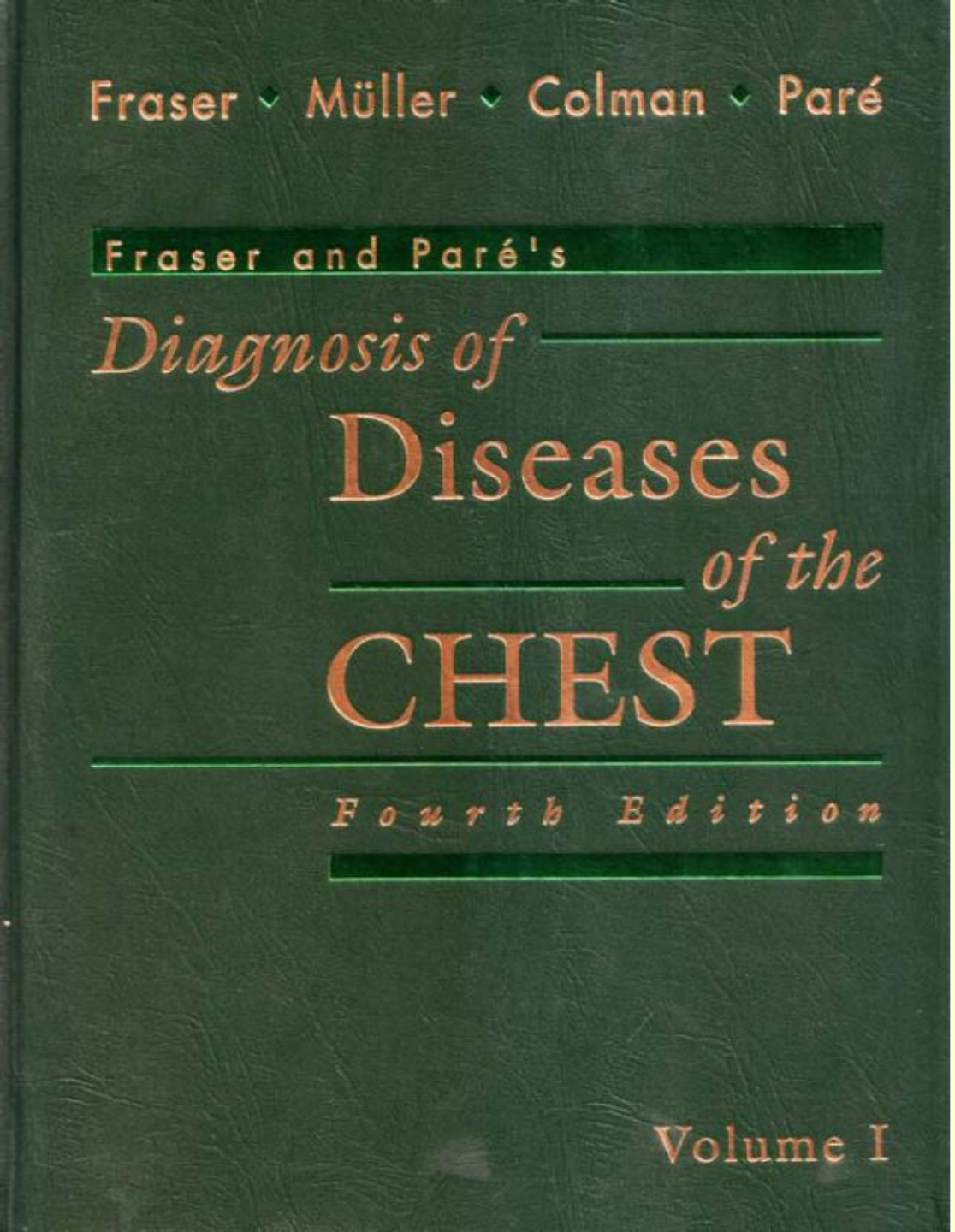
Dr. Jules Arthur Peter Paré (1917-2013)

Photos courtesy of Paré Family

Dr. Paré

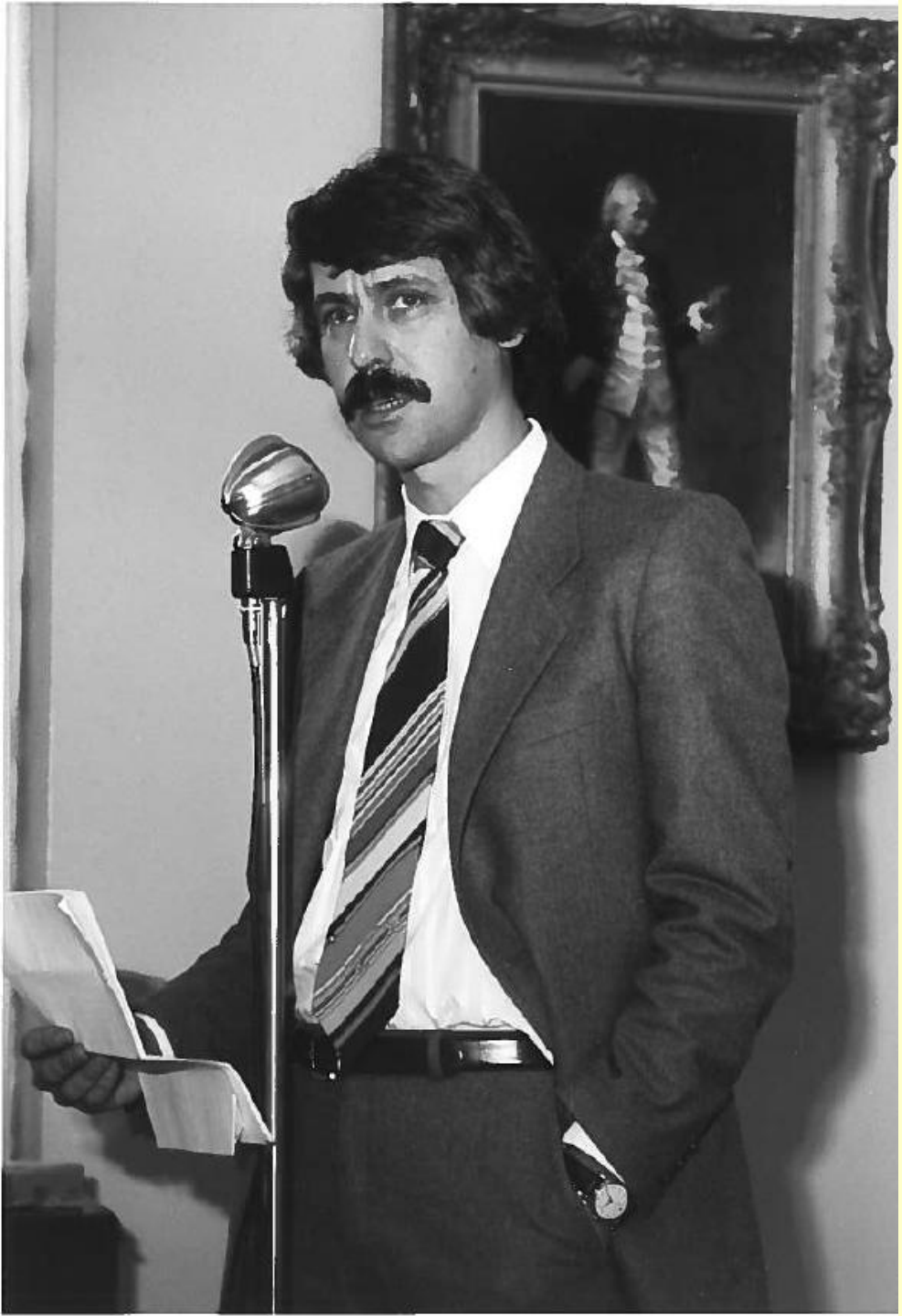
- Joined attending staff at RVH and RELH in 1949
- Became Full Professor in 1975; served as Respiratory Division director 1975-83
- Truly a “giant” (6 foot 4!)
- Trained many clinicians across Canada and US, including American Thoracic Society leaders

Dr. Robert Fraser



- Still a respirology "bible"
- Guides the way we approach and manage patients
- Guides our teaching and rounds, known as Paré rounds
- Dr. Paré's philosophy still serves as the code by which we work together

RVH, December 1987

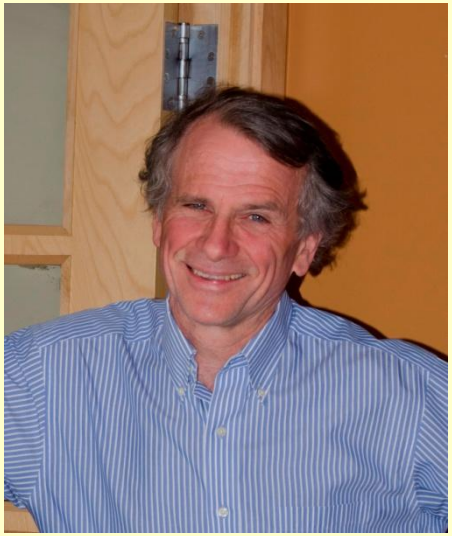


Who is this man?

Hint: Taken at opening of Clarence Campbell Respiratory Division, 1985

Respirology at the MGH

- The chest clinic and pulmonary function measurements began in 1953, as part of the Cardio-Respiratory Service under cardiology
- In 1975, Dr. Donald MacIntosh became the first director of the newly formed Respiratory Division
- In 1976, Drs. Neil Colman and Arnold Zidulka were his first appointees
- Dr. MacIntosh left in 1978, and was replaced by Dr. Paré (Respirology being true MUHC pioneers)
- Dr. Neil Colman replaced Dr. Paré in 1982, and remained Division Director until 1995
  - A period of extensive growth in human and physical resources; in clinical programs and expertise e.g. multidisciplinary specialized asthma unit, lung transplantation; and in research




Today: Multidisciplinary specialized clinics, linked directly to research and teaching

MCI photos generously provided by MCI Legacy committee

Incredibly committed and innovative nursing, allied health and administrative staff

And a Foundation that is always “in our corner”

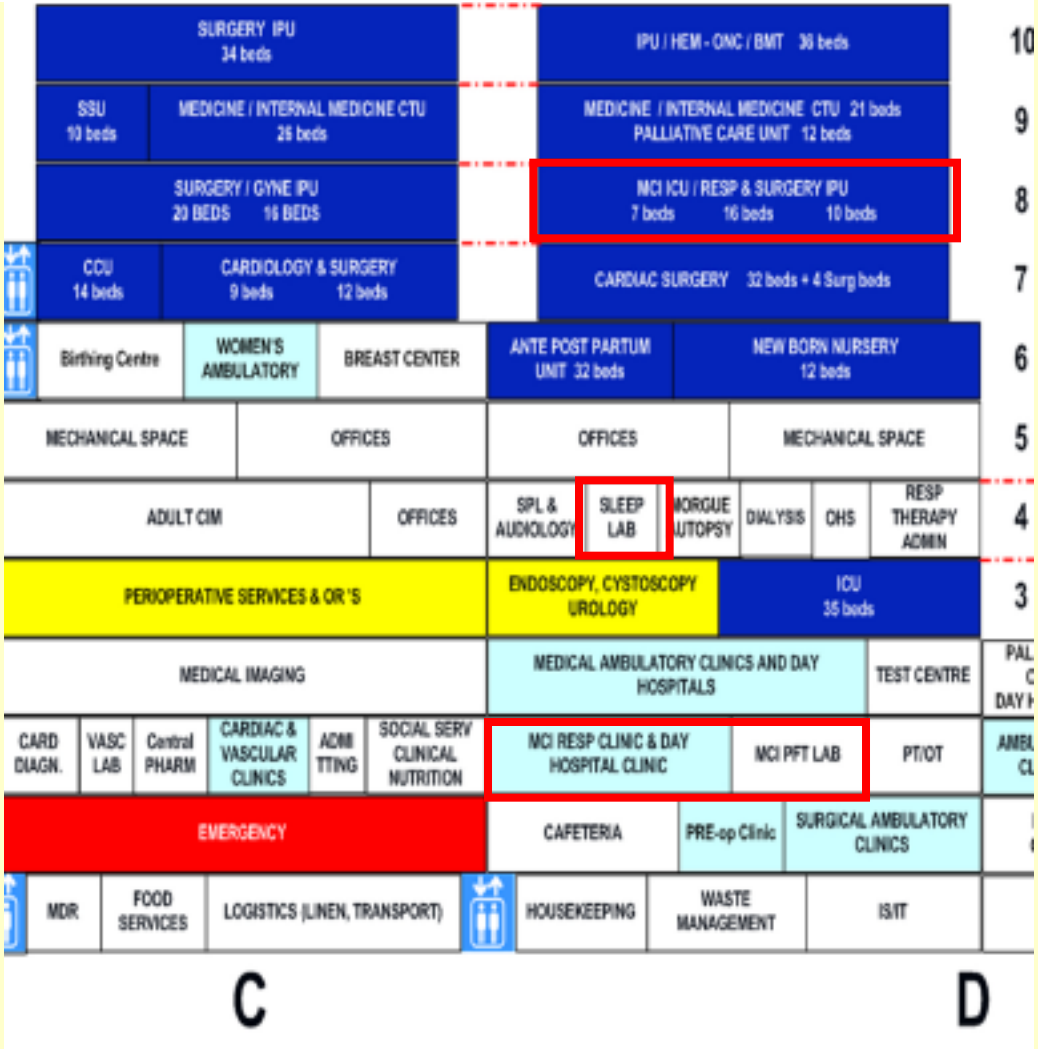
Coming soon…

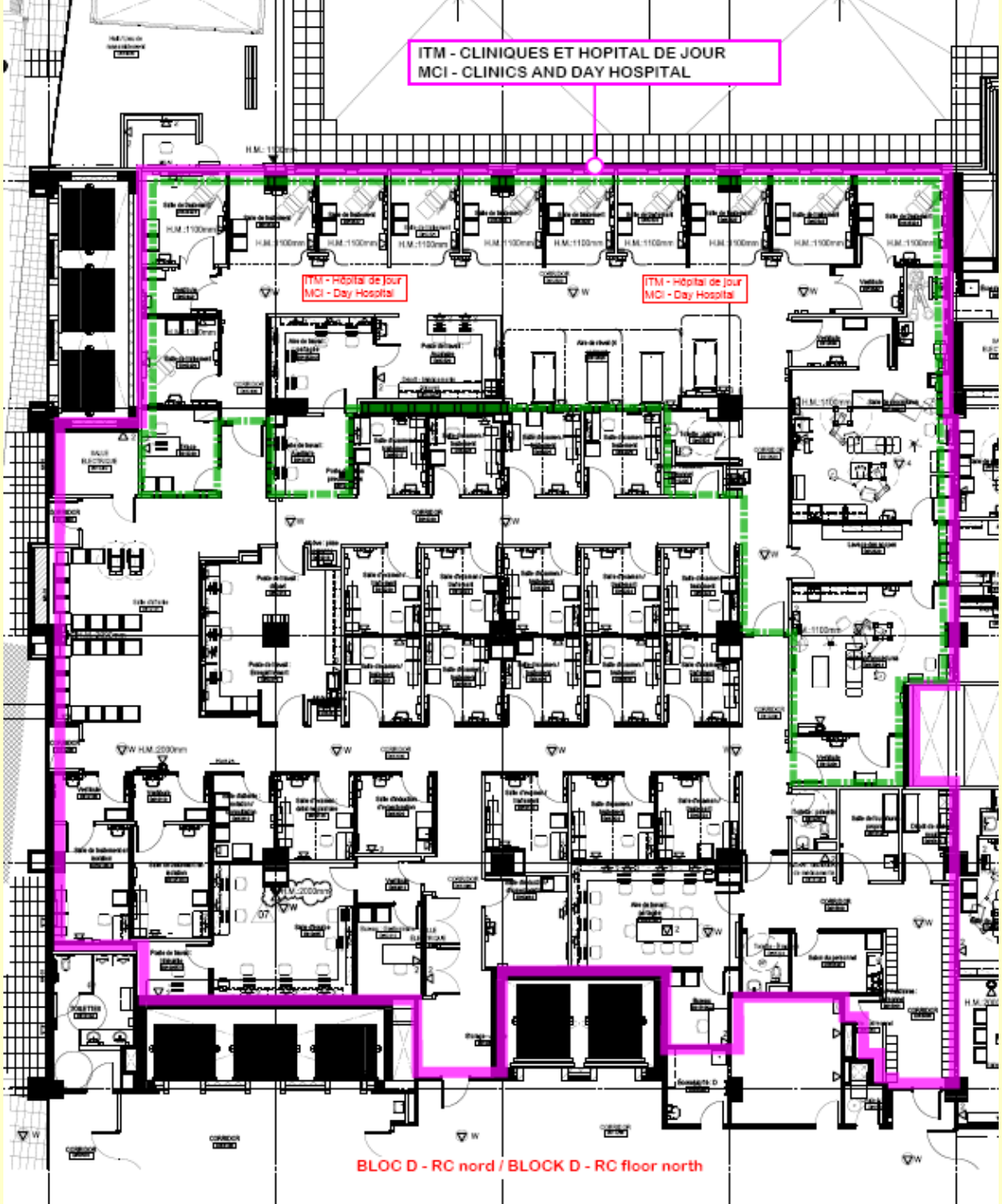
Centre universitaire de santé McGill

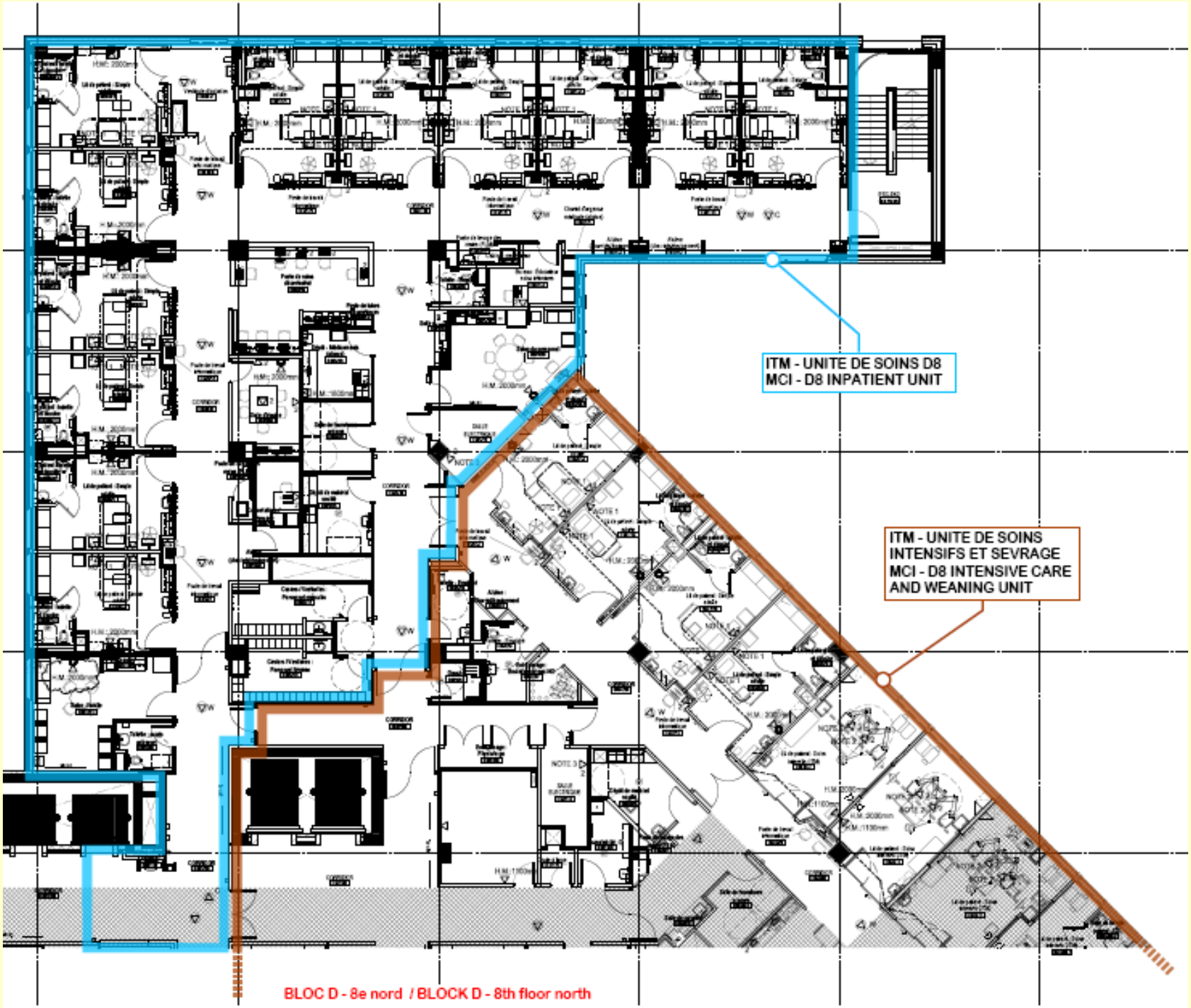
McGill University Health Centre

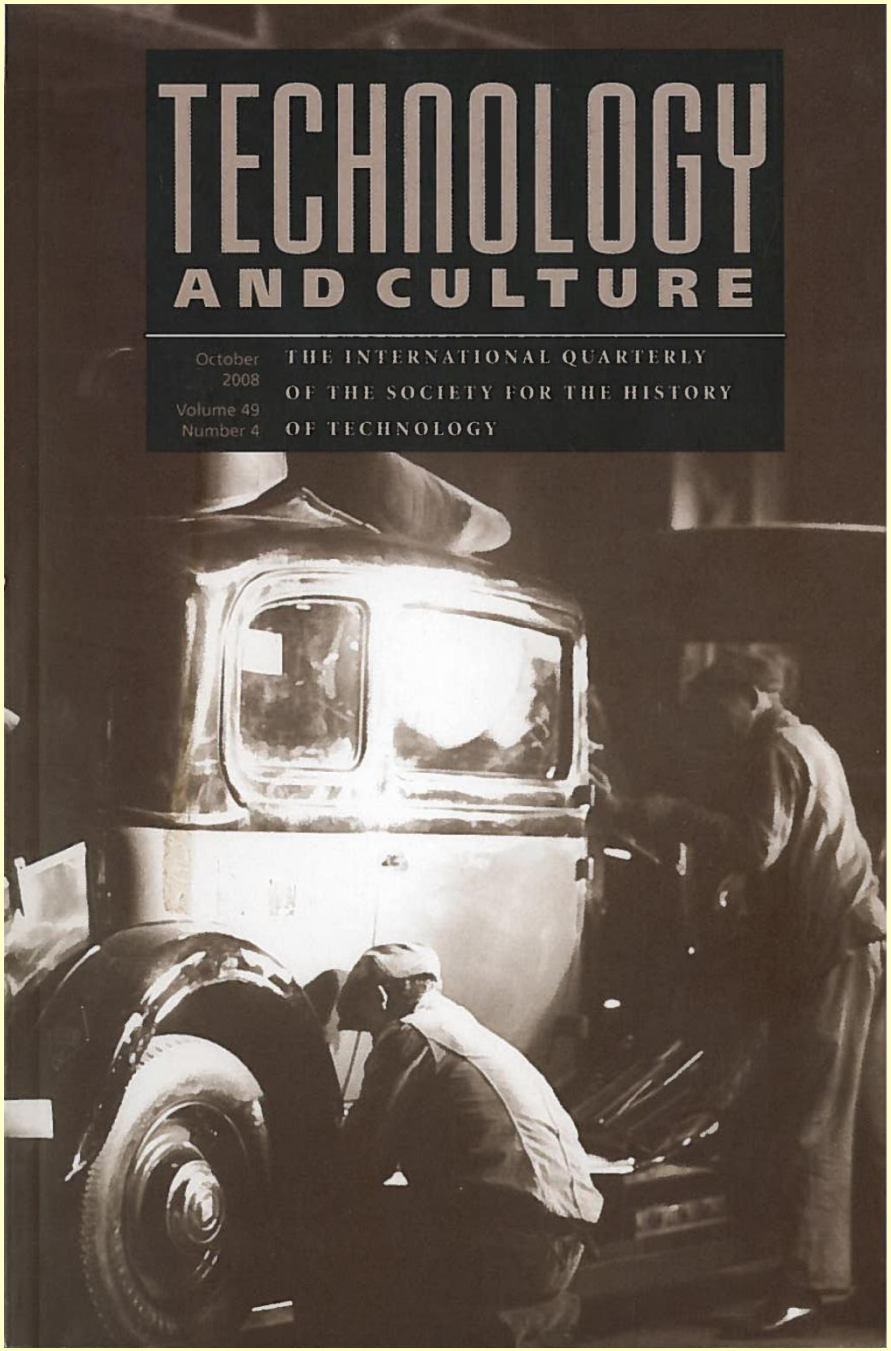
Glen Stacking Diagram

View from Saint-Jacques Street (West to East)




ITM - CLINIQUES ET HOPITAL DE JOUR
MCI - CLINICS AND DAY HOSPITAL
ITM - Hôpital de jour
MCI - Day Hospital
ITM - Hôpital de jour
MCI - Day Hospital
BLOC D - RC nord / BLOCK D - RC floor north


ITM - UNITE DE SOINS D8
MCI - D8 INPATIENT UNIT
ITM - UNITE DE SOINS INTENSIFS ET SEVRAGE
MCI - D8 INTENSIVE CARE AND WEANING UNIT
BLOC D - 8e nord / BLOCK D - 8th floor north


TECHNOLOGY
AND CULTURE
October
2008
Volume 49
Number 4
THE INTERNATIONAL QUARTERLY
OF THE SOCIETY FOR THE HISTORY
OF TECHNOLOGY


DANGER DANGER DANGER DANGER

Adams, A., Poutanen, M.A. “Architecture, Religion, and Tuberculosis in Sainte-Agathe-des-Monts, Quebec,” *Scientia Canadensis* Vol 32, No. 1 (2009): 1-19.

Adams, A., Schwartzman, K., Theodore, D. “Collapse and Expand: Designing for Tuberculosis,” *Technology and Culture* Vol. 49, No. 4 (October 2008): 908-942.

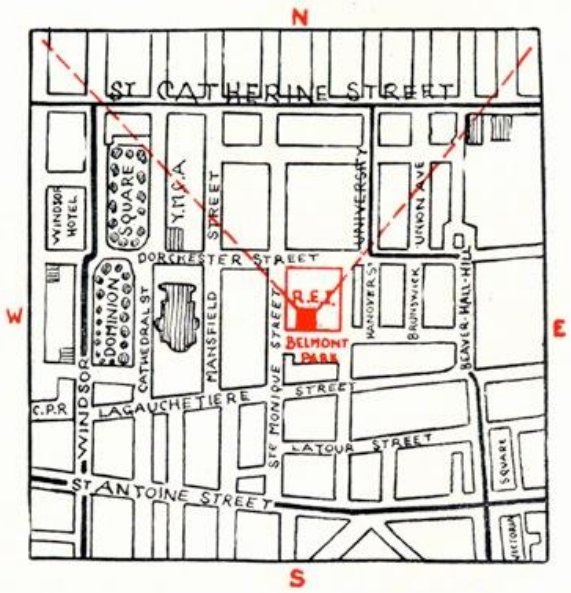
Adams, A., Burke, S. “A Doctor in the House: The Architecture of Home-offices for Physicians in Toronto, 1885-1930,” *Medical History* Vol. 52, No. 2 (April 2008): 163-194.

Adams, A., Burke, S. “’Not a shack in the woods’: Architecture for Tuberculosis in Muskoka and Toronto,” *Canadian Bulletin of Medical History* Vol. 23, No. 2 (2006): 429-455.

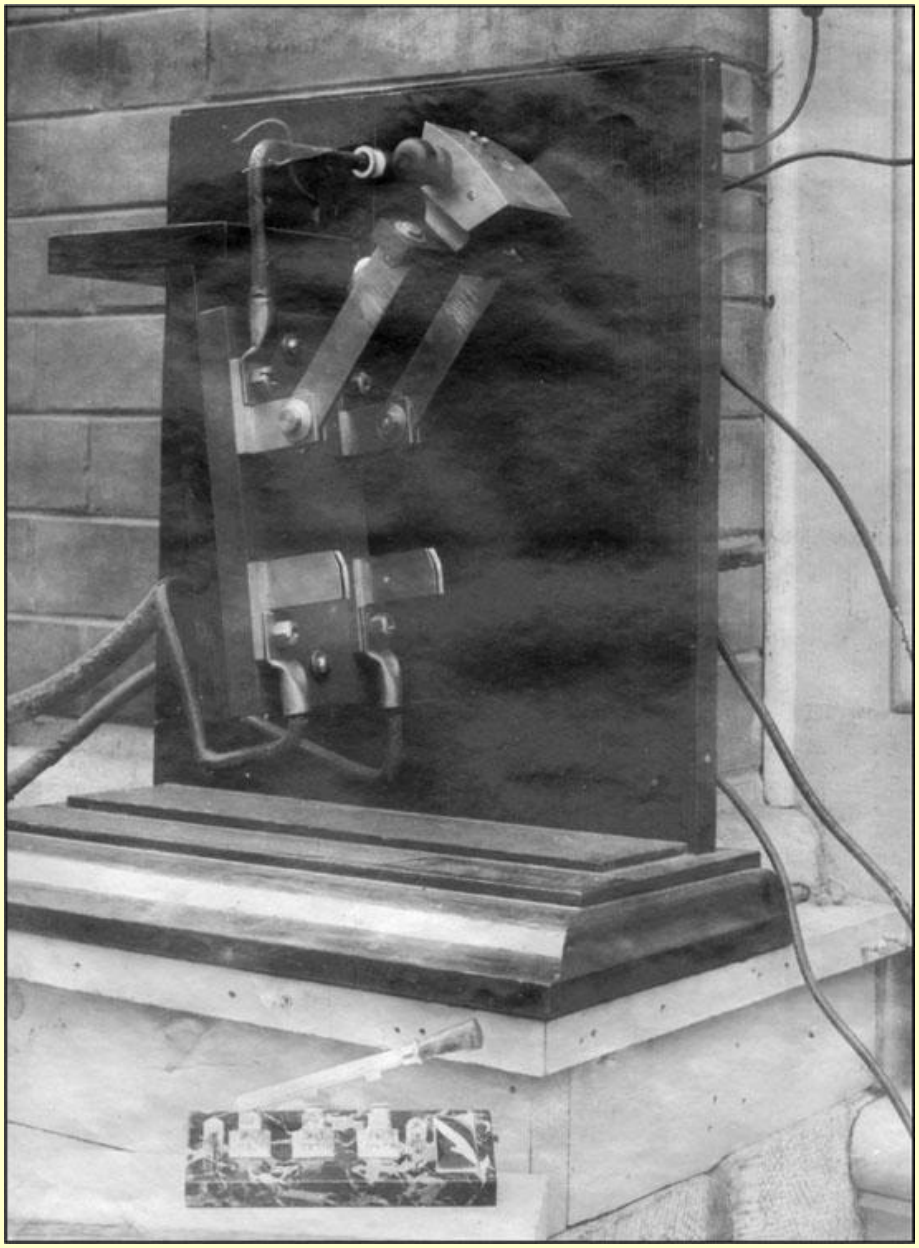
Adams, A., Schlich, T. “Design for Control: Surgery, Science, and Space at the Royal Victoria Hospital, Montreal, 1893-1956,” *Medical History* Vol. 50, No. 3 (July 2006), 303-324.

Adams, A., Schwartzman K. “Pneumothorax Then and Now,” *Space and Culture* Vol. 8, No. 4 (November 2005), 435-448.

How To Reach the Dispensary



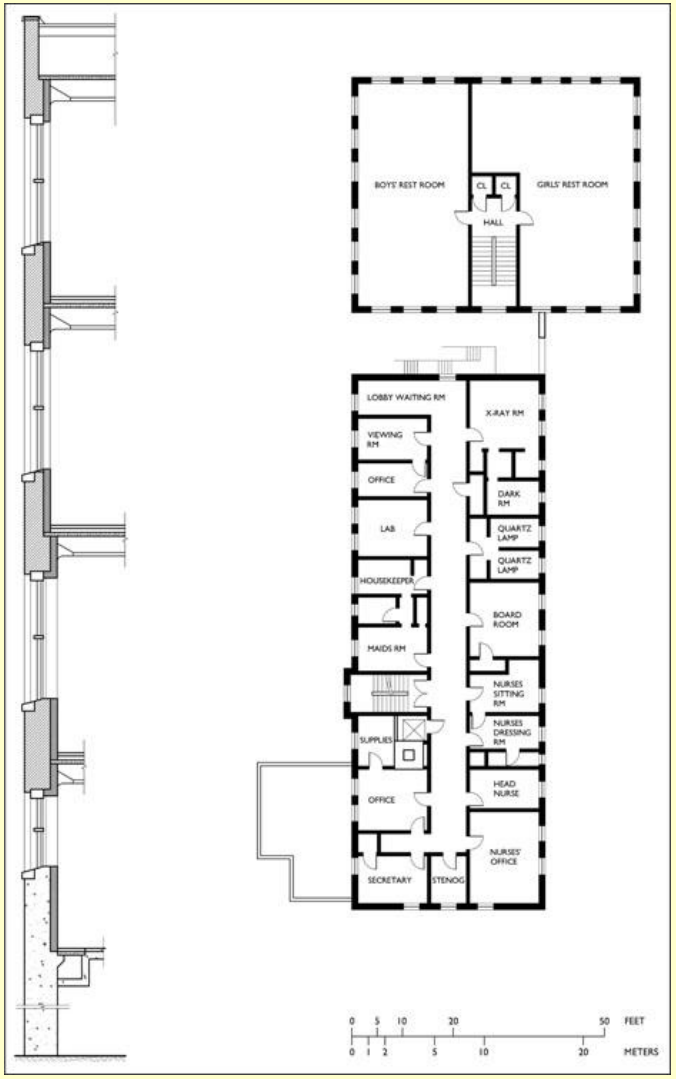
MAP showing four car lines enclosing square within which the ROYAL EDWARD INSTITUTE is situated. The building, indicated by the RED SQUARE, is but three minutes' walk from the Beaver Hall cars (at Belmont Street), five minutes from the Windsor cars (at Dorchester Street), and five minutes, or less, from the St. Catherine Street Cars (getting off at McGill College Avenue and walking down St. Monique Street.)



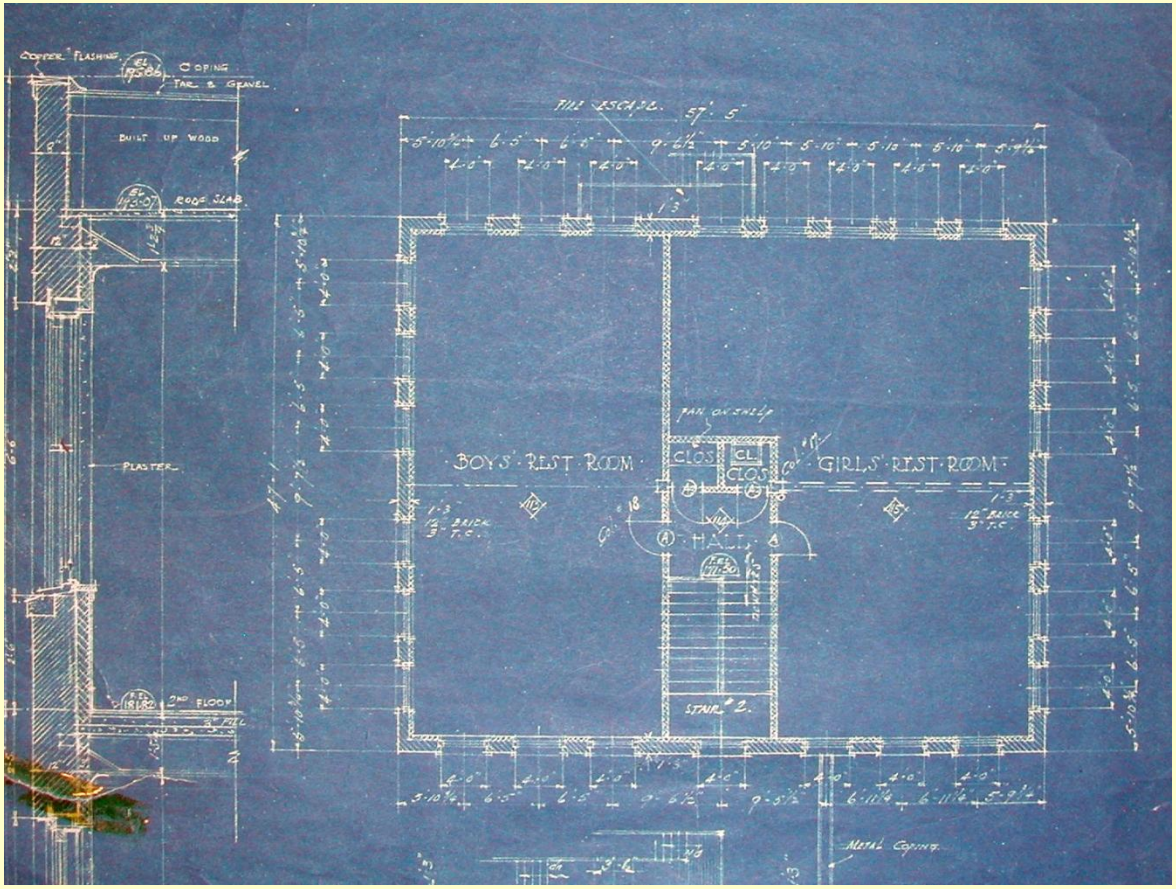
OPEN-AIR SCHOOL: SUMMER CAMP IN THE GROUNDS OF THE INSTITUTE

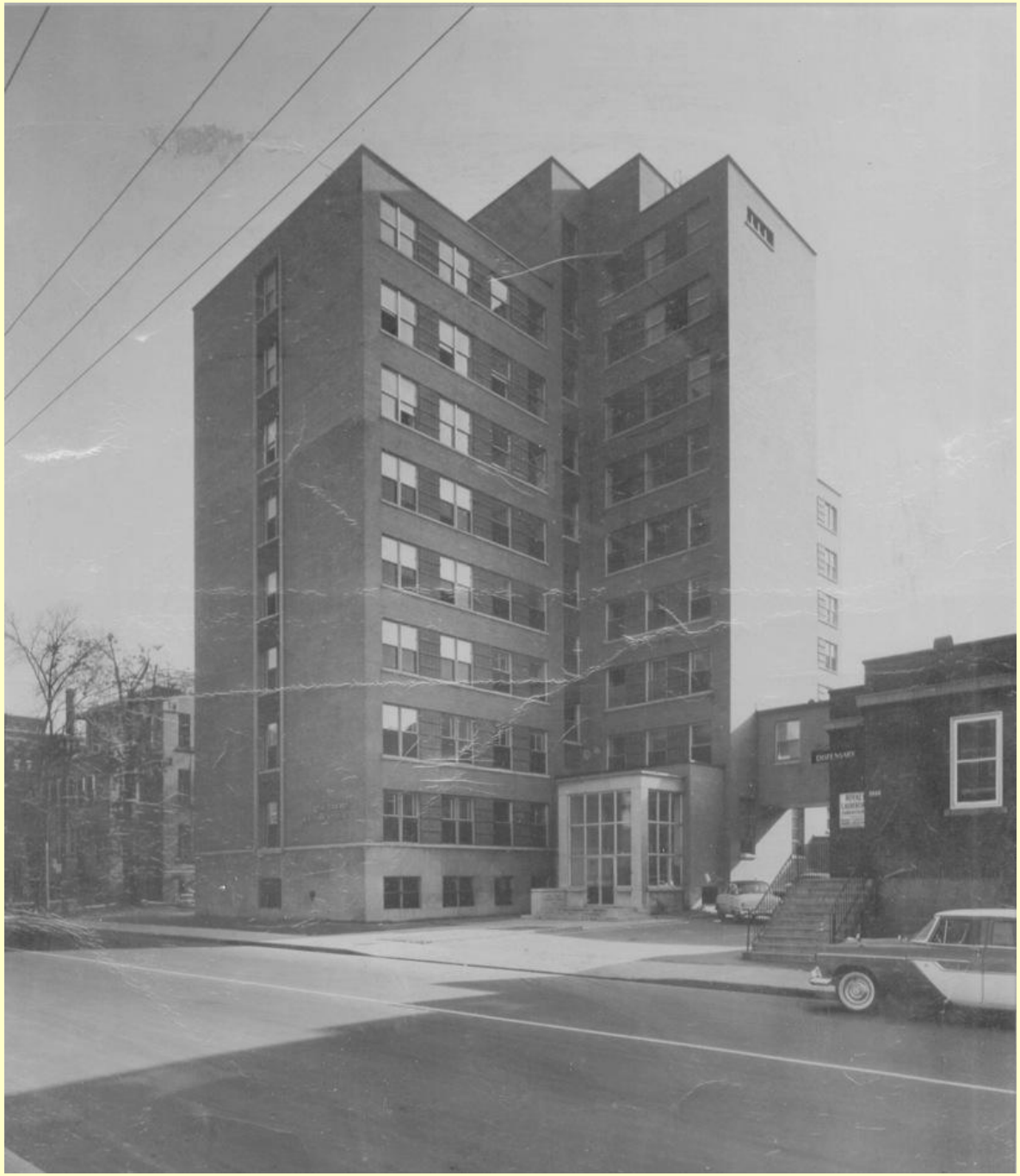
THE OPEN-AIR SCHOOL: A FEBRUARY MORNING

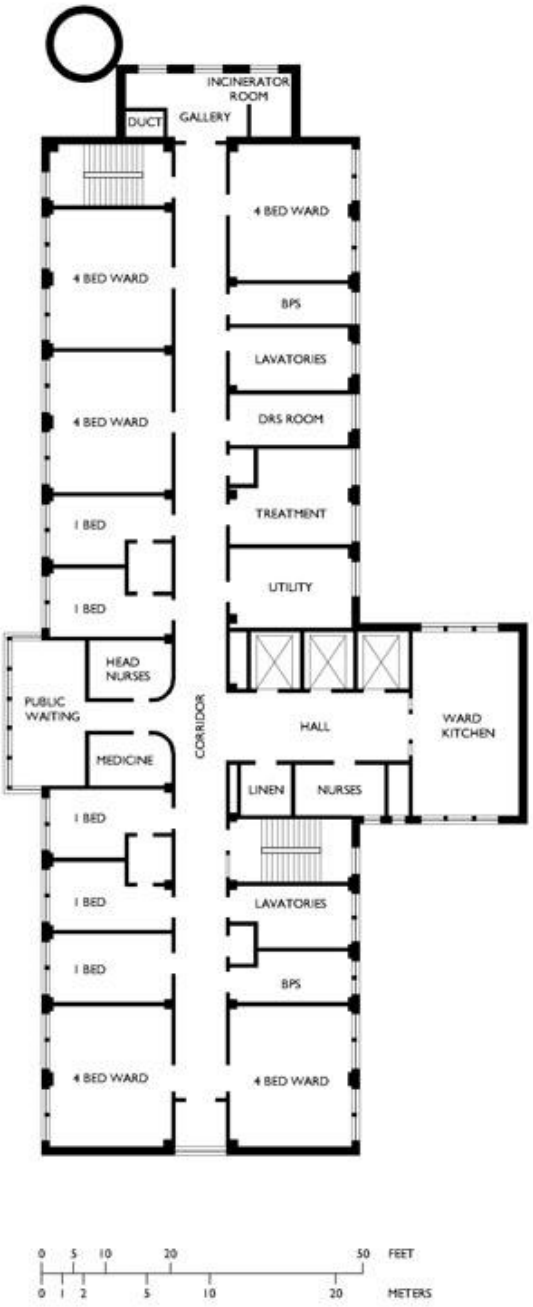

ROYAL EDWARD LAURENTIAN HOSPITAL


BOYS' REST ROOM
CL
CL
GIRLS' REST ROOM
HALL
LOBBY WAITING RM
X-RAY RM
VIEWING RM
OFFICE
DARK RM
LAB
QUARTZ LAMP
QUARTZ LAMP
HOUSEKEEPER
BOARD ROOM
MAIDS RM
NURSES SITTING RM
NURSES DRESSING RM
SUPPLIES
HEAD NURSE
OFFICE
NURSES' OFFICE
SECRETARY
STENOG
0 5 10 20 50 FEET
0 1 2 5 10 20 METERS


JEFFREY BURLAND SCHOOL


COPPER FLASHING
COPING
TAR & GRAVEL
BUILT UP WOOD
ROOF SLAB
PLASTER
2ND FLOOR
TILE ESCAPE
BOYS' REST ROOM
GIRLS' REST ROOM
CLOS
CL
CLOS
HALL
STAIR #2
PAN OF SHELF
METAL COPING




INCINERATOR ROOM
DUCT
GALLERY
4 BED WARD
4 BED WARD
BPS
LAVATORIES
4 BED WARD
DRS ROOM
TREATMENT
1 BED
UTILITY
1 BED
HEAD NURSES
PUBLIC WAITING
CORRIDOR
HALL
WARD KITCHEN
MEDICINE
LINEN
NURSES
1 BED
1 BED
LAVATORIES
1 BED
BPS
4 BED WARD
4 BED WARD
0 5 10 20 50 FEET
0 1 2 5 10 20 METERS

ROYAL EDWARD LAURENTIAN HOSPITAL
McDOUGALL, SMITH & FLEMING - ARCHITECTS
J. L. E. PRICE & CO. LIMITED - GENERAL CONTRACTORS
JANUARY 29TH, 1952 PICTURE No. 1

SERVICE BUILDING

THE ROYAL EDWARD HOSPITAL

STE-AGATHE

PAV. V

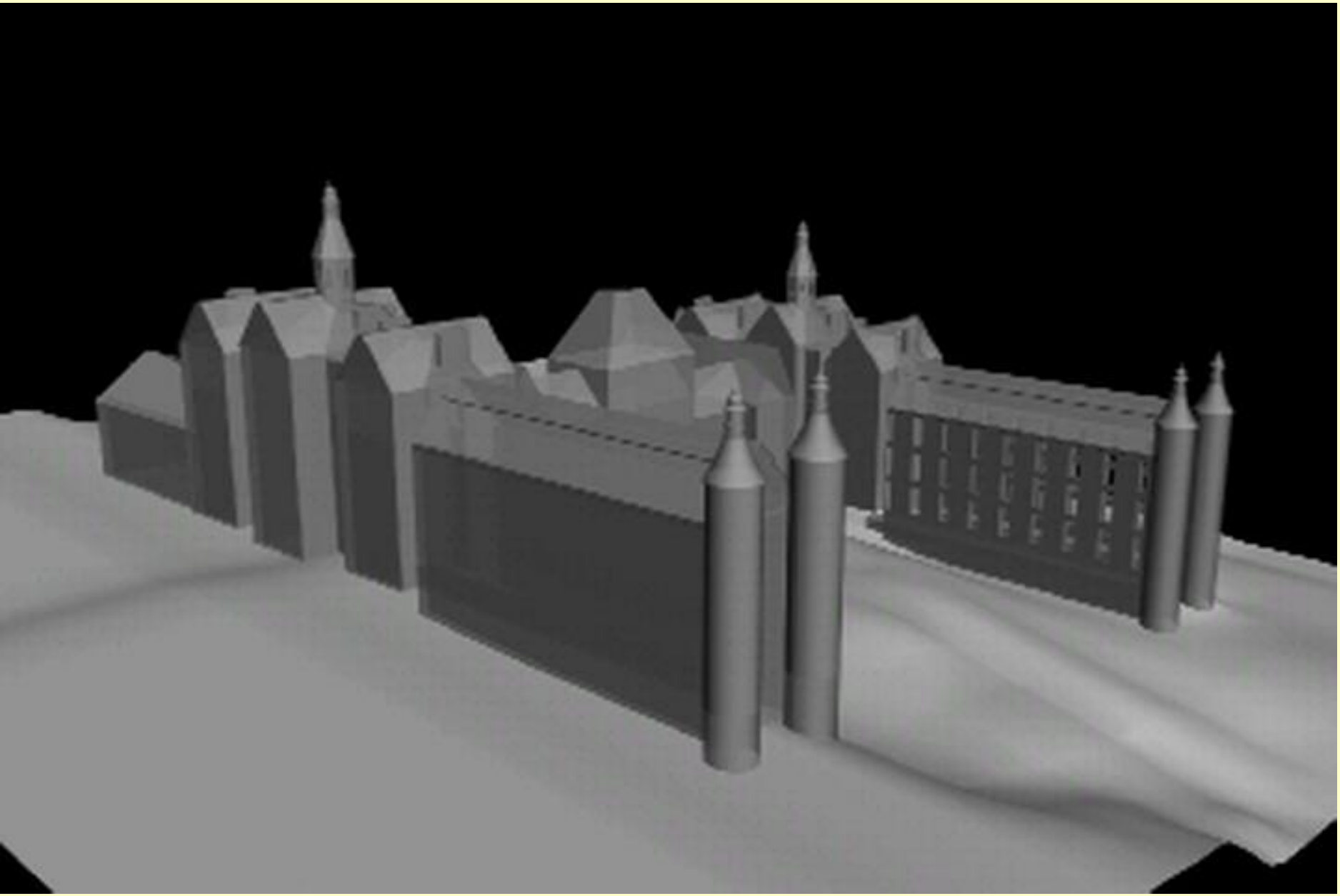
PAV IV

NURSES' HOME

PAV III

PAV II

PAV I



Respiratory Research at McGill

Sir William Osler

Shortly before his death in 1919, Sir William Osler, then Regius Professor of Medicine at Oxford University, wrote to the dean of the faculty of medicine, recommending that McGill appoint a full time chairman of the department of medicine who would establish research in the hospital as an essential part of academic medical activities.

Until that time the teachers at McGill's medical school were all part-time physicians who had private practices outside the teaching hospitals.

It took the dean some time to act on Sir William's recommendation, but in 1924…….

PT Macklem, in **PHYSIOLOGIC BASIS OF RESPIRATORY DISEASES, 2005**

Dr. Jonathan Meakins

- Came from University of Edinburgh
- 1st full-time chair of medicine at McGill
- Incorporated clinical laboratory services into the Dept, away from Pathology
- Responsible for hospital based clinical research
- Attributed the use of oxygen therapeutically

A British Medical Association Lecture

ON

THE CAUSE AND SIGNIFICANCE OF DYSPNOEA IN PULMONARY DISEASE.*

BY

JONATHAN MEAKINS, M.D., F.R.C.P.E.,

CHRISTISON PROFESSOR OF THERAPEUTICS, EDINBURGH UNIVERSITY.

THE occurrence of respiratory distress is one of the most common and important symptoms in diseases of the lungs. This symptom may be described by the patient in many ways. Indeed it may vary from an urgent complaint without any conspicuous or even obvious change of rate to a very pronounced objective disturbance with or without the patient indicating any inconvenience. It may usually be stated that "dyspnoea" is the conscious desire for increased pulmonary ventilation. But this is not absolutely correct, as there are certain pathological conditions in which increased pulmonary ventilation occurs without conscious distress on the part of the patient. Nevertheless, in cases which exhibit such an increased respiratory function its significance is none the less important. In fact its diagnostic and prognostic import is frequently in inverse ratio to the distress or discomfort it gives the subject. Therefore the disturbances of function and structure which give rise to respiratory abnormality in pulmonary diseases should be clearly understood.

THE POWER OF ADAPTATION.

The underlying causes of dyspnoea are numerous and frequently are to be found in structures far removed from the lungs. Consequently those causes which result from pulmonary diseases may be looked upon as local, in spite of the fact that their effects may influence many other remote and important functions. But being localized there is a definite and concrete opportunity for their investigation and interpretation. In order that this may be accomplished, certain biological phenomena must first be considered. These are concerned mainly with the power of adaptation which the animal body seems inherently to possess. It is a well known fact that an organism if suddenly plunged into a radically new environment will rapidly succumb. If, however, the change of environment be brought about slowly it will gradually acquire in the same or succeeding generations an unexpected tolerance or even a relish for an

Further, although so essential there are no known reserves, which is contrary to the case of many other almost equally important supplies. In regard to the elimination of carbon dioxide the reserve powers for dealing with its retention are much more adequate provided a simultaneous and acute deprivation of oxygen does not occur. Want of oxygen makes the respiratory centre and probably all the other tissues more sensitive to their normal hydrogen-ion concentration, which is influenced by that of the arterial blood. If the circulation rate through the tissues remains normal or is increased a lowering of the carbon dioxide content of the arterial blood will lower its hydrogen-ion concentration and consequently will effect the reaction of the tissues. Thus the effect of acute oxygen want is to produce a moderate degree of dyspnoea which is not so much due to the lack of oxygen as to the fact that the organism has not sufficient time to lower the hydrogen-ion concentration of the blood by removing carbon dioxide. Hence the pulmonary ventilation is increased in order that this may be accomplished. If a more insidious oxygen want should occur there will be a slight increase of pulmonary ventilation, which lowers the carbon dioxide pressure of the alveolar air and thus of the arterial blood, and so the tissues gradually reduce their carbon dioxide pressure and thus their hydrogen-ion concentration. Therefore there is no demand for violent pulmonary ventilation. The respirations, however, will gradually become shallower and shallower and to some extent faster, but at no time giving distress, until eventually inspiration and expiration are so diminished that the respiratory movement practically ceases. This may be called the anoxaemic type of respiratory failure so characteristic of uncomplicated oxygen want which occurs in mines with increasing "black damp." It is also tragically revealed by Tissandier in his diary of the famous balloon ascent of the "Zenith" in 1875.

There are practically no pulmonary lesions which solely produce a retention of carbon dioxide. This is accounted for by the fact that carbon dioxide is twenty times more soluble than oxygen, and also on account of the peculiar character of the former's dissociation curve, which allows it to be removed from the blood entering the lungs at an almost constant rate in proportion to the degree of pulmonary ventilation. If, however, there be acute oxygen want and carbon dioxide retention a most violent form of dyspnoea is produced. Most characteristic examples of this condition are to be found in acute laryngeal obstruction due to diphtheria and in certain cases of spasmodic asthma. Furthermore, such a condition can be experimentally produced and studied in man by introducing a resistance to

Based on a lecture given to McGill Medical students -1925

An Address on

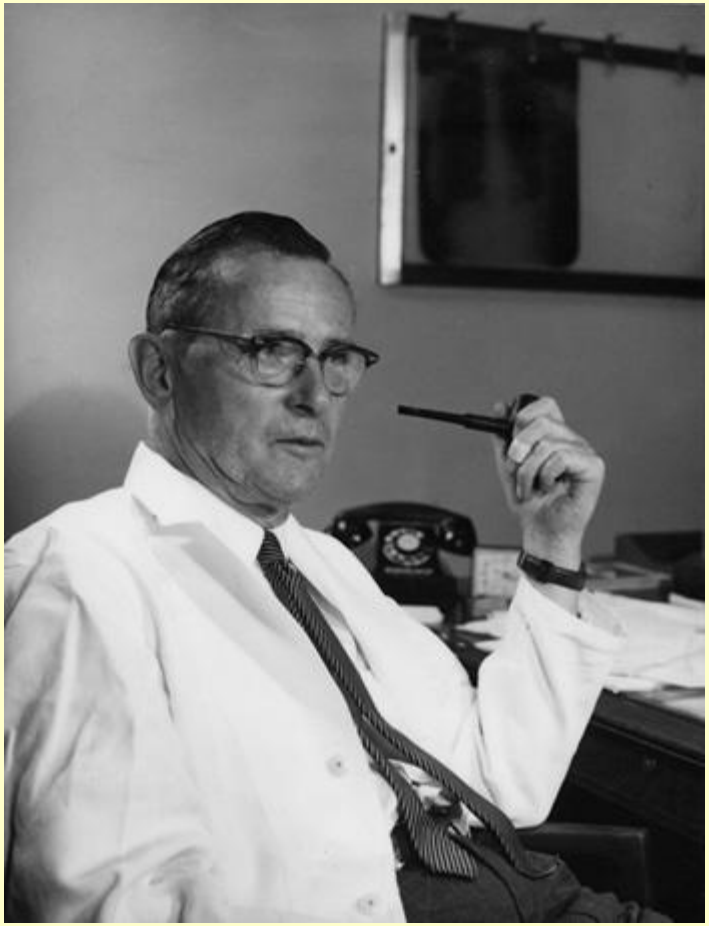
THE CAUSE OF DYSPNOEA*

JONATHAN MEAKINS, M.D., F.R.C.P., (Edin.)

Professor of Medicine, McGill University, Montreal

DURING the past fifty years there have occurred two broad developments in medicine which have not always received the recognition which is their due. They are the advancements which have taken place in pathology (or morbid anatomy) and clinical medicine (or morbid-physiology). Their importance viewed in a comprehensive manner has many times been obscured by individual discoveries. Pathology has now advanced to such a realm of philosophical study as to take its place as an independent science. The progress of medicine in the true sense of the word namely, the study and investigation of the processes of disease in the living organism is slowly but surely advancing. This does not mean only the recognition of particular structural changes and their classification, but, in addition, the elucidation of abnormalities of function with or without obvious alterations of structure. the dignity of a science itself. Sir Archibald Garrod[1] has brilliantly outlined the great debt science owes to medicine. As medicine has developed on surer ground there have broken away fundamentally important parts of her matrix such as physiology, anatomy, pathology and pharmacology. Although these sciences constitute an important part of medical education, yet their development has tended increasingly to separate them from the problems intimately connected with the elucidation of disease as met with in man. It has been a great stimulus to these subjects as independent sciences but it has been a grave disadvantage to medicine. Not only did she lose many of her brightest and most enquiring minds, but more recently the ranks of these sciences have been filled by those who know not medicine and her difficulties. In consequence of this the investigative minds in medicine have sought to

Dr. Ronald Christie



- Recruited as a post-doctoral fellow by Jonathan Meakins in early 30s.

- Spent 7 yrs at RVH before returning to St. Bartholomew's Hospital where he rose to the rank of full professor.

- He was enticed back as chair of the department in 1955.

- He published extensively on the mechanical properties of the lung.

- Made key recruitments

THE LUNG VOLUME AND ITS SUBDIVISIONS

I. METHODS OF MEASUREMENT

By RONALD V. CHRISTIE

(From the Department of Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal)

(Received for publication June 21, 1932)

In perhaps no realm of physiology is there a more confusing medley of terms than in that which deals with the lung volume and its various subdivisions. Not only does the meaning of many terms vary with the user but there is an unfortunate superfluity and synonymity of the terms themselves.

Residual air as first described by Davy (1800) is the amount of air remaining in the lungs after the fullest possible expiration.

Vital capacity as described by Hutchinson (1846) is the amount of air that can be expired from the fullest inspiration to the fullest expiration.

Total lung volume or total capacity is the sum of residual air and the vital capacity.

Mid-capacity as defined by Panum (1868) is the amount of air in the lungs at a point mid-way between normal inspiration and expiration, this level being referred to as the mid-position or mid-point, or even vital respiratory level. Siebeck (1910) and others prefer to describe the mid-capacity as a quantity synonymous with the functional residual air (vide infra).

Functional residual air as described by Lundsgaard and Schierbeck (1923) is that amount of air remaining in the lungs after a normal expiration. This quantity has also been called the mid-capacity or normal capacity, and the level has been named the resting respiratory level, the expiratory level, the mid-position or mid-point.

Complemental air has been variously described as the amount of air inspired from the mid-position to maximum inflation, or from the height of a normal inspiration to maximum inflation.

Reserve air or supplemental air has been variously described as the air expired from the mid-position to maximum deflation or from the end of a normal expiration to maximum deflation.

Tidal air is the quantity of air expired by a breath of average depth.

JCI 1932

THE INTRAPLEURAL PRESSURE IN CONGESTIVE HEART FAILURE AND ITS CLINICAL SIGNIFICANCE [1]

By RONALD V. CHRISTIE and JONATHAN C. MEAKINS

(From the Department of Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal)

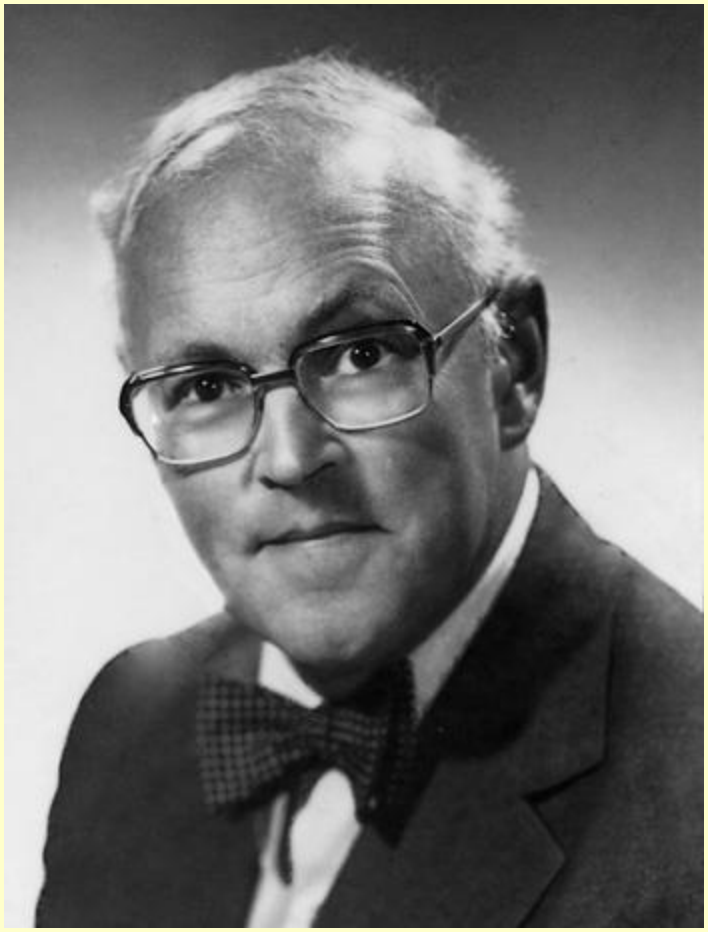
(Received for publication November 17, 1933)

The mechanism of cardiac dyspnoea remains a matter for conjecture although many hypotheses have been advanced. Most of these resolve themselves into a statement that a correlation between dyspnoea and some other physical sign exists. Reduction in the volume of the vital capacity, increase in the venous pressure, reduction in the cardiac output, and so on, have been suggested as the "cause" of cardiac dyspnoea, since they are usually proportional to the degree of respiratory distress. Most, if not all, of those hypotheses which blame impairment of one or other of the mechanisms which are known to control breathing, do not bear the test of experimental analysis. We will review in brief the various theories which have been advanced to describe the cause of cardiac dyspnoea.

Cardiac dyspnoea can conveniently be divided into four groups which are quite distinct clinically, and which presumably are caused by different mechanisms. These are orthopnoea, paroxysmal cardiac dyspnoea (cardiac asthma), Cheyne-Stokes respiration, and lastly dyspnoea on exertion, which, as heart failure with congestion progresses, becomes continuous dyspnoea exaggerated by exertion. The last type is a cardinal symptom of heart failure and the various theories which have been advanced as to its causation will be dealt with first.

a. Imperfect aeration of the respiratory centre, due either to diminished circulation rate of flow or to deficient aeration of the arterial blood, has long been emphasized as one of the primary causes of *cardiac dyspnoea.* Yet there is seldom any significant oxygen unsaturation of the arterial blood and the pressure of CO_2 is almost invariably below normal. The circula-

Dr. David Bates



- Recruited by Ronald Christie
- Recruited in turn Drs. Maurice McGregor, Margaret Becklake, William (Whitey) Thurlbeck, Joseph Milic-Emili, Nicholas Anthonisen, Charles Bryan, Peter Macklem
- Wrote the famous book “Respiratory Function In Disease”
- Chair of Department of Physiology
- Major contributions to respiratory health and environmental pollution

Dr. Margaret Becklake

- 1967- Immigrated to Montreal
- 1991- Fellow of the Royal Society of Canada
- 1997- Distinguished Achievement Award of the American Thoracic Society
- 2007- Order of Canada
- 2011- Grand Officer of the National Order of Quebec
- Established respiratory epidemiology at McGill
- 162 papers, many chapters
- Contributed to our knowledge of occupational lung disease, asthma, dust induced diseases

Dr. Margaret Becklake, “What Is The Question?”

- “One knew who the truly important people of the McGill medical community were when Dr. Margaret Becklake was on service. Lights went on in their houses at 2 AM when she had a clinical query.”
- “Hello, Tony [head of Cardiothoracic Surgery]. I’m terribly sorry to bother you so late but I was just worrying over this patient in the ICU not doing altogether well and I wonder what you know about the current status of ECMO? Could we borrow your machine for a few days?”
- “Amazingly, no one said no to [Dr. Becklake] and, meek as school boys, each offered their opinions and time on how this or that would or could not be done.”

J. Leech, I Remember [ATS Centennial Vignettes]

Dr. Margaret Becklake

- “While the statisticians around her were arguing the minutiae of the latest trendy analysis method, her voice could be firmly heard: ‘What Is The Question?’•
- “For aspiring young investigators throughout the McGill system, other supervisors recommended a consultation with Dr. Becklake as the way to clarify and crystallize one’s thoughts on the design of the study, the provenance of the study population and the methods to be used, once the essential question was pinpointed.

J. Leech, I Remember [ATS Centennial Vignettes]

Dr. Margaret Becklake

- “It is likely that all their lives these researchers would hear her voice in their heads as they worked to live up to that standard of clarity and one imagines they too, often in far different places and circumstances, would be turning to keen young colleagues and in just that very precise way asking “What Is The Question?”

J. Leech, I Remember [ATS Centennial Vignettes]

Dr. Maurice McGregor

- 1957- McGill University
- Head of Cardiology, and Physician in Chief of the Royal Victoria Hospital, in Montréal, and as Dean of Medicine and Vice Principal of McGill University.
- Bethune Exchange Professor at Peking Medical College (1973), and as Dean of Medicine of his alma mater (1984-87).
- He has published over 180 articles, chiefly in the fields of cardiovascular disease, cardiovascular physiology and pharmacology, medical education and health policy.
- The founding President of Quebec's Conseil d'évaluation des technologies de la santé du Québec (1988 to 1994)

The Meakins Christie Laboratories

Paul Paré

Paul Paré, President of Imperial Tobacco provided funding through the Canadian Tobacco Manufacturer's Association to build the Meakins Christie, then in the Lyman Duff building.
Opened in 1972.
Subsequently much work was done to demonstrate the adverse effects of smoking on lung health

Dr. Peter T. Macklem (1931-2011)

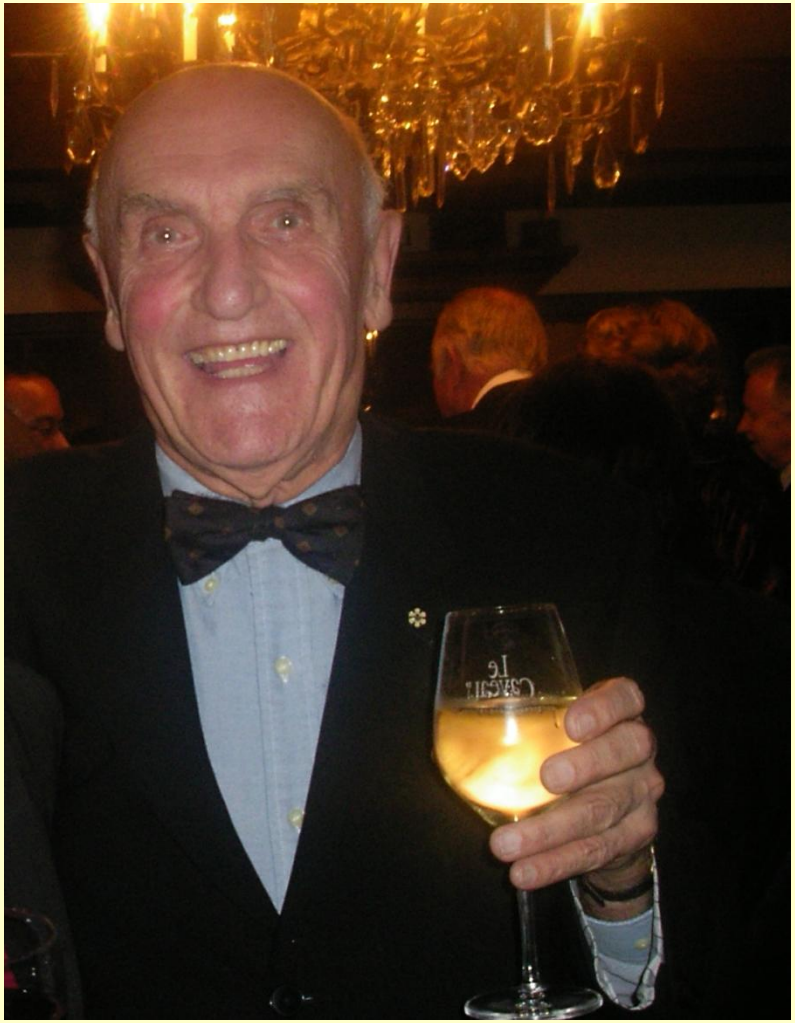
- 1972 -1979 First scientific director of the Meakins Christie Labs
- 1982 Fellow, Royal Society of Canada
- 1986 Amberson Lecturer, American Thoracic Society
- 1987, ’97 Doctor Honoris Causa Université Libre de Bruxelles and University of Athens
- 1988 Officer of the Order of Canada
- 1997 Distinguished Service Award, CSCI
- 1999 Trudeau Medal of the American Lung Association
- 1999 The Gairdner Foundation Wightman Award

Dr. Peter T. Macklem

- Effects of smoking on the lungs
- Causes of asthma
- Methods to study respiratory diseases
- The muscles of breathing
- Complexity and the meaning of life

- 312 original articles, reviews, editorials and book chapters published
- More than 150 major lectures given over the period from 1979 to 2004
- H factor > 60
- Trained many HQP that are now leaders all over the globe

Dr. Joseph Milic-Emili



- Scientific director Meakins Christie Labs 1979-1992
- Fellow of the Royal Society
- Officer of the Order of Canada
- Trudeau Medalist of ATS
- 331 publications
- Major contributions to measurement techniques for respiratory system mechanics, breathing control , determinants of dyspnea, mechanical ventilation

Other notable figures

Dr. William Thurlbeck

Dr. James Hogg

Dr.Charles Bryan

Dr. Ludwig Engel

Dr. Ann Woolcock

Dr. Charis Roussos

Dr. Marc Decramer

Dr. Dean Schraufnagel

Meakins Christie Laboratories and other sites now

- Centre for basic research in respiratory disease- inflammation, innate and adaptive immunity in the lungs, biophysics of smooth muscle, respiratory skeletal muscle, protein metabolism, epithelial function, lung fibrosis, infections,
- Director: Dr. Q. Hamid
- Other sites- sleep disordered breathing, neuromuscular disease

Respiratory Epidemiology and Clinical Research Unit

- Centre for clinical epidemiological research in respiratory disease
- Dominant themes are COPD, tuberculosis and asthma
- Director: Dr. Jean Bourbeau

What were the secrets to success?

- Intellect
- Humour
- Curiosity
- Unwavering dedication to excellence
- Respect for the traditions of academic excellence and its integration into medicine
- Lots of hard work

Recommendations for the future

- Abandon the corporate culture
- Rediscover the excitement of medical science
- Create a culture of interaction, collaboration and creativity
- Regain our supremacy as a university hospital