

1986

Presidential Address

New York—a bellwether for thoracic surgery

James R. Malm, M.D.,* *New York, N. Y.*

New York is blessed and cursed by the presence of two entities and images both bearing the same name. One refers to the great collection of skyscrapers, harbors, money, power, and culture called New York City, and the other is the all encompassing region of 49,000 square miles known as New York State. Each supports and requires the other for balance, survival, and sanity. Those who see New York as ribbons of cement will benefit from a trip to upper New York State and the Adirondack Forest Preserve, with over 2½ million acres of land, protected as forever wild, by provisions of article 14 of the state constitution since 1895. It is an enchanting world of mountains, natural forest, wildlife, laced with lakes and streams, a natural model for over 100 years of preservation and safeguard of our natural heritage. Our story begins in this part of the world, so enchanting in the summer, so challenging in the winter.

Edward Trudeau, born in New York in 1848, was a natural athlete with a passion for the outdoors. As a young man, he spent many happy months in the Adirondack Mountains near Saranac Lake, New York, hunting, hiking, and fishing. In 1865 his older brother, Francis, became gravely ill with tuberculosis, and

Edward devoted himself full-time to his care until Francis' death. A decision to study medicine followed shortly thereafter, and he enrolled in the College of Physicians and Surgeons at Columbia University in 1868. Soon after graduation and marriage, he developed a rectal abscess and cervical adenitis, both of which were later to be identified as tuberculosis in origin, a direct consequence of his long contact with his brother. Within a year, he was running daily fevers, lost weight, and had extensive tuberculosis in his left lung. It was apparent to all that he had a fatal disease. Previous hunting and fishing trips in the Adirondack Mountains had instilled in him a deep love for the wild, and he wished to spend his last days there. With a longing for rest and peace in the great wilderness, he returned to the Saranac Lake area, where he was cared for by former mountain guides. Under Paul Smith's guidance and his wife's cooking, Trudeau began to gain weight, his fever receded, and he even enjoyed hunting and fishing from a canoe. After a dramatic improvement, he returned to New York briefly, with prompt recurrence of his symptoms.

It was, therefore, decided to send him and his family to establish permanent residence in Saranac, and as his health improved he started a horse and buggy practice. An increasing number of tuberculosis patients came to the Adirondacks, many seeking Dr. Trudeau's consultation and the benefits of the region on the disease. Stimulated by these patients' needs, he read everything he could find on tuberculosis including Koche's epoch-making paper on the etiology of tuberculosis in 1882.

Read at the Sixty-sixth Annual Meeting of The American Association for Thoracic Surgery, New York, N. Y., April 28-30, 1986.

Address for reprints: James R. Malm, M.D., 161 Fort Washington Ave., New York, N. Y. 10032.

*Professor of Clinical Surgery, Department of Surgery, Columbia University, College of Physicians and Surgeons; Chief, Division of Thoracic and Cardiac Surgery, Columbia Presbyterian Hospital, New York, N. Y.



Fig. 1. Dr. Edward Trudeau in his laboratory at Saranac Lake. (Published with permission of the Trudeau Institute.)



Fig. 2. Dr. James Alexander Miller founded the Chest Medical Service at Bellevue Hospital, New York City.⁶

Motivated by a desire to grow the bacillus in the guinea pig as a first step to finding something to kill or modify it, he established a laboratory in his home (Fig. 1) with the assistance of a New York City bacteriologist, Dr. Michael Prudden. "One of my greatest problems", he said, "was keeping my guinea pigs alive in the winter because they would freeze to death in our cottages no matter what type of heat I could provide."¹

As more patients came to the area, Dr. Trudeau recognized the need for a place to provide proper care and to establish a sanitarium. Two patients were accepted in February, 1885, to the Little Red Cottage, which still stands restored at the Trudeau Institute, a reminder of the atmosphere of hope and confidence to all who came for "cure." The program of rest, fresh air, and good nutrition not only served the patient but also, by removing the sick from the usual surroundings, resulted in isolation from family and thus prevented spread of infection. Thus the first private tuberculosis sanitarium in America became a model and a stimulus for the vast sanitarium treatment programs in the United States, very much as the sanitariums in Europe developed 20 years before, as so vividly portrayed in Thomas Mann's *The Magic Mountain*.² The rich, poor, and famous entered the program at Saranac Lake. Dr. John Alexander³ wrote a classic text, *The Surgery of Pulmonary Tuberculosis*, published in 1925 while a patient at Trudeau. He was encased in a body spica for Pott's



Fig. 3. Dr. Adrian V. S. Lambert, chief of Thoracic Surgical Service at Bellevue Hospital from 1926 to 1940.

disease of the spine and wrote on a specially constructed overhead writing board to facilitate his work. The Trudeau Sanitarium held up to 1,300 inpatients during the peak of the period and a total of 300 clinics were established in New York State alone. It was this large backlog of patients who needed surgical management of their tuberculosis, with the introduction of pneumothorax, phrenic crush, and thoracoplasty, that rapidly caught the imagination and challenge of a group of New York surgeons who made major contributions to the treatment of tuberculosis and thoracic surgery.

Dr. James Alexander Miller graduated from the College of Physicians and Surgeons in 1889 to pursue the practice of medicine (Fig. 2). He devoted his summers to practice in the Saranac Lake area in the Adirondacks, where his friendship with Dr. Trudeau generated a lifelong interest in tuberculosis after his cure there. He was appointed on the General Medical Service at Bellevue Hospital in New York City in 1903, but he became interested in tuberculosis and patients' needs with the stimulus, encouragement, and guidance of Dr. Trudeau.

At that time, the Tuberculosis Service at Bellevue was known as an outlying service that included alcoholic, prison, erysipelas, and the medical psychopathic wards. One house officer, one intern, and two elderly nurses on



Fig. 4. Dr. Alexis Carrel inspecting tissue cultures at the Rockefeller Institute in New York City.⁶

duty covered a service of 400 beds. There were standing orders for cough mixture and one quarter grain of morphine for cases of hemorrhage. A regular half ounce of whiskey three times a day for every patient was available so that patients signing out were uncommon and survivals were rare. Dr. Miller spent his life in the movement to provide adequate patient care, education of the public, and guidelines for efforts to improve the management of tuberculosis. He early enlisted the aid of a surgeon, Dr. Adrian V. S. Lambert, who was appointed to Bellevue surgical staff in November, 1903 (Fig. 3).

Dr. Lambert graduated from the College of Physicians and Surgeons and decided on a career in surgery, despite the loss of his right eye as a result of an infection during his internship. He became a leader in the use of collapse therapy for the treatment of tuberculosis, stressing the importance of removal of the first rib for effective chest collapse and particularly in the treatment of tuberculosis empyema. Five years after his first



Fig. 5. Dr. Willy Meyer, founding member of The American Association for Thoracic Surgery.⁶

association with Bellevue, his happiness and family life were suddenly challenged when his first born daughter, Mary, was found to have melena neonatorum. At that time, no cause or cure for the hemorrhagic disease was known. With characteristic vigor and thoroughness, Dr. Lambert read all the literature on hemorrhage and decided that a blood transfusion might be lifesaving.

Alexis Carrel (Fig. 4), an experimental surgeon working at the Rockefeller Institute in New York, had developed techniques of blood vessel anastomosis with interrupted sutures and rigid asepsis. Dr. Lambert reasoned that if the baby was suffering from blood loss, an arterial suturing type procedure might enable him to give blood to the baby. The operation was scheduled on the dining room table at his home without anesthesia. Dr. George Brewer isolated the left radial artery of the father and the right popliteal vein of the infant. Dr. Carrel, who at that time was operating only on animals, performed the anastomosis with the help of bulldog clamps and silk sutures. The left radial artery, of course, was used because of the possibility of Dr. Lambert's hand becoming gangrenous, and as a right hand is better than a left hand for most surgeons.

After the successful donation of blood, both vessels were tied, the baby promptly stopped bleeding, and the father's hand healed without incident. Not only was this the first transfusion in New York, but it was the first time that melena neonatorum had been cured. This procedure was performed 4 years before Landsteiner identified the four blood types and 25 years before the cure for the disease, vitamin K, was identified.

Dr. Lambert was shy of public recognition and attention, but at that time a wave of antivivisection had arisen to the Albany legislature. Dr. Lambert brought his 1-year-old child to Albany and told the tale of how her life had been saved by Carrel's experimental work. This dramatically ended any serious legislative efforts in New York to rule out vivisection at that time. Dr. Carrel subsequently was awarded the Nobel Prize in medicine in 1912 for his many contributions in experimental surgery, the first such award to come to America.

Among the group of New York surgeons interested in thoracic surgery was Dr. Willy Meyer (Fig. 5). He was born in Germany and trained with Trendelenburg, and he was prominently mentioned in Professor Borst's honored guest's address⁴ at last year's meeting of this Association. In June, 1913, at the American Medical Association meeting in Minneapolis, Minnesota, Dr. Meyer delivered the fifth and last paper in the surgical section, entitled "Extrathoracic and Intrathoracic Esophagoplasty in Connection With Resection of the Thoracic Portion of the Esophagus for Carcinoma." There was no discussion of this important paper. Dr. Meyer found it difficult to accept such a total lack of response toward thoracic surgery. Besides, type A surgeons are the same around the world; they like to be heard, praised, and discussed. He made the decision that a society must be instituted at which these important problems in thoracic surgery could be freely and thoroughly discussed. He envisioned a society for thoracic surgery rather of thoracic surgeons to include internists, anesthesiologists, physiologists, and radiologists.

Four years later, Dr. Meyer invited a group of his friends with the specific aim of forming a New York Society for Thoracic Surgery. A second and equally important task was inviting a large group selected from across the United States and Canada, consisting of those who had demonstrated sufficient interest in thoracic surgery, to collaborate in founding a society of national scope. After due discussion and consideration, the New York Society for Thoracic Surgery was adopted, and Dr. Willy Meyer was elected its first president. This society, of course, is alive and well today, meeting three times a year. Dr. Meyer's first suggestion after its founding was the formation of The American Associa-

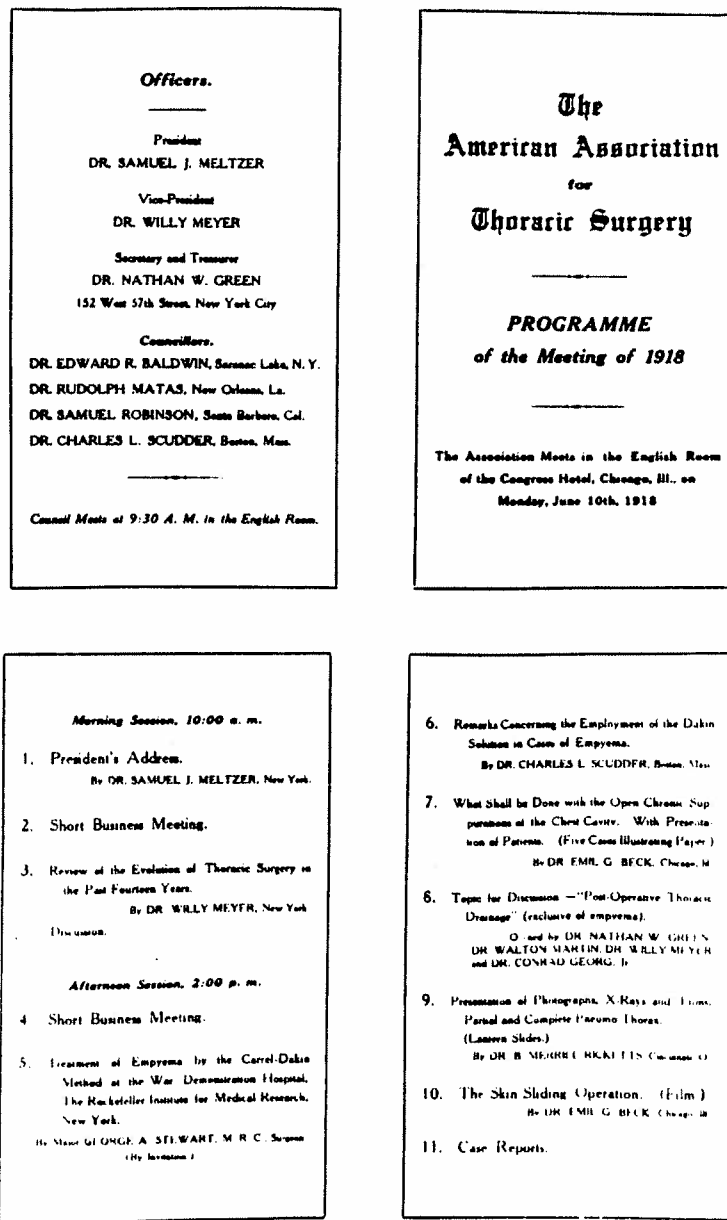


Fig. 6. The program of the first meeting of The American Association for Thoracic Surgery, June, 1918.⁶

tion for Thoracic Surgery, and he appointed a committee to suggest possible members from North America. Twenty-four of the New York Society's members became founding members of The American Association for Thoracic Surgery. The New York Society for Thoracic Surgery then sent invitations to 42 physicians and surgeons throughout the country to attend a luncheon at the Waldorf Astoria on Thursday, June 7, 1917, at 1:00 P.M. After discussion and again reviewing the needs and goals for a national society to exchange

ideas and interests in thoracic surgery, a motion was made that The American Association for Thoracic Surgery be formed. The motion was seconded and carried, and the first president of the Association was Dr. Samuel J. Meltzer, Jr. He was an internist and physiologist, who was a strong proponent of the positive-pressure intratracheal form of respiratory support during thoracic surgery.⁵ The charter members included Dr. James Alexander Miller, who had done so much for the organization for the treatment of tuberculosis at Belle-



Fig. 7. Dr. Dickinson W. Richards (*left*) with Dr. Courmand (*right*) and their protégé, Dr. Alfred Fishman, with whom I (J.R.M.) spent a research period.

vue; Frank Torek, whose work on the esophagus was monumental; Howard Lilienthal, the father of lobectomy; Dr. Alexis Carrel; and Chevalier Jackson, the bronchoscopist.

The first meeting was held in Chicago in 1918.⁶ The first item on the agenda was a presidential address, followed by a short business meeting (Fig. 6). A review of the evolution of thoracic surgery in the past 14 years was then given by Dr. Willy Meyer. Dr. Meyer said at the outset of his address that Dr. Halsted of Baltimore and Dr. Henry Janeway of New York had each been asked to assume that task, but unfortunately their heavy workload would not permit them to accept presenting the review. He said that the Council had then charged him with giving the review. With all his other work to be fulfilled, he stated, he had found it simply impossible to prepare notes, and he asked his audience to be satisfied with his extemporaneous efforts. He subsequently gave a talk that covers 14 typewritten pages and was a brilliant review and a presidential address in itself.⁷ In regard to cardiac surgery, he did say that surgery of the heart, aorta, and pulmonary artery is still part of the music of the future. He did, however, acknowledge Rehn's first bold attack on the heart with the first successful closure of a stab wound, Trendelenburg's work with pulmonary embolus, and Carrel's and Jeger's experimental work in the treatment of some forms of valvular heart disease. He said it may not be utopian to imagine that the surgeon's knife may in the future in

some way or another reach the places of trouble and bring help in cases of stenosis of the bicuspid or tricuspid valve. He concluded by saying that the outlook for thoracic surgery is wonderful. Anyone who started working in intrathoracic surgery would never give it up, and he predicted a constantly increasing number of men who will enter upon this fascinating work. The rest of the Association's progress is history. It now has 900 members with 2,500 registrants at this annual meeting. We have strayed somewhat from our original mandate, namely, electing members from other disciplines interested in thoracic surgery, but the Association's meetings continue to be of the highest scientific quality and the discussions remain spirited if not provocative. I am sure that Dr. Willy Meyer never presented a paper again that did not receive due attention and appropriate discussion.

World War I drained New York of many surgical and medical talents, but Dr. James Alexander Miller continued his fight to educate the public and officials on the true nature of tuberculosis, namely, that it was a social, economic, public health, and medical problem. It was not until 1926, however, that authorities saw fit to form a specific service for the care of tuberculosis patients at Bellevue. A surgical facility was made available for the treatment of tuberculosis, and Dr. Adrian Lambert performed an eleven rib thoracoplasty that signaled the birth of thoracic surgery at Bellevue Hospital. In 1933, Harry Hopkins, a former tuberculosis



Fig. 8. Dr. Frank Berry, chief of Columbia General and Chest Surgical Service at Bellevue Hospital from 1945 to 1954.



Fig. 9. Dr. Robert Wylie, chief of the Chest Surgical Service, Bellevue Hospital and Columbia-Presbyterian Medical Center, 1954 to 1972.

patient and close advisor of President Roosevelt, arranged for Dr. Miller to visit President Roosevelt and explain the needs for tuberculosis care. The president responded by arranging for the use of federal funds for erection of a new tuberculosis pavilion at Bellevue Hospital, which was opened in 1938, and Dr. Adrian Lambert initiated the first thoracic surgical training program in New York. Dr. Herbert Maier was the first thoracic surgical resident on the service, and both men became president of The American Association for Thoracic Surgery. The service was staffed by attendings from all three services covering Bellevue, Columbia, Cornell, and New York University.

In 1930, Dr. Miller had established a medical residency on Chest Tuberculosis Service at Bellevue Hospital on the Columbia Division, appointing a young French scientist, Dr. Andre Cournand, to begin training. Before that appointment, Cournand was sent to the Tuberculosis Service at the Trudeau Sanitarium for a 4 month period. A few years later, Dr. Cournand was to present his first scientific paper at a national meeting at the Trudeau Sanitarium. In 1932, Dr. Miller asked Cournand, then chief resident of the chest service, to develop a pulmonary function laboratory at Bellevue Hospital. Dr. Miller and Dr. Adrian Lambert encouraged Dr.

Lambert's nephew, Dr. Dickinson W. Richards, to take Dr. Cournand under his expert tutelage, a relationship that would expand over a 41 year period (Fig. 7). A research plan was developed to treat the heart-lung and circulation as a single system for gas exchange. Methods for measuring pulmonary function and calculating pulmonary blood flow were established to qualitate normal and abnormal pulmonary physiology. They worked closely with thoracic surgeons and Dr. Frank Berry, a surgeon at Bellevue, and reported their first studies on patients undergoing thoracoplasty at the Trudeau Institute in 1938.⁸ Dr. Cournand often said that the importance of his results were quickly appreciated by surgeons, including Dr. Evarts Graham, who was a frequent correspondent.

A simple method to obtain mixed venous blood gas was necessary to continue the physiologic studies. Stimulated by Forssmann's self experiment with right-sided heart catheterization, they began by placing catheters in the right atrium in human cadavers, dogs, and chimpanzees, and in 1940 in humans. For cardiac and thoracic surgery, their work with cardiac catheterization and the publication in 1949 of Dr. Cournand's textbook⁹ "*Cardiac Catheterization in Congenital Heart Disease*" co-authored with Dr. Janet Baldwin, a pediatrician, and



Fig. 10. Dr. George H. Humphreys, chairman of the Department of Surgery, Columbia University College of Physicians and Surgeons, 1946 to 1969.

Aaron Himmelstein, a thoracic surgeon, changed our specialty forever.

During World War II, Dr. Alfred Blalock was head of the Shock Section of the National Research Council and heard Dr. Cournand's grant proposal to study shock by catheterization during an AATS meeting. The importance of this technique in research was immediately apparent to Dr. Blalock and resulted in his supporting the productive Bellevue shock studies. It is now history that Dr. Cournand shared the Nobel Prize for medicine and physiology on December 11, 1956, with Forssmann and Dickinson W. Richards for their discoveries concerning heart catheterization and the pathologic changes of the circulation. These scientific adventures and dissertations on scientific responsibility are set forth in Cournand's recently published book¹⁰ *From Roots... To Late Budding: The Intellectual Adventures of a Medical Scientist*, a reading must for investigators in our field.

Dr. Frank Berry (Fig. 8) was a general and thoracic surgeon serving under Dr. Adrian Lambert at Bellevue. During World War II, he organized the Ninth Evacuation Hospital (The Roosevelt Hospital Unit) and had a distinguished war experience beginning in North Africa through the Italian campaign and joining the Seventh

Army's push to the Rhine. Dr. Berry¹¹ recorded his autobiography on an oral tape history recorded by The Columbia University Library. He mentioned his meetings and his admiration for Dr. Pete Churchill, consultant to the European theater, as well as military surgeons, our historian and past president, Dr. Lyman Brewer and Paul Samson. Dr. Berry remained in Germany with the Allied occupation forces for a year after the war in the section of Health, Education, and Welfare to help rebuild the German Health System and to reinstate medical schools and hospitals. Professor Sauerbruch, then 70 years old and still professor at The University of Berlin, invited Drs. Berry and Churchill for dinner. He stated that the war had isolated Germany from the mainstream of thoracic surgery and that surgical removal of part of a lung or a whole lung was unheard of. He was charged with aiding the Nazi cause as advisor to the Wehrmacht and receiving a medal for an operation on former President Von Hindenberg. Dr. Berry saw the charges were ridiculous and was instrumental in clearing the old, unhappy Prussian who had helped so many of our founding members.

Dr. Berry then returned to Bellevue in 1946 as both chief of the First Division General Surgery and director of the Chest-Surgical Service. In 1952, he was invited by President Eisenhower to be assistant secretary of defense for Health and Medical Affairs. Many of us remember Dr. Berry for devising the "Berry Plan," which provided mechanisms for residents to complete their training and still meet their military obligations during the Korean War.

Dr. Robert Wylie (Fig. 9) assumed the directorship in 1954, and it was under his direction that the service became one of the most sought after thoracic training programs in the country. The attending surgeons included Dr. Adrian Lambert, Dr. Herbert C. Maier, and the colorful Dr. J. Maxwell Chamberlain. With the advent of closed heart surgery, the residency was expanded to include a rotation on the Chest-Surgical Service at the Columbia-Presbyterian Medical Center under the leadership of Dr. George H. Humphreys, chairman of the Department of Surgery and pioneer in cardiac surgery in New York (Fig. 10). This program provided the unique opportunity for senior resident responsibility, and 26 residents completed this thoracic training program before Columbia's affiliation with Bellevue ended in 1967. My classmate from the College of Physicians and surgeons, Dr. Albert Starr, was among these residents and served as president of the Society of Thoracic Surgeons this year.

The introduction of open heart surgery in 1953 had a profound impact on our specialty in New York. Over-

night
perf
in th
thor:
macl
trust
Th
with
capp
prec
with
tech
assu
surg
vari
perf
met
of t
requ
esta
for
that
al d
I
Ser

recorded his
led by The
his meet-
ill, consul-
is military
Dr. Lyman
ained in
for a year
ation, and
system and
Professor
sor at The
Churchill
Germany
and that
e lung was
Nazi cause
medal for
nberg. Dr.
was instru-
1 who had

46 as both
id director
invited by
of defense
remember
h provided
ining and
ie Korean

ctorship in
he service
c training
ns includ-
r, and he
he advent
panded to
ice at the
the lead-
an of the
c surgery
ided the
ility, and
program
ended in
cians and
residents
Thoracic

53 had a
k. Over-

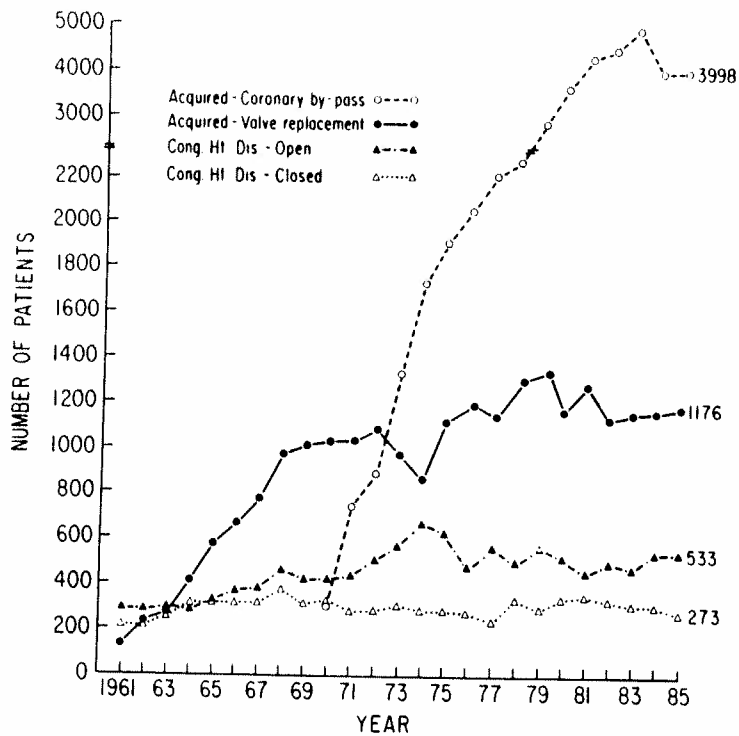


Fig. 11. Cardiovascular surgical caseloads in New York City from 1961 to 1985.

night at least 30 cardiac teams had been organized to perform open heart surgery. The common denominator in the group was an enthusiasm in a new branch of thoracic surgery, the ability to purchase a heart-lung machine, and strong pressure by the hospital board of trustees to enter this prestigious field.

The patient population was almost exclusively those with congenital heart disease. The Bureau for Handicapped Children of New York City had established a precedent of paying for the hospital care for patients with congenital heart disease utilizing closed heart techniques. It was therefore logical that they would assume the costs for those undergoing open heart surgery. It quickly became evident that there was a wide variation in the quality and number of cases being performed in the programs throughout the New York metropolitan area, and the then commissioner of health of the city of New York, Dr. Leonia Baumgartner, requested consultation from the medical profession to establish standards for the care of rheumatic fever and for closed and open heart surgery. She felt very strongly that the recommendations should come from professional deliberations rather than bureaucratic dictums.

Dr. George H. Humphreys, director of the Surgical Service at Columbia Presbyterian Medical Center, was

appointed chairman of a 14 member committee and served in this post until his retirement in 1969. The committee was strictly advisory to the city and subsequently to the New York State Commission of Health through The Bureau of Hospital Services and New York State Department of Health. Multidisciplinary teams were formed that periodically reviewed hospital programs including an on-site visit. In New York City in 1961, the first annual report questionnaire was devised to obtain information about the activities of cardiac diagnostic and surgical centers. This formed a unique 25 year view of the cardiovascular surgical case load trend. The experience from 1961 to 1977 was previously reported by Dr. Sylvia Griffiths,¹² who contributed material to this portion of my dissertation.

Cardiovascular surgical case load in New York City from 1961 through 1985 is shown in Fig. 11. These data are now collected from 14 hospitals performing surgery for acquired heart disease and, of these, eight are approved for pediatric cardiac surgery. The dramatic rise in the number of coronary artery bypass operations being performed after 1970 is well known. It reached its peak in New York City in 1983, at which time nearly 4,870 operations were performed. For the first time, in 1984, there was a drop in the number of cases to 3,976,

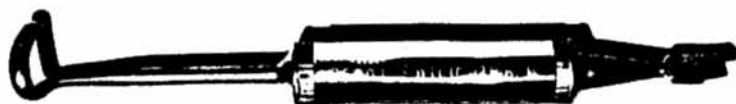


Fig. 12. The Lambert periosteal elevator engraved from Berry to Wylie to Malm.

Table I. Current factors influencing volume of open heart operations for congenital heart disease in 16 hospitals in New York State (1980-1985)

Year	Total caseload	Reoperations	No. from abroad
1980	827	33	?
1981	919	36	?
1982	1,070	66	130
1983	1,075	63	162
1984	1,087	59	170
1985	1,170	80	179

almost similar to the 1985 figures of 3,998. Approximately 1,000 percutaneous transluminal coronary angioplasties were performed in New York City in 1984, and this figure has risen to 1,700 in 1985. This first decline in coronary artery bypass procedures noted in the past 15 years may be related to the extended use of percutaneous transluminal coronary angioplasty or to a regional redistribution of cases, as successful open heart programs have developed in surrounding states. The number of isolated valve cases has remained about the same: since 1970, approximately 1,000 valve cases annually. Six hundred multiple procedures or complex operations for acquired disease have been performed and are not reported on the graph.

The case load of operations for congenital heart disease is characterized by the *lower two lines*. The *closed triangle line* indicates open heart procedures for congenital heart disease and the *open triangle line*, closed procedures. It is in general a straight line over time since 1973. The birth rate in New York City fell to 106,000 in 1979 and was 113,300 in 1984.

The tables summarize the experience with operations for congenital heart disease, open and closed, as reported from 16 hospitals within New York State from 1980 to 1985, when specific questions were inserted in the annual report. There is a small incremental increase in the total case load (Table I), which can be explained in part by an increase in the number of reoperations performed and more especially the number of patients

Table II. Age distribution of patients undergoing open heart operations for congenital heart disease at 16 hospitals in New York State in 1985

	No.	% of total
<1 yr	243	22
1-21 yr	741	67
>21 yr	<u>121</u>	11
	1,105	

who are arriving from abroad. The age distribution has been unchanged for the past 3 years, namely, 22% of the patients are under 1 year of age (Table II). This figure is similar to that for 1977, which is surprising, as one would have expected an increasing number of infants to be undergoing correction. The most frequent defects are atrial and ventricular communications and tetralogy of Fallot, making up nearly half of the operative experience (Table III). Finally, the three most frequent closed heart procedures are ductus ligation, coarctation repair, and, interestingly, the Blalock-Taussig shunt, which is still widely used, particularly its polytetrafluoroethylene modification, for complex cyanotic congenital heart disease (Table IV). The annual case load distribution among 16 hospitals is shown, with five hospitals doing between 25 and 49 cases (Table V) and only two doing more than 100 cases per year. Fifty cases is the minimum case load suggested by The New York State Department of Health for approval to perform operations for congenital heart disease if the program is also approved for acquired heart disease. There was no correlation between case load and operative mortality, which may be more a function of a case load selection and referral than quality of care. These data would suggest that, despite careful state regulation, there are a large number of hospitals performing a relatively small number of operations for congenital heart disease. The implications here for optimal patient care and particularly for training pediatric cardiac surgeons in the future are of great concern. A number of these programs are attached to university hospitals or are regionally isolat-

Table III.
among pa
for conge
New York

Atrial se
Ventricu
Tetralog

ed, so th
service,
services
arterial
plastic le
requirem
directing
that the
appropri
the pedi

The c
with ca
research
trainees
will be
rather
governm
the indi
cost co
quality
surgeon
that ar
liability
federal
cost o
patient
will be
as the

As f
in Ne
prepar
in his
parapl
senten
say ho
and f
oppor
25 ye
Servic
for 12
chang

Table III. *The three most frequent diagnoses among patients undergoing open heart operations for congenital heart disease in 16 hospitals in New York State in 1985 (total, 1,170 cases)*

Diagnosis	No.	% mortality
Atrial septal defect (second degree)	226	0.9
Ventricular septal defect	138	2.9
Tetralogy of Fallot	134	7.5

ed, so that it is difficult to withdraw this particular service, yet it would be inappropriate for low volume services to take on the more complex operations of arterial switch and the two-stage procedure for hypoplastic left heart syndrome in an attempt to meet volume requirements. These data demonstrate the difficulty in directing referral care in a free society, but is interesting that the difficult and complex cases find their way to the appropriate service by virtue of the care and concern of the pediatric cardiologist.

The complexion of our specialties has been changed, with cardiac surgery dominating the operating time, research energies, and the imagination of the majority of trainees. The content and structure of future training will be more dictated by Congress and training support rather than by previous patterns of residency. The government budgetary constraints on health care and the industry's involvement with health maintenance and cost containment have placed cost effectiveness above quality of patient care. The increasing harassment of surgeons and the advisory doctor-patient relationships that are created in the atmosphere of the insurance-liability crisis will most certainly be solved by state and federal legislation, as they are adding enormously to the cost of medical care without benefiting those few patients who have truly suffered injury. This litigious era will be looked upon in the future with the same disbelief as the old witch trials of Salem, Massachusetts.

As for my own career, fortune and chance placed me in New York at a moment of opportunity. I had prepared cardiac and thoracic surgical training at a time in history when open heart surgery began. I have paraphrased from Dr. Cournand's book in the next few sentences, as his views so closely fit my own. It is hard to say how much of my career can be credited to planning and how much to serendipity, but I had the unique opportunity of being chief of cardiac surgery for the past 25 years and director of the Cardiac and Thoracic Service at the Columbia-Presbyterian Medical Center for 12 years during a period of enormous expansion and change in the specialty. These rapid changes emphasize

Table IV. *The three most frequent diagnoses among patients undergoing closed heart operations for congenital heart disease in 16 hospitals in New York State in 1985 (total, 640 cases)*

Diagnosis	No.
Patent ductus arteriosus	233
Blalock-Taussig shunt*	131
Coarctation of aorta	113

*Including polytetrafluoroethylene.

Table V. *Annual caseloads (1985)—open heart operations for congenital heart disease in New York State*

No. of cases	No. of hospitals
25 to 49	5
50 to 74	5
75 to 99	4
100 +	$\frac{2}{16}$

the continuing need for all in this field to maintain intellectual integrity and to prepare for changes in our specialty and our medical system. We must avoid the undisciplined introduction of subjective elements into our perception of patient care and avoid allowing desires and aversions to penetrate our irresolute goal for the best care of our patients within the system. In addition, we must maintain a sense of belonging to a large medical-surgical scientific community, thus sharing our interests, observations, and discoveries freely. A close working relationship must be maintained with medical and basic science disciplines. With a half-life of biologic knowledge at the amazing rate of 4½ to 5 years, it is critical to maintain the high level of continuing education by attending and participating in local and national meetings.

If I were asked what I thought of the future of thoracic and cardiac surgery, I would say it is unlimited and filled with opportunities for young, energetic, and imaginative surgeons. I am constantly amazed at the quality of abstracts submitted by members and potential members of this organization to our annual meeting and by the quality of applications for membership. The training background, interest, and productivity of these men is truly outstanding.

There is a surgical instrument called the Berry-Lambert periosteal elevator on the Columbia Chest Service (Fig. 12). Although still in use today, this particular old instrument is the symbol of leadership and

is engraved with the names from Berry to Wylie to Malm. There is ample space for new names, and for it is in here that opportunities arise from the leaders of tomorrow. The pioneers of cardiac surgery are now passing the responsibility for progress and direction to new leadership. With this knowledge, it will be to capable hands, well prepared for the challenges ahead.

Now what does this have to do with my title, "New York—A Bellwether for Thoracic Surgery"? For those intellectually curious, a bellwether refers to a ram that has a bell around its neck, which was used by shepherders to hold the herd together and provide direction. I would say if you are interested in trends in thoracic and cardiac surgery, past and present and in the future, and if my rambling account has had any message, you would do well to keep an eye on New York!

REFERENCES

- 1 Meade GM: Edward Livingston Trudeau, M.D. *Tubercle* 53:299-250, 1972
- 2 Mann T: *The Magic Mountain*, New York, 1928, Alfred A. Knopf, Inc.
- 3 Alexander J: *The Surgery of Pulmonary Tuberculosis*. Philadelphia, 1925, Lea & Febiger, Publishers
- 4 Borst HG: *Hands across the ocean*. German-American relations in thoracic surgery. *J THORAC CARDIOVASC SURG* 90:477-489, 1985
- 5 Meltzer SJ: Amer J: Continuous respirations without respiratory movements. *J Exp Med* 11:622-625, 1909
- 6 Founding of The American Association for Thoracic Surgery. Published by the Historical Committee for the Fiftieth Anniversary, 1967
- 7 Meyers W: A review of the evolution of thoracic surgery within the past fourteen years. *Med Rec* 95:761-769, 1919
- 8 Lambert AVS, Berry FB, Cournand A, Richards DW Jr: Pulmonary and circulatory function before and after thoracoplasty. *J THORAC SURG* 7:302-325, 1938
- 9 Cournand A, Baldwin JS, Himmelstein A: *Cardiac Catheterization in Congenital Heart Disease*, New York, 1949, The Commonwealth Fund
- 10 Cournand A: *From Roots . . . to Late Budding. The Intellectual Adventures of a Medical Scientist*, New York, 1985, Gardner Press
- 11 *The Reminiscences of Dr. Frank Berry*, 1974, Oral History Research Office, PRCQ No. 979, Columbia University, New York
- 12 Griffiths SP, Zazula BM, Courtney D, Spencer F, Malm JR: Trends in cardiovascular state (1961-1977). Review of the New York City and State experience. *Am J Cardiol* 44:555-562, 1979