E V A R T S  A M B R O S E  G R A H A M

1883—1957

A Biographical Memoir by
LESTER R. DRAGSTEDT

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Biographical Memoir

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EVARTS AMBROSE GRAHAM
March 19, 1883–March 4, 1957

BY LESTER R. DRAGSTEDT

Evarts Ambrose Graham was born in Chicago, on March 19, 1883, and died in St. Louis of cancer of the lung on March 4, 1957. At the time of his death Dr. Graham was widely recognized as the leading surgeon of his day. He was, in every sense, a surgical statesman and was for many years the most influential voice in surgical meetings all over the world. He had devoted many years to the study of cancer of the lung and, together with Dr. Alton Ochsner of New Orleans, had pointed out the important role of cigarette smoking in the cause of this disease. In 1933, he first successfully removed the lung from a patient with lung cancer. This patient survived and was cured of his disease. Ochsner and Graham noted that practically all of the patients with lung cancer upon whom they operated were habitual cigarette smokers. Not long before his final illness, Dr. Graham and his wife, together with my wife and I, attended a surgical convention in Glasgow, Scotland, and were houseguests of Professor and Mrs. Arthur Mackey. Mrs. Mackey, a charming young lady, was smoking a cigarette when the Grahams and Dragstedts arrived at their home. To our consternation, shortly after the introductions, Dr. Graham took the cigarette away from Mrs. Mackey and told her that that was the last cigarette that she was to smoke. He said that he had been a confirmed cigarette smoker all of his life and that it was too late for him, but not too late for
her, to quit. Possibly he knew at that time that he had lung cancer and that the involvement of both lungs made removal by a surgical operation impossible. Before Dr. Graham and Dr. Ochsner reported their clinical studies, cigarette smoking was so common among surgeons that their convention rooms were often so clouded that it was difficult to see the speakers. By the time Dr. Graham died, it was almost impossible to find a surgeon smoking a cigarette.

Evarts Graham attended public schools and subsequently the Lewis Institute in Chicago. In the fall of 1900 he entered Princeton University and in 1904 graduated. His father, Dr. David W. Graham, was a leading surgeon on the west side of Chicago. He was a charter member of the staff of the Presbyterian Hospital and was president of the medical staff from 1898 to 1901. Although David Graham had contact with Christian Fenger, the Danish physician who first brought to Chicago and the Midwest knowledge of cellular pathology, bacteria, and infectious disease, he remained skeptical and paid scant attention to aseptic techniques in his surgical work. As a beginning medical student in 1911, I recall seeing “Daddy” Graham, as we students called him, perform an operation for the removal of tuberculous lymph glands in the neck of a child. Evarts Graham was his assistant and did all that he could to persuade his father to observe the principles of aseptic surgery. However, when Daddy Graham had finished scrubbing his hands and rinsing them in an antiseptic solution, as a final measure he washed his beard in the solution to the dismay of his son Evarts. We students were delighted, because, at this time, we had been taught something of bacteriology and were persuaded of course about the aseptic method of surgery.

Evarts’s mother, Ida Barnett Graham, was a woman of extraordinary intelligence and energy, who devoted much of her life to public service, especially in connection with the Presbyterian church and hospital. For many years she was chairman of the woman’s board of the hospital, a voluntary organization repre-
senting the Presbyterian churches of the Chicago area and including a general membership of public-spirited women. This remarkable woman was not only an inspiration to her husband and son, but also to other surgeons as well. With this background it is not surprising that Evarts embarked on a career in surgery.

After completing his studies at Princeton, Evarts Graham pursued medicine at Rush Medical College. At that time, the first two years of the medical course were given at The University of Chicago and the last two years at Rush Medical College, on the west side of Chicago, near the Cook County Hospital. At The University of Chicago, he was exposed to the inspiring teaching of Dr. A. J. Carlson, H. Gideon Wells, R. R. Bensley, and many others. After the completion of these two years, Evarts entered Rush Medical College and began his training in the clinical subjects. He made an outstanding record as an undergraduate student and was given an appointment in pathology with Ludvig Hektoen. During this period, he collaborated with Dr. Ernest E. Irons in a report on generalized blastomycosis. He received an M.D. degree in 1907 and spent the following year as an intern in the Presbyterian Hospital, where he became a close personal friend of Dr. Rollin T. Woodyatt, an internist some ten years his senior.

Woodyatt had just returned from a year of postgraduate study in the clinic of Professor Friedrich Muller, in Munich, and was charged with enthusiasm for the scientific spirit and investigative insight of this man. He sought to develop in Chicago a scientific clinic patterned on that of Muller, who was an able chemist in addition to being a leading internist; and this no doubt was responsible for Woodyatt’s advice to Evarts to secure more training in chemistry. Dr. Arthur Dean Bevan, Chairman of the Department of Surgery in Rush Medical College, thought that Evarts was making a mistake in withdrawing from clinical work to spend two or three years in chemistry. He, as well as Evarts’s father, failed to see how a knowledge of chem-
istry could be useful to a general surgeon. Evarts's persistence in studying chemistry in spite of this opposition is testimony to his independence and determination. However, Evarts has said this about his father: "I shall always be grateful to him. He supported me very eagerly both financially and by sympathetic understanding during the time that I stretched out my period of graduate training, even including the two years that I spent in the study of chemistry."

It was at The University of Chicago that Dr. Graham met Helen Tredway, who was also a graduate student in pharmacology. They were married in 1916. Throughout his life, Dr. Graham enjoyed the enthusiasm and intellectual support of this remarkable woman. In addition to her household duties and the care of two young children, Helen Tredway Graham became an associate professor of pharmacology at Washington University in St. Louis and continued an active career in teaching and research until she retired, in 1959. She was also active in a wide range of educational and civic matters, including civil liberties and air pollution control. She served as vice-president of the St. Louis League of Women Voters and a board member of the St. Louis Civil Liberties Committee. Mrs. Graham helped draft the civil service provisions of the St. Louis County Charter and was a member of the Board of Freeholders that drafted the metropolitan district plan for the coordination of services in St. Louis County. Like her husband, Mrs. Graham became concerned over the health dangers caused by air pollution and was instrumental in helping to secure air-sampling stations in St. Louis. She died of a heart attack in 1971, when she was eighty years old.

In 1915 Dr. Graham entered upon the private practice of surgery in a clinic in Mason City, Iowa. This was, on the whole, a disappointing experience. It was here that he became impressed with the evils of fee splitting and ghost surgery. It was often the practice of medical men to refer patients to surgeons
for operations and receive in return a portion of the surgeon's fee. The surgeon often felt that the medical man was insufficiently rewarded for his diagnostic work and so agreed to the split. Unfortunately, some surgeons returned a larger portion of the fee in order to secure more referred patients; and some medical men chose often inferior surgeons who gave a larger return. When Dr. Graham became President of the American College of Surgeons, he used his great influence to persuade the surgical societies to stop this practice among their members.

In 1918 Dr. Graham enlisted in the U.S. Army, was commissioned a captain, and sent to Fort Lee. He had been assigned to take a course in neurosurgery when he was visited by Dr. Allen B. Kanavel, a leading Chicago surgeon, who was on duty as a consultant in the office of the Surgeon General of the Army. Dr. Kanavel told Graham that there was growing apprehension about the treatment of empyema (collections of pus in the chest cavities) in the various army camps. The country was then in the first year of an influenza epidemic that would undoubtedly increase in severity. Pneumonia, accompanied by empyema, often followed the influenza and was the chief cause of death. Dr. Kanavel suggested that Graham work on this problem because of his unusual chemical training. Dr. Graham agreed and was shortly sent to Camp Lee to join with bacteriologist Edward K. Dunham and chemist Richard D. Bell to become what came to be known as the Empyema Commission.

With the help of Dr. Kanavel, a questionnaire was sent to the army camp hospitals; and it was found that the mortality from influenza pneumonia was about 30 percent. Many patients whose pulmonary reserve had been crippled by massive, often bilateral bronchopneumonia, were being hurried to an operating room as soon as fluid containing bacteria was found in the chest. The operation was rib resection with open tube drainage. Death often occurred within a half hour after the operation.

At the time when Dr. Graham and his colleagues on the
Empyema Commission were doing their work, the writer of this memoir was also in the army serving as pathologist at the general hospital in Camp Merritt, New Jersey. The influenza was then at its height, and in the camp of 35,000 men, as well as in the surrounding cities, there was a general feeling of foreboding—almost of fear like that described in London and Paris during the plague. As many as twenty to thirty young soldiers died daily and were brought to the morgue for autopsy. My examination usually revealed both pleural cavities filled with pus and causing such compression on the lungs as to seriously interfere with breathing. At times I requested the physicians who were caring for these patients to drain the pleural and pericardial cavities at an earlier date. They responded by saying that such attempts had proved invariably fatal. The contribution of Dr. Graham and his colleagues consisted of devising methods for the closed drainage of these cavities without permitting air to enter and collapse the lungs. It was a great contribution to the treatment of empyema and opened the way for Dr. Graham's subsequent career as one of the leaders of the new thoracic surgery. *Streptococcus hemolyticus* usually accompanied the influenza in this epidemic and was responsible for most of the deaths. Penicillin, which controls this deadly infection, was not then available. Fortunately, influenza accompanied by *Streptococcus hemolyticus* seems now to have disappeared.

At his urgent request, Dr. Graham was given overseas duty as commanding officer of U.S. Evacuation Hospital #34 in France. On returning to the United States after the war, in the spring of 1919, he was assigned to Fort Sheridan, in Illinois. The following account of Dr. Graham's appointment as Professor of Surgery at Washington University Medical School was given to me by Dr. Philip Anderson Shaffer:

"At that time, members of the staff of base hospital #21 from Washington University were also returning from France. During their absence many circumstances had changed. Dr. Fred
Murphy, chief surgeon of base hospital #21 was also Professor of Surgery in Washington University and head of that department. During his absence the full time system in medicine had been adopted for heads of the clinical departments. This plan displeased Murphy and led to his retirement thus making it necessary to seek his successor.

"In 1916, I had been drafted as Dean of the Washington University Medical School and, in that capacity, went to Chicago in search of a candidate for our department of medicine. My friend Dr. Rollin T. Woodyatt, whom I consulted, told me that if I had wanted a surgeon he could have named an excellent candidate. He cited the talents and accomplishments of Evarts Graham who, however, had just accepted appointment to a clinic in Mason City, Iowa.

"In 1917, I had been sent to France as an officer in the section of food and nutrition in the sanitary corps attached to the surgeon general's office. At that time I received the resignation of Dr. Murphy as professor of surgery at Washington University Medical School. I recalled the praise of Woodyatt and others of a young surgeon whose name I had forgotten. My files however disclosed it. Dr. Graham was located at Fort Sheridan and a committee of the faculty was sent to confer with him as to his qualifications and interest in the position in St. Louis. He was invited to visit the school, which he did on June 6 and 7, 1919. The corporation approved his appointment as Professor of Surgery effective July 1, 1919.

"Evarts's prompt acceptance of this appointment after such a short visit was surprising to me but was explained many years later when by chance I recognized his face in a group photograph of a large attendance at the first convention of the Federation for Experimental Biology and Medicine to meet in St. Louis. Examination of the program of that meeting showed that Evarts had read a paper there and had taken part in the discussion. He had already explored the plan for a modern medical school and
appreciated the opportunity for the development of his ambitions. With the acceptance of that appointment he entered into associations that continued for the rest of his life: devoted and loyal to his friends and to his responsibilities, of unshakable mental integrity, outspoken and with wide vision. He was invaluable not only to his department and field, but as a member of the executive faculty of the whole medical school and from this post his influence in the field of medical education and practice spread worldwide.” This eloquent tribute by Dean Shaffer was re-echoed by the many faculty members who attended Dr. Graham’s retirement dinner.

Dr. Graham entered upon his work as professor of surgery at Washington University with enthusiasm and high hopes. He had long been interested in the work of Peyton Rous and P. D. McMaster on the function of the gallbladder. These men had demonstrated that the thin bile from the liver was stored in the gallbladder between meals and concentrated there by the absorption of water by the gallbladder mucosa. John J. Abel and Leonard Rowntree had discovered that the chemical phenoltetrachlorphthalein, when injected into the blood stream, was selectively removed from the blood by the liver and excreted in the bile. A similar compound, phenoltetrabromthalein, was being used as a test of liver function. Dr. Graham speculated that if iodine could be substituted for chlorine in the molecule of this drug then perhaps the phenol tetraiodothalein would also be selectively excreted in the bile. Iodine being opaque to X rays would make the bile cast an X-ray shadow, and so the gallbladder could be visualized. He was able to secure sodium tetraiodophenolphthalein from the Eastman Kodak Company and began his work in the laboratory on experimental animals. Drs. Warren Cole and Glover Copher assisted in these experiments. Dr. Cole relates that, although they were able to visualize the gallbladder in dogs, when they first administered the drug to patients with gallstones or suspected gallstones, no visualization
of the gallbladder occurred. This was a great disappointment, as it was hoped that by this method of visualizing the gallbladder by X ray a diagnosis of gallstones could be made or confirmed. Fortunately, they later gave the drug to patients without symptoms of gallbladder disease and found that the gallbladder visualized perfectly. Subsequent experiments revealed that the method provided a good test for the function of the gallbladder. If the gallbladder mucosa were normal, it would concentrate the bile; and the concentrated bile containing the drug was visualized by X ray. When the gallbladder wall was diseased and did not concentrate the bile, there was no visualization of the gallbladder. Nonvisualization of the gallbladder indicated that the mucous membrane of the gallbladder was not normal and so did not concentrate the bile. Often the visualized gallbladder displayed gallstones that, because of the absence of the drug in the stones, cast a negative shadow. These discoveries by Dr. Graham and his associates made the diagnosis of diseases of the gallbladder much more accurate and, in addition, proved very useful in further investigations of the function of the gallbladder in other conditions. Undoubtedly Dr. Graham's work on the gallbladder was influential in his election as a member of the National Academy of Sciences in 1941.

Although teaching and administrative burdens consumed much of Dr. Graham's time, he devoted himself with great success to the study of chest diseases along with his work on the gallbladder. His department became one of the leading centers for thoracic surgery in the United States. At that time removal of a lobe of the lung was occasionally done in patients with cancer of the lung where the tumor was thought to be limited to one lobe. Dr. Graham was operating upon a fellow physician when exploration of the lung revealed that the cancer involved more than one lobe. To the awe of the surgeon spectators, he then proceeded to remove the entire lung. It is probable that he had considered this eventuality before and that his decision to
remove the entire lung was not so casual as it seemed. The patient recovered and was cured of his disease. This surgical triumph in 1933 electrified the surgical world, and, in addition to adding to Dr. Graham's fame, stimulated other surgeons to try to cure these unfortunate patients. In succeeding years, Dr. Graham and his associates operated upon many more patients sent to them from all parts of the world. I recall one of his forceful statements, namely, that every patient upon whom he had operated for cancer of the lung had been an inveterate cigarette smoker.

Four days after Dr. Graham's death, the Board of Directors of Washington University on March 8, 1957, passed the following resolution:

"Whereas, Dr. Evarts Ambrose Graham lighted man's way to longer life and better health by his diligent pursuit of truth and by his brilliant and courageous achievements in surgery and medical research; and

"Whereas, Dr. Graham devoted thirty-eight years of his life to a distinguished career with the Washington University Medical School, receiving international acclaim for his valuable leadership in medical education; and

"Whereas, Dr. Graham served the University faithfully and with excellent results in many special assignments, including chairmanship of faculty committees to select new chancellors;

"Therefore, be it resolved that the Board of Directors of Washington University express its gratitude for the life of this great man and pay tribute to a memory that will forever deserve a place of honor in the annals of man."
EVARTS AMBROSE GRAHAM

HONORS AND DISTINCTIONS

ACADEMIC POSITIONS
1910-1914 Assistant in Surgery, Rush Medical College
1919-1951 Professor of Surgery, Washington University School of Medicine, and Surgeon-in-Chief, Barnes Hospital and St. Louis Children’s Hospital

MILITARY SERVICE
1918 Major, Medical Corps, U.S. Army, with Empyema Commission. Later Commanding Officer, Evacuation Hospital #34 in France

HONORARY DEGREES
1926 Ll.D. Central College
1927 Sc.D. University of Cincinnati
1928 M.S. Yale University
1929 Sc.D. Princeton University
1931 Sc.D. Western Reserve University
1940 Sc.D. University of Pennsylvania
1941 Sc.D. University of Chicago

LECTURESHIPS
1924 and
1934 Harvey Lecturer
1924 Mutter Lecturer
1926 McArthur Lecturer
1928 Shattuck Lecturer
1930 Melbourne (Australia) Permanent Postgraduate Committee
1930 Alvarez Lecturer
1931 Joyce Lecturer
1932 Arthur Dean Bevan Lecturer
1933 Caldwell Lecturer
1935 Balfour Lecturer
1937 Judd Lecturer
AWARDS AND DISTINCTIONS

1920 Co-editor, *Archives of Surgery*
1920 Gross Prize
1921 Société Internationale de Chirurgie
1922 Sent by Rockefeller Foundation to Great Britain to investigate teaching of surgery in British Medical Schools
1924–1933 Member, National Board of Examiners
1925 Temporary Surgeon-in-Chief, Peter Bent Brigham Hospital
1925 Editor, *Yearbook of Surgery*
1925 Gold Medal, Radiological Society of North America
1925 Leonard Research Prize, American Roentgen Society
1925–1939 Member, Medical Fellowship Board, National Research Council
1927 Gold Medal, St. Louis Medical Society
1928 President, American Association for Thoracic Surgery Society of Clinical Surgery
1931 Editor, *Journal of Thoracic Surgery*
1932 Kaiserlich Deutsche Akademie der Naturforscher
1933 Gold Medal, Southern Medical Association
1934 Co-editor, *Annals of Surgery*
1937 John Scott Medal of the City of Philadelphia
1937 President, American Surgical Association
1937–1941 Chairman, American Board of Surgery
1938 Honorary Fellowship, Association of Surgeons of Great Britain and Ireland
1938 Honorary Membership, Society of Thoracic Surgeons of Great Britain and Ireland
1939 Temporary Professor of Surgery, St. Bartholomew's Hospital, London
1940 Chairman, Committee on Surgery, National Research Council
1940–1941 President, American College of Surgeons; elected to the Board of Regents, 1941
1941 Member, Royal Society of Sciences, Uppsala, Sweden
1941 Member, American Philosophical Society
1941 Member, National Academy of Sciences
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<th>Year</th>
<th>Award/Recognition</th>
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<tr>
<td>1941</td>
<td>Honorary Member, Argentine Society of Surgeons</td>
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<td>1942</td>
<td>Member of committee appointed by Secretary of War to study the Medical Department of the Army</td>
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<td>1942</td>
<td>Lister Medal for 1942</td>
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<td>1942</td>
<td>St. Louis Award</td>
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<td>1943</td>
<td>Honorary Fellowship, Royal College of Surgeons of England</td>
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234 BIOGRAPHICAL MEMOIRS

BIBLIOGRAPHY

KEY TO ABBREVIATIONS

Am. J. Med. Sci. = American Journal of Medical Sciences
Am. J. Roentgenol. = American Journal of Roentgenology
Am. Rev. Tuberc. = American Review of Tuberculosis
Arch. Pathol. = Archives of Pathology
Arch. Surg. = Archives of Surgery
Cancer Res. = Cancer Research
Dis. Chest = Diseases of the Chest
J. Am. Chem. Soc. = Journal of the American Chemical Society
J. Exp. Med. = Journal of Experimental Medicine
J. Infect. Dis. = Journal of Infectious Diseases
J. Mo. State Med. Assoc. = Journal of the Missouri State Medical Association
Postgrad. Med. = Postgraduate Medicine
South. Med. J. = Southern Medical Journal
Wash. Univ. Med. Alumni Q. = Washington University Medical Alumni Quarterly

1906


1907

1908

1909

1910

1911

1912


1913

1914

1915

Late poisoning with chloroform and other alkyl halides in relationship to the halogen acids formed by their chemical dissociation. J. Exp. Med., 22:48–75.

1916


1917


1918


Acidosis in surgery. Journal of the Iowa Medical Society, 8:130.


1919

1920

Sodium carbonate in chloroform poisoning. Archives of Internal Medicine, 25:575–83.


1921


1922


1923

Clinic on cholecystitis at University of California Medical School, Feb. 9, 1923, and Clinic on Empyema at Leland Stanford Junior University School of Medicine, Feb. 10, 1923. Journal of the California State Medical Association, pp. 1–12 and 13–22.

1924

Alterations of intrapleural pressure and their significance. (Harvey Lecture) Medicine, 3:417.

1925


1926
Some recent developments in our knowledge of the biliary tract. British Medical Journal, 2:671–76.

1927
Le Diagnostic des Cholécystites et le Mécanisme de Vidage de la Vésicule Biliaire. Revue Médicale Française, 8:119.


The Department of Surgery, Washington University School of Medicine, St. Louis. In: Methods and Problems of Medical Education, p. 327. Eighth Series. New York: Rockefeller Foundation.

1928


1929

The significance of changed intrathoracic pressures. Arch. Surg.,
18:181–89.
Pulmonary tuberculosis combined with carcinoma of lung. J. Mo.
State Med. Assoc., 26:70–73.
Editor. The Year Book of General Surgery, 1929. Practical Medicine
The surgical treatment of pulmonary tuberculosis. J. Mo. State
Med. Assoc., 26:583–86.
With Duff S. Allen. Effects of pressure on the heart, with reference
to the advisability of decompression of greatly enlarged hearts.
19:1545–51.
With N. Arneson and R. Elman. Value of blood amylase estimations
in diagnosis of pancreatic disease; clinical study. Arch. Surg.,
1552–70.
St. Louis Meeting of the American Association for Thoracic Surgery.
Arch. Surg., 19:1545–1678. (Portion of program provided by
Washington University School of Medicine and the Chest Service
of Barnes Hospital)
The application of surgery to pulmonary tuberculosis. Proceedings,
Annual Meeting of the Missouri Tuberculosis Association,
Sept. 27.

1930

Editor. Surgical diagnosis, 3 vols. Philadelphia, Pa.: W. B. Saunders
Co.
With Franklin E. Walton and R. M. Moore. The nerve pathways in
With H. C. Ballon, H. M. Wilson, and J. J. Singer. Esophagus,
stomach and heart following unilateral phrenicectomy. Arch.
Surg., 1291–1314.
Editor. The Year Book of General Surgery, 1930. Practical Medicine
Physiological aspects of the lungs of importance to the surgeon.

1931


1932


1933

Estimating the risk of operations on the biliary tract by testing the excretory function of the liver. Radiology, 21:105–206.


1934


The clinical application of some recent knowledge of the biliary tract (Harvey Lecture) The Harvey Lectures, 1933–1934, 29:176–203.


1935


1936


1937


1938


1938


1939


1940


Aneurysm of the ductus arteriosus, with a consideration of its importance to the thoracic surgeon. A report of two cases. (Written for Dean Lewis Volume) *Arch. Surg.*, 41:324–333.

1941


1942


1943


1944


Indications for total pneumonectomy. Dis. Chest, 10:87–94. (Read before American College of Chest Physicians)


1945


1946


1947

Chest surgery. In: The Doctors Talk It Over, vol. 6, pp. 86–93. (Radio broadcast sponsored by Lederle Laboratories Division, American Cyanamid Company)


1948


1949


1950


1951


1953


1954

1955


1956


A tribute to Rollin Turner Woodyatt. (This tribute was the first part of the First Rollin T. Woodyatt Lecture) Quarterly Bulletin of the Northwestern University Medical School, 30:286-89.

1957


A brief account of the surgery of a half century ago and some personal reminiscences. Medical Clinics of North America, 41:1061-70.