

## What Primary and Secondary Sources Are

Primary sources are materials that provide direct or first-hand evidence about an event, person, object, or work of art. Usually, primary sources are created during the time in question. Examples: letters, diary entries, news films, photographs, poetry, fiction, music, pottery, clothing, and buildings.

Some examples of primary sources are:

- Recording of and letters by various Civil Rights leaders such as Dr. Martin Luther King, Jr.
- Student's own writings—e.g., journal entries, poems, text messages, emails, etc.
- Song lyrics, artworks, and novels
- Personal items—e.g., Madame Curie's lab notebook, George Washington's glasses

Secondary sources are at least one step removed from the event or phenomenon being studied; they interpret, assign value to, conjecture about, and draw conclusions about the events reported or thoughts expressed in primary sources. Many secondary sources are published works such as textbooks, histories, magazine articles and reviews, encyclopedias, etc., but can also take the form of radio or TV documentaries, for example.

Some examples of secondary sources are:

- Student's written biography of Harriet Tubman, report on another country, etc.
- Online Wikipedia
- Textbooks on art history, American Civil War, etc.
- A map showing the relocation of Native Americans after specific treaties
- An article about NASA's Mars rover, Curiosity.

## The Charles R. Drew Papers: Biographical Information

*“ . . . So much of our energy is spent in overcoming the constricting environment in which we live that little energy is left for creating new ideas or things. Whenever, however, one breaks out of this rather high-walled prison of the "Negro problem" by virtue of some worthwhile contribution, not only is he himself allowed more freedom, but part of the wall crumbles. And so it should be the aim of every student in science to knock down at least one or two bricks of that wall by virtue of his own accomplishment.”*

--Charles R. Drew to Mrs. J. F. Bates, a Fort Worth, Texas schoolteacher, January 27, 1947

Charles Richard Drew, the African American surgeon and researcher who organized America's first large-scale blood bank and trained a generation of black physicians at Howard University, was born in Washington, DC, on June 3, 1904. His father, Richard, was a carpet layer and financial secretary of the Carpet, Linoleum, and Soft-Tile Layers Union--and its only non-white member. His mother, Nora Burrell Drew, was a graduate of the Miner Normal School, though she never worked as a school teacher. Charles and his younger siblings, Joseph, Elsie, and Nora, grew up in the largely middle-class and interracial neighborhood of Foggy Bottom (a third sister, Eva, was born after the family moved to Arlington, Virginia, in 1920.) Their upbringing emphasized academic education and church membership, as well as civic knowledge and personal competence, responsibility, and independence. At the age of twelve, Charlie (as he was called, even as an adult) became a paper boy, selling several Washington papers from a street corner stand; within a year, he had six other boys working for him and covering a wider area. As he got older, his after-school and summer jobs included supervising at city playgrounds, lifeguarding at the local swimming pool, and working construction jobs.

Washington was still racially segregated during that era, but its large African American community included many prosperous and well-educated families, and their public schools were often excellent. Drew attended Stevens Elementary and then Dunbar High School, which was then one of the best college preparatory schools--for blacks or whites--in the country. Though bright, he was not an outstanding student; instead, he devoted much of his effort to athletics, where he excelled. Ambitious and competitive, he lettered in four sports, and won the James E. Walker Medal for all-

round athletic performance in both his junior and senior years. He was voted "best athlete," "most popular student," and "student who has done the most for the school." He also served as captain of Company B in the Third Regiment of the High School Cadet Corps during his senior year. Drew did not express any early medical ambitions; his senior yearbook entry noted that he aspired to become an electrical engineer.

Drew graduated from Dunbar in 1922 and went to Amherst College in Massachusetts on an athletic scholarship. His achievements on the Amherst track and football teams were legendary; long after he distinguished himself as a blood banking pioneer and medical educator, many still remembered him best as an athlete. As in high school, Drew did not excel scholastically. He did, however, develop an interest in the medical sciences through his biology courses with Otto Glaser. Later, he would also cite the death of his oldest sister, Elsie (from tuberculosis complicated by influenza), in 1920, and his own hospitalization for a college football injury as events that fostered his interest in medicine. Drew received his AB from Amherst in 1926. To earn money for medical school, he took a job as athletic director and instructor of biology and chemistry at Morgan College (now Morgan State University), in Baltimore. During his two years at Morgan, his coaching transformed its mediocre sports teams into serious collegiate competitors.

The racial segregation of the pre-Civil Rights era constrained Drew's options for medical training. Some prominent medical schools, such as Harvard, accepted a few non-white students each year, but most African Americans aspiring to medical careers trained at black institutions such as the Howard University College of Medicine in Washington, DC, or Meharry Medical College in Nashville, Tennessee. Drew applied to Howard, but was not accepted because he lacked enough credits in English from Amherst. Harvard accepted him, but wanted to defer his admission to the following year. Not wanting to wait, Drew applied to the McGill University Faculty of Medicine in Montréal, which had a reputation for better treatment of minorities.

McGill University allowed its graduate and professional students to play on school teams, and Drew once again became a star athlete. But he also became a star student, winning several important prizes and fellowships, and graduating second in a class of 137, in 1933. During his internship and surgical residency at Montréal General Hospital, 1933-1935, he worked closely with bacteriology professor John Beattie, who was

exploring ways to treat shock with transfusion and other fluid replacement. This work fostered an interest in transfusion medicine that Drew would later pursue in his blood bank research. Drew hoped to extend his training with a surgical residency in the United States, preferably at the Mayo Clinic, but major American medical centers rarely took on African American residents, partly because many white patients in that era would refuse to be treated by black physicians. In 1935, he joined the faculty at Howard University College of Medicine, starting as a pathology instructor, and then progressing to surgical instructor and to chief surgical resident at Freedmen's Hospital.

Howard's College of Medicine was upgrading its programs with help from the Rockefeller Foundation's General Education Board. This effort included appointing well-qualified white department chairs to set up and run residency programs and train black successors, along with fellowships for further training of junior faculty. Drew trained with Department of Surgery chair Edward Lee Howes for three years and then got a fellowship to train with eminent surgeon Allen O. Whipple at New York's Presbyterian Hospital, while earning a doctorate in medical science from Columbia University. At Presbyterian, he worked with John Scudder on studies relating to treating shock, fluid balance, blood chemistry and preservation, and transfusion. His main project with Scudder--and the basis for his dissertation--was an experimental blood bank at Presbyterian, opened in August 1939. In June 1940, Drew received his doctorate in medical science from Columbia, becoming the first African American to earn the degree there.

While attending a conference in April 1939, Drew met Minnie Lenore Robbins, a professor of home economics at Spelman College in Atlanta. They married in September of that year, and had three daughters and a son. (The eldest daughter, Bebe, born in 1940, was named for the blood bank--BB--project her father was immersed in at the time.)

With his fellowship completed, Drew returned to Howard University to take up duties as assistant professor of surgery. He was called back to New York in September 1940 to direct the Blood for Britain project. Great Britain, then under attack by Germany, was in desperate need of blood and plasma to treat military and civilian casualties. In August, Presbyterian and five other New York hospitals had begun a collaborative effort to collect and ship plasma (the fluid, non-cellular portion of blood)

to Britain. Although others had developed the basic methods for plasma use, Drew, as medical director, instituted uniform procedures and standards for collecting blood and processing blood plasma at the participating hospitals. When the program ended in January 1941, Drew was appointed assistant director of a pilot program for a national blood banking system, jointly sponsored by the National Research Council and the American Red Cross. Among his innovations were mobile blood donation stations, later called "bloodmobiles." Ironically, as the blood bank effort expanded in preparation for America's entry into the war, the armed forces initially stipulated that the Red Cross exclude African Americans from donating; thus Drew, a leading expert in blood banking, was ineligible to participate in the program he helped establish. The policy was soon modified to accept blood donations from blacks, but required that these be segregated. Throughout the war, Drew criticized these policies as unscientific and insulting to African Americans.

While working on the Blood for Britain project, Drew also passed his American Board of Surgery exams, receiving certification early in 1941. He returned to Howard University and in October became chair of the Department of Surgery and Chief of Surgery at Freedmen's Hospital. He also became the first African American to be appointed an examiner for the American Board of Surgery. For the next nine years he devoted himself to training and mentoring his medical students and surgical residents, and raising standards in black medical education. He also campaigned against the exclusion of black physicians from local medical societies, medical specialty organizations, and the American Medical Association.

Drew's innovative work was recognized by awards and honors including the 1942 E. S. Jones Award for Research in Medical Science from the John A. Andrew Clinic in Tuskegee, AL; an appointment to the American-Soviet Committee on Science in 1943; the 1944 Spingarn Medal from the NAACP, for his work on blood and plasma; honorary doctorates from Virginia State College (1945) and Amherst College (1947); and election to the International College of Surgeons in 1946.

Drew died on April 1, 1950, in Burlington, North Carolina, from injuries sustained in a car accident while en route to a conference. Despite the prompt and competent care he received from the white physicians at a nearby hospital, he was too badly injured to survive. Drew's tragic death generated a persistent myth that he died because

he was denied admission to the white hospital, or was denied a transfusion, but such stories have been debunked repeatedly. Though he died prematurely, Drew left a substantial legacy, embodied in his blood bank work and especially in the graduates of the Howard University College of Medicine.

### Biographical Information: Brief Chronology

- **1904** --Born June 3 in Washington, DC to Richard and Nora Drew
- **1922** --Graduated from Dunbar High School, Washington, DC
- **1926** --Received AB from Amherst College, Amherst, Massachusetts
- **1926-28** --Athletic Director and Instructor in Biology and Chemistry at Morgan College, Baltimore, Maryland
- **1933** --Received MD and Master of Surgery from McGill University Faculty of Medicine, Montréal, Canada
- **1933-35** --Internship and residency at Montréal General Hospital
- **1935-36** --Instructor in Pathology at Howard University School of Medicine, Washington, DC
- **1936-37** --Assistant instructor in Surgery at Howard University and surgical resident at Freedmen's Hospital
- **1937-38** --Instructor in Surgery at Howard University and Assistant Surgeon at Freedmen's Hospital
- **1938-40** --Graduate work at Columbia University and surgical resident at Presbyterian Hospital, New York
- **1939** --Married Minnie Lenore Robbins on September 23; they had three daughters (Bebe, Charlene, and Rhea) and a son (Charles Jr.)
- **1940** --Received Doctorate in Medical Science from Columbia University for research and dissertation on blood banking; returned to Howard University School of Medicine as assistant professor of surgery and surgeon at Freedmen's Hospital (June)
- **September 1940-January 1941** --Medical supervisor for the Blood for Britain project organized by the Blood Transfusion Betterment Association in New York
- **February 1941** --Appointed Assistant Director of the first American Red Cross Blood Bank (Presbyterian Hospital, New York) and Assistant Director of Blood Procurement for the National Research Council, in charge of blood for use by the U.S. Army and Navy
- **April 1941** --Certified a diplomate of the American Board of Surgery, returned to Howard University School of Medicine
- **October 1941** --Appointed professor and Head of the Department of Surgery at Howard University, and chief surgeon at Freedmen's Hospital, certified as an examiner for the American Board of Surgery

**Brief Chronology (continued)**

- **1944-46** --Chief of Staff, Freedmen's Hospital
- **1944** --Received the NAACP's Spingarn Medal for work on the British and American blood plasma projects
- **1946** --Elected fellow of International College of Surgeons
- **1946-48** --Medical Director, Freedmen's Hospital
- **1949** --Consultant to U.S. Army Surgeon General's Office, part of a team to assess health care in post-war Europe
- **1950** --Died April 1 of injuries received in car accident near Burlington, North Carolina

“Biographical Information” in *Profiles in Science: The Charles R. Drew Papers*.

<http://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/336>

Courtesy National Library of Medicine

## The Charles R. Drew Papers

### Education and Early Medical Career, 1922–1938

Drew had no clear plans for a medical career when he began his studies at Amherst College--with an athletic scholarship--in 1922. His high school years had been distinguished more by athletic than academic achievement. Likewise, at Amherst his performance on track and football teams became legendary, while his coursework lagged behind. Yet his experiences on the playing fields shaped his character and his approach to life as nothing else would. In athletics, he later noted, one learned to meet and overcome all kinds of challenges, to subordinate self for the good of the team. By fighting on and knowing that others had won similar battles, an athlete developed the confidence essential to facing life's other challenges. Athletics at Amherst forced Drew to face one of those other challenges--racism. Though a popular, celebrated athlete at a liberal college, Drew was still one of only 13 African Americans in a student body of 600. He and several black team mates were sometimes targeted for rough treatment by opposing teams, and refused service at restaurants when they traveled to games; and he was passed over for football captain in his senior year, though as the team's top performer he deserved that rank.

Drew later credited his biology professor, Otto Glaser, for fostering the scientific interests that led him to medical school. But athletics also played a role: in his junior year an infected football injury put him in the hospital for surgery. Later, in his application to McGill University Faculty of Medicine, he traced his desire to study medicine to his sister Elsie's death, in 1920, from tuberculosis complicated by the post-war pandemic influenza. Following graduation from Amherst in 1926, Drew worked for two years at Morgan College in Baltimore to earn money for medical school. There, he taught biology and chemistry, and, as Director of Athletics, he transformed the college's mediocre football and basketball teams into champions.

Like many American professions and institutions in the pre-Civil Rights era, medicine was largely segregated, and this constrained Drew's options for medical school. Some prominent medical schools, such as Harvard, accepted a few non-white students each year, but most African Americans aspiring to medical careers had to train at one of two black institutions: Howard University College of Medicine in Washington, DC, or Meharry Medical College in Nashville, Tennessee. Howard, Drew's first choice, turned him down for not having enough undergraduate English credits. (Howard did offer him a coaching job, which he declined.) Harvard accepted him, but wanted to defer admission to the following year. Not wanting to wait, Drew applied to the McGill University Faculty of Medicine in Montréal, which had a reputation for better treatment of minority students.

In medical school, despite the financial hardship of his first years in Montréal, Drew began to distinguish himself academically. By his third year he had won an annual prize in neuroanatomy and a scholarship; he was elected to Alpha Omega Alpha, the medical honor society, and served on the staff of the *McGill Medical Journal*. In his fifth year, in competitive

examination with four other top students, he was awarded the J. Francis Williams Prize in medicine. And, as McGill allowed professional and graduate students to participate in college sports, Drew became a star athlete yet again, winning Canadian championships for McGill in several track events. In 1933, Drew received his MD and CM (Master of Surgery) degrees, graduating second in a class of 137.

During his internship and surgical residency at Montréal General Hospital, Drew worked closely with bacteriologist John Beattie, who was then studying ways to treat shock with blood transfusion and other fluid replacements. Shock is a fundamental medical challenge in which blood volume is greatly reduced by bleeding (e.g., from surgery or other injury), dehydration (e.g., from vomiting or diarrhea), fluid loss from severe burns, or a reduction in peripheral circulation. When shock sets in, blood pressure and body temperature plummet, pulse and respiration become rapid and shallow, and tissues are deprived of oxygen as circulation starts to shut down. Although the mechanisms of shock were still not completely understood in the 1930s, it was clear that restoring blood volume with transfusion was the surest way to reverse shock. Transfusion had become a practical option thirty years earlier, when Karl Landsteiner and others discovered the four basic groups of blood antigens--A, B, AB, and O. "Typing" donor and recipient blood for compatibility avoided many, though not all, dangerous immune system reactions to transfused blood. (Blood subtypes, particularly the Rh factors, had yet to be worked out, so severe reactions could still occur.) Although some researchers had successfully used stored blood for transfusion, there were no blood banks, so donors had to be found on short notice when transfusion was needed. During Drew's residency a fire at the hospital left a number of patients badly burned, providing him with a stark demonstration of the need for a reliable blood or blood substitute supply.

Following his residency in Montréal, Drew hoped to get further surgical training at a major medical center such as the Mayo Clinic. But specialty residencies were rarely given to African Americans (or women or Jews) during that era, and Drew received no offers, despite his excellent record at McGill. The same segregationist culture that had limited his medical school choices constrained his options for further training. Prestigious American hospitals selected their residents for their professional potential, but also for their academic and social pedigrees; many non-elite candidates were thus disqualified. And even if supervisors and fellow residents could accept a minority doctor, many patients--whether black, white, male, or female--expected their attending physicians to be white males. Drew reluctantly concluded that he would probably have to pursue his career at Howard University. When his father died in 1935, leaving him as the family's primary support, he applied to Numa P. G. Adams, dean of Howard University's medical school, for a position in the department of surgery. Adams quickly hired him as a pathology instructor, the traditional first-year faculty assignment for young surgeons.

Drew arrived at Howard at a good time: both the university and the medical school were undergoing substantial changes. Like many historically black institutions, Howard had been founded after the Civil War by white benefactors, and was for many years run by whites.

Though the faculty was mixed, blacks were rarely appointed as department chairs or deans. The paternalistic pattern began to shift as the pool of highly educated and successful African Americans gradually expanded during the first half of the twentieth century. At Howard, this trend was reflected by the appointment of its first black president, Mordechai Johnson, in 1926, and Adams' appointment as the first black dean of the medical school in 1929. Johnson and Adams, like many African American educators, knew that overcoming the predominant Jim Crow culture would require, among other things, that their graduates meet or exceed the standards set by the better white institutions. To that end, they sought to improve the quality of their students, faculty, and facilities.

Howard University's basic operating budget would not support the improvements envisioned by Johnson and Adams. As a private university supported primarily through yearly federal appropriations of erratic size, Howard had few reserve funds. Fortunately, substantial help became available through the Rockefeller Foundation's General Education Board (GEB), beginning in 1920. That year, the GEB provided a matching grant for \$250,000 to help Howard establish an endowment. A grant of \$130,000 in 1927 helped build a new main medical education building, and in 1929 the medical school received \$75,000 to cover Adams' salary for four years, and fund a five-year advanced training program for four faculty members. Thus, when Adams began his tenure as dean, the medical college had some new facilities, funding for training and administration, and a commitment from the GEB for continued support.

Adams developed a comprehensive plan for reorganizing the medical school, and recruited exceptional African American medical graduates to train as teachers and eventually full professors in their fields. These included W. Montague Cobb and Robert Jason in preclinical fields and J. Robert Lowry and Charles Drew in clinical surgery. By 1935, Adams had won approval for resident training programs in medicine, obstetrics and gynecology, pediatrics, and surgery. Initially, Adams also planned to hire two outstanding African Americans as the new heads of the surgery and medicine departments. Unable to find the highly qualified candidates he sought, in 1935 he asked the GEB for funds to hire two first-rate white medical professors, who would head the departments, modernizing and reorganizing them, for five years. They would also train the most promising black residents as their successors. For the department of surgery, Adams chose Edward Lee Howes, a young Yale-trained surgeon who was already a recognized authority on wound healing.

Adams had had his eye on Drew for several years as he worked to upgrade the medical faculty, and was glad to hire him. At the end of Drew's first year, Adams' evaluation rated him highly and commented, "A very high type of man. Intelligent, forceful. Willing to work." After Howes arrived in 1936, Drew worked closely with him as surgical instructor and then as assistant surgeon. Impressed by his excellent work, Howes recommended Drew for one of the two-year specialty training fellowships made available by GEB funding. Adams strongly encouraged his fellowship recipients to earn doctorates in medical science if possible. The fellowship not only gave Drew his longed-for chance to get further surgical training at a leading

medical center--New York's Presbyterian Hospital--it brought him into the blood bank research and development work for which he would be best known.

“Education and Early Medical Career, 1922–1938” in *Profiles in Science: The Charles R. Drew Papers*. <http://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/336>  
Courtesy National Library of Medicine

## The Charles R. Drew Papers Becoming “the Father of the Blood Bank,” 1938–1941

In 1938, Allen O. Whipple's surgical residency program at the Presbyterian Hospital in New York, the main teaching hospital for Columbia University's College of Physicians and Surgeons, was one of the most advanced in America. It extended surgical residencies to three years, the last two of which gave residents experience in surgical pathology and bacteriology, surgical laboratory research, and the outpatient clinic, in addition to the operating rooms and surgical wards. After passing their surgical board exams, the two best residents served an additional year in the hospital, honing their skills even further. The program thus turned out surgeons familiar with all aspects of surgical science and therapy, and gave them opportunities to pursue research in individual fields. (An added benefit to having such experienced residents was that Presbyterian's surgical mortality rates were impressively low.) However, though the hospital was committed to serving the poor regardless of race, African American physicians had never been granted residencies or staff privileges there. Thus, when Charles Drew arrived with his dual goals of gaining more surgical training and earning a doctorate in medical science, Whipple assigned him to John Scudder's surgical lab, assuming that he would spend his fellowship there and not attend patients. But Drew, with his soft-spoken charm and obvious brilliance, persuaded Whipple to train him as a resident, and won over his fellow residents and the hospital staff as well. (As one of his Columbia colleagues later noted, it probably helped that Drew was very light-skinned; a more conspicuously African American physician, regardless of competence or charm, might not have had the chance to attend patients with Whipple.) Whipple soon became one of Drew's strongest allies, supporting both his surgical training and his doctoral research.

In Scudder's lab, Drew again pursued research into fluid balance, diagnosis and control of shock, and transfusion. Scudder believed that certain aspects of blood chemistry, such as specific gravity and protein content, could indicate the beginning of shock earlier than blood pressure readings, and possibly help differentiate between hemorrhagic and other forms of shock. Drew helped develop blood tests to diagnose early shock, and published several articles with Scudder on these studies.

Much of Drew's research, however, focused on one of the most challenging medical problems of that time: how to "bank" blood so it would be available for transfusions as needed. Blood loses its integrity--and thus its utility--soon after it leaves the blood vessels: it starts to clot, and soon the cellular elements, especially the white blood cells, deteriorate, and levels of electrolytes change. Before World War I several researchers had discovered that sodium citrate would keep the blood from clotting, and that dextrose would preserve it for up to two weeks under refrigeration. One WWI medical officer, Oswald Robertson, set up a temporary small-scale blood bank and did twenty-two successful transfusions with stored blood. During the inter-war period, researchers in America and abroad studied blood's properties to better understand how it changed under various storage conditions and how such changes affected transfusion outcomes. At the same time, clinicians at some large urban hospitals were

establishing transfusion donor services, registering donors who could be called in quickly when transfusions were needed. In 1929, New York's leading hospitals, surgeons, and blood researchers founded the Blood Transfusion Betterment Association (BTBA) to provide the local medical community with reliable, thoroughly tested donors on demand, and to provide financial support to blood researchers. Only a few of these programs stored the collected blood for later use; the first opened at Chicago's Cook County Hospital in 1937; its director, Bernard Fantus, coined the term "blood bank." (Although many American researchers were unaware of it, Soviet physicians had established a large blood donation network, and had experimented successfully with transfusing stored cadaver blood.) These programs varied in their staffing arrangements, facilities, equipment and lab protocols, donor recruitment, and other aspects, however--there was still no standardized procedure for collecting blood, preserving it from contamination and deterioration, and protecting transfusion recipients.

For his doctoral research, Drew set out to assess the blood and transfusion research to date, and to apply his findings to a trial blood bank program. He reviewed the history of blood transfusion as well as all the current research on blood chemistry and fluid replacement, including the Soviet investigations. He then evaluated all the variables that might affect the shelf life of stored blood: how it was collected (in open or closed vessels, or under a vacuum), what types and amounts of anti-coagulants and preservatives were used, the shape of the storage containers, storage temperatures, and so on. He also queried the directors of six leading transfusion clinics about their procedures and experiences. In August 1939, he and Scudder obtained funding and authorization to set up an experimental blood bank at Presbyterian Hospital to work out the organization and best collection protocols for such an operation.

Medicine now takes blood banks for granted, but the first ones presented many technical and administrative challenges to Drew and Scudder and their colleagues: blood had to be collected with sterile equipment, into sterile containers, and treated with anticoagulant, then stored at a constant temperature, in refrigerators that were reliably efficient and protected from electrical outages. Each donation had to be typed, and tested for syphilis (one of several diseases that could be transmitted via transfusion.) Donors had to be recruited, scheduled, and screened for obvious health problems before "bleeding." Nursing and laboratory personnel had to be trained in collecting, handling, and testing the blood, and standard procedures set up, including forms to track every step of the donation process. Their experiment, which ran for seven months, was a success, and served as the basis for Drew's dissertation, "Banked Blood," for which he received his doctor of medical science degree in June 1940.

In the meantime, World War II had begun in Europe with Hitler's invasion of Poland in September 1939. American leaders hoped to stay out of the conflict, but started assessing the nation's readiness for war, including its medical and scientific resources. As part of this effort, the National Research Council (NRC) appointed a Committee on Transfusion (which included many leading clinicians and researchers, such as Scudder) in May 1940 to evaluate the status of blood supplies. By mid-June, the Netherlands, Belgium, and France had fallen to German

forces, and the British had been forced into retreat. As Germany began the sustained bombing of England that summer, the British were in desperate need of medical supplies, including blood and plasma for transfusion. In response, members of the BTBA met with representatives from the NRC and the American Red Cross to organize a relief program--Blood for Britain--to collect blood donations at area hospitals and ship blood plasma to England. Besides providing vital short-term aid to England, Blood for Britain was intended to gather the research and administrative data and experience needed to launch a nationwide blood banking program if the U.S. entered the war.

Plasma--the fluid portion of blood, containing various proteins and electrolytes but no cells--had been investigated as a blood substitute by several research teams, including Drew and Scudder, during the 1930s. Although it lacks oxygen-carrying red cells, it worked well to replace fluids and treat shock. And, especially for emergency or combat situations, it had advantages over whole blood: it keeps longer without refrigeration; it won't deteriorate when agitated during transport; it can be used with any blood type; it is much less likely to transmit diseases; it can be given intravenously, intramuscularly, or subcutaneously, and in large doses. And several labs were working on methods to dry plasma, which would make it even easier to transport and use. Drew worked with Scudder and E. H. L. Corwin to draw up a blueprint for Blood for Britain. Their blood bank at Presbyterian served as an organizational template, but had to be scaled up enormously to collect, process, and store large amounts of plasma at six (later nine) different hospitals. Besides the basic blood bank operation, they had to set up procedures for extracting plasma and ensuring that it would still be uncontaminated and safe to use when it arrived in Britain. Plasma was separated from the blood cells by centrifuging or sedimentation, then the plasma from an average of eight collection bottles was pooled (using an aseptic procedure in a dust-proof, air-conditioned, ultraviolet-lighted room, under a lab hood), and a sample cultured for bacteria; merthiolate (an anti-bacterial) was added, and the batch tested again after a week. Finally, each batch was transferred to a shipping container (again using aseptic methods) and diluted with sterile saline solution. A final sample for bacteria testing was taken before the containers were sealed and packed. Despite its size and complexity, the project was set up quickly, and a trial shipment of plasma was sent to England in early August. The British reported that it was "entirely satisfactory" and the program opened officially on August 16.

Soon after drafting the Blood for Britain blueprint, in June 1940, Drew had returned to his faculty post at Howard University. During the initial weeks of the program, however, it became clear that tighter coordination of the participating hospital operations was needed. The BTBA called Drew back to New York in September to serve as the full-time medical supervisor. Under his direction, the collection procedures, equipment, and record-keeping were standardized. He also improved the quality-control provisions, including designating a central laboratory at Presbyterian Hospital to perform the final bacteriological check on batches of plasma. Although Drew didn't "discover" plasma as a blood substitute, his expertise and leadership were largely responsible for the program's success. When it concluded in January 1941, Blood for Britain had collected 14,556 blood donations, and shipped (via the Red Cross)

over 5,000 liters of plasma saline solution to England. Drew's final report on the project, issued by the BTBA in January 1941, established him as a leading expert on blood procurement and processing. An in-house Red Cross history noted that Drew's report "had brought together, for the benefit of hematologists working everywhere, the latest knowledge acquired by scientists working in several different fields." It was a remarkable synthesis of research studies (both commercial and academic), clinical tests, and the practical experience gained from blood bank operations here and abroad.

Just as he had used the Presbyterian blood bank as a template for Blood for Britain, Drew now used the latter program as a model for a three-month Red Cross pilot program to mass-produce dried plasma in New York. In February 1941, he became assistant director for this pilot program, which in turn became the model for the National Blood Donor Service. During this trial, Drew introduced the use of mobile collection units (later called "bloodmobiles.") By the time he returned to Howard in April 1941, Drew's reputation as a blood plasma pioneer and "father of the blood bank" was growing. Drew never claimed these titles himself, despite his substantial contributions, always noting that it took the combined efforts of many people to make the massive wartime project succeed.

Ironically--considering the essential part that an African American played in its success--the national blood collection project was sullied by racism from the start. Blood donations and plasma for Blood for Britain had been segregated, on the assumption that the British would prefer this. The Red Cross pilot project, at the insistence of the armed forces, excluded black donors. This policy was maintained when the National Blood Donor Service officially began in November 1941, provoking protest from the black press and the NAACP, among others. In January 1942, the Red Cross announced that it would accept blood from black donors, but would segregate it. Drew, of course, objected to this policy--there was no scientific evidence, he said, of any difference between blood of different races, and the policy was insulting to African Americans, who were just as eager to contribute to the war effort as anyone else. He wrote and spoke about this frequently during the war years; as he noted in his Spingarn Medal acceptance speech in 1944, "It is fundamentally wrong for any great nation to willfully discriminate against such a large group of its people. . . . One can say quite truthfully that on the battlefields nobody is very interested in where the plasma comes from when they are hurt. . . . It is unfortunate that such a worthwhile and scientific bit of work should have been hampered by such stupidity."

There is no evidence, however, that this blood exclusion policy was Drew's reason for leaving the pilot program and not continuing on to direct the national project, as some accounts suggest. As absorbing as the blood banking projects had been for him, he had been apart from his wife and their first child (Bebe, named for the *Blood Bank*) for much of the previous year, and was eager to return home. Moreover, he had always expected to return to his faculty duties at Howard and pursue his long-range plan to establish a first-rate surgical program there.

“Becoming ‘the Father of the Blood Bank,’ 1938–1941” in *Profiles in Science: The Charles R. Drew Papers*. <http://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/336>  
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## The Charles R. Drew Papers

### “My Chief Interest Was and Is Surgery”—Howard University, 1941-1950

Drew returned to the Howard University College of Medicine faculty in April 1941. During his last months in New York, with Allen Whipple's sponsorship, he had passed the American Board of Surgery exams. (In surgical circles, Drew's performance on the oral part of the exam, in which he confidently lectured his examiners about fluid balance and management of shock, became as legendary as his athletic feats had been at Amherst.) In October 1941, he was appointed chairman of the Department of Surgery and Chief of Surgery at Freedmen's Hospital, Howard's main teaching facility. That same month, he became the first African American to be appointed as an examiner for the American Board of Surgery.

Once in charge of the department, Drew could at last pursue his larger ambition: training young African American surgeons who would meet the most rigorous standards in any surgical specialty, and to place them in strategic positions throughout the country, where they could, in turn, nurture the tradition of excellence. This, Drew believed, would be his greatest and most lasting contribution to medicine. The blood bank and other achievements were, he noted to a friend, only the preface in his life story. His style as a medical educator was memorable: an energetic, highly organized, demanding perfectionist, he was also genial, diplomatic, fair, and supportive. If he believed in a student's potential, he would find a way to develop it. He searched out further training opportunities for his best residents, and occasionally underwrote their travel expenses to medical meetings that might benefit them. Drew also kept in touch with former students, encouraging them to share their experiences with the Howard surgical community. As he told one of them, Dr. Jack White:

Our horizons are being widened by the residents all the time and the things they write back, sharing . . . their daily experiences, enriches us all and . . . forges the bonds which unite us even more firmly, so that each man is inspired to do more and more on his own in order to be worthy of the fine companionship of such a group. In the individual accomplishments of each man lies the success or failure of the group as a whole. The success of the group as a whole is the basis for any tradition which we may create. In such a tradition lies the sense of discipleship and the inspiration which serves as a guide for those who come after, so that each man's job is not just his job alone but a part of a greater job whose horizons we at present can only dimly imagine . . .

In December 1948, Drew's first group of residents passed their Board of Surgery certification exams, with two of them achieving the top two scores. Between 1941 and 1950, Drew trained more than half of the black surgeons certified (eight of the total number); another 14 who passed later had received part of their training with him.

Besides speaking out against the Red Cross's policy of segregating blood donations, Drew also repeatedly petitioned the American Medical Association, the American College of Surgeons, and other groups to revise their membership requirements. Eminent as he was, Drew was not eligible for membership in the AMA because, as an African American, he was excluded from joining the local District of Columbia chapter of the AMA. Many national medical specialty groups followed this pattern, with membership in local societies (or the sponsorship of local white physicians) required for admission. This was not a trivial matter--hospital privileges and specialty training were increasingly contingent upon AMA membership; by allowing local AMA chapters or county medical societies to be the "gatekeepers," the national AMA excluded many qualified African Americans because of local prejudices. Drew never did obtain AMA membership, and the American College of Surgeons made him a fellow only posthumously.

Drew did receive professional recognition from other quarters, including election to the International College of Surgeons in 1946. In 1949 he was appointed one of four surgical consultants to the Surgeon General's Office, and spent six weeks in Europe, inspecting American military medical facilities and recommending changes.

In the early hours of April 1, 1950, Drew and three colleagues set out for the John A. Andrew Hospital annual free clinic in Tuskegee, Alabama. (Drew rarely missed the week-long clinic, which had provided unparalleled teaching and learning opportunities for both black and white physicians since 1912.) Near Burlington, North Carolina, driving fast, Drew fell asleep at the wheel. He woke as the car ran off the road, but over-corrected trying to pull it back on course. The car rolled several times, tossing one passenger free. Drew was half out of the car, his right leg caught in the pedals, as the car rolled, crushing his chest, breaking his neck, and tearing up one leg. His companions escaped serious injury, suffering only bruises, scrapes, and one a broken arm. They all were taken quickly to nearby Alamance General Hospital, which, like most southern hospitals then, had segregated wards, but a common emergency room. There, three white physicians worked to save Drew's life. They gave him transfusions; they consulted by phone with doctors at the Duke University Medical Center, twenty-five miles away. But several hours later, with his major blood vessels ruptured and other serious injuries, Drew died.

His tragic death generated an enduring legend that Drew, the man whose transfusion research had saved so many lives, ironically bled to death because he was refused treatment at an all-white hospital, or was even denied a transfusion. Although the legend has been debunked repeatedly--by Drew's companions, witnesses at the hospital, his family, and others--it has persisted. Why? Perhaps, as historian Spencie Love has noted in her analysis of the Drew legend, (*One Blood: the Death and Resurrection of Charles R. Drew*), the facts of Drew's premature death were bent and blended together with the stories of genuine victims of medical segregation, to convey an underlying message about the consequences of racial prejudice. While understandable, the legend hardly does justice to Drew, a man who achieved so much

before he died, and who worked to undo racial discrimination by demanding excellence of himself and of his students, without ever embracing the role of victim.

“My Chief Interest Was and Is Surgery’—Howard University, 1941–1950” in *Profiles in Science: The Charles R. Drew Papers*. <http://profiles.nlm.nih.gov/ps/retrieve/Narrative/BG/p-nid/336>  
Courtesy National Library of Medicine

## Timeline Project: Charles R. Drew, MD

You will work in small groups. Each group will be assigned to examine primary and secondary sources for one of the three different time periods of Dr. Drew's life presented in the Profiles in Science: The Charles R. Drew Papers website.

Your main task is to study the online materials related to the assigned time period, then create a visual timeline presentation of Dr. Drew's life. The "Project Procedures" below provides step-by-step instructions on how the group will prepare and produce the timeline presentation. Also, each group should refer to the "Timeline Presentation Assessment Criteria" on the second page, for guidelines on a successful presentation preparation and delivery.

### Project Procedures

**First**, read the biography narrative (one example of a secondary source) assigned to your group. The biography highlights a specific period in Drew's life.

**Second**, consider and answer the following questions based on your reading of the biography and your knowledge of world and U.S. history:

- What were some key events and accomplishments in Dr. Drew's life during this period?
- What challenges do you think Dr. Drew faced during this time? What were some causes of those challenges? Was Dr. Drew able to overcome these challenges? Why or why not?
- What was happening in the world and the U.S. during this particular period of Drew's life? Which key events or circumstances affected Dr. Drew? What facts in the biography relate to this historical context?
- What do you consider to be one of Drew's greatest achievements during this time period? What makes this achievement particularly significant? How does it show Dr. Drew's own talents and innovation? How did his achievements influence future generations?

**Third**, as a group, discuss your answers to the questions, and determine the facts to be included in the timeline, as well as the presentation format—e.g., digital or poster-board presentation, performance by all group members, etc. Each timeline entry/fact should have a heading and a brief description (1-3 sentences) of its significance in Dr. Drew's life.

**Fourth**, research in the "Visuals" section of the Profiles in Science: The Charles R. Drew Papers website to find visual sources to highlight your timeline entries. Also search for visuals from Drew's lifetime that are not included in the Profiles in Science: The Charles R. Drew Papers website. The final timeline should include a minimum of five primary and secondary sources from the Charles R. Drew Papers website, and two outside visual sources related to historical setting or events in Dr. Drew's life.

**Fifth**, review all entries and visual items gathered for the timeline, edit and finalize the timeline content, then prepare the presentation based on the format that the group has established earlier.

### **Timeline Presentation Assessment Criteria:**

Your group timeline presentation will be assessed based on the following criteria:

#### CONTENT

- Does the timeline title convey the most important aspects of the time period in Dr. Drew's life your group was assigned?
- Does the timeline list important events, challenges, and accomplishments in Dr. Drew's life during that time period?
- Does the timeline include historical events relevant to Dr. Drew's life at that time?
- Does each entry have a heading and a brief description (1-3 sentences) of the entry's impact on Dr. Drew's life? Is the work completed without spelling and syntax errors?
- Are the minimum number of primary and secondary-source visuals and historical entries included? (five and two, respectively)

#### ORGANIZATION

- Is the information presented in a clear and logical manner?
- Does the timeline convey a strong sense of chronology?
- Is there a clear focus and sense of progression?

#### PRESENTATION

- Have all group members contributed to the analysis and timeline?
- Have all group members participated in the presentation?
- Does everyone seem well-prepared and engaged with the audience?
- Does the presentation promote a clear understanding of the challenges and accomplishments in Dr. Drew's life during the assigned specific time period?
- Is the material presented in a neat and visually appealing manner?
- Does the presentation use colors, text sizes, and styles to highlight important information and communicate different categories?
- Is the presentation format creative?

## Final Essay: Charles R. Drew, MD

Now that you have a general understanding of Dr. Drew's accomplishments as a surgeon, a medical scientist, and a teacher who trained and mentored many young African American physicians, you will write a final essay about Dr. Drew. For your essay:

- 1. Select an experience, struggle, or achievement from Dr. Drew's early life that you think was a key influence on an event or decision in his later life.**
- 2. Draw a connection between the two moments.**
- 3. Follow the guidelines below:**
  - The essay should be 3 pages long essay.
  - Focus your thesis on the significance of the connection between the two moments.
  - Include a minimum of five primary and secondary sources—visuals and documents—from the [Profiles in Science: The Charles R. Drew Papers](http://profiles.nlm.nih.gov/BG) website.
  - Follow the established writing guidelines for the essay, including correctly using and citing quotations and all sources.