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Heart's Blood: A Biography of Lemuel Whitley Diggs

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HEART'S BLOOD:
A BIOGRAPHY OF LEMUEL WHITLEY DIGGS

by

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In memory of Peter G. Nollan.

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papers of important contributors to the history of the University of Tennessee, including the Lemuel Whitley Diggs and James N. Etteldorf Collections that were essential for this story.

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This dissertation is the result of years of work and preparation, and one of the most satisfying periods of my life. To the extent that I have accomplished anything, including writing the dissertation, the years of preparation are also a reflection of the family, in which I grew up. I am grateful to my parents for the upbringing that they provided for me, my sister Juliane and my brother Peter. Hans, my father, especially was a model to me for his humor, work ethic, and steadfast support. Charlotte, my mother, taught me more than she realized about art, food, and our German family.

My brother Peter was born a "blue baby,": he had a congenital disorder that I later came to understand as a ventricular septal defect that allowed the mixture of oxygenated and deoxygenated blood in the heart to be pumped into the body, which resulted in a characteristic blue tinge to the lips and fingertips. In 1983 he passed away at age of twenty-five. It is to his memory that this dissertation is dedicated.

ABSTRACT

Nollan, Richard H. Ph.D. The University of Memphis. May 2012. Heart's Blood: A Biography of Lemuel Whitley Diggs. Major Professor: Charles W. Crawford, Ph.D.

This dissertation examines the career of Lemuel Whitley Diggs, who joined the faculty in 1929 at the University of Tennessee Medical Units in Memphis. As a white doctor, he spent his career seeking more effective therapies for patients afflicted with sickle cell anemia, which was considered a black disease, a racial marker, and a sign of black inferiority. His most insightful contributions to understanding sickle cell occurred in the 1930s and 1940s while he was relatively unknown except to a handful of sickle cell researchers nationwide. By the late 1930s, storing blood for later transfusion became a practical reality, enabling Diggs in 1938 to open the first blood bank in the South and the fourth in the nation at the John Gaston Hospital, which made him into a locally recognized hematology expert. Because of the growing role that laboratory technicians played in blood banking and patient care, Diggs advocated a new curriculum to train laboratory technicians in the proper administration of the growing number and importance of clinical tests. He also advocated for clinical pathology as a medical subspecialty distinct from general pathology. In the late 1940s and early 1950s, Diggs devoted more of his energy to creating a Sickle Cell Center that would focus on scientific research into the pathology of the disease, and include social research that would inform patients and key people in their lives of ways to cope with the illness. In the mid-1950s Diggs became a member of the steering committee to create a new kind of hospital as envisioned by the Hollywood entertainer Danny Thomas, who credited Diggs with the idea to make St. Jude a research hospital. St. Jude appealed to Diggs as both a new kind of hospital and a second venue in Memphis for sickle cell research.

The data to support this research came from archives, interviews, newspapers, and medical and other publications.

Medicine permeated Diggs's worldview. His life was planned by the goals he set for himself. How he met the social and medical challenges during his career offers us a window into the times in which he lived.

TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

Lemuel Whitley Diggs's life is remarkable for what it reveals about the dramatic changes that evolved in American medicine over the course of the twentieth century. These changes affected the established boundaries for scientific inquiry and patient care in the categories of race, gender, and class. Diggs faced and overcame enormous obstacles in order to carry out a scientific and humanitarian program of international importance. In 1929 he came to Memphis to pursue a medical career that situated patient care as an integral component of an ambitious career agenda. He brought this way of thinking to an institution that, like many publicly supported medical schools at the time, did not think highly of research, but instead was expected to focus on training health care professionals. Not only did Diggs pursue research along with his clinical duties; he also concentrated his attention on sickle cell disease, a devastating illness that society and the medical community viewed through a racial and class-based lens. His choice was a conscious one and indeed a political one.

In this complex atmosphere, while engaged in broad-based research and patient care activities, Diggs achieved the extraordinary goal of establishing the first blood bank in the South. As was the case for sickle cell disease, the collecting and transfusing of blood had racial, social, and cultural implications that he was quite willing to accept in order to bring the most innovative practices in medicine to the University of Tennessee and the Mid-South region. Among these practices was a new approach to medical and laboratory testing that made them an essential part of patient care; Diggs was in the forefront among his colleagues in advocating this type of relationship between the

laboratory and the patient. He advocated more laboratories and technicians near patient-care areas, and supported a curriculum at the University of Tennessee for the training of technicians--a health-related profession that he perceived as vital for the future of medical care. Moreover, laboratory technology represented a permissible entry point into medicine for women at this time. Lastly, one of Diggs's finest contributions to the development of medicine in the U.S. was the critical role he played in the founding and organization of a unique hospital, the St. Jude Children's Research Hospital. His perspicacious thinking and vision transformed the initial concept for this hospital from that of a pediatric hospital to what it finally became: the highly influential and successful research hospital known all over the world for its cutting-edge research and its humanitarian mission. Diggs clearly was the type of independent thinker who learned everything he could from the medical literature before making his own contribution--and he possessed the courage to follow his medical instincts even if they defied prevailing social conventions.

The features of Diggs's life, like the iron filings on a sheet of paper that are brought over a magnet, began to coalesce with his decision in college to become a doctor. His family's religion was important to him and, as a boy, he was encouraged by his parents to become a Methodist minister. He chose instead to transfer that sense of calling from his religious sensibilities to a medical context, and from that point in his life, medicine occupied the center of his worldview and became the center of his professional activities. Medicine gave Diggs the calling he needed in order to organize his life: it filled his inner life with vital content, gave it a noble meaning and purpose (even a heroic purpose), and provided him with the intellectual resources for expressing himself.

Medicine fully shaped Diggs's world, and he expressed himself personally through it. His career was spent in finding ways to adapt his work to the changing world of academic medicine in the 1920s, to the economic and educational challenges posed by the beginnings of sickle cell research in the Great Depression, to the upheaval of World War II, and to the transformation of sickle cell research in the post-war years. The compassion that Diggs expressed was always that of a doctor for his patient, a fundamental aspect of his medical training deeply instilled in him from the days of his childhood and adolescence.

Diggs's life was long and fruitful. He was born in Hampton, Virginia on January 8, 1900. His life spanned the century beginning with America's entrance onto the world stage as a dominant political and military power. Theodore Roosevelt's presidential campaign of 1912 included health insurance reform in its platform, in the belief that a country could not become great while its people were weak and poor.[1] He witnessed the renewed health care reform efforts of the 1990s. Diggs's career began in 1929 at the same time that hematology emerged as a separate subspecialty and the microscope became a required clinical tool. The vast scope of his life can be captured in part by a picturesque detail: when he was a young man, horses were still a common mode of transportation, and even in his later life he would measure distances by the amount of time it would take to traverse them on horseback. Diggs was born during William Osler's reign as the quintessential American physician, with Osler's emphasis on the patient and the bedside training of residents and students. He lived to see the advent of health maintenance

[1] See: Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry* (New York: Basic Books, Inc., 1982), James A. Morone, *Neglected Institutions: Politics, Administration, and Health Reform. (Political Institutions and Health Care Reform)*, 1994), p220(4). See: Morone, 1994; Starr, 1982.

organizations and participate in the debate on health care reform at the end of the twentieth century. Following in the footsteps of Osler and the faculty at Johns Hopkins School of Medicine, Diggs formed his life's goals.

Racial ideologies in the early twentieth century already informed medical opinion, especially on diseases such as sickle cell anemia. At a time when most researchers were using accepted practices for an understanding of the disease, Diggs specifically applied research to better understand and treat an illness so debilitating that patients frequently were unable to work, had attacks of pain so excruciating that they produced distinctive screams, and typically died at a young age. When his interest in sickle cell began, the disease was known only to a handful of researchers and unidentified among blacks. One historian described Diggs as a "lone white Memphis pathologist,"[2] because of his abiding interest in the illness rather than in understanding the disease. By the late 1940s sickle cell had become familiar to many researchers; in 1971 President Richard M. Nixon declared it a "neglected disease" badly in need of a concentrated national research effort to find a cure that was supported by the National Institutes of Health. This landmark declaration by President Nixon transformed sickle cell overnight into a national issue.

As soon as Diggs arrived in Memphis in 1929, he took an interest in sickle cell anemia at the Memphis City Hospital and immediately developed a powerful curiosity about it. Little did he know that finding a cure for this disease would become his life's work. As a white doctor interested in what was considered a disease affecting only blacks, Diggs fought numerous battles to validate his work at the University of Tennessee

[2] Keith Wailoo, *Dying in the City of the Blues: Sickle Cell Anemia and the Politics of Race and Health* (Chapel Hill: University of North Carolina Press, 2001), 338. See page 21 for quotation.

Medical Units in Memphis. He sought allies and financial support in unusual places in order to support his research. His multifaceted efforts to advance his work interacted in positive ways with the Civil Rights movement; his work would also be markedly affected by changes in national politics.

Before the Civil War, medical education had consisted of two years of course work taught by didactic instruction for the purpose of moral and intellectual discipline. After the war, as money and leadership in medical education reform became more plentiful, this more philosophical view of medical education gradually gave way to the notion that a college education should prepare doctors for their professional careers with skills more relevant to real-world situations.[3] By 1911 this trend had evolved into the familiar curriculum of two years of basic science, including biology and biochemistry, and two years of clinical training and practice. It was a time marked by the identification of infectious and nutritional diseases that were managed quickly and at a relatively low cost.[4] Medicine benefited from the steady stream of discoveries made in the late nineteenth century, such as identifying microorganisms as the underlying cause of a specific disease, and consequently pinpointing the means for controlling them. The conjunction of medicine and science constituted a medical consensus that illnesses could not be only managed, but perhaps even be eliminated.[5] The average hospital stay in the early part of the twentieth century averaged between two and three weeks, which meant

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[3] Kenneth M. Ludmerer, *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care* (Oxford: Oxford University Press, 1999).

[4] William G. Rothstein, *American Medical Schools and the Practice of Medicine* (New York: Oxford University Press, 1987).

[5] Gerald N. Grob, *The Deadly Truth: A History of Disease in America* (Boston: Harvard University Press, 2005).

that students had ample time to study the natural history of a disease, learn principles of therapy, and develop relationships with their patients and families.[6] As other non-infectious, chronic diseases emerged, the hope grew in the medical community that science would lead to their satisfactory management, if not to an outright cure. The science that was integral to medicine seemed almost magical to many people. This attitude was reflected in the popular culture of the time; for example, in movies, books, and radio, blood transfusion and skin grafting became common narrative devices. From the 1930s to the 1950s doctors enjoyed considerable esteem and admiration. [7] Diggs chose medicine as a profession during this time of rapid changes in American and world culture.

As a twenty-three year old, first-year medical student, Diggs acquired two blank notebooks. In them he wrote aphorisms, adages, and sayings from a variety of authors, a habit that he would keep for many years. He believed that they articulated some personally relevant truths about life or medicine. The seventy-one pages of these notebooks also contain his own words. On May 23, 1923, Diggs laid out a list of goals for himself, including specific markers, which are themselves reflective of the times in which he came of age:

> To become a great doctor, not a famous one, to know more than any other man about my line in order to give my patients the greatest possibility of recovery. To become a surgeon, if qualified to do that better

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[6] Ludmerer, *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care*, Grob, *The Deadly Truth: A History of Disease in America.*

[7] American Film Institute, "American Film Institute Catalog of Motion Pictures: Feature Films," (1971), Susan E. Lederer, *Flesh and Blood: Organ Transplantation and Blood Transfusion in 20th Century America* (Oxford: Oxford University Press, 2008), Peter E. Dans, *Doctors in the Movies: Boil the Water and just Say Aah* (Bloomington, IL: Medi-Ed Press, 2000).

than some other service. To settle in the South and spend my life for the uplift of my country.

To win the respect of men by sheer frankness, straightforwardness and ability, unselfishly rendered.

To gain control over myself.

To win the love of, and to marry a decidedly feminine girl, to love her above any other human being or object, to protect her, to build for her a home, to live in it and raise healthy children to entrust the world to after I'm gone.

To become like Lee, and like the best of the best men, but not too good to see the best in the worse men.[8]

Diggs fulfilled his goals. Throughout the course of his life and career, he possessed both ambition and humility, marrying a traditional wife and creating a stable family in a home located in the South.

From his early years, Diggs possessed a future-oriented personality that was searching for a life path that he could follow. With a scholarship in hand, he attended Randolph-Macon College, where he completed a Bachelor of Arts degree in English, and remained there an extra year in order to complete a Master's degree. It was during this time that he abandoned his family's wish for him to become a Methodist minister in favor of pursuing a degree in medicine. He was accepted at Johns Hopkins School of Medicine, the leading medical school of the day. In the shadow of William Osler, Florence Rena Sabin, Max Brödel, John Huck, and others, the Hopkins experience shaped his professional personality and worldview. It gave him the path and professional home that he needed. Medicine at this time was akin to a calling that guided and defined the lives of its adherents in a way that Diggs admired and appreciated. After graduating from this distinguished university, he went to the University of Rochester, where he completed his

[8] L. W. Diggs, *Notebook of Collected Sayings* Personal, [1924]). See page 54 for the quotation.This document can be found in:

internship and residency. At Rochester he worked with George Whipple and William McCann. It was here that his passion for healing was awakened.

In his early career at the University of Tennessee Medical Units in Memphis, Tennessee, he saw a surprising number of sickle cell patients. His curiosity was piqued. He found the problem that would grow to occupy him for the remainder of his professional life. A year after his arrival in Memphis he married Beatrice Moshier, whom he had met while still a resident at Rochester. He began a research program by first reading everything he could find about sickle cell, conducting his own research, presenting papers at conferences, and publishing the results of his studies. He established the incidence of the disease among blacks, clarified the defining features of the disease, and challenged misunderstandings about it. He saw the pressing need to educate his patients about the disease, even though his dean was not supportive of this initiative.

In 1938, Diggs opened a blood bank in Memphis. Blood units were separated to ensure that the segregation of the races was maintained. Whereas his work in sickle cell was conducted in obscurity, the blood bank lifted him into the public spotlight. At the same time, Diggs's interest in clinical pathology was growing, with its patient-care focus that differed from that of general pathology (which foregrounded disease analysis instead). As the number of clinical tests increased, Diggs advocated a curriculum that would train technicians to fill a growing need in medical care.

World War II accelerated the rate of change at the University of Tennessee. Diggs's research energies were diverted to studies that were necessary for the war effort. At the same time, he became involved in a disagreement with his department chair about the need to create a clinical pathology department. He was also concerned about his

salary. Because of his dissatisfaction with how these issues were addressed, he accepted an offer from the Cleveland Clinic, where he would pursue clinical pathology and laboratory technology more systematically. While at the Cleveland Clinic he also organized his second blood bank. Despite the promise of the move in professional terms, both Diggs and his wife Beatrice had growing reservations about Cleveland and were unable to adjust to the new setting and harsher northern climate. They decided in 1947 to return to Memphis. Diggs was made a full professor at the University of Tennessee and viewed his return as an opportunity to build a better sickle cell research program.

Upon his return, Diggs made great progress in creating the Sickle Cell Center. This center evolved the research and patient care model that Diggs had refined when he had worked mainly by himself. From 1955 forward, Diggs had the opportunity to participate in a new kind of hospital, as envisioned by the Hollywood entertainer Danny Thomas. Diggs recommended that it be a research hospital based on his concept of what a hospital should be, which resolved some major issues connected with building another hospital in Memphis. The relationship between St. Jude and the University of Tennessee was stormy at times, and Diggs worked behind the scenes to help weather these disagreements.

Diggs retired in 1970 to expand his focus on his research. As noted above, in 1971 Richard M. Nixon had declared sickle cell to be a neglected disease, which led to the creation of ten research sites around the country, including the one in Memphis. Overnight sickle cell became nationally recognized. At the same time, however, the funding provided by the federal government was tied to guidelines that ran counter to the model that Diggs had envisioned and that created the difficulties reflected in the Civil

Rights protests of the 1970s. Diggs continued to produce journal publications until late December of 1994. He died on his birthday, January 8, 1995.

Diggs possessed a sense of history that was personal and particularized: he remained convinced for his entire life that what he was doing was worthwhile. He described his medical findings and achievements in sickle cell and blood banking by always placing them into the context of what others had accomplished before him. One of his goals, after all, was to be a great physician, rather than a famous one. He was a dedicated and passionate physician, a researcher, and an educator. He knew that life could contain disappointments and challenges, but he resolved to remain above the fray and take the best course of action. If he had any personal code in times of controversy, it might have been to continue to do his best work and to wait for cooler heads to prevail. His life was shaped by the goals he set for himself. He had already resolved to be the best at something when he arrived at the Johns Hopkins School of Medicine. Thus, what his medical training gave him was a professional ethic, along with the scientific and clinical frameworks that allowed him to complete the formation of his goals. The rest of his life would be spent in acting to maintain his core beliefs in the face of scientific and social racism, in conducting research in an atmosphere that discouraged it, and in establishing a sickle cell center that would carry his research into the future.

Lemuel Whitley Diggs's life offers us a window into the times in which he lived. To understand his life first as an anonymous researcher dealing with medical problems and the racism associated with sickle cell anemia, and subsequently as a public figure in the post-war years, this biography aims to present a fuller picture of the complexities and triumphs of his life. At a time when it was more comfortable not to engage in research

and treat patients afflicted with curable and socially acceptable "white" diseases, Diggs followed a harder path. At a time when many of his colleagues were earning larger amounts of money for treating middle- and upper-class patients, Diggs treated the disadvantaged and disenfranchised without charge, ennobling their struggles to lead dignified and productive lives. He was dismayed at the lack of attention sickle cell anemia was receiving in the medical community, and found it ethically and morally unacceptable to ignore the existence in his adopted city of such widespread suffering. The elegant continuity of his work brought about no less than a reformation in how patients of all races were treated and how medicine was practiced in the United States.

CHAPTER TWO

A YOUNG DOCTOR COMES TO MEMPHIS

". . . I will be eminent . . ."

Henry Wadsworth Longfellow, 1824[1]

Lemuel Whitley Diggs arrived in Memphis in the first days of September 1929 during a period of hot, humid, and partly cloudy weather. He had traveled to this Southern city to begin the duties of his first professional appointment as an assistant professor of pathology. He had received arguably the best medical training in the country, first at Johns Hopkins University School of Medicine, and subsequently at the University of Rochester School of Medicine. His arrival marked not only the advent of his professional career, but also the beginning of a meaningful personal life: he had become engaged to Beatrice Mosher and was ready to begin his new life with her in Memphis. Beatrice was born and raised in Rochester, New York, where they also met.

Memphis represented a promising setting for Diggs to begin his career. According to the 1930 U.S. census, the city had a population of approximately 253,140 people, a huge increase of 56% over that of the previous census. Of this number, 61.8% were white and 38.1% were black.[2] In 1929 Memphis as the largest city in Tennessee had expanded to include 20.3 miles of suburban land. Its population had become relatively

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[1] L. W. Diggs, *Notebook of Collected Sayings* Personal, [1924]) This epigram is contained in a letter to Longfellow's father dated December 31, 1824. Diggs recorded it on the title page of a notebook. There are two notebooks containing aphorisms and sayings that Diggs considered most meaningful for his worldview or for the profession of medicine. They were begun while he was a student at Johns Hopkins University School of Medicine. The notebooks can be found in: Lemuel W. Diggs, "The Lemuel W. Diggs Collection," The University of Tennessee Health Sciences Historical Collections.

[2] Roger Biles, *Memphis in the Great Depression*, 1d ed. (Knoxville: University of Tennessee Press, 1986), 174. See page 50.

homogeneous as a result of the yellow fever epidemics of the 1870s, and this trend continued into the twentieth century. Moreover, the city's population swelled as part of the national migration from the countryside to the city at the turn of the century; the city was also a stopping point for many migrants in the years after World War I from the South to the North. Memphis had problems with crime and segregation, but it also had a reputation as a clean and progressive Southern city, due in large measure to the political organization of the city's notorious party organizer and boss Edward Hull Crump.[3] Memphis was a Southern city in the sense that nearly all of its citizens were either born in Memphis or natives of other Southern states.[4] In the words of one historian,

> These recent arrivals from the country-side who were responsible for giving the city a decidedly provincial air included in their cultural baggage such items as a nostalgic devotion to the southern Lost Cause, a propensity for violence, and belief in stringent codes of honor, fundamentalist religion, and white supremacy.[5]

Memphis was the nation's largest inland cotton market, and it remained a one-crop town with a very small textile industry. The city also included the University of Tennessee Medical Units and a mix of private hospitals, with the Memphis City Hospital serving as the only public hospital that predominantly served the poor and African-American patients.

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[3] James Edward Hamner, *The University of Tennessee, Memphis 75th Anniversary -- Medical Accomplishments* (Memphis, TN: The University of Tennessee, Memphis, 1986), Biles, *Memphis in the Great Depression*, 174. , G. Wayne Dowdy and Edward Hull Crump, *Mayor Crump Don't Like it : Machine Politics in Memphis*, 1std ed. (Jackson: University Press of Mississippi, 2006), 159.

[4] Biles, *Memphis in the Great Depression*, 174. See the table "Origins of Memphis Population by State of Birth, 1930," p. 30.

[5] Roger Biles, "The Persistence of the Past: Memphis in the Great Depression," *The Journal of Southern History* 52, no. 2 (1986): 183. See page 185.

Who was Lemuel Whitley Diggs? What features of his formative years and young adulthood may have contributed to his lifelong commitment to research on sickle cell disease and compassion for his fellow human beings? Diggs was a tall, athletic Virginian, self-aware and confident in his abilities and in the future. He was born in 1900 in Hampton, Virginia, the son of devout Methodist parents. His father owned a grocery store and grew crops that he also sold in the store. The store was not as profitable as it could have been, because his mother as a strict Methodist would not allow serving alcohol. At family meetings, religious subjects, such as the question of the literal translation of the Bible, were discussed, sometimes heatedly. However, Diggs was disappointed at how these discussions could divide people and by the emotion produced at these meetings, both of which outcomes did not lead to any enlightenment on the topics under discussion. As a young man, Diggs also enjoyed playing sports, including baseball, which his family did not allow him to pursue on Sundays. He had an early interest in the Founding Father George Mason, who was an opponent of slavery, the principal author of the Virginia Declaration of Rights of 1776 (which was adopted into the Constitution of Virginia), and a proponent of the United States Bill of Rights of 1789. In particular, it was the distinction between natural and legal individual rights that Diggs found compelling and that would inform his thinking in future debates on national health insurance—a subject in which he would maintain a lifelong interest.[6] He would have definite ideas about what government could and could not do regarding personal liberties, and what individuals should expect from their government.

[6] L. W. Diggs, *Health Care and Human Rights*, Walter Diggs and Richard Nollan, *Interview with Walter Diggs* (Memphis, TN:, June 13, 2008).

In 1918 Diggs graduated from Hampton High School in a class of thirty-seven. His high scholastic achievement was rewarded at his graduation with a scholarship to Randolph-Macon College in Ashland, Virginia, where he began his undergraduate education. That same year Diggs was also given a Classification I by his Selective Service Board. As the presidency of Woodrow Wilson began to vigorously cast the war in Europe in terms of a battle between democracy and autocracy, and the need for America to join with its democratic allies, American universities and colleges responded by taking up the cause.[7] This was true at Randolph-Macon, whose administration was admonished by the students for its lack of preparedness for the coming struggle.[8] Diggs arrived in the fall of 1918 and spent part of his first semester in this atmosphere until the war's end in November of that same year. Even though he was eligible, he was never called up, nor did he enlist.[9]

What kind of college was Randolph-Macon? It was a Methodist college situated on an idyllic, spacious campus in the Virginia countryside north of Ashland with a network of curving footpaths linking its buildings. It had an all-male student body closely controlled by the Methodist Church, which required that student education be in strict adherence with the principles of its Bible-based theology. At the same time, when Diggs joined the freshman class the school was caught between the position of a church requiring stricter adherence to Christian principles, and the moral and intellectual disruption arising from the American involvement in World War I. In order to keep

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[7] David M. Kennedy, *Over here: The First World War and American Society* (New York: Oxford University Press, 2004).

[8] James Edward Scanlon, *Randolph-Macon College: A Southern History, 1825-1967* (Charlotteville: Universtiy Press of Virginia, 1983).

[9] Diggs, *The Lemuel W. Diggs Collection.* See folder LWD 001-01.

undesirable influences from taking over and to maintain the high ideals of the church, the church and college administration exerted greater pressure on the faculty and students to observe the campus rules. The result was a ban on drinking alcohol, dancing, and showing movies on campus. Although dancing was banned on campus, off-campus dancing events remained front-page news in the student newspaper until the college authorities complained about this as well. According to one historian, the closest comparison to the disruption by the war effort on campus life was that caused by the Civil War in the 1860s when the school resisted attempts to turn it into a military academy. The more recent Spanish American War of 1898 passed almost unnoticed in campus life. Randolph-Macon maintained its decorum, and student life on campus was generally quiet. Radios were not banned on campus, but were rare and discouraged in the dormitories. Activities sponsored by the college that took place off campus, for example, athletic and debating team events, were well attended. Fraternities were also very popular, because they functioned as a social nexus on campus that provided few venues for social gathering. Fraternities were allowed to have houses, although members were not allowed to sleep in them. Students were forbidden to have automobiles at this time, requiring them to utilize trams and trains when they needed transportation to the forbidden attractions of Richmond some twenty miles away, which Diggs did on occasion with one of his uncles.[10]

It was the family's intent, probably issuing from Diggs's mother, that he become a Methodist minister, and for this purpose Randolph-Macon College was a hopeful choice. With this expectation in mind, Diggs participated fully in campus life. He joined

[10] Scanlon, *Randolph-Macon College: A Southern History, 1825-1967.* See especially Chapter 9, "Hand cultivation" on pages 287-321 for additional details.

the Sigma Phi Epsilon fraternity for his social needs. He continued his passion for sports by playing end for the football team, while selecting a major in English literature that satisfied his intellectual ambitions. Samuel Taylor Coleridge was one of his favorite poets. Coleridge would have appealed to Diggs for the colorful and elegant use of language and his invention of many words and phrases. He enjoyed participating on the debating team, where he would learn to argue both for and against the issues of the day. This type of mental activity would serve him well throughout his life as a doctor when he would need to be able to make his case in a variety of controversial circumstances. Once, while representing the opposing side against the resolution "that England should recognize Ireland as an independent republic," Diggs and his partner R.H. Winn won for Randolph-Macon against its rival Richmond College.[11] For reasons that remain obscure, during the course of his studies at Randolph-Macon Diggs turned away from his family's desire that he become a minister and instead formed his decision to go to medical school. He undoubtedly was attracted by the fact that medicine as a profession enjoyed a marked esteem. He probably had heard about the reputation of nearby Johns Hopkins University. Medicine had the precision of science, which would have appealed to him after the letdown of his family's heated discussions on biblical interpretation. He completed his bachelor's degree in 1921, but stayed an extra year at the college to finish his master's degree in English in 1922, also teaching as an instructor in that department. It was probably during this last year that he began applying to medical schools, which produced

[11] Diggs, *The Lemuel W. Diggs Collection.* Folder LWD 001-01 contains numerous photos of Diggs early years, and includes a clipping of a debating victory naming Diggs on the opposing side over a rival school.

his acceptance to the Johns Hopkins University School of Medicine.[12] The cost of medical school was a challenge for him: he had to borrow the money from an uncle, and was unable to repay until 1938. But he persevered in his quest to join the ranks of students at Johns Hopkins and graduate from this fine institution.

However Diggs reasoned it, he could hardly have selected a better school for his future career. Located in Baltimore, Maryland, Johns Hopkins had served as a model for American medical education in many ways since opening its doors in 1893. It was the medical school that Abraham Flexner used in 1910 as a standard of comparison for all other schools in the U.S. in the widely influential report now commonly referred to as the Flexner Report.[13] Johns Hopkins was the first school to require an undergraduate degree, to admit women on an equal basis with men, and to create a residency program as an integral part of medical training where students 'lived' in the hospital to better care for and learn from their patients. The towering figure of William Osler as Physician-in-Chief of the Johns Hopkins Hospital and his distinguished successors set the curriculum for the clinical program in which Diggs was trained. From its inception, Johns Hopkins moved almost immediately to the forefront of medical education in the country and consistently attracted the best faculty and student talents to its programs. [14]

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[12] Diggs and Nollan, *Interview with Walter Diggs*

[13] Abraham Flexner, Henry S. Pritchett, and Carnegie Foundation for the Advancement of Teaching, *Medical Education in the United States and Canada; a Report to the Carnegie Foundation for the Advancement of Teaching* (New York City: 1910), 346.

[14] "The History of Johns Hopkins Medicine," [cited 2010]. Available from http://www.hopkinsmedicine.org/about/history/., Harry F. Dowling, *City Hospitals: The Undercare of the Underprivileged* (Cambridge, MA: Harvard University Press, 1982) Dowling, p. 115.

The life of a medical student was demanding and at times filled with drudgery. Students worked long hours, and performed numerous simple laboratory, therapeutic, and diagnostic functions, also known as "scut work," which was relatively easy to learn but had to be performed repetitively over a period of many months. Students could also be called upon to donate blood and participate in clinical activities beyond the domain of patient care.[15] Diggs struggled with chemistry, but was able to pass all of his other subjects easily. Diggs enjoyed it all, including the summers. His summer work activities included the following: in 1923 he worked as an instructor in chemistry at Mount Vernon College in Baltimore, in 1924 he participated in the International Health Bureau's Malaria Survey, and in 1925 he was a camp doctor in Cooperstown, New York.

Beginning in 1924, at the middle of his medical school education, Diggs began keeping two notebooks in which he recorded the moral and professional pearls of wisdom that resonated with him about life and medicine. One contained brief, epigrammatic sayings taken from many different sources about the nature of life and manhood. The second contained similar sayings about the nature and idealism of medical practice. The entries were by poets and writers, such as Robert Frost, Henry Wadsworth Longfellow, George Eliot, and Thomas Carlyle; presidents, such as Woodrow Wilson and F.D. Roosevelt; and scientists and doctors as, for example, William Osler, William W. Keen, and Oliver Wendell Holmes. The notebooks reflect Diggs's love of language, an abiding interest that he carried with him throughout his career. His fascination with language, in words and their definitions, extended even to the creation of new words as new scientific discoveries were made.

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[15] William G. Rothstein, *American Medical Schools and the Practice of Medicine* (New York: Oxford University Press, 1987)

In keeping with his fondness of language, Diggs later recalled the story of George Whipple and William Leslie Bradford from the Department of Pediatrics, who coined the term "thalassemia" (a hereditary form of anemia found chiefly in people of Mediterranean origin) to replace other names by which the disease was known, such as "Mediterranean" or "Cooley's" anemia. Diggs good-naturedly blamed Bradford for "suggesting a seemingly erudite, but less meaningful and less understood Greek word." Bradford and Diggs both played on the Strong Memorial baseball team in Rochester. When asked why he had changed the name of the disease to "thalassemia," Bradford replied, "A good baseball player does not argue with the umpire."[16] Diggs's love of language was essential to his character throughout his life and would sustain him in other debates and as new medical knowledge emerged.

It was at Johns Hopkins that Diggs's interests in hematology and cell morphology were awakened. While a student, he took courses on medical illustration, bacteriology, and other related subjects that emphasized the important role of the microscope as a clinical tool. His medical school class was the first to require that each student purchase and use his own oil immersion microscope and keep it available at all times, thus reinforcing its importance as a clinical tool. Indeed, Diggs's career began at about the same time as the use of the microscope became widely accepted as a clinical tool.[17] He also studied sickle cell and other blood diseases at this time under Dr. John Huck, who

[16] L. W. Diggs, "Dr. George Hoyt Whipple," *The Johns Hopkins Medical Journal* 139, no. 5 (Nov 1976): 196-200.

[17] *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas*, ed. Maxwell M. Wintrobe (New York: McGraw-Hill Book Co., 1980).

was working on the clinical features of sickle cell disease and was the first to argue that it was transmitted according to Mendelian laws.

As a student at Randolph-Macon and Johns Hopkins, Diggs would ride a horse or sometimes take the boat from Hampton for transportation. It was still practical to ride a horse for those unable to afford an automobile at this time. One day while he was a medical student, a tree limb knocked him off his horse and he suffered a skull fracture. Dr. Alfred Blalock, then a neurosurgical resident at Johns Hopkins, treated him by using a burr to mill a hole in his skull to relieve the pressure of swelling on his brain, and this saved his life. Both Diggs and Blalock would remember this event many years afterward.[18] Blalock would later develop the shunt that relieved cyanosis in blue baby syndrome, also known as Tretralogy of Fallot that is the result of a defect in the wall separating the two ventricles of the heart that allowed deoxygenated blood to mix with the oxygen-rich blood ready to be pumped to the body.

Diggs's first teacher at Johns Hopkins was Florence Rena Sabin, who taught him to mount his own stained and unstained histology slides. The first woman full professor at Johns Hopkins, she maintained interests in, among other areas, the lymphatic system, the supra-vital staining of living blood cells, and in the saturation of erythrocytes. "Some of her enthusiasm for hematology and cell morphology must have rubbed off," Diggs said.[19] He also studied for a time under the well-known John Hopkins medical illustrator,

[18] Diggs and Nollan, *Interview with Walter Diggs.*

[19] Diggs, *The Lemuel W. Diggs Collection.*

Max Broedel.[20] Broedel would influence Diggs's appreciation of the importance of 'seeing' comprehensively, whether the object was a patient or a slide under a microscope. Diggs would later admonish his students, "If you can't draw it, you haven't seen it."[21] He learned early the important connection in how the grace and beauty of the visual arts could be employed to clarify scientific ideas. In foregrounding the vitally useful role of art in medical education, Diggs would later employ the talents of a Memphis artist, Dorothy Sturm, to draw the morphology of blood cells from microscopic observation for students. Sabin and Sturm were both women. They reflect Diggs willing acknowledgement that women are capable and intelligent. He would use their work as contributors to his education and knowledge, and he would encourage and mentor them during his career.

Another noted professor at Johns Hopkins was Dr. Stanhope Bayne-Jones, who conducted a memorable course in bacteriology emphasizing the examination of stained and unstained preparations of body fluids. Drs. [Paul W.] Clough and John G. Huck taught a laboratory medicine course that was called "Clinical Mike" because of the emphasis that was placed on the use of the microscope for patient care. "I remember making drawings of sickled red cells and abnormal cells in other types of anemia," Diggs would recall.[22] Class notes by Diggs from these and other courses contain marginal

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[20] "Art as Applied to Medicine," [cited 2010]. Available from http://www.hopkinsmedicine.org/about/history/history7.html., *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas* In Wintrobe see page 334.

[21] Hamner, *The University of Tennessee, Memphis 75th Anniversary -- Medical Accomplishments* See page 74.

[22] Diggs, *The Lemuel W. Diggs Collection.* See folder LWD 001-07-01.

anatomical colored pencil drawings to illustrate the points made in class.[23] His class notes are clearly written and legible, and his illustrations exemplify the point in his notes.

The history of Johns Hopkins as a progressive and leading medical school is reflected not only in its faculty members, but also in its influence through its impressive reputation and publications, such as the Flexner Report, on medical education during the late nineteenth and early twentieth centuries. This character and influence were not lost on Diggs, who had a clear idea early in his life that he wanted to be the best at something; he was probably drawn to Johns Hopkins for these reasons. As his preparation for a medical degree neared an end, he could not have missed noticing the news of a new school of medicine and dentistry at the University of Rochester. This was remarkable news if only because the Rochester school was being built at a time when the overall number of medical schools in the nation was declining significantly. So many Johns Hopkins faculty members were moving to the new program at the University of Rochester that it was probably on advice and by the example of his professors that he chose to do an internship and residency at the newly built Strong Memorial Hospital that was part of the University of Rochester. He could have gone into practice with just his medical degree, but he understood that his future prospects would be considerably enhanced by specializing with an internship and residency in pathology and hematology. In addition, the professors at Strong Hospital, George Whipple and William McCann, would have appealed to his progressivist sensibilities. Whipple was the revered dean of the medical school at the University of Rochester. He was respected a researcher, but he felt, as did his students, that his highest accomplishment was that of superb teacher.

[23] Ibid. Class notes can be found in folder LWD 001-01 of this collection.

McCann was the first dean of the Department of Medicine and also established the Hematology-Oncology Unit at the University of Rochester.

At the completion of his medical degree, Diggs did indeed go on to specialized training in pathology at the University of Rochester, which had started its new medical school and opened a new hospital in 1926. He was in the first group of about twenty-four young physicians, interns, and residents; in 1928 he became Rochester's first hematologist.[24] He interned for two of his three years under William McCann, who was chair of the Department of Medicine. Here he learned "to participate in developing laboratory procedures, stocking clinical laboratories, starting a syphilis clinic and teaching." There were opportunities for someone in the first group of interns at a new hospital and university, and Diggs seized the chance to learn everything he could. At this time there were no laboratory technicians or medical students to perform basic laboratory tests, so the interns were required to perform all routine tests, including basal metabolism and electrocardiograph tests. In addition, emergency chemical tests had to be done by them at night and on holidays. Despite the drudgery and boredom, Diggs's decision to specialize in clinical pathology and hematology was reinforced. "Instead of being bored with and resentful of laboratory assignments I became interested in Clinical Pathology and Hematology." After his year as a new intern, he was assigned to the infectious disease unit and the bacteriology and transfusion laboratory. In his third year, a formal department of hematology was formed and Dr. McCann assigned him to teach the first

[24] Diggs and Nollan, *Interview with Walter Diggs.*

course in clinical pathology and hematology to medical students, as well as give lectures to nurses.[25]

It was also while at the University of Rochester that Diggs met Beatrice Mosher, a young woman working in the laboratory who helped feed the dogs beef, liver, skeletal, and muscle extracts and other substances as part of an ongoing nutritional experiment. A native of Rochester, Beatrice was employed at the University of Rochester in Dr. Whipple's "Animal House," where he maintained a colony of dogs that he used in his nutritional studies. It was in this environment that she and Diggs became friends and fell in love; after a courtship, they became engaged to be married in 1929. They would often remark to friends that while she was feeding extracts to the dogs, he was feeding extracts to the patients. Her family belonged to the Unitarian Church of Rochester.[26]

Whipple's nutritional research began around 1918 as an investigation into the difference that specific foods could make in the improvement of anemia. Together with his assistant, Frieda Robscheit-Robbins, Whipple maintained a dog colony as the basis for his research into the nutritional role in anemia. When Whipple arrived at Rochester in 1921, the first building constructed was the one that housed this colony and that came to be known as the "Animal House." Staff offices were also located here. The dogs would be bled to maintain a known level of red blood cells and would then be fed different foods to see which dogs would replace the lost cells most quickly to which foods. The result was a clear indication that some anemias required nothing more than a nutritional

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[25] Diggs, *The Lemuel W. Diggs Collection.* See folder LDW 001-07-12.

[26] *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas*, *The University of Rochester Medical Center: Teaching, Discovering, Caring: Seventy-Five Years of Achievement, 1925-2000*, ed. Jules Cohen and Robert J. Joynt (Rochester, NY: University of Rochester Press, 2000), Diggs and Nollan, *Interview with Walter Diggs.*

adjustment to cause an improvement. This turned out to be especially true in the case of the uniformly fatal disease known as "pernicious anemia." In 1934 Whipple would receive the Nobel Prize in Physiology or Medicine, along with George Richard Minot and William Parry Murphy, for this research. In Diggs's mind, this example of the certain and progressive knowledge that scientific research could produce must have represented a more satisfying world than that of his family's discussions about the correct interpretation of biblical passages.

Diggs's experience at the University of Rochester was a stimulating one that no doubt gave him the experience and the training that he wanted. The intellectual atmosphere that Whipple expected of all faculty and staff involved interactions without regard to rank, while the encouragement of a high level of intellectual achievement contributed to Diggs's sense of satisfaction. Diggs was able to observe firsthand Whipple's evenhandedness in his administration of the faculty and students in the wards, during lectures, and in the midst of the inevitable clash of egos. On one occasion, Diggs's clinical notes on a pending case of erysipelas (an acute streptococcal infection) were criticized. "As a Resident in Medicine assigned to the Infectious Disease Unit, my observations relating to patients receiving the serum were recorded. Serious objection was expressed regarding my clinical notes and my statement that the serum sickness that often developed was worse than the disease. Whipple calmed the troubled waters by stating that 'honest differences of opinion are what make horse races.'"[27] All things considered, Diggs was very pleased with his experience of three years with the members of this select group. His satisfaction with the institution and his colleagues is recorded on

[27] Diggs, *Dr. George Hoyt Whipple*, 196-200.

the back of a group photograph of his Rochester class that was taken in 1927. In the picture he is dressed in a suit and bow tie and wearing round glasses. He wrote on the back: "A peach of a crew to work with. Not a loafer or a crab in the outfit." [28]

Diggs recalled that the pinnacle of his training at the University of Rochester came while he participate in a nutritional trial to find a cure for pernicious anemia under Dr. George Whipple's supervision. The onset of this form of anemia was so gradual that patients usually could not remember when they first noticed the symptoms of this fatal disease. The characteristic manifestations of the disease included the triad of a sore mouth or glassy-appearing tongue, a slight jaundice of the eyes and skin, and numbness or tingling of the fingers or toes. The disease could also lead to a demyelinating lesion of the spinal cord leading to personality and memory changes that would only be visualized in an autopsy. At the heart of the disease was a mysteriously declining red cell count. Whipple's experimentation on dogs gave the first indication that liver extract could reverse the decline in red blood cells and resolve the disease's symptoms. This research into the correlation between foods and anemia started in the Animal House and progressed from there to use in humans. The clinical use in humans investigated the response in patients to different extracts of liver, kidney, spleen, and bone marrow. A range of different dietary supplements had been tried at other institutions with mixed results, but it was clear that only some supplements showed the promise of altering the course of the disease. Whipple had already established that liver extract held the key to controlling this disease. Diggs would later observe that Whipple had "proved that

[28] Diggs, *The Lemuel W. Diggs Collection.* See folder LWD 001-01 photo of the class with the caption written on the back.

'Popeye' was wrong about the virtues of spinach," and also that "the Dairy Council had overstated the value of milk as a complete food."[29]

Diggs had been assigned to grind liver extract for his patients, one of whom refused to take the extract. Her mental deterioration was such that the decision was made to force feed her by inserting a gastric tube, instead of giving her a transfusion. Over a period of days he monitored her blood count, hemoglobin, and reticulocyte (immature red cell) counts, and the response could not have been more dramatic. "The transformation of this terminally sick and maniacal patient in a few days' time with the megaloblastic (an abnormally large, immature, and dysfunctional red blood cell) cells disappearing from her blood smears and the erythrocyte values steadily increasing was probably the high light [sic] of my medical experience. It proved to me the value of basic and applied research.[30]" More than just the scientific satisfaction that Diggs felt, he must have felt that this experience justified the decision he had made years earlier to abandon the unproductive debates on biblical passages at his family gatherings for a more fulfilling career in medicine.

Despite this clinical success and the breakthrough that it seemed to represent, a complete conquest of the disease would continue to remain elusive. Some patients with a clear diagnosis of pernicious anemia still failed to respond to the liver extract, and a remission in the disease was almost certainly followed with one or more relapses. Once the liver extract had been identified as a cure for the disease, Eli Lily & Co. began

[29] Diggs, *Dr. George Hoyt Whipple*, 196-200.

[30] Diggs, *The Lemuel W. Diggs Collection* LWD 001-09-12.

producing its Liver Extract 343.[31] Scientific medicine and the drug companies were positioning themselves to bring even greater benefits. Nevertheless, the cure reversed the perception of the disease as uniformly fatal, which gave the appearance of conquering the disease.[32]

With his training at an end, it was time for Diggs to find a medical center where he could begin his career, and settle in a community to begin a new life with his fiancée. He had the sensibilities of a researcher and a clinician, and he undoubtedly wanted an institution that would allow him to continue his work. A medical center associated with a university would suit him best. In the spring of 1929, Diggs visited the campus of the University of Tennessee Medical Units. He decided to plan his visit to coincide with the Kentucky Derby on the way in early May, where Clyde van Dusen won easily that year. He could stop there and enjoy the race before continuing on to Memphis. Since they were engaged, Beatrice did not accompany him on this trip.

The connection to Johns Hopkins can hardly be overstated, both for Diggs's introduction to the UT Medical Units or for American medical education in general. His training at Johns Hopkins School of Medicine and the University of Rochester had fully prepared him for a career that was about to begin at the University of Tennessee Medical Units. His ambition to achieve something in his life allowed him to consider Memphis as

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[31] Michael A. Flannery, *Civil War Pharmacy: A History of Drugs, Drug Supply and Provision, and Therapeutics for the Union and Confederacy* (New York: Pharmaceutical Products Press, 2004).

[32] Keith Wailoo, *Dying in the City of the Blues: Sickle Cell Anemia and the Politics of Race and Health* (Chapel Hill: University of North Carolina Press, 2001), 338. , Frieda S. Robscheit-Robbins and George H. Whipple, "Blood Regeneration in Severe Anemia: XIV. A Liver Fraction Potent in Pernicious Anemia Fed Alone and Combined with Whole Liver, Liver Ash and Fresh Bile," *Journal of Experimental Medicine* 49, no. 2 (1929): 215-27.

his new home at a time when few Virginians were taking that step.[33] Along with his new appointment, he was scouting for a house to rent, where he and his fiancée Beatrice could begin their new life. They were planning their wedding at the same time that they were contemplating their move to Memphis. One phase of Diggs's life was now completed, and he was looking forward to the next one.

The interview trip to Memphis must have impressed Diggs both in light of the professional prospects for himself and of the location for a home with his fiancée. She had stayed behind in Rochester while he went ahead to make preliminary arrangements for their home. Harry C. Schmeisser was the chair of the Department of Pathology and Bacteriology at this time. He came from Emory University after a seven-year period as a student and instructor at John Hopkins. Administrative Officer of the Medical Units, O.W. Hyman, recalled of Schmeisser that he "brought to Memphis a clear conception of what should be done to develop a first-class Department of Pathology and Bacteriology, and during the next several years was able to supplement the staff and rearrange the work so that by the time he had been in Memphis five years, the University had a good Department of Pathology."[34] Schmeisser came to Memphis in 1921, and in the intervening years helped to develop a strong department of pathology, which no doubt influenced Diggs's decision to join the department. Schmeisser had a reputation of being a good teacher on the wards to the residents, but he was terrible in the classroom where

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[33] Biles, *Memphis in the Great Depression*, 174.

[34] Hyman, *Notes on the Development of the Medical Units, University of Tennessee, Strictly through the eyes and Prejudices of O.W. Hyman,* p.26. This history of the University of Tennessee Medical Units can be found in folder SRB 051-32 of the Simon Rulin Bruesch Collection in the UT Health Sciences Library's Historical Collections. The notes were written by one of its most influential and leading figures.

he preferred to just read from textbooks to the students rather than delivering prepared lectures.

For medical schools in general, pathology as a specialty grew slowly in the first half of the twentieth century. It was one of the basic scientific departments that performed autopsies for educational, medical, and research purposes, which also came to include bacteriological and histopathological studies, especially cancer. Autopsies were often the only way that diseases could be definitively diagnosed. They were also often the first step in finding an underlying cause for a new or mysterious disease. The clinical-pathological conference (CPC) with its regularly scheduled autopsies was a familiar feature in medical schools and an important teaching forum. During these conferences autopsies would be performed with students, interns, and residents observing the procedure, with the expectation that observers would visualize the lesions and then think about them in terms of the pathological anatomy at the patient's bedside. In 1926, the American College of Surgeons required accredited hospitals to hire qualified pathologists and perform diagnostic tests and autopsies. This new requirement probably played a role in Schmeisser's need for a full-time pathologist placed in the university's main teaching hospital, the Memphis City Hospital.[35]

In May Diggs had received a letter from Harry C. Schmeisser, chief of the Division of Pathology and Bacteriology and also a Johns Hopkins graduate, offering him a position as Assistant Professor of Pathology: this was the university's first full-time faculty position in the Department of Medicine. Diggs sent his acceptance of the position on May 20, and just three days later Dr. Schmeisser drafted a short, enthusiastic letter of

[35] Rothstein, *American Medical Schools and the Practice of Medicine.* See page 158.

acknowledgement. "Your letter of May 20th accepting appointment of Assistant Professor of Pathology was received with genuine pleasure by us all."[36] On the same day, Schmeisser also sent a more formal letter to the dean of the College of Medicine, Thomas Palmer Nash, requesting Diggs's appointment at a salary of $4000. This was a median-range, entry-level salary at a time when salaries for an assistant professor ranged from $1050 to $8000.[37] At one of the leading medical schools, a researcher's salary might be worth as much as $15,000. This letter was *pro forma*, but it listed the details of Diggs's training and his duties teaching the clinical microscopy course, as well as supervising the Clinical Laboratories. Graduating from Johns Hopkins and studying under Drs. Whipple and McCann made Diggs a valuable addition to the Medical Units. It probably made the decision easier for Schmeisser to select Diggs, because he had also graduated from Johns Hopkins seventeen years earlier and could count in addition what this prestigious school would bring to his program. Equally important, the letter touted Diggs's postgraduate training under two internationally respected physicians, William S. McCann and George H. Whipple, at the University of Rochester.

From its inception in 1911, the Medical Units operated on a shoestring budget from the Tennessee State Assembly that included a small compensation component for faculty, with the result that its administration relied almost exclusively on volunteer and part-time faculty to teach its students. Financial support for the campus stemmed primarily from state allocations, clinical fees, and student tuition. This situation was

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[36] Diggs, *The Lemuel W. Diggs Collection.* These letters can be found in folder LWD 002-06-01.

[37] Herman G. Weiskotten, Alphonse M. Schwitalla, William D. Cutter, and Hamilton H. Anderson, *Medical Education in the United States 1934-1939* (Chicago: American Medical Association, 1940), Page 58.

ameliorated by the fact that, although local physicians could earn far more in private practice, many of them nevertheless felt the lure of a university faculty appointment and were willing to forgo some of the financial compensation of private practice in favor of the prestige associated with this higher-level appointment. Practicing physicians were attractive to universities at this time because of the accepted idea that they, and not the full-time faculty members, possessed the appropriate kind of experience for training and educating students. Full-time faculty, it was felt, would get lost in the ivory tower and lose their grasp on patient care. Nevertheless, the pressure for medical schools to maintain a dedicated faculty prevailed, and the number of full-time faculty members gradually increased. Diggs's appointment grew out of this noticeable change for the Medical Units by virtue of being one of the first full-time faculty appointments on the campus, and the first in the Department of Medicine.

The University of Tennessee Medical Units opened in July of 1911. The State of Tennessee, like many states, in an effort to create a medical school that would meet the needs of the people of the state, provided minimal funding to create the campus in Memphis. At the same time, the University of Tennessee was enamored of having a medical school affiliated with it. It is extremely likely that neither the university nor the Tennessee State Assembly took into account the cost associated with starting and maintaining a medical school, including the number of faculty needed or the amount and cost of scientific equipment required for training physician-scientists. Medical training was, and still is, a more labor-intensive activity than other forms of higher education. The ration of faculty to students is lower, and the equipment and paraphernalia for laboratories and hospitals is higher. This lack of understanding was built into the genetics

of the campus and continued as a perennial problem. Like much of the rest of the country, this was the era of the racial practices known as "Jim Crow," and the movement to civil rights still lay in the future. In general, the faculty and students at this time were white and male, although some women physicians were graduating. Sara Conyers York was the first female graduate in 1913. Medical schools were beginning to offer freer access for women to education in the health care professions, but the feminist movement lay in the future as well. The emphasis on science permeated medicine to the extent that it nearly excluded any other way of thinking about health care. Social Darwinism and eugenics were part of the social fabric, and they were taught at most medical schools as some part of the medical curriculum. And, not least of these, the growing intimate collaboration between the pharmaceutical industry and health care in general was just beginning to form.

Diggs's grew up in the pre-World-War-I era characterized by Teddy Roosevelt and the dynamism of an emerging national pride as a nation that was a beacon to the world and a democratic model to emulate. His belief was to be the best that he could be as a man and a physician, and not to waste a single moment in the achievement of both. He was practical and frugal in the way in which he conducted his life and his professional activities--a characteristic that was probably learned at home, but which received emphasis while he was under the influence of George Hoyt Whipple.[38] His medical education took place at a time when patient care and research were at the center of medical education; for many people, doctors were still considered heroes and part of a fraternity dedicated to helping the sick through the application of science. By the time

[38] Diggs, *Dr. George Hoyt Whipple*, 196-200.

Diggs entered medical school, the three principles of patient care, research, and medical education were firmly established as essential to the practice of modern medicine and would continue as canonical throughout the twentieth century. He came of age at a time when Jim Crow was the established social norm, and in an age that advocated Social Darwinism. It is noteworthy that this was the time before the Civil Rights Movement, feminism, and a healthy skepticism of corporations' involvement in health care. Diggs's arrival in Memphis took place only a few months before the stock market crash of 1929 that would signal an economic tsunami making its slow and threatening way to Memphis.

CHAPTER THREE

MEMPHIS

"Our main business is not to see what lies dimly at a distance, but to do what lies clearly at hand."

Thomas Carlyle as quoted by William Osler.[1]

One of the early questions that Lemuel Diggs and his wife Beatrice were often asked after arriving in Memphis was, "Which church will you attend?" Beatrice was a Unitarian Universalist, while Diggs had been raised as a Methodist. Diggs chose to adopt his wife's faith tradition, for several understandable reasons. They decided to join the congregation of the First Unitarian Church in Memphis stewarded by Reverend John Petrie, who maintained the practice of an open pulpit where anyone could speak. Diggs was dissatisfied with the religious discussions he remembered from his family reunions, and thus, while still a student at Randolph Macon and later at Johns Hopkins, he gradually moved away from his family's Methodist roots to embrace a faith that would be more open and compatible with his own beliefs. Beatrice's family was Unitarian, and her mother had been in Susan B. Anthony's Sunday school class in Rochester. Her convictions probably encouraged her husband to become Unitarian. Moreover, both Diggs and his wife would have felt uncomfortable in some of the stricter and more fundamentalist churches in Memphis. It is also noteworthy that the Unitarian Universalist Church's theology contained, in addition to an openness of faith, an

[1] L. W. Diggs, *Notebook of Collected Sayings,* Personal, [1924]). The epigraph was written by Diggs in his personal notebook and the quote can be found in William Osler, *A Way of Life :An Address Delivered to Yale Students, Sunday Evening, April 20th, 1913* (Springfield, Ill.: Thomas, 1969).

intellectual component that appealed to Diggs. All of these considerations prompted the young couple to join the Unitarian Church around 1930.[2]

During his first year in Memphis Diggs acclimated himself to the new clinical / medical setting in Memphis. He wanted to develop a clear understanding of the patients he would see at the Memphis hospital, as well as become acquainted with his new colleagues. Only one important order of business remained, and that was for him to wed Beatrice Mosher. In October of 1930, they exchanged vows [where]. The department chair of Pathology, Harry Schmeisser, loaned the newlyweds his vacation house, called Chestnut Lodge, in Blowing Rock, North Carolina, an idyllic, wooded area where the couple could spend a secluded honeymoon. By this time Diggs had rented a home for the couple in Hawthorn Street.[3]

Diggs's move to Memphis, followed by his marriage the next year, represented a happy period of his life. Like other inhabitants of Memphis, he remained relatively untouched in that first year by the economic troubles of the rest of the United States. He was earning a reasonably good salary, and he had the chance to establish himself and his career as a doctor and member of a university faculty. It is customary to mark the beginning of the Great Depression with the Stock Market Crash in 1929, but it took about a year for its economic effects to reach the Bluff City, because of the distribution and service character of its economy. Indeed, in October of 1929, the gloomy financial news affected only a few downtown speculators. The two daily newspapers carried no

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[2] Walter Diggs and Richard Nollan, *Interview with Walter Diggs* (Memphis, TN:, June 13, 2008).

[3] Lemuel W. Diggs, "The Lemuel W. Diggs Collection," Manuscript Collection, The University of Tennessee Health Sciences Historical Collections. See LWD 001-01 with photographs.

headlines of financial disaster or suicide. Historian Roger Biles noted: "The Memphis *Commercial Appeal* called talk of a major national disaster 'unbelievably silly' and generously quoted President Hoover on the nation's health."[4] Despite the local confidence, however, by the time of the Diggs's marriage in October 1930 the optimistic mood in Memphis had changed. As industry began to slow, cotton prices dropped, and traffic on the Mississippi River slowed to a trickle. Unemployment rose dramatically, overwhelming the city's public relief services. In 1931 the Tennessee state legislature reduced appropriations to the University of Tennessee by ten percent in January and then again by nine percent in July, for a total of nineteen percent in that year.[5] Diggs's initially promised salary dropped from $4000 to $3240--but he was lucky to have continuing employment. As one historian noted concerning the scene in Memphis, "The increasing frequency of suicides served as a grim barometer of the worsening situation. Suddenly so many people were jumping off Harahan Bridge into the Mississippi that the newspapers printed the names and telephone numbers of clergymen and urged the dispirited to seek counseling. 'Soon a Memphis preacher jumped off.'"[6] The advice offered by the Herbert Hoover administration indicated that the country was on sound economic footing. In time the market forces would identify the source of economic instability, which Hoover believed lay outside the United States, and they would be brought back into balance.

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[4] Roger Biles, "The Persistence of the Past: Memphis in the Great Depression," *The Journal of Southern History* 52, no. 2 (1986): 183. See p. 186.

[5] James Edward Hamner, *The University of Tennessee, Memphis 75th Anniversary -- Medical Accomplishments* (Memphis, TN: The University of Tennessee, Memphis, 1986). See page 85.

[6] Biles, *The Persistence of the Past: Memphis in the Great Depression*, 183. See p. 187.

Diggs had been trained in the new model of the physician scientist, one who was comfortable in the clinic caring for patients and in the laboratory performing patient tests and carrying out research. For Diggs, each of these activities represented two sides of the same coin: his patients and their illnesses were his laboratory, while the laboratory was where he learned about his patients and their diseases.[7] Scientific knowledge and his own research were mediated by his clinical judgment to help his individual patients. His clinical research would focus on finding ways to improve treatments for various diseases, and would likewise be informed by what he learned from his patients.

Diggs's heroes were the medical faculty at Johns Hopkins University, who taught and practiced in the tradition of William Osler. It was there that he began to appreciate pathology and the growing field of hematology. At the University of Rochester and the Strong Memorial Hospital, his heroes were the school's dean George Whipple, its first Chief of Medicine George McCann, and the second Chief of Pediatrics William Bradford. Under McCann, Diggs taught the university's first course in hematology. He brought the training he had received and the ideals instilled in him to his new career in Memphis.[8]

William Osler was another of Diggs's heroes and the individual who established the training of all medical students coming through Johns Hopkins. Before he left Johns Hopkins, Osler hand picked his successor and made sure that the traditions established by

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[7] Kenneth M. Ludmerer, *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care* (Oxford: Oxford University Press, 1999); Kathryn Montgomery, *How Doctors Think: Clinical Judgement and the Practice of Medicine* (New York: Oxford University Press, 2006)

[8] Walter Diggs, *LWDiggs Heroes*, Correspondence to Richard Nollan, 25 September 2008.

him would be faithfully maintained. All students, he believed, should receive their clinical instruction beginning with the patient, and their training should likewise end with the patient. His approach to the laboratory was much the same. The medical literature consisting of books and journals were the bedrock of medical research and understanding; the high-quality training Diggs received as a result of both a patient orientation and the reading of large amounts of medical literature contributed to his success throughout his career.[9] He was also widely read outside of medicine, as his degree in English literature at Randolph Macon College showed, where he became especially fond of the English poet, Thomas Carlyle.[10]

Diggs drew inspiration from his patients, as his experience with pernicious anemia had shown. The potential power of science to alter the course of a life-threatening disease was evident to him. His belief in the laboratory orientation and reliance on the microscope in particular drew him to a blood picture[11] that looked starkly like one he had seen as a student. He knew that the human eye could be very useful in ordinary circumstances, but the microscope was better suited for close, scientific observation. He had studied sickle cell anemia while in John G. Huck's clinical microscopy class at Johns Hopkins. He had spent even more time on a similar disease, thalassemia (another

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[9] Michael Bliss, *William Osler: A Life in Medicine* (Oxford: Oxford University Press, 1999), [database on-line]; available from ISBNDB XML, Harvey Cushing, *The Life of Sir William Osler* (London: Oxford University Press, 1940), "William Osler - Biography," [cited 2011]. Available from http://www.medicalarchives.jhmi.edu/osler/biography.htm.

[10] Diggs, *LWDiggs Heroes*, 1. The epigram at the beginning of this chapter is taken from the first page of: Diggs, *Notebook of Collected Sayings*

[11] "Blood picture" is a generally used phrase in the language of this time that refers to the microscopic observations of the percentage of blood cells and their condition. Later the phrase would become more metaphorical as laboratory test results were included as part of the blood analysis.

hemolytic anemia due to an inability of the body to synthesize hemoglobin) that was known to be endemic to Italian people. When he saw the elliptical, sickle-shaped cells characteristic of sickle cell anemia, his medical curiosity was piqued. He knew that little was known about the disease, and as a consequence he decided to make his first, informal clinical study of the disease by using the liver extract given to him by Whipple that had been so successful in treating patients with pernicious anemia. He recalled, "Dr. Whipple gave me some samples of liver extract to test out on people with iron deficiency anemia and pellagra which was then present. But, when I came to Memphis, I came across cases of sickle cell anemia at the old Memphis City Hospital. And, I became so interested in sickle cell anemia . . ." He knew that "nothing was known about the disease hardly at that time."[12] But the liver extract produced no results, and it must have become apparent to him fairly quickly that sickle cell anemia would not yield to a nutritional therapy. He examined his patients in all stages of life, including the "patients at the old folks' home who were over fifty years of age and who remembered slave days and the Civil War."[13] As he pursued sickle cell, the puzzle grew and only deepened his conviction to find a solution that would relieve those afflicted by this devastating illness. While still living at home, his family had encouraged him to train to become a Methodist minister, a career path that he could not choose. He did, however, retain the sense of religious zeal that he had learned at home, and he transferred this sense of dedication to medicine, in particular to solving the mystery of sickle cell disease.

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[12] L. W. Diggs and Thelma Mabry, *Interview with Lemuel W. Diggs* (Memphis, TN: Memphis State University, 1984).

[13] Diggs, *The Lemuel W. Diggs Collection* See Digg's autobiographical writing in folder LWD 001-01-13.

The microscope was a preferred clinical investigative tool. Its importance was established at Johns Hopkins, where the students in Diggs's class were required to own an oil immersion microscope. The obvious advantage was its ability to make extremely small objects, such as blood cells, large enough to observe and evaluate. A microscopic view allowed students to see normal cells, but also those that were abnormal and, thus, characteristic of individual pathologies.

The microscope was no less powerful as a research tool, where the purpose of the endeavor was not so much to benefit an individual patient as to aid in generalizing about the material being enlarged and potentially adding to or expanding the scientific knowledge base on sickle cell or other diseases. The microscope, like other technologies, could help to conceptualize the world as mediated by the microscopic image "by the extent to which it explains the features of our lived experience."[14] Diggs as a clinician and a researcher was the arbiter of what he saw clinically and microscopically, which meant that he could give it the measure of clarity and definition that he sought both for himself and for the scientific eye represented by the community of scientific researchers. The technology of the microscope and its improvement through the centuries brought about new medical knowledge by its very ability to make extremely small objects appear large.

Diggs's office was located in the Memphis City Hospital, a sixty-three-year-old building that was the city's only public hospital. The warm Memphis days often required keeping the windows open during class. The baseball stadium was located next door, which meant that noise from a game would interfere with classroom instruction.

[14] Lorraine Daston and Peter Galison, *Objectvity* (New York: Zone Books, 2007).

His appointment was with the university, but his work would be in the city's public hospital. It was only a few years before, in 1924 that Memphis and the UT Medical Units had entered into an agreement by which the city would supply the nurses, facilities, and patients, while the Medical Units would supply the doctors and medical supplies. The Medical Units did not own a hospital, and this opportunity offered many advantages. In effect, it would give the university an "almost limitless wealth of clinical material afforded by the General Hospital," which would cost nothing to the university and would give it a more-or-less equal status with other medical schools with better endowments.[15] The hospital itself was old by the time Diggs had arrived, but it was a recognized city landmark. Diggs found himself in this largely favorable administrative arrangement. His office, the laboratory he would use, and the patients he would see were all in close proximity.

Diggs represented the cutting edge of medicine for his day. His laboratory-based, research-oriented way of helping patients was a reflection of his training, but it also stood in contrast to the situation he encountered in Memphis. He was probably out of step with many of the physicians in Memphis at this time, many of whom were home-grown and for whom research was a part of faculty responsibilities, but not encouraged. Diggs recalled: "Patients and physicians, alike, did not support research efforts." But here, at the Memphis City Hospital, Diggs found not only an interesting problem to satisfy his desire

[15] Frank D. Smythe, "A Golden Opportunity for the University of Tennessee Medical College," *Memphis Medical Journal* 1 (1924): 214-218. See page 216.

for research, but "always numerous, readily available, cooperative patients whose type of hemoglobin was already established by routine and specific tests."[16]

Medicine as a profession in Memphis, as elsewhere, was racially segregated. The only black workers in the hospital were maintenance and janitor workers. Vivien Thomas, a black laboratory technician aspiring to be a doctor, was the exception that proved the rule. He began his career at Vanderbilt University and moved during the Great Depression to Baltimore, where he began a lifelong collaboration with Alfred Blalock, the same surgeon who treated Diggs's concussion.[17] As one historian points out the number of white medical schools in 1900 numbered 160 and the number of black schools numbered ten. By 1930 there were seventy-six white schools and two black ones. The educational transformation that began with the Flexner Report on American medical education resulted in a more homogeneous, that is to say white medical profession.[18]

George Whipple had asked Diggs to use the ampules of liver extract on patients with iron deficiency anemia or pellagra, but the latter's thought was to give the liver extract to his sickle cell patients, which he knew had not been tried elsewhere, along with other anti-anemic drugs. He tried this approach for several years with disappointing results. The solution to the disease did not appear to lie in nutrition. He also considered

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[16] L. W. Diggs, "The Sickle Cell Center in Memphis," File Card Index, p. 1, *The Press Scimitar* Morgue File, The University of Memphis Ned McWherther Library, Special Collections. File number 80145. See page 1 for the first quotation and page 2 for the second.

[17] Vivien Thomas, *Partners of the Heart* (Philadelphis: University of Pennsylvania Press, 1985), 245. , W. Michael Byrd and Linda A. Clayton, *An American Health Dilemma: Race, Medicine, and Health Care in the United States: 1900-2000.* (New York: Routledge, 2002).

[18] Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry* (New York: Basic Books, Inc., 1982) See page 121. For a broader description see William G. Rothstein, *American Medical Schools and the Practice of Medicine* (New York: Oxford University Press, 1987).

giving the extract to the patients with pellagra, a disease with similar symptoms. But something about sickle cell interested and even intrigued him. Perhaps because the disease was both little understood and was appropriate for the use of the technology that was close to him -- the microscope and the clinical laboratory -- that sickle cell inspired an abiding commitment in him. Sickle cell was one of the few diseases at this time that could be diagnosed microscopically. This could not be said of diseases such as pellagra, for which others were studying the therapeutic benefit of liver extract.[19]

The Memphis City Hospital also included the Pathology Institute where Diggs did much of his work and teaching. Pathology as a specialty was seen as an important source of new medical knowledge. It was highly regarded because examining the body after the death of the patient was often the only way to visualize how the patients died. Doctors could make their best guess about what was going on inside a patient's body while he / she was alive, but there was no way to look inside and see, short of resorting to surgery. X-rays were helpful in terms of imaging the inside of the body, but only insofar as their images represented tissue densities. Soft tissues were very hard to read and often fell far short of providing useful information. Thus case reports were frequently published in the medical literature with autopsy results.

The Pathology Department was a UT medical department that was located in the city hospital's Pathology Institute. O.W. Hyman, the UT Medical Unit's chief administrator, viewed it as a key department. He was cognizant of the growing need for pathology as a training program, as a basic science, and as a service, and he wanted to create a first rate pathology program for the university. To that end, he hired Harry

[19] Julian M. Ruffin and David T. Smith, "The Treatment of Pellagra with Certain Preparations of Liver," *American Journal of the Medical Science* 187, no. 4 (1934): 512-520.

Christian Schmeisser, also trained at Johns Hopkins, from Emory University in 1921 and asked him to reorganize the department. Hyman wrote: "He brought to Memphis a clear concept of what should be done to develop a first-class Department of Pathology and Bacteriology, and during the next several years was able to supplement the staff and rearrange the work so that by the time he had been in Memphis five years, the University had a good Department of Pathology."[20] By 1929 a new crop of faculty members had replaced those of 1921. This group included Israel D. Michelson, trained at Johns Hopkins, who was an associate professor by 1929, and Anna Dean Dulaney, a doctor of philosophy in bacteriology from the University of Missouri, who was an assistant professor. In addition, there were two instructors.[21]

Although pathology was respected, the use of laboratory tests as a functional, much less essential part of clinical medicine was contested in Memphis as elsewhere. "Laboratory tests," as Diggs noted, "were not at first universally accepted. It was felt by some that reliance upon the laboratory for diagnosis would encourage laziness on the part of the clinician and abandonment of established practice."[22] This feeling was generally accepted by many of the senior-level physicians in Memphis. The worry was that physicians, who came to rely on laboratory testing for information about their patients, would lose the vital skill to use their clinical judgment based on the use of their five senses to understand and treat their patients. For many, the ideal doctor was the one who

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[20] Orren W. Hyman, *Notes on the Development of the Medical Units, University of Tennessee* ([Sweetwater, Tenn.]: O.W. Hyman, 1974).

[21] Simon R. Bruesch, "The Simon R. Bruesch Collection," Manuscript Collection, The University of Tennessee Health Sciences Historical Collections. Many of these details are taken from Dr. Bruesch's notes about the historyof pathology found in folder SRB 024-05.

[22] L. W. Diggs, "Clinical Pathology," in *History of Medicine in Memphis* (Memphis: Memphis and Shelby County Medical Society, 1971), 239-264. See page 240.

could operate a solo practice and make all the important assessments without waiting for a nurse or technician. As late as 1924, one local specialist wrote, "A physician who cannot prescribe for the average patient or who will not venture a diagnosis until after he shall have had submitted to him the reports of internes and nurses, with their interpretations of the findings of the various specimens submitted, will never be able to take care of the sick and injured of an isolated community."[23]

Behind this concern was also the growing need for physicians in rural areas of Tennessee. Doctors who specialized or who required laboratory tests and personnel were more likely to practice in the cities, rather than in the middle or smaller towns where the need for health care was deemed urgent. To be sure, laboratories were considered important, but they would never replace the clinical judgment of a trained physician. As one of the new generation of doctors, Diggs represented those who embraces the new view, who did not question the value of the laboratory, and who sought to find ways to expand its use in clinical medicine. As an extension of his experience at the University of Rochester, he applied all the laboratory techniques he could to helping his patients. From the beginning as a part of the medical school curriculum, taught a course in clinical pathology as well as exercised his responsibility as the coordinator of the laboratory that was part of the Pathology Institute. In this he had the support of his department chair.

The Memphis City Hospital, including its cafeteria, was segregated, yet it was the only hospital that blacks could use, since all the other hospitals in the city were private and white. The patient population did not reflect the city population, which was 38.1% black-- many of these people were the result of the early twentieth century mass

[23] Smythe, *A Golden Opportunity for the University of Tennessee Medical College*, 214-218. See page 216.

migration from rural communities to the cities. The percentage of blacks in the hospital was at about 80%, because it was the only hospital to which they would have been admitted. The building had a central three-story administrative and central services tower with two, two-story arms of patients' rooms extending at an angle from either side. The tower had a dome on top that was modeled after the well-known one atop Johns Hopkins's hospital in Baltimore, a sign of the influence that the famous medical school had exerted, and also a tacit reflection of the Flexner Report, which had used the Johns Hopkins School of Medicine as a measure for evaluating all of the medical schools in the country.[24]

By 1929 the Memphis City Hospital in general had transitioned successfully from the almshouse and charity institutions that preceded it in the nineteenth century, to one that aligned itself with the cascade of medical innovations and the science that produced them. By this time it was a place where health could be restored, instead of a place where the chronically ill went to die. The hospital had adopted a business model and was attempting to attract middle-class patients. "Dumping," the practice of transferring extremely ill or seriously injured accident victims from one hospital to another, also began at about this time in an effort by the hospital to avoid expensive illnesses or to improve hospital death rates. No independent or federal regulations for hospitals or doctors existed at this time.[25]

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[24] Abraham Flexner, Henry S. Pritchett, *Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching* (New York: Carnegie Foundation for the Advancement of Teaching, 1910). See the author's introductory remarks to the evaluation.

[25] Harry F. Dowling, *City Hospitals: The Undercare of the Underprivileged* (Cambridge, MA: Harvard University Press, 1982)

The sickle cell patients whom Diggs saw had recognizable symptoms, including a jaundiced appearance, skin ulcers (usually on the legs), painful abdominal and joint crises, and the familiar abnormally shaped red blood cells. From the point of view of the patients, the hallmark of this illness was the excruciating pain "out of the clear sky oftentimes" that it caused. Diggs described:

> And, the pains are in multiple parts of the body, but usually they are in the back or in the bones. As they say, "It bees bones." And, they put their hands on the bones. But, this pain is very severe and it makes them scream and cry and they, it's like an abscessed tooth or a kidney stone or gallstone colic. It's very severe pain and it makes them seek medical aid and go to the emergency room and to go to the hospital. And, it's the type of thing that occurs over again and really is a curse of the people who have sickle cell anemia and that is one of the efforts in research, is to try to find out how to prevent these crises and how to treat them after they occur.[26]

These symptoms appeared in a variety of places, which gave rise to a number of possible causes -- but none of them could account for all of the symptoms together. Thus, misdiagnosis of the disease was frequent. This likewise qualified the disease at this time as a "great masquerader," a disease that could mimic the symptoms of other diseases. There was nothing that Diggs could do in terms of treatment, apart from treating the symptoms. No way had been identified conceptually to link the manifestations of sickle cell anemia to an underlying cause. Moreover, the accumulation of clinical statistics would not be useful in forming a picture of the disease for the same reason. As a young physician beginning his career and establishing his reputation, Diggs saw an opportunity that intrigued him and superbly fit his professional training and inclinations.

[26] Diggs and Mabry, *Interview with Lemuel W. Diggs* For these quotes see pages 6-7.

If the clinical findings from his patients were unhelpful, the literature was equally so. "There was no one had any interest in it," he recalled.[27] One of the first things that he did was to find out how much had been published on sickle cell that could augment what he knew with new information. In keeping with his scientific training and habit, he sought to compile everything that was known about the disease at that time. Diggs noted that, "In 1929 the description of clinical, laboratory, and anatomical manifestations related to sickle cell anemia in the major textbooks were limited to a few lines, and there were few indexed publications."[28] To this end, he spent time reading what was published in the prominent textbooks of the day, which, if they contained anything, amounted to only a few lines or paragraphs. He scanned the English textbooks that he could identify, making marks and underlinings in them of what he thought important.[29] In addition, he scanned various German medical textbooks. Many of the words on the page were cognates, and thus recognizable as medical terms. With a German-English dictionary opened nearby, Diggs translated and wrote the meanings of the non-medical words onto the book page in order to decipher the meaning of the text.[30]

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[27] Thelma Tracy Mabry and L. W. Diggs, *History of Medicine in Memphis: Interview with Dr. Lemuel Whitley Diggs* (Memphis, Tenn.: Oral History Research Office, Memphis State University, 1984)

[28] Diggs, *The Lemuel W. Diggs Collection* For this quotation in Diggs's autobiographical notes in folder LWD 001-07-13.

[29] Paul Reznikof, "Anemia," in *A Text-Book of Medicine by American Authors* (Philadelphia: W.B. Saunders Company, 1927), 921-926. , A. Piney, *Diseases of the Blood*, Second ed. (Philadelphia: P. Blakiston's Son & Co. Inc., 1932), A. Piney and Stanley Wyard, *Clinical Atlas of Blood Diseases*, Second ed. (Philadelphia: P. Blakiston's Son & Co. Inc., 1932)

[30] Hans Hirschfeld, *Lehrbuch Der Blutkrankheiten für Ärtzte und Studierende*, 2d ed. (Leipzig: Verlag von Johann Ambrosius Barth, 1928), Otto Naegeli, *Blutkrankheiten und Blutdiagnostik: Lehrbuch der Klinischen Hämatolgie* (Berlin: Verlag von Julius Springer, 1931).

More important than the textbook information, however, was what could be found in the medical literature. All new ideas, conjectures, and clinically and scientifically significant findings were published here. Diggs wanted to know everything there was on the disease from the time it had first been described in 1910. He thumbed through copies of *Quarterly Cumulative Index Medicus*, the specialized subject heading and author catalog of all medical journal publications, searching for relevant citations.[31] The results were meager. Information about the disease was both limited and confusing. He acquired copies of all the relevant journal articles that had been published to that time by using the interlibrary loan services of the newly built C.P.J. Mooney Library located across the street from his office and named after the editor-in-chief of the Memphis newspaper *The Commercial Appeal*. He requested reprints from article authors by mail (a standard practice at the time), received photo duplications of articles, and sometimes used a typewriter to reproduce an article. Diggs followed the same research instinct that he would use throughout his career. He not only read the articles to supplement his own knowledge about sickle cell and other diseases, but also began a filing system that would keep them organized, a habit that would grow over the next four decades into an essential resource; Diggs and others in Memphis would in future years frequently refer to these materials as a knowledge base of what was understood about the disease and could be used as a source of ideas for future research.[32] The articles contained in the indexed articles were perused and contain occasional marginal comments in Diggs's hand in the

[31] American Medical Association and National Library of Medicine, *Quarterly Cumulative Index Medicus* (Chicago:, 1927-1956)

[32] Mabry and Diggs, *History of Medicine in Memphis: Interview with Dr. Lemuel Whitley Diggs*

form of corrections or updates to an author's assertions. In one instance, an author making the assertion that "The true sickle cells in the blood of an active case are absolutely unaffected by oxygen." To this, Diggs wrote a firm "NO!" in the margin.[33]

Diggs always relied on the contents of the literature to guide his work, and he would use them to help him understand the clinical, laboratory, and anatomical/pathological manifestations of sickle cell disease. He would routinely refer in his publications to the number of journal articles available on its subject and would include either a complete list of those articles, or list the significant ones. His purpose was not only the practical purpose of showing where he had obtained his information, but also to teach the most effective approach to any clinical research problem.

Diggs supplemented what he had learned while a student of John Huck at Johns Hopkins, where he saw and heard about sickle cell disease for the first time. He knew that the disease had first been described in 1910 by James B. Herrick, whose patient had leg ulcers, yellow sclerae (jaundice), anemia, and the peculiar "thin, elongated, sickle-shaped" red cells that would characterize the disease. Herrick could not diagnose the cause or do anything more than suggest that it was possibly the result of syphilis or an intestinal parasite. [34] Another similar case was described a year later.[35] In 1915 Jerome

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[33] The note can be found in 1929-4 of *The L.W. Diggs, M.D. Sickle Cell Literature Collection: 1910-1970*, ed. Compiled by Lemuel W. Diggs, M.D., with assistance of the Bluff City Medical and Pharmaceutical Auxiliary (Memphis, TN: N.p., 1981). The article commented on was: V. P. Sydenstricker, "Sickle-Cell Anemia," *Medical Clinics of North America* 12 (1929): 1451-1457.

[34] J. B. Herrick, "Peculiar Elongated and Sickle-Shaped Red Blood Corpuscles in a Case of Severe Anemia. 1910," *The Archives of Internal Medicine* 5 (1910): 517. See page 518 for quotation. Similar sickle cells had been described in animal blood as early as 1840, for which see page 320 of: C. Lockard Conley, "Sickle-Cell Anemia -- the First Molecular Disease," in *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas* (New York: McGraw-Hill Book Co., 1980), 319-371.

Cook and Jerome Meyer reported a third, similar case, in which the authors stated for the first time that the symptoms defined a new disease that was probably limited to blacks. On the basis of the three known cases, they started a trend toward identifying the inherited nature of the disease that would become a central element in the definition of sickle cell disease.[36] At about the same time, Victor Emmel developed a laboratory test that could demonstrate the sickling of red cells in symptomatic and some asymptomatic people. With this technology, he used a blood sample from the non-anemic father of Cook and Meyer's patient--someone who had never manifested the symptoms of the disease--to show that his red cells would sickle on a glass slide under a microscope. With this test, Emmel moved the discussion about the disease away from the clinical assessment of symptoms to its cellular nature, and to discussion about an active disease and the trait found in an otherwise normal individual.[37]

John Huck, Diggs's teacher at Johns Hopkins, performed the first comprehensive studies of sickling that resulted in a definition of a dominant trait that is inherited according to the Mendelian laws of inheritance for a single factor. In other words, only one parent with the dominant trait was required to transmit the disease to the child. Henceforth, the sickle cell would be cast as an inheritable disease.[38] Huck also made no

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[35] B. E. Washburn, "Peculiar Elongated and Sickle-Shaped Red Blood Corpuscles in a Case of Severe Anemia." *Virginia Medical Semi-Monthly* 15 (1911): 490-93.

[36] Jerome E. Cook and Jerome Meyer, "Peculiar Elongated and Sickle-Shaped Red Blood Corpuscles in a Case of Severe Anemia." *Archives of Internal Medicine* 16 (1915): 644-51.

[37] Victor E. Emmel, "A Study of the Erythrocytes in a Case of Severe Anemia with Elongated and Sickle-Shaped Red Blood Corpuscles." *Archive of Internal Medicine* 20 (1917): 586-598. The blood picture would become not only a means of diagnosis, but also of establishing heredity.

[38] Huck, *Sickle Cell Anemia*, 335-44.

distinction between those individuals possessing the trait and those with the active disease: the phenomenon of sickling was considered an indication of the disease and the disease could be found on a spectrum from severe to absent, which led to the odd notion that a person could be healthy and have a disease, both at the same time.[39] This conclusion was due in part to the lack of any test that could distinguish between those with the disease and those with the trait who would never manifest the disease. Emmel claimed that his test alone could be used for drawing inferences about the disease, in contrast to the earlier practice of grouping patients as the means for defining the disease. In 1922 another researcher, Verne Mason, would echo the importance of the laboratory findings, but stressed the need to include the clinical manifestations in any diagnosis.[40]

Virgil P. Sydenstricker added his observations to the handful that had been made before him. In 1923 he examined two patients (of two and six years of age) suffering from the disease and their families, using Emmel's test for "latent" sickling. The younger patient died. However, probably for the first time, Sydenstriker used the opportunity to examine the body to see the effects that the disease had had on the child, noting changes to the spleen, kidneys, and bone marrow. He made an early reference to the possibility that the problem might be the hemoglobin of the red cells. "The cells became darker and more 'brassy' as though there were a concentration of the hemoglobin."[41] The suspicion of hemoglobin as the center of the problem would remain elusive until after World War

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[39] John G. Huck, "Sickle Cell Anemia," *Johns Hopkins Hospital Bulletin* 34 (1923): 335-44.

[40] V. R. Mason, "Sickle-Cell Anemia," *Journal of the American Medical Association* 79 (1922): 1318-1322.

[41] Mason, *Sickle-Cell Anemia*, 1318-1322.

II. Sydenstricker also added his weight to the speculation that "sickle cell anemia is a condition peculiar to the negro race."[42]

Virgil Sydenstricker held that the condition of the blood and the hereditary nature of the disease were crucial for diagnosis, while maintaining a central concern for the clinical picture of the disease.[43] "Sydenstricker's analysis entailed that a patient's diagnosis may change over time as the phase of the disease changes. Thus, while he drew no etiological boundary between phases, he believed in an underlying structural reason for the differences. He introduced the term "crisis" to describe the acute and painful manifestations of sickle cell anemia in its active phase, which he saw as a cyclical pattern of remission and relapse." His work would lay the groundwork for much of the later research on sickle cell anemia.[44]

The first case of sickle cell anemia in Memphis was reported by J.F. Hamilton to the Memphis and Shelby County Medical Society in 1925, which presented the clinical aspects of a local thirty-three-year-old black farmer and World War I veteran, who was seen by the author in U.S. Veterans Hospital No. 88 with the familiar complaints of abdominal and joint pain, leg ulcers, a jaundiced appearance, and the characteristic

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[42] V. P. Sydenstricker, W. A. Mulherin, and R. W. Houseal, "Sickle Cell Anemia: Report of Two Cases in Children, with Necropsy in One Case." *Archives of Pediatrics* 40 (1923): 132-154. See page 154.

[43] Ibid, Virgil P. Sydenstricker, "Sickle Cell Anemia." *Southern Medical Journal* 17 (1924): 177-183. In Keith Wailoo, *Dying in the City of the Blues: Sickle Cell Anemia and the Politics of Race and Health* (Chapel Hill: University of North Carolina Press, 2001), Wailoo argues that the significance of focusing on sickle cell disease as a Mendelian disease is that only one parent with the trait is needed in order to transmit the disease to the offspring. A racist, for whom sickle cell is considered a "black" disease, could easily envision its being transferred from the black to the white race through miscegenation. See page 78 and passim.

[44] Simon D. Feldman and Alfred I. Tauber, "Sickle Cell Anemia: Reexamining the First "Molecular Disease"," *Bulletin of the History of Medicine* 71, no. 4 (1997): 623-650. See page 633 for quotation.

sickle-shaped red cells. The main purpose of Hamilton's report, apart from the significance of this being the first case in Memphis, was to briefly review the literature and note that the disease appeared "to occur only in the colored race" and be transmitted by the laws of Mendelian inheritance.[45]

Blacks were almost completely unaware that sickle cell disease existed, although the phenomenon was well-known and often described by the painful cries of its sufferers.[46] The understanding of the disease among physicians was equally poor. The fatigue caused by the anemia was often identified as "malingering," the joint pain as "rheumatism" or "arthritis," and the other symptoms as "other diseases," including malaria. Financial support for blacks in the form of health insurance was virtually unknown, which meant that sufferers would not go to the hospital until the illness was unbearable and usually quite advanced; under such conditions, they were also less likely to pay after they had left the hospital. In segregated hospitals, a black patient had the most difficult time of being admitted to the hospital, but if that hurdle could be overcome, the quality of care was only marginally worse than for white patients. Prejudices among the hospital staff did not disappear, but were usually made secondary to professional standards. Most hospital staff members would extend themselves to provide the same quality of care to blacks as to whites, but only as long as the patients were compliant to the staff's orders. If a black patient resisted care or refused to obey, racial prejudices

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[45] J. F. Hamilton, "A Case of Sickle Cell Anemia." *Memphis Medical Journal* 2, no. 11 (1925): 253-55.

[46] Wailoo, *Dying in the City of the Blues: Sickle Cell Anemia and the Politics of Race and Health*, 338. See chapter one. And also Alfred P. Kraus, Lorraine Kraus, and Jim Gibb Johnson, "Oral Interview with Alfred P. and Lorraine Kraus," Oral History, p. 1, The University of Tennessee Health Science Center Oral History Project, Memphis, TN on page 3.

would emerge and could be harsh. As one physician at a Houston charity hospital put it, "we are forced to treat the poor Negroes as another species, test animals, relics of the Stone Age not as sensitive as we to pain."[47]

Diggs extended charity to his sickle cell patients by not charging them. This was a help to his patients, but also encouraged them to return to him, thus providing him with a small but growing group of patients that he could follow and learn from. Charity existed as an ideal shared by physicians, in which doctor-patient relations were central and the doctor would offer without charge to treat those who could not pay. This image continued to be central to the American Medical Association as the ideal of the doctor as a professional.[48] Hospitals also reflected that ideal, but in practicality could not afford it, for even though the doctor might not charge a fee for services, the services of the hospital, including nursing, equipment, and laboratory supplies, did have a cost attached to them that was lost when the patient did not pay.

Unfortunately, the perspective of white physicians was often less than charitable toward blacks. A Texas physician wrote in 1916, "It must be evident, therefore, that the negro race is responsible not only for its own high rate of mortality, but must also bear some burden of responsibility for the dissemination of disease and death among the whites.[49]" Because of the reported population distribution, the author asserted that the

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[47] Joe Adcock and Cynthia Adcock, "Houston's Hospitals: The Smell of Charity," *Nation* 200, no. 1 (1965): 5-8. , Dowling, *City Hospitals: The Undercare of the Underprivileged*. See page 8 of Adcock for quote.

[48] Ludmerer, *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care*, Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry.*

[49] Marvin L. Graves, "The Negro a Menace to the Health of the White Race," *Southern Medical Journal* 19, no. 4 (1916): 407-413.

poor health of blacks was essentially a Southern problem, one that for whites was "greatly intensified by our negro population" He went on to say this: "When we remember that the negroes of the South, our servants in intimate association with our families from the cradle to the grave, are widely infected, we can begin to understand how innocent infections may be widespread."[50] The author concluded that the magnitude of the problem that the black population posed for the white population was as yet not fully appreciated, and called for additional efforts to define the problem more precisely.

Closer to home, the Memphis Superintendent of Health, L.M. Graves, reported in 1929 to the Shelby and Shelby County Medical Society on the public health picture in the city. Rather than present a comprehensive picture, he focused on the five top troublesome illnesses of the day: typhoid, malaria, tuberculosis, diphtheria, and scarlet fever. The worst of these, tuberculosis and typhoid, were of greatest concern, because of the high incidence and high death rates that he attributed both to non-residents and to Memphis blacks. The reference to the non-resident population was due in part to the fact that Memphis had the only big city hospital for over a one hundred mile radius, and also to the demographic pattern of migration from the countryside to the cities.[51] The situation regarding tuberculosis caused one doctor to state, "the negro is the most important factor that we should place under control, if we ever hope to control tuberculosis"; another

[50] Ibid. See page 412.

[51] Robert A. Divine et al., *The American Story*, 3d ed. (New York: Pearson Longman, 2007). See pages 665-6.

doctor agreed that "our plan of attack, especially in a population such as we have in Memphis, must give more consideration to the colored element."[52]

Among Diggs's main duties in his new position was to teach clinical pathology and to supervise the clinical laboratories of the Memphis City Hospital. He was considered a thorough instructor, the kind who was so well organized in his lectures that students could readily take good class notes.[53] The people of this city hospital were generally those who were sick and poor. There was one wing for whites and another for blacks, but at any given time, most of the patients in the hospital, around eighty percent, were black. These patients suffered from the wide range of diseases seen in public hospitals at this time. Sickle cell disease was still poorly understood, despite having first been described in 1910 (almost twenty years earlier), and it was considered rare. No one had any idea of the prevalence of the disease. Diggs had learned how to identify it microscopically in medical school, and was struck by the number of patients he now saw in Memphis; he wondered what he could learn that would help those suffering from the illness.

For the first few years at the University of Tennessee Medical Units, Diggs remained intrigued by a puzzle: the disease was striking in its presentation. It could manifest itself as chronic fatigue or jaundice, and in the abdomen, joints, and elsewhere in the body, but it was always accompanied by episodes of severe and excruciating pain. At the heart of the disease were the strange sickled and abnormally-shaped red blood

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[52] Lloyd M. Graves, "The Public Health Situation in Memphis," *Memphis Medical Journal* March (1929): 56-59. See page 59.

[53] Jerry Francisco and Richard Nollan, *Interview with Jerry Francisco, M.D.* (Memphis, TN: n.p., 2011).

cells. As was characteristic of his research style, Diggs's first instinct was to find out everything he could about the disease.

When he was with his patients he was not a scientist, but rather a physician intent on treating their illnesses by using whatever science was available and appropriate for the treatment. He used science as a sounding board for his own ideas to help people, and if a cause could be found that would lead to an intervention, such as a drug, then his task was to reach a therapeutic and positive outcome. By contrast, in the laboratory he was a scientist involved in the activity of producing new scientific knowledge, using the discipline of a scientist together with the laboratory tools that were available.[54]

In all, there was much to learn about the disease, and Diggs found himself immersed in sorting through the ideas about sickle cell that were presented in the literature. After his first attempt to treat the disease as a nutritional disorder with the liver extract he had brought with him from Rochester, he began working through the puzzle more systematically. At an annual meeting of the Southern Medical Association in 1931in New Orleans, he presented his first paper on the disease, focusing on the core problem, namely, the blood picture of the disease and its diagnosis. In the 1932 publication that grew out of this presentation, Diggs chose to begin by attacking the most common misunderstanding, that sickle cell is a rare disease. In his short time at the Memphis City Hospital, he had come to understand that sickle cell was a much more common disorder than was generally recognized. The reason for this, he said, was because "the condition is unrecognized, and a knowledge of the blood picture is

[54] Montgomery, *How Doctors Think: Clinical Judgement and the Practice of Medicine*, Kathryn Montgomery Hunter, *Doctor's Stories: The Narrative Structure of Medical Knowledge* (Princeton: Princeton University Press, 1991).

necessary for its recognition."[55] The disorder was not rare because the incidence was low, but rather because a greater effort was required by physicians to understand what to look for, which was the purpose of this paper. Diggs went on to make the point even finer:

> Although the characteristic hematological findings have been clearly stated in the past by Sydenstricker, Graham, Steinberg, and other students of the disease, there still occur in the meager treatment of the subject in recent reference books gross misstatements; and in the literature confusing terms and unwarranted generalities based upon inadequate evidence.[56]

Diggs's need for clarity in language, his desire to educate others, and his emphasis on scientific rigor were evident here and throughout this paper. Another of his principles was to base the paper on a complete review of the literature and to cull together sixty-four recorded cases, to which he added ten additional cases from the Memphis hospital.

Diggs drew a distinction between the illness as manifested in individuals having the familiar sickled and elongated red blood cells and showing the symptoms of the disease, and as manifested in those individuals possessing the trait but who were not ill. He argued that the latter category of individuals should be excluded from consideration for the time being, because information about it was still sufficiently confusing. Those individuals whose blood could be made to sickle in the laboratory by using Emmel's test, but who did not manifest the clinical features of the disease, were excluded from consideration in his first paper, because too little was understood about this aspect of the disease. The essential features of the disease that Diggs discussed included sickled cells, signs of red blood cell destruction, signs of red blood cell regeneration, and a chronic and cyclical recurrence of symptoms. He argued that these four conditions had to be present

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[55] L. W. Diggs, "The Blood Picture in Sickle Cell Anemia," *Southern Medical Journal* 25 (1932): 615-620.

[56] Ibid. See page 615 for this citation.

for any diagnosis of sickle cell, and by definition such a diagnosis could not include those with the trait, who did not have the active symptoms. Except for the ten patients that Diggs discusses, this paper was a review of the available literature and of all the cases that were reported for the common features that defined the disease, and of the statements made about the disease that were misleading and erroneous. In this latter regard, Diggs argued, far from being rare, sickle cell was quite common. He pointed out, "countless cases of sickle cell anemia have been missed or diagnosed hemolytic jaundice, pernicious anemia or von Jaksch's anemia because these obvious sickled forms were not present."[57]

Furthermore, this paper demonstrated Diggs's interest in medical illustration as a means of summarizing scientific information. Joseph L. Scianni, who joined the Department of Pathology years before Diggs's arrival, was the department's artist and the illustrator in this paper. Although no one lacked admiration for the microphotograph and the immediate realism that it conveyed, it also had its limitations, such as the momentary angle of the photograph (the inability to 'pose' a microscopic object) and the distortions in the surrounding medium. The subject being shot was usually not in the ideal position or completely free of flaws. Moreover, at this time the images were still black-and-white, which meant that the colors seen in the microscope that were crucial to scientific understanding were absent both for the clinician and the teacher. The powerful advantage of using an artist could be seen in the undistorted and colorful image that would result;

[57] The reference on Von Jaksch's anemia is characterized by anemia, high white cell count, an enlarged speen, and fever. By 1925 it was included under the heading of "thalassemia." See page 375-376 of: D. J. Weatherall, "Toward an Understanding of the Molecular Biology of some Common Inherited Anemias: The Story of Thalassemia." in *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas* (New York: McGraw-Hill Book Co., 1980), 373-414. For more on quotation at the end of the paragraph: Diggs, *The Blood Picture in Sickle Cell Anemia*, 615-620. See page 617.

this would in turn yield valuable information for the doctor. The artist's image might be idealized, but, so the thinking went, it was often a better rendering than any microphotograph could produce, because it could contain more pertinent and better-organized visual information than that in a photograph. Of course, the artistic illustrations were only as good as the artist and knowledge that produced them, which could date an image as scientific knowledge changed. Another drawback was that the artist must be medically as well as artistically trained, and to bring the artist's medical expertise to the required level was often more expensive and more time consuming than to take a photograph with a camera. Needless to say, the camera would become widely used, because of its mechanical, true-to-nature renderings as the technology improved. Photography and x-ray images were part of a broad social movement at this time, and much effort was being made to read meaning into these new mechanical pictures; this was no less true in medicine and the sciences in general. Artists such as Scianni in the Department of Pathology, Diggs's teacher at Johns Hopkins Max Brödel, and others would eventually disappear.[58] Diggs could accept the neutrality and the utter realism of the microphotograph, but he could also acknowledge the photo's inability to capture every aspect of the subject due to randomness or a messy symmetry of nature. The artist's rendering could ignore the imperfections and position the subject in the most advantage way; moreover, the subject could be colored in a way that black-and-white film could not capture.

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[58] Harry C. Schmeisser and J. L. Scianni, "Art as Applied to Medicine," *Journal of the Tennessee Medical Association* 19 (1926-27): 311-315. , H. C. Schmeisser, J. V. Caltagirone, and J. L. Scianni, "Graphic Art and its Application to the Teaching of Medicine: Animated Film," *Southern Medical Journal* 25 (1932): 886-888. , Max Brödel, "The Origin, Growth, and Future of Medical Illustration at the Johns Hopkins Hospital and Medical School," *Johns Hopkins Hospital Bulletin* 26 (1915): 184-190. , Daston and Galison, *Objectvity*.

Whereas Diggs's first paper sought to define the disease based on everything that was known at that time, his second paper began to focus on the process of the disease itself. In particular, it was concerned with the rate at which red cells sickle in someone with active sickle cell disease, as contrasted with someone having the trait (but not the active disease). Thus Diggs had succeeded in publishing several important papers by 1932 that established his reputation and commitment to sickle cell disease.

Diggs attitude towards money was acquired during his Methodist upbringing, namely, that money was to be spent carefully and only on things that were necessary. He sought ways the spend money more efficiently. This was in contrast to attitudes of the decade of the 1920s, which can best be characterized as the "get-rich-quick mentality" of the Roaring Twenties.[59] By 1932 the effects of the economic disaster had made themselves felt in full force in Memphis.

Diggs read widely to keep up with his areas of interest, especially anything that would help get him improve his understanding of sickle cell disease. In his perusal of the literature at the Mooney Library, he serendipitously came across a journal article in the *West African Medical Journal* that he found referenced in another article: this article presented a case of malaria with a marked splenic involvement in a two-year-old boy, a type of anemia known as "von Jaksch anemia" and found in children.[60] This form of anemia would later be renamed "thalassemia." Smith reported the autopsy findings, which included a detailed description of the effects of the disease on the patient's internal

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[59] Lynn Dumenil, *Modern Temper: American Culture and Society in the 1920s* (New York: Hill and Wang, 1995), Nollan, *Interview with Walter Diggs* See Dumenil for information about the Roaring Twenties, and the Diggs interview about the family.

[60] E. C. Smith, "A Case of Malaria with a Blood Picture Suggestive of Splenic Anaemia," *West African Medical Journal* 4 (1932): 69.

organs. Diggs wrote a letter to the editor of the journal, offering his assessment of Smith's findings of "definite jaundice, fever, and marked regenerative bone marrow activity," which, he suggested, since it was found in a young Negro, also fit the syndrome of sickle cell anemia. His letter was published, and in the following month Smith responded by quoting Diggs's own findings to the journal's readers.[61] This exchange would lead to the future collaboration and exchange of information between the two doctors, especially in understanding the role of the spleen in sickle cell disease. Diggs contacted many sickle cell researchers and would later claim to have been in contact and have met everyone involved in sickle cell research at one time or another.[62]

An example of the ways in which Diggs became acquainted with other researchers was his presentation of a paper (published in 1933) on the pathology of sickle cell disease at the Southern Association Conference in Richmond. There he spoke for the first time on the likely cause of the anatomical lesions and painful crises that he and others had noted. His observations revealed the possibility that the distorted red cells were packing together and causing capillary infarction, namely blockage that prevented blood flow and resulted in tissue death in the surrounding area. "A possible explanation of the capillary engorgement is that the elongated and spiked cells interlock and pass with more difficulty through narrowed spaces than do normal cells."[63] It had already been noted that the sickling process happened in the absence of oxygen, Diggs continued, and this might account for the spontaneous appearance of painful episodes occurring

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[61] E. C. Smith, "Letter to the Editor," *West African Medical Journal* (1933 June 21 1933)

[62] Mabry and Diggs, *History of Medicine in Memphis: Interview with Dr. Lemuel Whitley Diggs*

[63] L. W. Diggs and R. E. Ching, "Pathology of Sickle-Cell Anemia," *Southern Medical Journal* 27 (1934): 839-845. See page 340 for quote.

anywhere in the body.[64] Once the sickled cells formed packs, thus slowing and stopping the flow of blood, the level of oxygen in the area declined, creating a condition that prompted the increased sickling to occur. Research results such as these stimulated the thinking of other doctors, in turn leading to cross-fertilization of ideas and hypotheses, and moving the subject of sickle cell anemia and its treatment further towards the foreground of discussion by members of the medical-scientific community at that time.

The impact of this capillary packing of red cells led to another, unfortunate but instructive incident involving the surgical removal of a spleen as a last resort to help a young woman with sickle cell symptoms that began early in life and had persisted. "At school and while working in the cotton fields, the patient tired more easily than other children and took little part in their play."[65] Every therapy was tried to alleviate the young woman's condition, but to no avail. Diggs noted that the young woman had what he thought was an enlarged spleen. As a last resort, Diggs considered allowing the surgical removal of her spleen. Sickle cell patients with enlarged spleens were thought to be anemic, in part because of the sickling of the red cells, which were removed by the body's immune system, and also by a malfunctioning spleen, which many thought withdrew and eliminated normal red cells. "People who had severe anemia and had jaundice associated with anemia and other diseases, hereditary spherocytosis (red cells that are spherical instead of biconcave), were profited sometimes if you removed this big spleen which was a destroyer of red cells, and you could help to restore their balance and

[64] Diggs, L.W. 1934.

[65] R. E. Ching and W. Diggs. L, "Splenectomy in Sickle-Cell Anemia; Report of a Case with Necropsy in an Adult on Whom Splenectomy was Attempted," *Archives of Internal Medicine* 51 (1933): 100-111. See page 101 for quotation.

make them less anemic."[66] The Chief of Surgery Lucius McGehee performed the surgery with assistance from the Chief of Medicine J.E. McElroy. Because of the historic nature of the operation, it was performed in the surgical amphitheater with the senior medical students invited to observe. After opening the abdomen, Dr. McGehee was unable to find the spleen. What had appeared to be a large spleen on physical examination turned out to be an enlarged liver that had extended over into the area of the abdomen that included the spleen. "Perspiration broke out over his forehead, and his brow was repeatedly wiped by the operating room nurses. He enlarged the incision, resected a rib, and shifted his retractors to get better visualization." All to no avail. In frustration, McGehee was heard to mutter that he would eat the spleen, which normally weighs 150-200 grams, if it weighed 10 grams. The Chief of Medicine could not resist a joke at the expense of the hapless surgeon by pointing out that "we would do better if we had more competent surgeons."[67]

Despite every effort, the young woman died the following day; after her death an autopsy was performed. Hoping to salvage something from the previous day's embarrassment, Dr. McGehee attended the autopsy to continue his search. This time he was rewarded with success. The spleen was found adhering to the diaphragm, small and almost unrecognizable. It weighed 7.5 grams. Thus, Dr. McGehee did not have to eat it, but it raised an important question in Diggs's mind: How could an organ shrink to almost nothing on its own? Diggs published the negative findings of this surgery along with a review of the literature on similar splenectomies, in which he argued against removing

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[66] Mabry and Diggs, *History of Medicine in Memphis: Interview with Dr. Lemuel Whitley Diggs* See page 14 for quotation.

[67] Diggs, *XXXI. Clinical Pathology*, 239-264. . See page 253-254 for quotation.

the spleen until much more was learned about its role in the disease.[68] "If left alone, they will in effect 'splenectomize' themselves without the benefit of surgery."[69] His interest in and growing knowledge about this mysterious disease was deepening.

This surgical experience was reported in the *Archives of Internal Medicine* and was followed by articles about other instances of spleens that seemed to just disappear. Diggs was thus motivated to try to work out "what the sequence of events [was] in the spleen that first was large and later became small." There was another case in which the spleen shrank to a size that made it impossible to find: "We traced the place where it ought to be and made sections of a little scar tissue where it ought to be and it wasn't there." The experience of seeing an entire organ disappear spurred on Diggs's interest in this disease. "I tried to know why in the world that spleen had disappeared or had gotten so small." He understood that infarctions were caused by the bizarre shapes of red cells, together with the cells' sensitivity to low oxygen levels, but if this could happen to the spleen, what could be occurring in any of the other organs in the body? "In other words, the spleen can actually disappear in these people on account of the fact that the sickled cells plug up the capillaries and the spleen just doesn't have blood supply and it just atrophies and goes away." Starting from this point, Diggs's focus was on the effect that the disease had on organ systems, and this focus would continue for the remainder of his career.

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[68] Ching and Diggs. L, *Splenectomy in Sickle-Cell Anemia; Report of a Case with Necropsy in an Adult on Whom Splenectomy was Attempted*, 100-111.

[69] L. W. Diggs, "Siderofibrosis of the Spleen in Sickle Cell Anemia," *Journal of the American Medical Association* 104 (1935): 538-541. See page 11 for quotation.

In these years from 1929 to the 1950s, Diggs did not have a formal relationship with the African-American community. He was preoccupied with learning his responsibilities as a faculty member, teacher, clinician, and laboratory supervisor. As an assistant professor, his duties were limited to conducting research and publishing in the medical journals, teaching, seeing patients, and serving on campus committees and in professional organizations. Diggs chose to do active research in conjunction with his clinical duties even though it was expected but not encouraged; he did not have a quota of publications to meet, and did not necessarily have to publish in the major medical journals. Promotion in rank was often treated as a perfunctory activity and usually at the discretion of the department chair. Faculty members were sometimes informed of their promotion without the knowledge that they were even being considered for promotion.

After the clinical and research work, the bulk of Diggs's time was spent on teaching. In 1930 the campus changed its curriculum from a two-semester to a four-quarter program. A four-quarter program had been discussed for several years at a number of medical schools. The chief business officer, O.W. Hyman adopted a plan that incorporated the maximum flexibility for students, which was achieved by offering all of the courses in the medicine curriculum in every quarter. The advantage for students was that they could complete their degrees in as little as three-and-one-quarter years. In addition, if they needed to earn money for tuition or living expenses, students could opt out at the end of any quarter and resume their studies one or two quarters later without having to repeat any courses or risking the loss of any academic standing. The clear disadvantage to the faculty was that the new system increased teaching loads by requiring

them to teach all courses every semester.[70] Such an increase in the working load for faculty was burdensome and came at a time when the Tennessee budget would not allow the hiring of additional faculty.

Just as the Great Depression exposed the weaknesses of the American economic system, it starkly exposed the weaknesses of the health care system. If the loss of capital and unemployment was bad, it was in all aspects worse for blacks, because they had access to fewer resources and were assigned a lower social position. The only people less informed about sickle cell disease were blacks, who were undoubtedly familiar with symptoms they could not understand, but who had no means to find doctors who would treat their symptoms. The symptoms of this disease were debilitating and recurring, which meant a considerable expense for the sufferers. Their hospital stays were longer, ranging from several days to several weeks: by 1917 hospitals in Memphis were already charging all patients two dollars for routine blood and urinalysis tests.[71] For someone earning little or nothing, it would be easy for a visit to the doctor or the hospital to amount to a week's or a month's income.

In order for Diggs to study sickle cell in his patients, he needed to have systematic access to them over a long period of time. It was not enough for him to see patients as

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[70] O. W. Hyman, "The Tennessee Four-Quarter Plan," *Journal of the Association of American Medical Colleges* 4 (1929): 300-7. , L. W. Diggs, "The Four-Quarter System at the University of Tennessee," *Southern Medical Journal* 29, no. 10 (1936): 1014-1020. , O. W. Hyman, "The Influence of Recent Changes in the Distribution of Physicians upon the Conditions of Medical Practice in Tennessee," *Memphis Medical Journal* 9 (1932): 93-96. Hyman was concerned about the steadily declining numbers of physicians working in rural Tennessee communities. He believed that the four-quarter system would make medical education affordable to lower income students and that seventy percent of these students would return to their home communities after graduation. If so, he reasoned, the four-quarter system would assist lower income men to seek a medical degree and help reverse the demographic shift of doctors from the countryside to the city.

[71] Bruesch, *The Simon R. Bruesch Collection.* See folder SRB 024-05, page 8.

they appeared in the hospital; he would need to follow them over a period of time. This was a daunting task, considering that his patients were often unable to come to the hospital, either because they did not understand the nature of their illness or, just as often, they could not afford to pay the hospital and doctor fees that would be required of them. There was no research funding for a disease that no one considered important. The disease was expensive for families because of the recurring, painful crises that required the attention of a physician, and often the crises were so severe that they required admission to a hospital for several days or weeks. "Transportation, laboratory tests, medicines, and sometimes the cost of intravenous solutions and/or transfusions" added to the cost of the disease. "Any single crisis requiring intravenous therapy may cost more than the total weekly earnings of the family." Although irregular, crises could occur as often as four to six times per year. Surgical supplies and complications, such as gallstones, blood in the urine, osteomyelitis, pulmonary emboli, and so on, could also add to the medical expense. Moreover, absence from school and inability to participate in childhood activities interfered with the education and training of the sufferers, and could lead to an inferiority complex. In general, sickle cell patients were handicapped and needed to plan their life's work accordingly. They needed to have a job that allowed them to contribute to their support, but not jobs with sustained physical exertion, such as heavy lifting, or exposure to extreme heat, cold, dehydration or low oxygen environments, such as stewardess training. Sickle cell posed a challenge for employers, because recurrent illnesses caused the afflicted to miss too much time from their work; hence jobs that did not require daily, uninterrupted attendance were ideal. Given the challenges facing the people with the disease and doctors seeking to learn more about it, Diggs quickly realized

that part of the solution for coping with this disease lay in the education of everyone involved, including patients, families, health care personnel, teachers, social and welfare case workers, rehabilitation and job-training counselors, and insurance companies.[72]

There was genuine suspicion in the black community about doctors who might experiment on patients out of an overzealous sense of scientific curiosity; this sentiment was deeply seated and widespread. For a physician such as Diggs, who was seeking the participation of his patients in scientific studies, the task was one of convincing them that his motives and procedures were the highest and noblest. At this time in American medicine, the profession expected that patients be asked for their consent before participating in any kind of study should, although it was less clear to what extent they should be fully informed of the consequences of the study to which they were agreeing. In general, consent was left up to the discretion of the physician.[73]

Despite the high regard that medicine enjoyed and in the absence of any codified policy of informed consent in any kind of investigation, there were lingering fears in society in general about medicine's "true" aims. Prisoners, orphaned children, and those deemed "idiots" were involved in scientific experiments in the absence of any formal guidelines and without their full knowledge of the risks they were taking. An organized response to these concerns was the antivivisectionist movement, which began in the last quarter of the nineteenth century and lasted through the twentieth century. It raised

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[72] L. W. Diggs and Ernestine T. Flowers, *The Socio-Economic Problems in Sickle Cell Anemia* (Memphis, TN:, 1976).

[73] Perhaps the Tuskegee Project is the starkest reminder of the extent of medical racism at this time. The longest non-therapeutic medical project began in 1932 in Alabama and continued to 1972. See: Susan Reverby, *Examining Tuskegee: The Infamous Syphilis Study and its Legacy* (Chapel Hill: University of North Carolina Press, 2009).

important issues concerning who should be allowed to participate in medical research and under what circumstances. "For the antivivisectionists, exploitation was the issue."[74] This public concern must have played a role in the minds of Diggs's patients. At the same time, physicians felt the criticism as an attack on the science they were so closely allied with and the very integrity of their charge to help those afflicted. One prominent Memphis physician reacted this way to groups opposing experimentation:

> One of these is a society whose influence is felt even in the American Congress called Anti vivisectionists whose sole purpose seems to be to block the way at the very threshold of scientific research and who regard the lives of beasts and birds or the bodies of the dead as being more sacred than the lives and health of human beings. For without a knowledge of anatomy there could be no knowledge of disease without experimental therapeutics no knowledge of cures and without vivisection no advance in surgical procedures.[75]

Arguments on both sides were passionate and persistent. Diggs would have to work very hard to overcome public attitudes and the "Jim Crow" prejudice of the day to assure his patients that his work was in their best interest and would not harm them.[76] He had the achievements of medicine on his side. Clinical medicine was well established by the 1920s and 1930s as evidenced by the discovery of insulin, sulfa drugs, and the new treatments for pernicious anemia that were part of the cascade of innovations trumpeted in the public media. He would have to take pains to ensure that he secured the consent of

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[74] Susan E. Lederer, *Subjected to Science: Human Experimentation in America before the Second World War* (Baltimore: Johns Hopkins University Press, 1995) See page 111 for the quotation.

[75] I. A. McSwani, "Some of the Opposing Forces to Rational Therapeutics," *Memphis Medical Monthly* 25, no. 9 (1905): 467-472. For the quotation see page 468.

[76] J. Wasserman, M. A. Flannery, and J. M. Clair, "Raising the Ivory Tower: The Production of Knowledge and Distrust of Medicine among African Americans," *Journal of Medical Ethics* 33, no. 3 (Mar 2007): 177-180.

those who would work with him at a time when there were no formal guidelines to direct him or any physician concerning how his work was to be done.

Sickle cell disease was reasonably well defined in terms of the symptoms that distinguished it from every other disease. The pieces of the puzzle were there, but what was lacking was a convincing way of explaining how the pieces fit together. The most striking piece, the sickle-shaped red cells, served only as a marker for the disease, but shed little therapeutic light. There existed no understanding of how or why the cells became deformed in this way, and no way to explain *how* or even *if* these deformities contributed to the illness. In broad terms, Diggs was trying to advance his understanding of a crippling disease during a decade, the 1930s, that can probably best be characterized as being concerned with anatomical development of the disease in the body, its natural history, and the ways that these changes manifested themselves physically in the signs and symptoms that the patient or the doctor might recognize.

As Diggs became more knowledgeable about sickle cell disease, and with his wife becoming acclimated to the campus, the city, and the university, it became clear to him that understanding the disease would require more than just a medical understanding. He would also have to include an understanding of the individual and social contexts of the disease, and for him to accomplish this would require long-term follow-up visits by his patients to monitor the manifestations and natural history of the disease. As he established himself at the university and in the community, he would have to find ways to broaden his investigation of the disease, as well as educate his colleagues. At the same time, there were new ideas in the air that he would be called upon to implement, such as

the recent opening of a new blood bank at Cook County Hospital in Chicago, which he would duplicate in Memphis. He was thirty-eight, and about to enter his peak years.

CHAPTER FOUR:

LABORATORY MEDICINE AND BLOOD TRANSFUSION

Ah, but a man's reach should exceed his grasp,

Or what's a heaven for?

Robert Browning, Andrea del Sarto

Diggs worked through most of his first decade with the University of Tennessee to establish himself as a faculty member, and build his reputation as a physician. He was known for his interest in sickle cell. In publications and conferences he had focused on what was known about the disease, how it was clinically defined, and the indications for further study in order to find a cure. He knew most, if not all, of the sickle cell researchers in the world, and communicated with them regularly about the disease. He was well aware of the fact that sickle cell carried a stigma with it, which made it difficult for his colleagues in Memphis and elsewhere to appreciate what he was doing. But if sickle cell was an 'invisible' disease at this time that made it hard for him to promote himself professionally, changes in blood banking and blood transfusion were about to put him in the public light. These changes would also contribute to the growing body of knowledge about this devastating disease.

Diggs's professional work included other diseases of the blood, such as leukemia, blood coagulation, blood group compatibility diseases, bone marrow diseases, and bleeding disorders. Because of his active involvement in treatment for these diseases, his reputation was growing. For example, in 1937 he provided a local lawyer, W.E Quick, with a medical opinion in the case of a twelve-year-old girl who had been injured in a playground accident and subsequently diagnosed with chronic myeloid leukemia, "in

which the marrow or myeloid cells of the body are involved." The lawyer's concern was whether the trauma of the playground accident caused the disease, to which Diggs responded in a five-page, single-spaced letter that it could not have caused the disease. Using his instincts as an educator, he instructed the lawyer on the natural history of the disease, and laid out all the essential details before giving his professional opinion.[1]

As his work and reputation were growing, so was his family. Beatrice gave birth to their first son Walter in 1932. Two years later, John was born, and after two more years Lemuel and Beatrice produced a daughter Alice. During the depression, salaries were first reduced and then remained flat for many years. Diggs felt the need for added income to support the needs of his growing family. He wanted to build a family environment that included a home with enough land for a garden. He had worked in his family's garden as a boy in Hampton, Virginia, but in the economically depressed times of the 1930s a garden offered the added benefit of providing inexpensive food for his family. Over the years, the garden would be a fixture of the Diggs household that he would often refer to as his "country club."[2] By 1933 after his first son Walter was born, he had purchased his first home on Evergreen Street.

Just as the Diggs family was changing, so was the environment at the University of Tennessee and in Memphis. After seventy years of service to the Memphis community, the city slated a new building to replace the Memphis City Hospital about a block away on Madison Avenue. Teresa Gaston, the wife of a well-known Memphis businessman, donated part of the money for the new building. When she died, she stipulated that a part of her inheritance should be used to build a new city charity hospital

[1] See the letter from Diggs to W. E. Quick, October 11, 1937 in folder LWD 002-06-04.

[2] *Interview with Walter Diggs*, Richard Nollan, 2011.

to be named after her husband John. Plans were begun as early as 1934, but, although sizeable, the amount of the inheritance was not enough to meet the projected cost of the new building. Local and state agencies were without resources, because their revenue sources, such as property taxes, had dried up. Like many local and state governments, Memphis turned a wary eye to Washington for support. The Memphis City government decided to take advantage of the help from the federal government through the Public Works Administration, one of the many new programs started by Franklin Roosevelt's administration to assist in major building projects. With the help of the WPA, the John Gaston Hospital opened its doors to the public in 1936.[3]

For Diggs, the new hospital offered welcome advantages in terms of patient care. He noted that, unlike the old city hospital with its centralized laboratory facilities, "small subsidiary laboratories were installed [in the Gaston Hospital] as functioning units of each ward with the idea that laboratory procedures could be rapidly performed in convenient locations."[4] The benefit to patients and students was obvious to Diggs, because he evaluated hospital settings in terms of the efficacy of patient care. His heart clearly was in patient care and clinical pathology. These subsidiary laboratories would also have been a teaching advantage by making it quick and easy for students to perform standard and simple tests for immediate results. However, the city categorized functions performed by students as "teaching," and as such considered that the cost of the

[3] John Gaston, , 10/1/2011 2011 <http://www.memphishistory.org/People/TheBrave/JohnGaston/tabid/162/Default.aspx>., Roger Biles, "The Persistence of the Past: Memphis in the Great Depression," *The Journal of Southern History* 52.2 (1986): 183.

[4] L. W. Diggs, "XXXI. Clinical Pathology," *History of Medicine in Memphis*, ed. Marcus J. Stewart, William T. Black, and Mildred Hicks (Memphis: Memphis and Shelby County Medical Society, 1971) 239-264. See page 246 for quotation.

subsidiary laboratories should be borne by the university. But the university was unable to afford this cost. At the same time, students objected to performing tests on patients that were not their own. Despite Diggs's support of the educational and patient-care advantages of these subsidiary laboratories, all of them were closed except the laboratory in the Emergency Unit and the Medical Student Laboratory. "In these laboratories, physicians in training still have the opportunity to see and to learn about the value of immediate answers to immediate problems, and the information that can be gained by simple chemical and microscopic procedures."[5] This struggle over city and state responsibility for expenditures would manifest itself in other too ways over the years.

It was probably under the circumstances of the depressed economy and the need for the campus's business manager and Dean, O.W. Hyman, to run the campus as inexpensively as possible, that faculty compensation likewise remained flat. As part of his contract with the medical school, Diggs was allowed to see a limited number of private patients, but this source of income was restricted by his choice of patients, many of whom could not pay him. He wanted to see his income increase, in recognition of his contributions to the profession and the university. Diggs had never been interested primarily in making money, but he needed it for his growing family. He could have gone into private practice, or chosen a more lucrative disease to investigate than sickle cell , or selected wealthier patients for the limited private practice he was allowed to maintain. The situation on the University of Tennessee campus was not dire, but the Depression may have tested the will of the state legislature to continue to support this expensive and relatively new branch of the university system. The faculty was composed of volunteers

[5] Diggs, 239-64. See page 246 for quotation.

with only a handful of full-time professors, Diggs among them. The hours were long and the money was short.

During the Depression years, many faculty members were satisfied just to have jobs. Nevertheless, the medical curriculum was heavily weighted toward education, with little support or encouragement for research. At least part of the problem for Diggs at this time was the academic structure adopted for the campus in 1930, known as the four-quarter plan. As Diggs knew, the idea for the plan grew out of a desire by many, mostly non-medical colleges and universities, to take advantage of the idle summer months and make more efficient use of the campus facilities. A third of the year, it was felt, was wasted because of a tradition that dated from a period when students would be called upon to work on their family farms. Since fewer and fewer of them were spending their summers on the farm, or even in the countryside, the idea emerged of using this time to expand the curriculum to one that was year-round.

What made Hyman's plan for the medical school different was the requirement that all courses be taught in every quarter. The advantage for the students was plain. If they could afford to do so, they could complete the traditional four years of medical school in only three-and-one-quarter years. If students could not afford to pay the tuition for an upcoming quarter, they could leave the program after any quarter to earn money, and then continue in the following quarter without any penalties or missing any courses. As Hyman noted, "earning periods may be alternated with study periods and the two may be varied to secure any desired sequence."[6] A number of professional athletes--football players and golfers--completed their medical degrees during the off-seasons of their

[6] O. W. Hyman, "The Tennessee Four-Quarter Plan," *Journal of the Association of American Medical Colleges* 4 (1929): 300-7. See page 302 for quotation.

sports. As an administrator concerned with the decreasing number of physicians practicing in rural areas and, as a consequence, the aging of those remaining in small towns, Hyman believed that three out of four Tennessee boys with roots in small towns would, if given an affordable medical education, return to their hometown communities to practice medicine. "We have consciously modeled our curriculum so as to strengthen the training of graduates for practice in communities where they could not rely upon others for diagnostic aid or for help in the cure of their patients."[7] Twenty-five students were admitted per quarter and there were four graduations each year. Tuition was kept low to make medical education affordable for middle- and low-income boys in Tennessee. Based on twenty years of data, Hyman believed that three out of four graduates would return to their small towns and rural homes to practice medicine. Hyman understood the importance of seeking to find ways to return medical graduates to their rural Tennessee roots. As one historian noted, "the chief 'manpower' issue of American medical practice in the 1920s and 1930s was felt to be the inadequate distribution of doctors to rural areas and small communities, not the over production of specialists."[8] Despite this admirable goal, the four-quarter plan came at a price.

The price of the four-quarter plan became a disadvantage for Diggs and the faculty, because it meant more teaching hours and no prospects of hiring extra faculty members to offset the increased teaching load. As a result of the increased emphasis on teaching, research and scholarly achievement were discouraged. Diggs's five-year

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[7] O. W. Hyman, "The Influence of Recent Changes in the Distribution of Physicians Upon the conditions of Medical Practice in Tennessee," *Memphis Medical Journal* 9 (1932): 93-6. See page 94 for quotation.

[8] Kenneth M. Ludmerer, *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care* (Oxford: Oxford University Press, 1999). See page 99 for the quotation.

assessment of the four-quarter plan was at odds with Hyman's conception, because the former was convinced that research and scholarly activities were essential to a well-educated faculty and its ability to teach students competently. The more subtle point in Diggs's reasoning was that the school was purposefully teaching physicians to diagnose and treat patients without using laboratory tests--in preparation, as Hyman put it, for a career in a small community. This flew in the face of the growing need for medical technologists. As Diggs would note:

> The danger of the four-quarter system is that the advantages to the student, to the intern, to the hospital and to the state will be at the expense of the faculty, and that the advantages gained in one direction will be lost in another. Increased teaching and administrative duties, imposed by the system, unless counterbalanced by the increase in the size and caliber of the staff, will lower the standards of higher education and lead to an inferior quality of instruction.[9]

The Medical Units earned a reputation for producing well-educated and capable clinicians, but was not widely appreciated for its contributions to research.

Diggs's family was growing, along with his interest in clinical pathology and medical technology. Clinical pathology centered on the disease process in an individual patient, and laboratory testing very often facilitated the diagnosis. By the late 30s, hospital physicians were ordering multiple tests on patients, often nearly every available test, whether they needed them or not. "The level far exceeded that which was necessary for education, research, and the care of the sicker patients."[10] Hospital physicians were excessive in the tests they ordered, often with the excuse that ordering every test would cover unusual or unexpected findings. In doing so, they failed to follow their own rational

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[9] L. W. Diggs, "The Four-Quarter System at the University of Tennessee," *Southern Medical Journal* 29.10 (1936): 1014-20. See page 1018 for quotation.

[10] Ludmerer, *Time to Heal.* See page 100 for quotation.

and scientific approach to caring for the sick by neglecting to teach their residents and interns which laboratory tests were likely to contribute to an understanding of a patient's illness. This overuse of diagnostic tests was already beginning to contribute to the exponential increase in the cost of American medicine.[11]

As laboratory tests began to proliferate, Diggs also began to see an increasing need to train technicians to perform those tests as part of the medical school curriculum. He knew that the days of doctors feeling threatened by the laboratory were disappearing, and were being replaced with a reliance on and expectation that laboratory testing would be available any time of the day or night. His preference was for simple tests that could be performed even in the absence of a laboratory. This part of his thinking was consistent with Hyman's image of the community physician. But Diggs also recognized the growing number, importance, and sophistication of testing that would enhance diagnostic and therapeutic evaluations. The need for assistance in the laboratory in the form of a technologist to perform tests routinely and competently was growing in his mind.

Although Diggs was hired initially in the Department of Pathology, he actually was certified in internal medicine. His believed that clinical pathology, with its patient-oriented use of laboratory techniques, represented a well-defined area within the general field of pathology. Clinical pathology used chemical analysis and other laboratory procedures for the diagnosis and treatment of disease. A professional organization representing clinical pathologists was formed in 1922; Diggs came to feel more at home in this group than in the general field of pathology. Many of his publications in this area were contained within the pages of the journal produced by the *American Association of Clinical Pathologists*. His chair Harry Schmeisser could not see clinical pathology as a

[11] Ludmerer, *Time to Heal.* See pages 100-101.

separate field, but rather viewed it as an indistinguishable part of the field of pathology as the study of the nature and cause of disease based on the changes in structure and function in the body. However, as the number of tests and the demand for them grew in Memphis in the twentieth century, the earlier resistance to laboratory tests and their role in clinical care were gradually being replaced by the value and the necessity of them as a part of patient care.

The importance of patient care, as compared with contributing to the general knowledge of the natural history of diseases, had always motivated Diggs. In the late 1930s, he began arguing in favor of the training of medical technologists as a part of medical school education, to replace the number of poorly trained technologists as quickly as possible, and to alleviate the projected future need of trained technologists to perform standard tests more frequently and more efficiently than the physicians requesting them. Technologists were also important, as the fees charged for hospital tests represented a growing revenue stream for hospitals. The days of thinking that doctors were lazy for relying on laboratory tests for their clinical work were being replaced by the belief that clinical medicine could not operate effectively or in the patient's best interest without the use of laboratory tests.[12] As a result of his difference of opinion with Schmeisser, Diggs transferred in 1937 to the Department of Medicine.[13]

Because of its location, Memphis was vulnerable to a range of natural disasters that included thunderstorms, tornadoes, floods, and epidemics; for the people of the city, the memory lingered of the terrible yellow fever epidemics of the 1870s. At the same

[12] L. W. Diggs, "The Training of Medical Technologists as a Function of the Medical School," *Southern Medical Journal* 35 (1942): 1104-7.

[13] See Bruesch's pathology department notes in folder SRB 024-04 and SRB 024-05.

time, there were man-made disasters, such as fires, acts of violence, and various kinds of accidents. All of these events created situations in which patients would require the replacement of lost blood. Dramatic scenarios related to such disasters and their resulting injuries were familiar to hospitals in the 1930s, and were a part of Diggs's professional environment.

It was at about this time that medical technology became an important focal point for the application of scientific knowledge about blood group compatibility (as a component of patient care in medium and large city hospitals) to the problem of transfusing blood safely. From his readings, Diggs understood that by the mid-1930s increasing numbers of hospitals were beginning to create and staff internally operated blood banks. Russian doctors had reported success at using cadaveric blood for transfusion, and blood banks had been reported in Spain during the Spanish Civil War.[14][15] It was evident that the scientific knowledge about preserving and transfusing blood had reached a point at which it conceptually could validate the creation of blood banks. The supplies and testing technology to support blood banking were available in every hospital. Perhaps most importantly, as with any new innovation, the task of managing an actual blood bank meant learning about the many unforeseen problems that would arise, and taking advantage of the new opportunities that presented themselves. The time had come when the feasibility of safely storing blood for later, just-in-time transfusion was at hand. Diggs opened the first blood bank in the South on the sixth floor

[14] Diggs, 239-64 See the section on transfusion pages 255-264. Diggs was an academic researcher with a habit of reviewing all relevant medical literature in all questions that interested him.

[15] J. R. Hess and P. J. Schmidt, "The first blood banker: Oswald Hope Robertson," *Transfusion* 40.1 (2000): 110-3.

of the John Gaston Hospital in 1938. Transfusions could begin in a matter of minutes for anyone in need of one. It is a testament both to Diggs's commitment to alleviating the suffering of patients, and to the confidence the Memphis medical community placed in him, that he was the doctor positioned to nurture the first blood bank in the South—a major historic event—into being. Diggs was farsighted and surely at the cutting edge of innovations in medicine at this time.

Blood is culturally the most value-laden of all the body's component parts, with the possible exception of the heart. Of all the organ systems it is the most recognizable. All people have experienced bleeding at some point in their lives, even in as simple a way as seeing their blood flow from a cut in the skin. But blood as a substance connotes much more than a red fluid of the body. Blood as a myth and symbol of life is deeply rooted in our thinking and has manifested itself in various ways throughout Western tradition. It participates in the language of lineage and race: blue blood, bloodlines, flesh-and-blood, bad blood, and blood (as in kinship) are examples that indicate the sense of hereditary and profound connections that bind people together or separate them, an ancient human feature that has endured through the centuries.[16] Given the powerful cultural meanings associated with the concept of blood, it should be of little wonder that the opening of a blood bank would spark a keen interest among the citizens of Memphis. What would this event mean? How would the donated blood be acquired, stored, and transfused? What guidelines would be used to determine who received it? Moreover, who would write these guidelines? People sometimes hold a lingering perception that

[16] Sarah E. Chinn, *Technology and the Logic of American Racism: A Cultural History of the Body as Evidence* (London: Continuum, 2000) 233., Louis Diamond, "A History of Blood Transfusion," *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas*, ed. Maxwell M. Wintrobe (New York: McGraw-Hill Book Co., 1980) 659-688.

what happens in the sciences happens in a world that operates within its own set of rules, its own methodology, and that it remains somehow separate from the extra-scientific world. Yet, as exemplified here, this is never quite the case. Technologies are never produced in the absence of or apart from the society in which they originate. Diggs and other doctors witnessed the unnecessary deaths of their patients due to a lack of availability of appropriate blood that could be transfused into them quickly and safely. Their desire to save lives and also advance the understanding of blood as a vital organ served as wellsprings for the creation of a blood bank.

For centuries, blood was promoted as a therapy for a range of disorders that had nothing to do with blood loss, such as lunacy, fits, palsy, melancholia, and bad disposition. In part, this practice was due to the belief that ill health was caused by bad humors that were poisonous, either due to imbalance or to a mysterious change in their composition. But whatever the cause, it was thought, someone with an ailment might benefit from the removal of the "bad" blood and its replacement with "good" blood, whether from a young, healthy person or an appropriate animal, such as a lamb. Physicians gave animal blood as a substitute for human blood on the assumption that by doing so, some desired quality of the animal, e.g., lamb's calmness or a dog's alertness, would be transfused as a component of the blood into the recipient.[17]

After William Harvey's hypothesis in the early seventeenth century that blood circulated in a closed system of the body, the focus by physicians turned to getting blood

[17] Douglas Starr, *Blood: An Epic History of Medicine and Commerce* (New York: Alfred A. Knopf, 1998)., Susan E. Lederer, *Flesh and Blood: Organ Transplantation and Blood Transfusion in 20th Century America* (Oxford: Oxford University Press, 2008)., L. K. Diamond, "History of Blood Banking in the United States," *JAMA : the journal of the American Medical Association* 193 (1965): 40-4.

into and out of the body through the system of veins and arteries. Clumping was the most vexing problem. Once motionless, blood began to form clumps, which interfered with its free flow; the clumps had to be removed. This, in turn, significantly reduced that the amount of blood left to transfuse. Before administering the blood, some physicians would stir it with a whisk or eggbeater to force the clumps to form, and then they would remove them. In the last half of the nineteenth century, physicians at Johns Hopkins would collect blood in Erlenmeyer flasks containing glass beads, which would cause the blood to clot, and thus make it easier to remove by filtering.[18] Another way around the problem was to try substituting milk or a saline solution as an alternative to blood.

As it became clear that animal blood was incompatible with human blood, the focus of physicians narrowed to transfusion solely between humans. The technique used in the nineteenth century was called the "direct method," which was a procedure in which the donor's artery was exposed surgically and connected to the recipient's exposed vein, either by suturing or by a cannula (a short length of tube). The advantage of this method was that it allowed a direct flow to the recipient, while avoiding clumping or any mixture of air. However, the procedure required skilled surgeons and numerous staff assistants. It also meant that the donor and recipient had to be in very close physical proximity to each other. Because of this arrangement, the outcome rested on the surgeon's judgment as to how much blood had been transfused, because there was no way to measure how much blood passed from the donor to the recipient.[19]

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[18] Starr, *The Social Trnasformation of Medicine,* and Lederer, *Flesh and Blood.*

[19] Diamond, "History of Blood Transfusion," 659-88

The history of blood banking in the twentieth century began with the intersection of three historical innovations. The first was the centuries-long desire by physicians to understand the nature of blood and its role in the body. Karl Landsteiner's discovery of blood types around 1900 gave an understanding of the composition of blood that made transfusion predictably safe.[20] The second innovation involved the availability of equipment, such as rubber tubing, flasks, rubber stoppers, and stopcocks (valves), which controlled the flow of blood in a more convenient and safe way. The third innovation was the realization that sodium citrate could be used as an anticoagulant, which eliminated the problem of clotting while the blood was in storage. Along with refrigeration, this ensured the preservation of blood for a week to ten days at a time.[21]

With these three innovations readily available, blood transfusion centers were theoretically possible. The first continuously operating blood bank in the United States was opened at the Mayo Clinic in 1935.[22] Subsequently, a blood bank was established in the Cook County Hospital in Chicago in 1937, followed by others in Philadelphia and Los Angeles.[23] In this remarkable context, the first blood bank in the South was opened in Memphis at the John Gaston Hospital on Monday, April 25, 1938. At this time Memphis had the highest mortality rate among women in childbirth of any city in the

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[20] Diamond, 659-88, Louis K. Diamond, "The Story of Our blood Groups," *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas*, ed. Maxwell M. Wintrobe (New York: McGraw-Hill Book Co., 1980) 691-717.

[21] Lederer, 235; Diamond, 659-88

[22] S. B. Moore, "A brief history of the early years of blood transfusion at the Mayo Clinic: the first blood bank in the United States (1935)," *Transfusion Medicine Reviews* 19.3 (2005): 241-5.

[23] M. Telischi, "Evolution of Cook County Hospital Blood Bank," *Transfusion* 14.6 (1974): 623-8.

U.S. The majority of women who developed bleeding during labor and delivery bled to death.[24] This fact, together with the shortage of blood in all areas of the hospital, made a blood bank a compelling need. It would store blood for immediate use, eliminate the confusion of contacting and typing potential donors, allow serum to be separated for use long after the shelf life of whole blood was past, reduce hospital expenses, and represent pioneering work in blood therapy.[25]

L.W. Diggs at the University of Tennessee Medical Units saw the need for and sought permission to create a blood bank in the John Gaston Hospital in Memphis. As a patient-oriented physician researcher, he was known to say that the goal of medicine should be to make "maximum use of our resources to make as many people as productive, as pain-free, and as happy as possible for as long as possible."[26]

Diggs conceived the idea of a blood bank in Memphis after hearing about the blood bank at the Cook County Hospital a year earlier. He travelled to the hospital and learned about the operation of the unit that relied on a system of donations and withdrawals; this process reminded the organizer Bernard Fantus of how a bank worked, and for this reason Fantus coined the term "blood bank." Since volunteers would continuously replenish the blood that was used, the only cost to the hospital would be supplies, which the hospital decided to assume. As long a relative or volunteer replaced the used blood, there was no charge to the patient. With this knowledge Diggs returned to Memphis where, with the approval of the Chief of Surgery Lucius McGehee and the

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[24] *Portrait of L. W. Diggs, M.D.,* May 7, 2004 , 10/6/2007 2007, <http://www.tabbonline.org/LW_Diggs_portrait.html>.

[25] *Memorandum to the John Gaston Hospital Medical Board* (Memphis, TN: n.p., 1938).

[26] Lemuel Diggs, *First Portion,* Anonymous , n.d.

Chief Resident in Surgery Charles Olim, he began assembling the resources that were needed for starting a blood bank.[27]

The purchase of a special refrigerator represented a significant start-up expense at the time. The Gaston Hospital was a city institution that operated with physicians, nurses, interns, and medical students from the University of Tennessee Medical Units. Since the city considered blood transfusions a laboratory expense, and the city contract with the university designated such costs as state expenses, the university covered them. The start-up cost, equipment, and facilities were to come from both institutions. When Diggs realized that neither the city nor the state had the approximately $2000 needed for the blood bank, he decided to make a public appeal.[28] At a meeting at the YMCA Diggs made an extraordinary appeal to a group of Memphis businessmen, a plea that was heard by the local philanthropist Herbert Herff and members of the Temple Men's Club. Together they provided the money to procure the refrigerator and operating supplies for the new blood bank. Some in the Tennessee state capital considered this appeal to be an act of faculty disloyalty, because Diggs went outside the university, i.e., the state system, for financial support. Fortunately, the rebuke for his actions was mild. Diggs recounted:

> Herbert Herff voluntarily and quite promptly obtained from a group of his Jewish friends in Memphis several thousand dollars which were used to purchase needed equipment, which included a new microscope, a large water-bath, ultra-violet lights for the processing room, and a four-door storage refrigerator with a recording thermometer and red signal lights that automatically flashed in the hall when there was electrical or motor failure.[29]

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[27] Ann Bell and Richard Nollan, *Conversation with Ann Bell, September 24, 2007*, Conversation notes ed. (Memphis: n.p., 2007).

[28] Diggs, 239-64.

[29] Diggs, 239-64.

The Memphis chapter of the American Red Cross also provided funding for the position of a medical technician (someone who would train other personnel) for a period of six months. The new blood bank was located on the sixth floor of the hospital, but was later relocated to the first floor to make access easier for donors.

The accepted practice concerning the supply of blood in Memphis and elsewhere before 1938 was to rely on family members and friends for blood to transfuse. However, in 1938 there were no black donors who volunteered to donate, despite public appeals to them and the large number of black patients in the Gaston Hospital.[30] Elsewhere, professional donors were used, and hospitals paid for their donations on demand. This was true at other Memphis hospitals, but not at the John Gaston Hospital, probably because of the difficulty of finding reliable professional donors and the lack of funds for paying them. The process of finding blood donors from family and friends that were compatible with a given patient's blood was time consuming, often requiring the testing of six or more donors before finding a suitable one. The effort could require as many as twelve hours. With this much time passing, it was not unusual for the patient to bleed to death before the process could be completed. It also assumed that the patient had family support in order to make donations a possibility.[31]

Relying on family and friends for potential donors mitigated concerns about the race of the donor or what might happen if blood was transfused across races. The patient would know the origin of the blood, and this knowledge minimized the issue of race. However, when blood banking started in 1938, the donor in effect was moved out of the

[30] *Memorandum to the John Gaston Hospital Medical Board*

[31] Diggs, 239-64

picture. Now, when a patient and his / her family faced a decision about the use of blood from someone unknown to the patient, the situation had the result of re-emphasizing the role of race in the decision to accept the donation. Patients had to be informed before the transfusion took place as to where the blood came from; perhaps they were also given some of the donor's personal information. The patient was allowed to make the decision and sign a form either to accept or to reject the blood. Some patients did reject blood on the grounds that it was from the "wrong" race, but the patient could refuse it for any reason, including religious or political ones. As Diggs recalled, "Occasionally Baptists refused to receive blood from Methodists, Protestants from Catholics and in rare instances because of their religion, parents of children or patients preferred to risk death rather than to allow transfusion."[32]

Located in the Jim Crow South, the blood bank operated from the beginning under the assumption that the city would segregate black and white blood in its hospital. This was most likely an administrative decision that was simply a continuation and a formalization of the practice that had prevailed when only direct transfusions were given. The ease and rapid accessibility of the new technology emphasized the separation of all blood units by race. Some medical personnel approved this decision, in part because of their own prejudices. But they also had concerns that the new bank would not work as well as expected. For example, there were some who felt that transfused cold blood would be toxic. Others were concerned that infectious diseases could be transmitted to the patient, and the perception was that the greater risk lay in black rather than in white blood.

[32] Diggs, 239-64

> Because of the high incidence of syphilis among blacks and the inadequate treatment which they receive, preliminary Kline precipitation test are performed by their laboratory interns on all negroes before they are selected as donors. After the blood for transfusion is collected in the bank, a check Kahn test is run in the serologic laboratory. White donors are questioned about primary and secondary lesions, blood tests and previous treatment, but preliminary tests for syphilis are not made before the bloods are taken. It has been found by experience that few bloods from white donors are discarded because of positive serology.[33]

The Kahn test was a widely recognized and inexpensive blood test for syphilis.[34] In the year before 1938, the John Gaston Hospital was treating 3000-4000 cases of syphilis, and the psychiatric clinic was full of patients suffering from neurosyphilis. It was estimated that about 30% of the black population had some form of the disease, which affected a significant but smaller percentage of the white population.[35] Treatment of the disease was hampered by the lack of an effective medicine (penicillin would not be used widely until about 1943, the year that the disease peaked in Memphis) and the social silence that shrouded references to the disease. The Kahn test would have detected the presence of the disease in potential donors and thus kept the rate of syphilis transmissions at an acceptable low level.

Although the hospital segregated blood and hospital staff informed patients about the blood that was available for transfusion, some hospital personnel, Diggs among them,

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[33] L. W. Diggs and Alice Jean Keith, "Problems in Blood Banking," American Journal of Clinical Pathology 9, no.6 (1939): 591-603. See quotation on page 594.

[34] Reuben L. Kahn, *The Kahn Test -- A Practical Guide* (New York: Williams and Wilkins Co., 1928).

[35] H. D. Packer, "Forty-five years against syphilis in Memphis--success or failure?" *Journal of the Tennessee Medical Association* 77, no.2 (1984): 75-9. In Memphis there was only one clinic for patients with syphilis and there was no follow-up program to keep patients on their regimens, which were complicated. The treatment of syphilis consisted of 20 weekly injections of an arsenical and 40 of a bismuth preparation, given in alternating courses over a one and a half year period.

believed that there was no biological difference or medical justification for this separation by race. They believed that as long as blood types were compatible, transfusion could proceed without any consideration of race. However, at this time in American medicine, some medical personnel believed that there existed a physical and detectable difference between black and white bloods. Historian Keith Wailoo has shown that from the 1920s to the 1940s many believed that blood analysis offered insights into salient questions of racial identity and hereditary character, beginning with the discovery of sickle cell anemia and of Emmel's technique to produce sickled cells (which demonstrated latency to sickling that was thought to be characteristic of black blood only). People also believed that sickle cell was unique to blacks and that the few cases found among whites were the result of earlier cross-racial relationships. "For many physicians in the early twentieth century, *Negro blood* was a term with clear technological origins and with biological, social, and public health meanings. These physicians based their view on what was at that time hematological evidence and scientific understanding of the genetics of the disorder."[36] The Red Cross also segregated its blood at this time, and drew heavy criticism from those disagreeing with its policy, as, for example, the American Association of Physical Anthropologists in 1942 and afterward.[37]

In 1941, in a Sunday edition of the Memphis *Commercial Appeal,* an article of more than two full pages on the Gaston Hospital's blood bank emphasized the separation of blood by race and its rigid enforcement. The reporter explained the reason for separation as follows:

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[36] Keith Wailoo, *Drawing Blood: Technology and Disease Identity in Twentieth-Century America* (Baltimore: Johns Hopkins University Press, 1997).

[37] Waldemar Kaempffert, "Science News in Review: Blood and Prejudice: Segregation of White and Negro Donations Brings a Protest," *The New York Times* June 14, 1942.

> Scientifically, according to the doctors, the blood of one race will serve quite satisfactorily for transfusion to a person of a different race. But there are other considerations. One of them is that since Negro patients are in the majority at John Gaston, it is only just that Negro donors should furnish their proper share of blood; and that white patients, in the minority, should receive their blood from white donors. In short, that each race should provide its own needs. In this way any question of racial discrimination has been avoided.[38]

Despite the acknowledgement by the author that there may be no scientific reason for separation, he cites "other considerations" for maintaining the separation of blood without elaborating on what they might be. Since the Gaston Hospital had a largely black patient population, the reporter concluded, blacks should carry the burden of providing the blood for their race. Despite the findings of medicine and science, Southern custom still dictated the separation of black and white blood. The reporter used a financial metaphor to suggest that blood, like money, must be paid and used in a strictly regulated way, with each donor and each recipient paying his or her own way. In reality, however, the rigid separation of blood was carried out only in principle. In practice, if the need arose, a patient was offered blood from the other race, with the clear understanding that the patient could refuse the blood if he or she chose to do so and was willing to sign a waiver to that effect. Diggs wrote:

> From a scientific point of view there is no justification for drawing a color line in the blood bank, but the presence of sentiment, and prejudice in the matter on the part of the patients cannot be denied. When in emergencies blood of one race is used for another, the patient or some responsible member of his family gives permission in writing.[39]

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[38] St John Waddell, "New Currency in the Blood Bank," *The Commercial Appeal* March 9, 1941, sec. IV.

[39] L. W. Diggs and Jeannette Spann, "Blood and Plasma Bank at John Gaston Hospital," *Hospitals* July (1942). See page 10 for quote.

In other words, the public policy expressed in the newspaper was not exactly the same as that practiced in the clinic. As long as the donor and the recipient were typed and matched properly, the transfusion would be successful. Diggs knew this and, despite his resistance to the idea of segregating bloods, he implemented the policy to segregate by race.[40] Blood donations were stored in bottles with labels indicating the name, blood type, and race of the donor, and a two-column file card organizer with "white" at the top of one column and "black" at the top of the other recorded what units were available by type and who had donated. However, strict enforcement of the separation of blood was not maintained within the storage refrigerator. Photographs of the refrigerator and its contents show several bottles on a shelf of the refrigerator; a close inspection of the labels reveals that at least one bottle with "black" circled on the label stands next to a bottle with the word "white" circled on its label. That this was a deliberate and normal practice in contrast to stated hospital policy seems clear.[41]

At first, other hospitals in Memphis did not react to the opening of the blood bank. The John Gaston Hospital was a public hospital, while all other Memphis hospitals, such as Baptist Hospital, Methodist Hospital, and St. Joseph's Hospital were private. The patient population of John Gaston consisted predominantly of black citizens from the Mid-South region, while the other, private hospitals in the city were exclusively white. Since the Gaston Hospital was the first of its kind in Memphis and the South, and

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[40] Diggs, 239-64.

[41] Lemuel W. Diggs, *The Lemuel W. Diggs Collection*, Manuscript Collection ed. (The University of Tennessee Health Sciences Historical Collections:, 1999). See folder LWD 001-01 for photographs from the early blood bank.

the blood bank's benefits gradually became obvious, it took only a few years before Baptist and St. Joseph's Hospitals followed with their own blood banks.[42] It was characteristic of blood banks in these early years that only hospitals opened them, and this would remain true even as the Second World War exerted a powerful influence on the national blood supply.[43] Given the immediate need that hospitals had for blood products, their medical expertise, and their control of operating costs, hospitals were in an advantageous situation for starting their own blood banks. Because hospital blood banks were considered an internal resource, they had few, if any, incentives to collaborate with each other. In the case of the Gaston Hospital, it soon became apparent that the blood bank would have an even greater significance than initially thought. Since it was a public hospital with patients from Tennessee, Mississippi, and Arkansas, and because it played an obvious role in community disasters, such as tornados, epidemics, and storms, the need to store blood became a regional rather than simply city-wide necessity. As the need for blood transfusions increased, Diggs began enlarging the blood bank's operation, moving it to the first floor of the building to accommodate the increasing number of donors.[44]

Apart from the issues of race in the blood bank, effectively staffing and equipping the facility was still a practical consideration. No companies existed to produce the bottles, stoppers, tubing, and other supplies needed, and no one taught the process of blood banking anywhere. For the blood bank in Memphis, Diggs had to rely on his own

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[42] *History of the City of Memphis Hospitals Blood Bank* (Memphis, TN: n.p., n.d.).

[43] Chinn, 233.

[44] John Carruth, "Blood Bank May Save Your Life," *The Commercial Appeal* June 4, 1950 1950.

expertise and best judgment. From 1939 to 1941 he began publishing a series of articles on blood banks, in which he shared not only what types of physical layout and administrative structure worked well, but where the mistakes were, how they were resolved, and what could be learned from them.[45]

When the John Gaston blood bank opened, the best time for drawing blood was on weekday evenings, from 6:00 p.m. to 10:00 p.m., after people had left work. However, in practice, anyone could make a blood donation at any time of the day. The blood bank staff only selected family members and friends of patients as donors, and did not use professional donors. Although the unit had Diggs as a clinical pathologist and a nurse supervisor as full-time personnel, the blood bank staff also included interns, medical students, nursing students, and technology students. The advantage of students in the blood bank was that they were plentiful and capable of performing the required tasks, which compensated for the main disadvantage that the students rotated through the unit as part of their educational duties and were always relatively inexperienced.[46]

One of the first lessons that Diggs learned was that the prolonged shelf-life of blood units allowed more time for contamination of the blood by bacteria. Earlier, blood was taken from the donor by allowing it to drain from the donor's arm through an open-ended tube into an open, uncovered container with sodium citrate as an anticoagulant. The earlier practice was based on the idea that a blood donation would be transfused almost immediately into the recipient, and thus contamination by elements in the air was minimal. The first ten or so blood units drawn after the new blood bank had opened were

[45] Diggs, 239-64

[46] Diggs and Spann, 3.

tested, found to be contaminated after a few days, and discarded as a result. For this reason, Diggs switched to a closed, sterilized system that included bottles with two-hole rubber stoppers that would minimize exposure to the air.[47]

The realization that cooler temperatures preserved blood was an important step on the road to blood banking. Diggs found that blood could typically be stored at one to six degrees Celsius. Together with sodium citrate as an anticoagulant, he could keep blood safely and reliably for a week to ten days. At first he believed that before the blood could be transfused, it would have to be re-warmed, or the cold blood would result in a reaction by the patient. However, with experience, it became clear that it was unnecessary to warm the blood, because there were no reactions by patients, and, it turned out, the process of re-warming the blood could lead to overheating and a destruction of red cells that would induce a reaction in the patient. The worst that happened, Diggs found, in the transfusion of cold blood was a cooling sensation in the recipient's arm, but the recipient's core body temperature remained unaltered.[48]

Needle size and needle placement raised several issues that Diggs explored. His concern was first to determine the size of the needle that would be most efficient for drawing the blood from the donor's arm. For some time, the 13-gauge needle was considered best because of its larger diameter. However, 14- and 15-gauge needles were smaller and found to work as well in men and women, without extending the donation time (and the insertion of these smaller needles proved less painful for the patients). The even smaller 16-gauge needle took longer to draw the blood, and he thus excluded it from

[47] Diggs, 239-64.

[48] L. W. Diggs, "Disputed Points Concerning Technical Procedures Used in transfusions by the Citrate Method," *Memphis Medical Journal* 17 (1942). See page 3 for reference.

recommendation. Another concern for Diggs was the placement of the needle in the arm, which was usually in the direction of venous blood flow, toward the shoulder. Diggs and his staff considered whether it would accelerate the process if the needle were inserted in the arm against venous flow, toward the hand instead, to see if this placement shortened the withdrawal time by meeting the flow of blood "head on." It did not, because the pressure in the vein was the same, regardless of needle direction. Still another consideration was whether negative pressure by mouth or by machine in the flask could be used to draw the blood from the body more quickly. But the added cost in terms of technology and skill, not to mention the possibility of collapsed veins in the patient, made this an unacceptable idea.[49]

For one year after the opening of the Memphis blood bank, Erlenmyer flasks were used to collect blood, but the cost of the flasks and awkwardness of the triangular shape of the bottle for storage led Diggs to consider another solution. Always looking for a way to cut costs by simplifying matters, he thought of the idea of using milk bottles instead of the flasks. The refrigerator was filling up with donated blood, and he could see that the triangular flasks were inefficient for the space in the compartment. In comparison, the parallel sides of the milk bottles could fit tightly together and increase the number of units that could be stored in the refrigerator. In addition to being cheaper, the bottles had large mouths that fit the rubber stoppers used in the hospital, and they could be easily

[49] L. W. Diggs, "Improved Needle and Observation Tube for the Collection of Blood for Transfusion," *American Journal of Clinical Pathology* 12, no. 11 (1942): 91-2, L. W. Diggs, "The Efficiency of Various Types of Equipment used in the collection of Blood For Transfusion," *American Journal of Clinical Pathology* 12, no.10 (1942): 518-22.

sterilized for reuse. Diggs put the milk bottles into use in 1939, and they were used for more than three years afterwards.[50]

Diggs exercised creativity in using the clinical supplies that were available to the hospital for the new blood bank, but he possessed a notable inventive streak as well. During the donation process, while the intern was drawing the blood from the donor, a second person continuously shook the bottle receiving the blood. Sodium citrate prevented the blood from coagulating and the shaking mixed the citrate uniformly with the blood; because blood coagulates when it stops moving, this provided additional anticoagulation by making sure that the blood continued to move. However, shaking is a mechanical process that can just as easily be accomplished by a machine as by a person. Jeanette Spann, who had been hired in 1938, was the first full-time medical technologist. She arrived at the idea of a mechanical shaker using a phonograph motor. Consequently Diggs sought help in creating a device that would provide the shaking needed. He turned for help to J.M. Smith and his students at the newly opened William R. Moore School of Technology in Memphis. Together they designed a machine using an electric motor from a Victrola phonograph attached to an eccentric disk that would gently shake the bottles during the course of the donation.[51] Two years later he implemented an improved design. This new device not only made the task of shaking the bottle easier, but it also meant that

[50] L. W. Diggs, "The Milk Bottle as a Blood Transfusion Flask," *American Journal of Clinical Pathology* 13, no.9 (1943): 101-7.

[51] L. W. Diggs and H. B. Turner, "A Shaking Device used in the Collection of Blood for Transfusion," *Journal of Laboratory and clinical Medicine* 27, no.8 (1941): 1070-1.

the task of drawing blood from a donor henceforth could be managed by a single person.[52]

In these early years only hospitals opened blood banks for internal use. There existed no regulatory authorities to oversee the operation of the blood bank in Memphis or elsewhere. The protocols for operation were based on the experience and ethics of the physicians in charge. There were no regional or national organizations that took up this cause until the war in Europe appeared to be unavoidable, at which time the American Red Cross initiated a national crusade. The war and its prospect of wounded and dying soldiers more than justified a national campaign to raise awareness of the importance of a national blood supply.[53] Although the Gaston blood bank participated in American Red Cross drives and the larger involvement in the war, its primary focus continued throughout this time as a local and regional resource. Eventually the other Memphis hospitals began operations of their blood banks, and it is clear that money was available to support the increased demand for storage and the hiring of personnel. By this time, reciprocal agreements were also in place to assure that the Gaston blood bank had adequate supplies.[54]

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[52] L. W. Diggs and J. M. Smith, "A Mechanical Shaker for Transfusion Flasks using a Standard Electric Motor," *American Journal of Clinical Pathology* 13, no.7 (1943): 67-9.

[53] Chinn, 233.

[54] "Memphis Unprepared, Even for a Peacetime Disaster: The John Gaston Hospital Blood Bank Director Reveals Inadequate Blood Plasma Storage Conditions, Pleads for Action Now," The *Memphis Press Scimitar* February 3, 1942, "Assure Blood Plasma Supply: Red Cross will Pay Bill if Memphis has Need," *Memphis Press-Scimitar* February 14, 1942., "Blood Bank's Aid to Victims: Speedy Assistance to Those Injured by Tornado," *Memphis Press-Scimitar* March 19, 1942.

The growth of the blood bank in terms of the number of transfusions given is astonishing. In June of 1937 a report to Memphis Mayor Watkins Overton's office for that month indicated that 87 blood transfusions had taken place, about 1000 for the year, all at the John Gaston Hospital.[55] By 1941 the number of transfusions jumped to 200 per month, about 2400 transfusions per year.[56] By 1950 the Gaston Hospital and the four major hospitals in the city were giving 18,000 – 20,000 transfusions annually.[57] This exponential increase was a clear sign that blood banking had become an indisputable asset to health care in the area; undoubtedly this change was further magnified by the United States' experience during World War II.

By 1942, Diggs's reputation as an expert on blood transfusion and banking was being recognized in the local press. He recognized the importance of blood banks for normal and wartime conditions, noting that blood reserves were inadequate even for peacetime disasters and criticizing the hospital community for not meeting this challenge. At a meeting of the Memphis Pubic Affairs Forum on February 2, he spoke on the subject of Memphis's disaster preparedness. He began his remarks by asking, "What is being done about blood plasma as a defense measure in Memphis?" After a pause, he responded, "I know the answer. Nothing is being done."[58] There are plenty of donors, he told the audience, but the need was for expanded facilities and some specialized

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[55] The John Gaston Hospital, *Report of the John Gaston Hospital for June 1937*.

[56] Waddell, 1.

[57] Carruth, 1.

[58] *Memphis Unprepared, Even for a Peacetime Disaster: The John Gaston Hospital Blood Bank Director Reveals Inadequate Blood Plasma Storage Conditions, Pleads for Action Now*

equipment, such as refrigerators. The need was not hypothetical, because there had been an explosion in nearby Millington a few days before. One month later, about one hundred victims needed transfusions after tornados struck in Kentucky, Tennessee, and Mississippi. "We had enough blood in storage to take care of at least 100 victims. But if there had been several hundred victims, we would have lacked facilities for taking blood from Memphis hospitals to some other point where it would be needed immediately."[59] A worse tornado that occurred one year earlier would have overwhelmed the blood bank. If an appeal to the community worked once before, as it did in getting the refrigerator needed for equipping the Gaston blood bank, then perhaps it would work this time, too. And it did. Within a few weeks, the "astounded" audience galvanized itself. "Two meetings of civic leaders, superintendents of hospitals, physicians and Red Cross workers have already been held – and in a month or six weeks the facilities that Dr. Diggs and others have hoped for will be fully provided."[60] The hospitals were beginning to work together, and the American Red Cross announced that it would supply plasma, should the city be attacked by an enemy. "More than 55,000 civilians have donated blood since the Pearl Harbor attack—and in about a month from now, when facilities are ready in Memphis, many more Memphis donors will be added to this number."[61]

Four years after the Gaston Hospital blood bank opened, Baptist, St. Joseph's, and other hospitals opened or expanded their own units for local use.[62] World War II added

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[59] *Blood Bank's Aid to Victims: Speedy Assistance to Those Injured by Tornado*

[60] Hugh Frank Smith, "Memphis Soon Will be Prepared for Any Big Emergency," [*Memphis Press-Scimitar*] 1942.

[61] Smith, 69.

[62] "Plans for Enlarging Blood Banks Speeded," *Memphis Press Scimitar* 1942.

impetus to the need for blood banks for whole blood and for serum, but the focus continued to be local and regional. By 1942, the Gaston Hospital blood bank was already beginning to struggle to keep up with the growth and change elsewhere. "We have asked for those facilities . . . but at the present time the hospital budget is not prepared to meet the cost and the $4000 or $5000 needed would have to be provided by special action of the City Commission."[63] Once again the spare budgets of the city and the state made keeping up with technological changes very difficult. Diggs stated in a newspaper article, "John Gaston hardly is able to maintain enough blood and plasma for normal needs, and never has any plasma ahead."

Characteristic of Diggs's intellectual style, he set out to create a knowledge base for blood banking and blood transfusion in general, as he had for sickle cell disease. With his encouragement, the Zonta Club in Memphis began identifying and assembling reprints of every medical article pertaining to blood banking, including those by foreign doctors. It did not take long before there were over 500 articles filed in the John Gaston blood bank office that were available free to anyone who wanted to learn more about blood banking. At this time there was little known among the general population about this process, and this repository was to serve as a resource for anyone with an interest in learning more about it.[64] This collection of reprints also served Diggs's desire to become knowledgeable about all aspects of blood banking and transfusion. On May 4, 1942, he

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[63] *Plans for Enlarging Blood Banks Speeded,* n.p.

[64] Ada Gilkey, "Blood Plasma Knowledge is Assembled in Library," *Memphis Press Scimitar,* n.d.

presented a detailed history of blood transfusion to a non-medical after-dinner audience at the Faculty Banquet at the University of Mississippi in Oxford.

The issue of the appropriateness of segregating black and white bloods continued to be a national one, and it was hotly debated in the medical as well as the popular media.[65] The policy to segregate was probably instituted nationally as it was in Memphis, simply as an extension and recognition of the Jim Crow beliefs and expectations of most people. The objection to segregating was that there simply was no medical reason for supporting the segregation of bloods; as long as the blood units were properly matched, transfusion was predictably safe. In Memphis, without the glare of national prominence that accompanied the decisions and actions of the military and despite the American Red Cross's policy of segregation, the physicians, nurses, and technicians at the Gaston Hospital blood bank continued dealing with race until it was either resolved or became a non-issue and therefore no longer worth acknowledging. Diggs wrote, "A few years later, the 'Jim Crow Law' in the blood bank was ignored by mutual consent of all intelligent persons."[66] When precisely this separation of white and black blood came to an end is unclear, but Dr. Diggs and others who were likeminded accelerated its demise by simply dodging the issue until it faded away. Once he established the blood bank and reduced the process of drawing and transfusing blood to a routine that could be handled easily by technicians, it no longer required his supervision. His interest in sickle cell disease continued and the war years offered new opportunities that took him away from

[65] Some examples include: "The Segregation of Bloods," *Science* 96, no. 2479 (1942): 8, "Orchids to Negroes," *The New Republic*: 350, Kaempffert, *The New York Times*, 14 June 1942.

[66] Diggs, 239-64

Memphis. As a result of Diggs's clearsighted and concerted efforts, the blood bank continued to grow as a valuable resource for restoring the health of patients.

The task of implementing a blood bank in the Memphis general hospital was both easy and difficult. Diggs saw the medical and staffing feasibility of the bank, managed the cultural beliefs of the city, tried new ideas, and shared what he learned through his publications. It was not long before the concept of blood banking was widely accepted, and within ten years all city hospitals had one. After World War II, there was enough interest among the hospitals to form a community organization for sharing blood units that competed with the American Red Cross.[67]

At the same time as Diggs's family was growing, so was his reputation. His stature in the community and his reputation as a physician grew, because of his sickle cell research and his interest in medical technology. Most importantly, however, his prestige and visibility grew because of his commitment to blood banking. From 1939 to 1943 he produced approximately thirteen publications on the techniques and problems associated with blood banking. In one noteworthy article among the aforementioned he argued the practicality of training medical technologists as part of the medical school curriculum. Medical technologists would staff blood banks as well as laboratories. During this period there were no publications on sickle cell until 1947. In the years immediately following World War II, the economic condition of the nation had improved considerably and medical schools were beginning to position themselves for the brighter period ahead. With his impressive reputation, Diggs received a number of offers to go to other schools. Although he was not predisposed to consider moving, he gave consideration to them, if

[67] L. W. Diggs, "Red Cross Participation in a Community Blood Bank in Memphis for the Mid-South Area," *Memphis Medical Journal* 25 (1950).

only because he felt that he was not receiving the salary and recognition that were commensurate with his status in the profession, and because he realized that he needed to provide for his growing family.

CHAPTER FIVE

WORLD WAR TWO AND THE CLEVELAND CLINIC

5 + 4 + 6 + 0 = 15

5 x 4 x 6 x 0 = 0

Let 0 = lack of spirituality

Diggs became a local figure and an authority on blood banking and blood transfusion in part because of the obvious value of being able to store blood for later use, its cultural significance and amplification by racism, but also because of the intensity of the Second World War which emphasized the need for blood products. The war years for the Medical Units were marked by an increased patient loads for doctor as their numbers declined due to the number of young doctors going into the military while, at the same time, the teaching load increased. He relinquished some control of the Gaston Hospital Blood Bank in the belief that the operation of the blood bank was sufficiently understood that it did not require a physician to coordinate. Instead, it could be managed by a nurse or a technician and, at this time, the person assisting him was Jeanette Spann, who Diggs hired in 1938 after the blood bank opened.

The war changed the atmosphere and the focus on campus. Diggs was interested in malaria as a blood disease. The research effort of the campus was given over to supporting the needs of wartime diseases, especially those likely to be found in the South Pacific. The number of uniformed students walking across campus likewise changed the look and tone of the campus. The uniforms represented mainly the Army or the Navy. The quacking of ducks was what many people remembered about this time in campus

history.[1] "At that time various drugs were being tried on ducks with avian malaria strains. We were also treating patients with CNS syphilis on mosquito inoculation with various strains of human and monkey malaria."[2] Monkeys were also used as part of the malaria research.

Pearl Harbor had galvanized the nation, and the focus of research and education at the Medical Units was directed wherever possible to support the military needs. Despite its local focus, the Gaston blood bank worked together with the American Red Cross to answer the call for blood products, especially for plasma, the yellowish liquid part of blood that remains after all the cells have been removed. Plasma had a much longer shelf life than whole blood, but when freeze dried it lasted indefinitely and needed only distilled water to reconstitute it. There was no need for typing or matching of donors and recipients, any recipient could receive plasma from any donor, which is what made plasma so valuable whether in peacetime or war. The technique for the mass processing and shipping of dried plasma was the innovation of Charles Drew, a noted black physician at a time when blood was segregated in blood banks.[3]

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[1] James Edward Hamner, *The University of Tennessee, Memphis 75th Anniversary -- Medical Accomplishments* (Memphis, TN: The University of Tennessee, Memphis, 1986). See page 113.

[2] Lemuel W. Diggs, "The Lemuel W. Diggs Collection," Manuscript Collection, The University of Tennessee Health Sciences Historical Collections. See LWD 001-17-14 for quotation.

[3] R. F. Gillum, "One Blood, Two Biographies," *The Pharos of Alpha Omega Alpha-Honor Medical Society.Alpha Omega Alpha* 61, no. 4 (Fall 1998): 27-28. , Spencie Love, *One Blood : The Death and Resurrection of Charles R. Drew* (Chapel Hill, NC: The University of North Carolina Press, 1996), 373.

One of the first assignments of the war years for Diggs was his selection in 1943 as a Markle Foundation[4] Fellow in Tropical Medicine through the Association of American Medical Colleges to Guatemala and Salvador, where his task was to study tropical diseases in preparation for teaching medical personnel.[5] The medical experience was eye opening. He was trained to understand malaria as it occurred in the South. It had been epidemic at times in the South but had been brought under control by the elimination of standing water that bred the mosquito that carries the parasite. What he found in Quirigua, the first Guatemalan city that he visited, was an excellent laboratory that he could use a base for his investigations into parasitology. The most obvious feature of this location was that malaria was pervasive, so much so that the medical staff were inclined to call everything that came into the hospital malaria until proven otherwise. "Malaria in the Montagua Valley is so common and so deadly that they treat all patients for it regardless of the laboratory, and after seeing patients die of blackwater fever and cerebral malaria, I am convinced that their way is best for the area."[6] However, the inclination to call everything malaria meant that it "dulls their suspicion for other diseases."[7] He felt that some of the "anemias, splenomegalies [enlarged spleens], jaundices, heart murmurs, and pains" could have other explanation, but there was little interest in differential diagnoses. Histories were not taken of patient, so that patient

[4] The Foundation, begun in 1927 known for its support for the diffusion of knowledge, funded medical research during and after World War Two. See: "Markle | History " [cited 2011]. Available from: http://www.markle.org/our-story/history.

[5] For a brief history of the organization see: Ibid.

[6] Diggs, *The Lemuel W. Diggs Collection*. See Diggs letter to Henry E. Meloney July 6, 1943 in LWD 002-06-09.

[7] Ibid. See page 1 for quotation.

records were not a source of much information for his understanding of malaria. He found that he was also hampered by his lack of Spanish language skills and the different medical culture. All in all he compared the hospital there to an industrial hospital. "Their aim was to look after the immediate acute sickness, to get the patient back to work as soon as possible and not to bother too much about details or exact diagnoses."[8]

The treatments for malaria were also of interest to Diggs. He found that calomel, a mercury compound, was used along with magnesium sulfate, atebrin, plasmoquin compound, "followed by pink pills which contain a little quinine, arsenic, iron, and nux vomica."[9]

> Blackwaters are treated by keeping in hot blankets to encourage sweating and copious fluids (water, barley water, citrous fruit juices, and Sternberg's solution). Drugs given are Vit. C, caffeine, sedatives if necessary and horse serum. I could not see the rationale for the horse serum, but they seemed content to follow routine and seemed to get irritated when I questioned any procedures. Not food was given until the patient began to void freely. I followed hematocrits on some of the patients and found that they developed a severe anemia very rapidly with very little regenerative response on the part of the bone marrow.[10]

Overall the trip was not unpleasant and a learning experience for Diggs and the other fellows sent on this trip. "The visits to hospitals, medical schools, clinics, etc., were mainly impressive in showing us how far they have to go and how backward is public health in C.A. [Central America]."[11] Characteristically, Diggs explored "behind the ditches, the people, their housing, manner of living and nutrition, in order to visualize the

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[8] Ibid. See page one for quotation.

[9] Ibid. See page two for quotation.

[10] Ibid. See page two for quotation.

[11] Ibid. See page two for quotation.

magnitude of the problem, the lack of support to be expected from the native population and the difficulties."[12] In his report to the American Association of Medical Colleges, he added, "The opportunity for us to widen our horizon, to see that public health is not a matter of a city or county but of countries working together was appreciated."[13] And it was well within this belief that he saw medicine as a social need that could perhaps be best served by organizations such as governments getting involved, a feeling that was also reinforced by his experience treating sickle cell patients in Memphis. By government, he meant some form of participatory democracy based on individual responsibility.

Along with the medical problems faced by the people of Guatemala, Diggs could see a social system in which the lack of access to healthcare or the means to afford it can have a detrimental affect on the people and their country. Diggs believed that all organizations, social or political, were and ought to be based on the personal responsibility of the individuals that form the groups, whether social, professional, or political, where the members of the group are individually responsible for their organizations actions. Individuals contribute to and form organizations for the benefit of individuals, which are constitutive of any group. In part this belief was formed as a young man growing up in Virginia. He read works by the countries founding fathers, including George Mason, who wrote the first drafts of the Virginia Declaration of Rights and the Virginia Constitution both of the of 1776, and Thomas Paine, whose political rhetoric in

[12] Ibid. See page three for quotation.

[13] Ibid. See page three for quotation.

Common Sense and deistic conviction influenced his thinking.[14] Thinkers such as these seemed to hold a central place in his thinking about human and civil rights, for he kept the thoughts of both writers.

Diggs's view of personal responsibility as the basis for any group or organization was also reflected in his acceptance of Unitarianism and his philosophy of science. Although born and raised in a strict Methodist family, after high school and leaving home, he began to move away from his family's religion, and the change could be traced to the dissatisfaction he felt as a boy at the family discussions about religious topics that were always contentious but never conclusive. After moving to Memphis, Diggs and his wife Beatrice joined the Unitarian Universalist Church, with its rejection of the traditional Christian concept of a Trinity, the godhood of Jesus, or any "fixed dogma" or "any authority as the ultimate truth."[15] Diggs did believe in a higher power, and his conception of religion also correlated with his view of science. His religion explicitly believed that "The universe is meaningful" and that "the laws of nature (laws of God) are established, can be depended upon and always work the same way."[16] What ties science and religion together for Diggs is his belief that "Man is given intelligence and is expected to use his head."[17]

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[14] Walter Diggs and Richard Nollan, *Interview with Walter Diggs* (Memphis, TN:, June 13, 2008), Diggs, *The Lemuel W. Diggs Collection* In the Diggs Collection, see the audio file marked "Health Care/Human Rights."

[15] L. W. Diggs, "Unitarian Philosophy and Research Philosophy Similar," "Unitarian Philosophy and Research Philosophy Similar" Statement sent to me by Walter Diggs of his father's Unitarian and scientific beliefs.

[16] Ibid.

[17] Ibid.

> To the extent that he can discover the laws of nature and adopt his living to these laws the better he adjusts and gets along[.] This applies not only to disease, but to social, economic and political problems."[18]

His beliefs are also a reflection of his upbringing and early readings. He was an admirer of the writings of Thomas Paine, whose professed deism undoubtedly influenced Diggs.[19]

Diggs held to this belief throughout his career. He did not write about it as was the case with his other non-medical interests. However, in 1943 a Tennessee State College professor asked Digs's about his views on religion and science. In a response to the professor, Diggs declared that "there is no conflict between science and Christianity."[20] He explained it this way.

> The consideration of the universe through the telescope reveals a magnitude that awes us and the revelations of the microscope reveals a smallness that is likewise big. In the advances of chemistry are revealed molecular structures comparable to the stars. Anyone who is a scientist has to admit the presence of a controlling power over things and the existence of a spiritual universe that is greater than his.[21]

The world has meaning, Diggs seems to be saying, because the universe was created with a complexity and organization that could be discerned by anyone willing to make the effort. An organization and complexity that could only have been created by a higher being. But, in Diggs's religion, individuals can understanding the world they live in without the need of a religious organization to make sense of it for them. Indeed,

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[18] Ibid.

[19] Diggs, *The Lemuel W. Diggs Collection* See the audio file marked "Health Care/Human Rights."

[20] L. W. Diggs, "Letter to Frank C. Jones," Manuscript Collection, p. 1, The Lemuel Whitley Diggs Collection, The University of Tennessee Health Sciences Historical Collections, Memphis, TN.

[21] Diggs, *Letter to Frank C. Jones*, 1.

religious organizations that insist on adherence to a system of beliefs only perpetuate misunderstanding and discourage inquiry.

> The acceptance of Christ as a man and as an inspiration is entirely compatible with science but the oriental interpretations of heaven and hell and immortality and essential sin are opinions of man recorded years ago and misinterpreted through the centuries. To insist upon them as divine truths is to weaken the church and to drive away from it intelligent people and to keep the others from thinking.[22]

The individual is his or her own best guide to understanding the world he or she lived in while still living in a community of people, with each possessing the freedom to accept or reject the ideas discussed within that community. The core of his belief is summarized by Diggs this way: "I personally believe that a search after truth and the application of truth to living is the best form of religion."[23]

If the war stirred an interest in research at the UT Medical Units, it also afforded Diggs as head of Clinical Pathology the opportunity to hire a secretary to help attend to his correspondence and writing and recordkeeping workload. In 1942 he hired Ann Bell, a young woman who had been born and raised in Memphis and completed her bachelor's degree at Randolph-Macon Women's College in Lynchburg, Virginia. After returning to Memphis she was attracted to science and found a secretarial position at the Medical Units. Apart from nursing, the medical professions offered few opportunities to women interested in the health care sciences. Laboratory workers were needed to do routine tests, and the field of medical technology had grown since the beginning of the century. By the early 1940s, a minimum educational standard had been established with established

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[22] Diggs, *Letter to Frank C. Jones*, 1.

[23] Diggs, *Letter to Frank C. Jones*, 1.

schools where students could be trained. Women had succeeded in earning medical degrees at the Medical Units as well as elsewhere. The first woman to graduate with a medical degree from the Medical Units was in 1913 and others followed, but their numbers were always small and the path to graduation was much more difficult than their male counterparts. Medical technology was one of the few entries into health care fields that was advertised as one that was appropriate for women even if that recommendation was made based on the stereotype of women as better at accuracy and attention to detail work of laboratory testing than men. However, what drove the profession's growth was the war. It attracted so many technicians into the military, that there was a demand to replace them in hospitals like the John Gaston Hospital. Although he advocated the creation of a medical technology program, the chief executive of the Medical Units, O.W. Hyman, refused due to limited means. Many technologists at this time were trained as apprentices. Diggs relied on the laboratory and was always on the lookout for good, dependable laboratory workers.[24] Although she began work as a secretary, it soon became clear that she wanted to do more and that her interest was in the laboratory and Diggs began to train her in laboratory techniques. Very quickly he came to depend on her skill and dedication.

Within a few months of his visit to Guatamala and Salvador, Diggs and his family were in Rochester, New York, where he took a temporary position to replace his former teacher at the Universitiy of Rochester, William McCann, who was on military leave to

[24] V. R. Kotlarz, "Tracing our Roots: Origins of Clinical Laboratory Science," *Clinical Laboratory Science : Journal of the American Society for Medical Technology* 11, no. 1 (Jan-Feb 1998): 5-7. , V. R. Kotlarz, "Tracing our Roots: The First Clinical Laboratory Scientist," *Clinical Laboratory Science : Journal of the American Society for Medical Technology* 11, no. 2 (Mar-Apr 1998): 97-100.

the Navy. The war had increased research and educational demands across the country and, like many, Diggs was also interested to see what the employment opportunities would be like elsewhere in light of the situation he found in Memphis and despite his promotion to associate professor in 1938. Along with the Markle Foundation Fellowship, Diggs also spent time "as a physician for one summer with DuPont at the time this company was manufacturing explosive materials."[25]

The return to the University of Rochester must have felt like a homecoming for Diggs, because he had trained and met his future wife there, and for Beatrice because it was her hometown. "We have a convenient and comfortable apartment or rather apartments, for we are in part living with Mother Mosher and have a two room apartment in addition. After living at Whiteaven I feel like a caged animal and feel sorry for the kids."[26] But much had changed. His work focused on the hematological changes in cats following the surgical removal of adrenal glands. He was also able to do "comparative studies of stained blood smears and of moist preparations stained by supravital dyes."[27] He wrote to Ann Bell that his office had only office equipment and "a place to hang my hat,"[28] and it was also across the hall from the student labs. He conducted weekday morning rounds for the students, and case studies three times per week. The case studies were diagnostic exercises "with a lot of x-ray, lab, E.K.G. all done, so it is very interesting as well as challenging." The student asked question, which included one or

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[25] Diggs, *The Lemuel W. Diggs Collection* See item number LWD 001-07-14.

[26] Ibid.

[27] Ibid. See item LWD 001-07-14.

[28] Ibid. See item LWD 001-07-14.

two that "you do not know but should."[29] Ann Bell was his lifeline during this time by helping him to maintain communications with colleagues in Memphis, and sending items as needed to Diggs.

His schedule was not so full that he could not spend time in the library perusing the medical literature as he enjoyed doing. It also allowed him time to prepare the lectures to the students and faculty that he has promised, on sickle cell anemia, malaria, and the treatment of anemias, for which Ann sent the slides as he needed them. Although he saw no sickle cell patients during this period, he did receive slides from the Army showing the presence of sickle cell in a white patient. Ann also sent him patent forms for a blood transfusion device, probably the bottle shaker, which she had O.W. Hyman fill in with his information before forwarding to Diggs. He was also working up an article for publication on the blood picture in malaria. By the beginning of September, he was reaching the end of his stay in Rochester. On the eighth, Beatrice and the children returned by train to Memphis, while Diggs stayed behind to complete his remaining courses. Then he went on Hampton to visit his mother before returning to Memphis.

He noted that the fall was just beginning when he left Rochester and the weather was comfortable in Memphis, where he had a few months to orient himself for what he thought would be a permanent move to Cleveland, Ohio, in January 1945 where he had accepted an offer there to join the faculty of the Cleveland Clinic. The move was a clear opportunity for Diggs to move to a prestigious medical center that probably included a significant salary increase, but his plans may also have been more strategic than practical. He had been struggling with his low salary and was looking for some way to raise it. It seemed clear that he could not do so by staying at the University of Tennessee, so he

[29] Ibid. Letter to Ann Bell 7/11/1944 from LWD.

chose the time-honored option of going to another institution in order to get a salary increase. When the Cleveland Clinic became interested, he acted. The family knew that Diggs was making the move for the money, but he told at least some of his colleagues in Memphis that he was leaving because clinical pathology was not receiving enough recognition at the university and there were better opportunities to practice clinical pathology at the Cleveland Clinics.[30]

If fall had only just arriving in Rochester, it was an all out snowstorm that greeted him when he arrived in Cleveland to complicate his search for an apartment. "Having arrived in a blizzard, waded around up to knees in snow drifts looking for a room without success and obliterated a few capillaries in my ears from the cold, have decided to stay in a hotel until the sun shines again and the sidewalks show up."[31] For a man raised in the South who probably envisioned spending his career there, the arrival in Cleveland was no doubt a challenge if not demanding.

The situation at the Cleveland Clinic looked promising. Dr. Russell Haden was a consummate researcher and the longtime chair of the Division of Medicine. He had carried the load of head of the division, supervised the clinical latoratories, and carried a heavy clinical load, too. In 1944 he gave up supervising the clinical laboratories and created the Department of Clinical Pathology, to which he appointed Diggs as its head. Diggs was the head of the department without formally designating him as the chair of the department.[32]

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[30] Diggs and Nollan, *Interview with Walter Diggs*

[31] Diggs, *The Lemuel W. Diggs Collection* See letter to Ann Bell 1/4/1945 by LWD.

[32] John D. Clough, *To Act as a Unit: The Story of the Cleveland Clinic*, 4d ed. (Cleveland, OH: The Cleveland Clinic Press, 2004). See page 270 for more details.

He was excited at the opportunity. His new office would be located on the same floor where "major interesting hematology is done by Dr. Haden's research staff of three full-time technicians, so will be in the middle of the activity am most interested in."[33] He saw the opportunities to continue his study of megakaryocytes[34] in a better setting, and he found the staff friendly. Indeed, the contrast to his situation in Memphis was noticeable. The highlight of his stay at the Cleveland Clinic was the opportunity to review the "coverslip preparations of bone marrows with excellent accompanying and follow-up records."[35] By being given access to Dr. Haden's work, Diggs was able to draw conclusions that led to publications related to "Idiopathic Thrombocytopenic Purpura, Plasma Cell Myeloma, Hodgkin's Disease, cytology of cells in bronchial washings, tests employed in hemorrhagic diseases and methods employed in sedimentation tests."[36] Unpublished papers from this period were on topics such as metastatic cells in bone marrow, leukocyte counts, and differentials in association with jaundice.

> Many of the men here are experts in their field and it is stimulating to be associated with them. At the clinical conferences they do not hesitate to jump on each other critically before the group for the sake of the patient. At the X ray conference this afternoon, they showed plates and made the fellows in turn get up in front of his associates and stick his neck out as to what he saw in skull or lung or kidney plate; teaching in the raw and most revealing for those not so well trained.[37]

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[33] Diggs, *The Lemuel W. Diggs Collection.* See letter to Ann Bell 1/4/1945 by LWD.

[34] Large bone marrow cells with large or multiple nuclei from which platelets are derived.

[35] Ibid. See page two of document number LWD 001-07-14 for quotation.

[36] Ibid. See page two of document number LWD 001-07-14 for quotation.

[37] Ibid. See letter to Ann Bell 1/4/1945 by LWD. See page one for quotation

More than "stimulated," Diggs found the environment at the Cleveland Clinic challenging in a way that he did not experience in Memphis. He was also aware of the state that the clinical laboratories were in and how much work he would have to do to improve them. As an established laboratory, some of the doctors had were special interests, such as one doctor with an interest in crystals in urine or the preference by the gastrointestinal clinic's preference for Ewald tubes, which Diggs considered outdated years ago. All in all he was looking for places that needed improvement and procedures that could be simplified. He was also looking forward to time that could be spent in the library and in study. The malaria paper that he had hoped to complete in the fall was still "plugging along."[38] As in Rochester, Diggs continued to rely on Ann Bell for charts, forms, and mimeographs that would be helpful for him in his new position.

Diggs had the opportunity to establish a second blood bank at the Cleveland Clinic. It was probably his reputation as someone who had already started one that led the Cleveland Clinic's administration to commission one on its premises. He modeled it on the one he designed in Memphis. The request that he organize a blood bank at the Cleveland Clinic was evident already several months earlier while he was still at the University of Rochester. He requested Ann Bell to send reprints of the floor plans for the Gaston blood bank to be sent to the Cleveland Clinic's architects in St. Paul.

Diggs was busy with new things happening every day. He learned about new procedures not done in Memphis as well as noticing procedures done in Memphis that were not done or done inadequately in Cleveland. "Such is the advantage and the

[38] Ibid. See LWD letter to Ann Bell 1/4/1945.

stimulus of moving."[39] In February he was still awaiting the completion of renovations to his office and for a secretary to assist him, but the work was a pleasant distraction from the snow and the six inches of ice on the sidewalks. By March 23rd the family had arrived in Cleveland, though "it is more like spring, but it is still snowing occasionally and no flowers are yet in bloom."[40]

By June Diggs had a secretary, who reported to Ann that he seemed to be doing very well since "he seems to sing a lot!"[41] Singing to himself was Diggs's habit when he was happy. Another reason might have been his pleasure at having the help he needed for his many projects. The summer was busier than usual just as the clinic staff was distracted by vacations. By September the busy summer work subsided. He reported to Ann that even though his own work continued to be interesting, the family still did not like Cleveland, so he renewed his request for news from the Gaston Hospital and, as always, sent his greetings to the staff there.

In January 1947, winter once again cast a shadow over the Diggs's situation in Cleveland. After six months technicians were still in short supply. "We still have trouble getting trained technicians and our staff of 38 are getting married or moving at about the rate of 1-2 per month."[42] Moreover, he was losing the capable service by the new secretary, who announced that she was "going to the Pacific as a medical missionary

[39] Ibid. See LWD letter to Ann Bell 2/9/1945.

[40] Ibid. See LWD Letter to Ann Bell 3/23/1945.

[41] Ibid. See Cecile Heidler letter to Ann Bell 6/28/1945.

[42] Ibid. See the letter from LWD to Ann Bell 1/16/1946.

(!)"[43] In a few months she would take her vows in her church and move to a leper colony in the South Pacific. He would be without an assistant again and leery of hiring a new one. In March he wrote to Ann: "I still do not have a secretary-technician, and have not taken chance on applicants so far. How about moving to Cleveland and being in my office again."[44]

Generally, however, the situation was not working out as well as Diggs had hoped.

> The kids are enjoying the ice & snow, but 'B' hates it up here and seems to like it less as time goes on. I do not like such a large city but find my work stimulating and associations at clinic pleasant in many ways.[45]

Diggs was preoccupied with his work and professional affiliations, but it fell to Bea to register the children for school and to establish ties in the local community where she knew no one and had no friends. Soon after arriving in Cleveland, she became pregnant and gave birth to their fourth child, Margaret Miller Diggs. The house with several acres was located on a dirt road about sixteen miles from the clinic in an area with a tumbling creek, a small lake, and a nearby park. It was an altogether ideal situation that they preferred. They played baseball with neighbors in a nearby empty lot. There was only one family car, which Diggs used to go to work. At a butcher's shop where she purchased their meat, the owner and other customers were all from other countries and spoke languages that she could not understand. Because of the distance from the clinic she could not assist Diggs with his presentations and slide shows. The kids seemed to be

[43] Ibid. See the letter from LWD to Ann Bell 1/16/1946.

[44] Ibid. See the letter from LWD to Ann Bell March 15, 1946.

[45] Ibid. See the letter from LWD to Ann Bell 1/16/1946.

thriving, but Bea found it difficult, so in 1946 they moved into a house in Cleveland that was located in a residential community much closer to the clinic.

They put the best face on the situation through the spring and summer, but it was already clear by August of 1947 that staying in Cleveland was not a viable option for the family. By this time, he was already making arrangements to return to Memphis, so he wrote to Ann asking her to make sure to order the new equipment for the Gaston laboratory. He had submitted his resignation and his last day would be at the end of the month. He still wanted to tie up all of the loose ends in Cleveland, so he would not be able to leave until sometime after that. Since they did not have a place to live in Memphis, he thought it would be necessary to leave the family in Cleveland until he could return to Memphis to find one. "Will be glad to be getting South and into teaching again," he wrote.[46] He would later recall, "I missed the South, [and] association with medical students and student technologists. I had rather be dead than live in industrial Cleveland the rest of my life."[47] With his usual optimism he looked forward to building up a real department in Memphis. The Cleveland phase of his career was good not only for the experience that he acquired, but it also allowed for his absence from Memphis to be felt. Diggs was missed, and the evidence of how much might be measured in the fact that he returned to Memphis with a full professorship and the commensurate boost in salary. "Opportunities were available at the time to be Dean at the University of Oklahoma and to be Director of Clinical Laboratories at the U. of Texas but I elected to

[46] Ibid. Letter from LWD to Ann Bell 8/15/1947.

[47] Ibid. See personal notes in LWD 001-07-14.

go back to the University of Tennessee as Professor of Medicine in the Department of Clinical Pathology."[48]

The return was warm both in climate and in friendship. The promotion to full professor almost certainly meant a salary increase, but he was also be glad to return to a situation that he needed: a laboratory with dedicated personnel and his work on sickle cell disease that had been absent during the war years and the time at the Cleveland Clinic. Ann Bell was showing great promise as a technical and Juanita Bibb, hired in 1940, had been directing the blood bank in Diggs absence. Upon his return he resumed teaching the course in clinical laboratories, supervising the clinical laboratories and the Blood Bank of the City of Memphis Hospitals, and teaching students and residents. The children were growing. The oldest, Walter, was approaching high school and John and Alice were each two and four years behind. Diggs looked forward to his work, at enjoying family life, and at finding a suitable home for them, preferably one in the country where he could grow the garden that he liked to call his "country club."

Although he had not published in this period on sickle cell disease, his interested in the disease continued. He saw patients when he could and interacted with colleagues. While still in Cleveland, he had an opportunity to spend some time in Washington, D.C. at the Armed Forces Institute of Pathology. A former assistant from Diggs's laboratory in Memphis, Colin F. Vorder Bruegge, had risen to the rank of Brigadier General and invited Diggs to examine the accessioned sickle cell cases there. "This led to my

[48] Walter Diggs and Richard Nollan, *Interview with Walter Diggs*, ed. Richard Nollan (Memphis, TN:, 2011) See LWD 001-07-14 for quotation in: Diggs, *The Lemuel W. Diggs Collection*.

appointment as a Consultant in Pathology at the AFIP,"[49] which continued for many years. The experience also widened the circle of colleagues that he knew in his field.

The campus culture was different. The influx of resources and the change in everyone's sense of mission was evident. The need for research was affected by these changes, and also by accreditation reviews of the Medical Units, which called for an improvement in the amount of research done. In response to this, Dr. Hyman made personnel changes that would encourage faculty to do more research, especially in the basic sciences. This came at a time after the war when faculty numbers increased and patient and teaching loads correspondingly decreased to more manageable levels. The war had galvanized a new, can-do spirit on campus.

Other aspects of city life around the campus did not change so quickly. The campus was located in a part of town that contained areas of poor black people and a bayou ran along a street near the Baptist Hospital. The contrast was stark as one physician in 1942 noted.

> Along the street was an open ditch and bordering this ditch were four or five structures, the backsides of which extended over the ditch, supported on stilts. Negro families were in residence, along with dogs, goats, chickens and at least one pig. All this looked strange for a medical center, and thought I must have lost my way; but the multistoried brick structure on my right turned out to be the south side of the Baptist Hospital . . .[50]

He was newly arrived from California and in need of a house for himself and his wife. A colleague was able to help him out by letting him stay in her mother's house until they found something suitable. Behind this house, there was a barn-like structure where an

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[49] Ibid.

[50] Roland H. Alden, *As I Recall: Recollections of Dr. Roland H. Alden, University of Tennessee* (n.p.: n.p., 1992) See page 9 for quotation.

elderly black man lived with his daughter. He was advised that the man "'my nigger,' meaning, as I later found out, that he was to do chores for me and I was 'to take care of him' – an arrangement I came to find rather complicated."[51]

But the awareness of black Memphians was changing due to the effects of the both the Great Depression that forced so many out of their communities to migrate for work elsewhere, and the Second World War with it emphasis on freedom, democracy, and equality. During the war, black workers organized unions and resisted the racial stereotypes of themselves as labors. E.H. Crump's control of the city and county had been unerring, however, by 1940 his organization was becoming ineffectual due to the ineffectual leadership of those in Crump's organization and the growing resistance among black citizens. [52] The Gaston Hospital was as segregated as was the rest of the city and not exempt from racial disturbances.[53]

This was a challenging time for Diggs as for everyone in the city. Before the war he had treated black patients and educated them about their disease as a way of helping them to cope with the manifestations. He continued to educate even after being told by his dean "We don't teach them."[54] He had started the first blood bank in the South and ignored the policy of strict segregation of blood units. He had done so without stepping

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[51] Ibid. See page 12 for quotation.

[52] G. Wayne Dowdy and Edward Hull Crump, *Mayor Crump Don't Like it: Machine Politics in Memphis*, 1std ed. (Jackson: University Press of Mississippi, 2006), 159. , Laurie B. Green, *Battling the Plantation Mentality: Memphis and the Black Freedom Struggle.* (Chapel Hill: The University of North Carolina Press, 2007).

[53] D'Army Bailey and Roger R. Easson, *The Education of a Black Radical: A Southern Civil Rights Activist's Journey, 1959-1964* (Baton Rouge: Louisiana State University Press, 2009), 237.

[54] Interview with Patricia Adams-Graves, M.D.

outside his role as a healthcare provider. In part this was his personality, but it also stemmed from the training he had received in medical school where he was encouraged to "maximize his medical and scientific contributions and minimize involvement with nonmedical, nonscientific activities."[55]

In 1948 Diggs hired a black medical technologist, James Childs, to serve as a phlebotomist in the Gailor Clinic. Childs had worked in the laboratory of Dr. Alfred Blalock at Vanderbilt University in Nashville before Blalock moved to Johns Hopkins University Medical School. This was the same Blalock who bored a hole in Diggs's skull to relieve pressure on his brain after he bumped his head on a tree limb while still a medical student. Upon the complaint of a white female patient in the clinic, the Memphis Fire and Police Commissioner Joseph Boyle complained that a "nigger" was drawing blood from white patients. Crump's longstanding policy was not to interfere with the policies of the University of Tennessee, so Boyles words were more bluster than substance. Diggs did nothing and nothing more came of it.[56]

Diggs was assigned to continue teaching the clinical pathology course, and to pursue his interest in sickle cell and other diseases, but the war overshadowed everything on campus. The pressures that were caused by the war, the increased patient and teaching load, began to receded, and the campus assumed some of its normal appearance. One big difference that must have pleased Diggs, was the increase in research on campus. He had

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[55] Walter Diggs, "Dr. L.W. Diggs and Civil Rights," Memoir, p. 1-4, L.W. Diggs Collection. the University of Tennessee Health Sciences Historical Collections. Memphis, TN. See page 1 for quotation.

[56] Ibid. For more on Boyle see: Dowdy and Crump, *Mayor Crump Don't Like it : Machine Politics in Memphis*, 159. , G. Wayne Dowdy, *Crusades for Freedom :Memphis and the Political Transformation of the American South* (Jackson: University Press of Mississippi, 2010), 183.

bemoaned the lack of a research mentality on campus, but the criticism by accrediting bodies for more research and the wartime emphasis on research changed that. The Chief Administrative Officer, O.W. Hyman, took the issue on and began emphasizing that new faculty hires had to be with an eye to increasing the research.

Even though the campus of the Medical Units was infused with new ideas, buildings, and resources, there were changes occurring in the city. Memphis had been a Democratic city for decades under the control of a political organization developed and run by Edward Hull Crump. Crump had served as Mayor from 1909 – 1916, when he was removed as mayor by the Tennessee state legislature for violating the state's prohibition laws, after which time he consolidated his power in the county, enough to also be a powerful influence in state politics as well. He also served as a member of the U.S. House of Representative from 1932 – 1938, but his controlling influence extended to his death in 1954. In a town with such a high percentage of black citizens, he was able to maintain his position as the city's "boss," in part by encouraging them to vote, as long as they voted Democratic, and by giving them access to city services, such as a day just for blacks at the municipal zoo and black-only parks. Crump is credited with creating and controlling a political machine that gave black and other constituencies a measure of power and participation in the city and county governments while, at the same time, it subordinated them to Crump's agenda. As Crump's control of the organization weakened in the early forties, black demands increased for more political recognition and more power.

Although his list of publications did not reflect activity in sickle cell disease, Diggs nevertheless continued his interest. After his stay at the Cleveland Clinic he was

resolved to build a better department, and he began to think in more organizational ways. He knew that the disease was found in every organ system of the body. That had been the principle lesson the patients he found with the disappearing spleens. He began to see sickle cell as a disease that affected every organ system, so he invited specialists to review and comment on the diseases pathological manifestations. In this way he could also educate them. "We thought that this was of interest to the orthopods … orthopedic doctors … because of the bone changes. They were interesting to the eye doctors because of the … they had blindness as one of the manifestations. They were particularly interesting the neurosurgeons because of the brain lesions. The gastrointestinal people were interested in it. The radiologists, of course, had a big part to play."[57] As did pediatricians, pulmonary function, and kidney specialists. He involved other physicians in his research by bringing them in to show them what he was doing or by sending them tissue samples and asking them for their evaluation of what they saw. In this way he established a local network of colleagues that both helped educated them on the ways that sickle cell disease could affect the body and that also helped him in his research.

For a time there was a glimmer of a hope that federal funding in the form of national health insurance might become available to help those without insurance. This insurance plan might have made more health services available to blacks as well as the poor and unemployed. Beginning in 1943, a bill that came to be known as the Wagner-Murray-Dingell Bill had been debated as a serious amendment to the Social Security Act that would provide payment, and thus medical care, for millions of uninsured and unemployed citizens. Opponents to the new bill branded it as "socialized medicine" and

[57] Thelma Tracy Mabry and L. W. Diggs, *History of Medicine in Memphis: Interview with Dr. Lemuel Whitley Diggs* (Memphis, Tenn.: Oral History Research Office, Memphis State University, 1984). See page 10 for quotation.

vilified the bill's proponents. Professional organizations rejecting the bill included the American Medical Association, the American Nursing Associations, and the American Dental Association. The fear was that the bill would nationalize the health care professions, thus threatening to lower healthcare standards, eliminate the autonomy of providers, and destroy the provider's relationship with the patient. A key element in the debate was the feeling of nationalism coming out of the war and the rising feeling of anti-communism that was affecting all aspects of American life. Thus opponents were not reluctant to imply that proponents of the Wagner-Murray-Dingell Bill were themselves dupes of foreign, anti-American interests.[58]

Diggs debated in favor of the bill even as the AMA and other professional organizations vilified Wagner-Murray-Dingell as nothing more than a subversive plot by foreign powers. Despite the controversy and the opposition of the AMA, Diggs supported passage of the bill. He could see the debate was generating more heat than light, and effect did nothing more than to distract attention away from the real problem that the bill was intended to address, namely the millions of needy and uninsured people, who were unable to take advantage of health care resources and who suffered needlessly. As a debater since his Randolf-Macon days, he found himself in arguments with his colleagues about the bill and its implications. Even within his family there must have been interesting discussions around the dinner table. Diggs believed in making a thorough assessment of any issue before he made up his mind. This was true in politics too, so that

[58] Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry* (New York: Basic Books, Inc., 1982), Alan Derickson, "The House of Falk: The Paranoid Sytle in American Health Politics," *American Journal of Public Health* 87, no. 11 (1997): 1836-1843. For Starr, see the section on "Socialized Medicine and the Cold War," pages 280-289.

when he voted on the issues, he tended to vote in support of the Democratic Party, while Beatrice tended to vote in favor of issues supported by the Republican Party. The Wagner-Murray-Dingell Bill was a product of the Depression Era New Deal politics of Roosevelt, and was a progressivist and liberal piece of legislation. When the war was won and confidence in the economy returned, political support shifted from the social planning and spending of the Democrats to the conservative and business-oriented Republicans.[59]

If Diggs had any concerns, it was not with how the benefits of national health insurance would affect patients, but how it might affect the political system of the country. He believed in the individual responsibility of earning what you got, and the funding for the Wagner-Murray-Dingal plan would come income taxes, so, in effect, people would be paying themselves for their healthcare. The worry for him was that people could come to expect that they had a natural right to healthcare, that healthcare should always be available. "It is the concept of something for nothing, of getting and not having put, which is dangerous. The shift of the responsibility from the individual and family or small social group to a large organization in which individual responsibility is lost is biologically wrong and will not work except in heaven where blood is not needed."[60]

From the time in 1910 when sickle cell was first identified, the disease was treated as a clinical entity characterized by skin ulcers and scars, enlarged glands, the yellow tinge of the sclera, and the "large number of thin, elongated, sickle-shaped and

[59] Diggs and Nollan, *Interview with Walter Diggs.*

[60] Diggs, *The Lemuel W. Diggs Collection.* The quotation is taken from an audio file in the collection entitles "Health Care and Human Rights."

crescent-shaped forms" in the blood.[61] By the time Diggs joined the community of researchers concerned with this disease, the disease had move from the clinic to the laboratory where the blood picture and the correlation with patients' symptoms was of prime interest. For Diggs any attempt to understand the disease was closely linked to the patients who suffered from it. He needed to solve the problem of maintaining regular access to them in order to follow their progress. However, from the time the disease was identified to the late forties and beyond, it remained invisible outside the scientists investigating it. This meant too that his patients usually only knew they had the disease when Diggs told them, which also meant that as a healer he would be their sole source of information on how to control the disease in their individual live.[62]

For many at this time the difficulties of the Great Depression seemed to evaporate with the onset of the war, and the war seemed to open up the prospect of new opportunities in American life that would be unlike anything before. Diggs was ready to try something new and better. "He has always sought the truth and demanded good patient care -- some might even call him a patient advocate."[63] This was true of medical philosophy up to war's end, but would also be a guiding principle during the post war boom. On his return from the Cleveland Clinic, Diggs wanted to build a better department. As the post war years saw a dramatic increase in federal funding for science, Diggs saw an opportunity to acquire the funding that up to now had remained elusive.

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[61] J. B. Herrick, "Peculiar Elongated and Sickle-Shaped Red Blood Corpuscles in a Case of Severe Anemia. 1910," *The Archives of Internal Medicine* 5 (1910): 517. See page 519 for quotation.

[62] T. L. Savitt, "The Invisible Malady: Sickle Cell Anemia in America, 1910-1970," *Journal of the National Medical Association* 73, no. 8 (Aug 1981): 739-746.

[63] Diggs and Nollan, *Interview with Walter Diggs.*

The post war years would see him translate his research interests into organizational structures that, he hoped, would better achieve his goal of better understanding of the disease and better patient care.

CHAPTER SIX

ST. JUDE AND THE SICKLE CELL CENTER

A job half done is not done at all.

My Daddy

Despite the opportunities and distractions of the war, Diggs returned to Memphis with a renewed dedication to his work: He was determined to find ways to ameliorate sickle cell disease, and to improve the research into and understanding of sickle cell disease. He had been carrying out research into the disease since he had arrived in Memphis in 1929, and had conducted this research largely without assistance before the war. He had worked hard to build up a group of patients whom he could see with some regularity and had involved colleagues in the evaluation of patients with interesting symptoms or findings related to their specialties, both to get their input into the treatment of the patients in question and to educate them about sickle cell. He was finding ways to overcome the lack of understanding of the disease that existed in the medical and the general community, and thus increased his activity in the areas that interested him the most: research, treating patients, and educating them.

As the focus of the nation in the late 1940s and early 1950s shifted from winning the devastating war in Europe and Asia to the Cold War, the booming economy, an emerging Civil Rights movement, and the influx of federal research dollars to support seemingly every kind of scientific research, Diggs began to implement new ways to achieve his aim of a better understanding of the disease that would also have practical

value for his patients and would enable him to build a "real department."[1] He probably had advanced as far as he could as an independent clinician researcher at the UT Medical Units. He participated in conferences, published papers and book chapters, communicated with everyone he could identify in his field, and he knew as much as anyone did about the disease. Although he was a researcher as well as a clinician, his major concern was always for the health of his patients. As the majority of sickle cell researchers moved on to the more theoretical research into the molecular biology of the disease, Diggs began to feel that an organizational solution to his problem was called for, a framework that would capitalize on the work already done with the group of patients he was able to assemble and the community of sickle cell researchers. Such a solution would ideally facilitate a regular discourse between patients and researchers for the benefit of the patients.

As part of his early interest and exploration of the disease's knowledge base, Diggs gathered publications on the treatment of the disease, which he summarized and supplemented with his own observations. In essence, he concluded:

> There is a dearth of information concerning the natural course of sickle-cell anemia in all its varied manifestations, and the possibility of spontaneous remissions must be considered in the evaluation of favorable therapeutic responses. The effectiveness of any form of therapy in the treatment of sickle-cell anemia remains to be proved.[2]

Little would change in the ensuing years. The most striking feature of the disease was its ability to cause patients to cry out in excruciating pain. Diggs avoided using the strongest

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[1] Lemuel W. Diggs, "The Lemuel W. Diggs Collection," Manuscript Collection, The University of Tennessee Health Sciences Historical Collections. Letter from LWD to Ann Bell 9/4/1947.

[2] L. W. Diggs, "Negative Results in the Treatment of Sickle-Cell Anemia," *American Journal of the Medical Sciences* 187 (1934): 521-527. See page 527 for quotation.

remedies available--opiates and their derivatives--because they suppressed respiration and thereby oxygen for the body, something that could trigger or exacerbate a crisis, and because of the likelihood of addiction, which would make a patient's life worse rather than better. Finding a way to crack this nut would preoccupy him for the rest of his life.

Part of the reason why his research in sickle cell subsided at this time may have been connected with the war. It was the case that from the late 1930s to 1949 very little new research was being conducted. Little progress was being made in creating new knowledge about the disease and, despite the research completed to date, nothing new had emerged therapeutically that would relieve sufferers. Without more new knowledge, researchers could do little more than repeat what had already been done.[3] The discovery that would change the face of sickle cell research and increase understanding of the underlying mechanism of the disease came in 1949 with the publication by Linus Pauling and Harvey Itano showing that the sickling effect in red cells was due to a defect that had been located in the globin portion of the hemoglobin molecule.[4] The research by Pauling and Itano exemplified the kind of pure research that Diggs elected not to pursue. He remained interested in exploring the clinicopathological features of the disease in the hope that would some finding would lead to an amelioration if not an outright cure of the disease. Nevertheless, all research was important to him, because a breakthrough could come from anywhere; however, the molecular research done by Pauling and Itano was too theoretical, i.e., divorced from interaction with and learning from patients.

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[3] Frankie L. Winchester, "The Path from Obscurity : Efforts to Gain Recognition for Sickle Cell Disease, Memphis, 1929-1975" 1991), See page 41.

[4] L. Pauling and H. A. Itano, "Sickle Cell Anemia a Molecular Disease," *Science (New York, N.Y.)* 110, no. 2865 (Nov 25 1949): 543-548.

Diggs's publications after returning from the Cleveland Clinic focused on a deeper analysis of the ways in which sickle cell manifests in all parts of the body. The mechanism of the disease was familiar. Once the cells sickled, red cells lost the spongy quality that allowed them to navigate through capillaries that were often smaller in diameter than the red cells themselves. When they assumed their familiar grotesque and pointed shape, sickled cells were rigid and could aggregate to form occlusions or blockages that prevented further blood flow through the vessels. Since an occlusion could happen anywhere in the body, the disease was also known as a masquerader that, without competent testing, could be mis-diagnosed as other diseases such as arthritis or pneumonia.[5] Finding a way to intervene was crucial to Diggs's goals as a researcher and a clinician. With this in mind, he considered how best to realize his concept of a clinical center by applying what he had learned from his experiences in designing the Gaston Blood Bank, and in managing the clinical laboratories and creating another blood bank at the Cleveland Clinic.

After 1955 Diggs gained additional organizing experience by becoming active in the efforts to help Danny Thomas locate and define a new pediatric hospital in Memphis, which would be an experience in creating a new kind of hospital. Diggs drew on all of this experience, plus the funding from various new and old sources, to create a sickle cell center. He continued to build a better program by finding ways to educate his profession on the multiple manifestations of sickle cell. Together with his wife Beatrice and Ann Bell, he began giving hundreds of workshops for pathologists and technologists in various parts of the country. He developed a fascination for finding ways to use the

[5] Travis Winsor and George E. Burch, "Sickle Cell Anemia: A Great Masquerador," *Journal of the American Medical Association* 129 (1947): 793-796.

photographic technology of his day to illustrate what he had learned about the morphology of blood cells. Since his student days he had been interested in studying the different forms that blood cells took and in showing how they appeared at different stages of their development.

At some point soon after the war, Diggs made the acquaintance of a Memphis artist by the name of Dorothy Sturm, who had a national reputation for her watercolors and enamels. She also had an interest in medical illustration. Since his days as a student in Max Brödel's medical illustration class at Johns Hopkins, Diggs understood the value of being able to draw what he observed, and he often included his illustrations in his publications. His daughter Alice likewise became interested in drawing, and she would contribute many drawings to his workshops and publications over the years.[6] What intrigued him about Sturm was the prospect of making definitive images for teaching that would incorporate everything that was known at the time about the appearance of the cells. With the help of Ann Bell, Sturm set up a microscope in her home to use for the observations that she would include in her drawings. She produced fifty-seven blood cell watercolors on paper that depicted blood cells in various forms, including erythrocytes, granulocytes, plasmocytes, monocytes, and neutrophils, along with a series on infectious mononucleosis. The unique combinations of shapes, colors, and textures revealed by the microscope fascinated her. She had established her reputation at a time when there was

[6] Alice Diggs and Richard Nollan, *Interview with Alice Sullivan Diggs*, 2011.

an increasing demand for the illustrator's talents, and few were adept at communicating visually what could be seen through a microscope.[7]

Sturm's images were idealized in the sense that they based on everything that was known about blood cells at the time and they illustrated what the viewer should see through a microscope without the interference or confusion of adjacent structures and artifacts that are found in blood smears. Diggs commissioned these images for use as a teaching aid for faculty and students; for years they hung on the walls of the Department of Clinical Pathology for anyone to study and review.[8] This collaboration with Sturm was so successful that Diggs further commissioned her to produce images for a book he was working on that would cover the topic completely. In 1954, his classic *The Morphology of Blood Cells* was published, and would prove to be his most enduring book-length work.[9] He shared the credit with Sturm and Bell by making them co-authors, an act that illustrated his generosity, humility, and collaborative spirit.

Diggs embraced the federal government's move to expand Social Security to include basic health insurance for everyone. Although the movement began during the Depression years in President Franklin D. Roosevelt's administration, the President did not wholly endorse it; as a result, it languished. The bill known as the Murray Dingell Bill was introduced in 1943; it ultimately became known as the Wagner-Murray-Dingell Bill. By supporting this bill, Diggs was not in opposition to the majority of his colleagues

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[7] Ibid., "Medical Illustrations of Dorthy Sturm," in University of Tennessee Health Sciences Library [database online]. Memphis, TN 29 April 2010 [cited 2011]. Available from http://library.uthsc.edu/history/dorothysturmexhibit/.

[8] Ibid.

[9] L. W. Diggs, *The Morphology of Blood Cells.*. (Chicago, Ill.: Abbott Laboratories, 1954), 28. Later the title would change to *The Morphology of Human Blood Cells*.

and most professional organizations, including the American Medical Association, which pooled large amounts of money and support to fund the largest public relations campaign that anyone had seen to oppose universal health insurance. The AMA's purpose was to defeat this bill in Congress, which it characterized as "socialistic"-- designed to destroy the doctor-patient relationship at the heart of American healthcare, and intended to subordinate doctors to the federal bureaucracy.

The campaign was vitriolic at a time when the Cold War was heating up and the debate often ignored the facts, seldom focusing on those who would have benefited from access to the healthcare system. The bill remained for consideration in Congress for ten years before its supporters abandoned it.[10] During this time Diggs would debate with anyone interested in discussing the issues. He knew as well as anyone could that health insurance made a significant health care difference. He was well aware that patients often delayed seeing a doctor because of the cost until their illness forced them to go, which meant that illnesses, such as those often seen at public hospitals like the John Gaston Hospital, were advanced and complicated, and much more expensive to treat than they would have been if treated earlier. At the same time, however, he did not believe that anyone had a right or entitlement to health care paid for by others, but rather that health was an obligation of the individual. The concept of something for nothing was unacceptable to him and a corrupting influence on society. If government were to assist,

[10] H. D. Chope, "Public Health and Public Medical Care," *California Medicine* 85, no. 4 (Oct 1956): 220-225. , "Wagner-Murray-Dingell Bill," *Journal of the American Medical Association* 130 (Apr 27 1946): 1234 passim. , "Wagner-Murray-Dingell Social Security Or "Cradle to Grave" Bill (S. 1161; H. R. 2861): Its Place in Relation to Medical Practice," *California and Western Medicine* 59, no. 2 (Aug 1943): 109-111. For a broader discussion see pages 280-286 of: Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry* (New York: Basic Books, Inc., 1982).

then it should be the local and not the federal government that should participate. One admirer wrote him: "It was people like you who signed the Declaration of Independence."[11] Diggs's view was derived in part from his understanding about what rights were from George Mason and the Virginia Declaration of Rights of 1776.[12] And there were others who speculated that his support of the bill led to his being scrutinized by the Federal Bureau of Investigation. He was not investigated, as it turned out, but the paranoid feelings of anti-Communism and the Cold War were pervasive.[13]

During this time Diggs continued attending conferences, the workshops that had begun during the war, and clinical pathology and medical technology professional seminars and meetings. He spoke on the issues that concerned him, and would include the colonial history that was close to him. He also gave lectures when invited to do so. His purpose, as always, was to teach others what he knew. His style was straightforward and easy to follow. At a typical presentation on the morphology of blood cells given to a group of medical technology students, he would present each cell and discuss its appearance under the microscope, and would leaven the presentation with his gentle sense of humor--such as referring to an unfamiliar cell as "What the cell is that?"[14]

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[11] Diggs, *The Lemuel W. Diggs Collection* See document LWD 002-06-17.

[12] L. W. Diggs, *Health Care and Human Rights*. This audio file can be found in: Diggs, *The Lemuel W. Diggs Collection*

[13] The suspicion that Diggs might have been under investigation can be found in: Walter Diggs and Richard Nollan, *Interview with Walter Diggs* (Memphis, TN:, June 13, 2008). The author used the Freedom of Information Act and was told that the files contained nothing about Dr. Diggs: David M. Hardy, *Subject: Diggs, Lemuel Whitley*, ed. Richard Nollan, 26 August 2010.

[14] Diggs, *The Lemuel W. Diggs Collection* Taken from the audio recording of a New Mexico Medical Technologist's presentation, entitled "Normal and Abnormal Morphologic Hematology."

Beatrice would often accompany him on these trips to assistant him during presentations; she acted as his typist and editor when the task was to draft papers for presentation or publication. Often, too, Ann Bell accompanied them when they traveled. With his teaching, clinical, service, and outreach activities, Diggs's workload was considerable. He still directed the blood bank as well. On one occasion he must have appeared overloaded to the blood bank staff, for they created a letter to cheer him up. It acknowledged that "things have been tough for you lately" and recommended that he "let up a bit"[15]:

> You are working too hard. Let the G.P [general pathology] lab, and the House Staff lab, go to pot one day. Chances are that the next day the problems will have smoothed out or better still you may have thought of a way to smooth them. All of this probably does not make sense, but at least we are not asking for anything.[16]

Diggs took the time to write letters to local media regarding the creation of a large park that would a preserve a pastoral setting in the Memphis area, to add to its other parks. He argued against the "jingle of money created by new payrolls, the noise of factories, of heavy trucks and shifting freight cars,"[17] and in favor of a park with golf courses, restricted areas for horseback riding, polo and rodeos, and fishing and picnicking.

Working hard and applying himself completely to whatever he did was Diggs's normal way of conducting himself. He pursued his scientific interests, but also dedicated himself to the mentoring of colleagues. In the latter context, his colleagues also felt inclined to remember him. In honor of his sixtieth birthday, they pooled their resources to

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[15] Ibid. See document LWD 002-06-15.

[16] Ibid. See document LWD 002-06-15.

[17] Ibid. See document LWD 002-06-20.

hire another local artist Billy Price Hosmer to paint a life-size portrait of Diggs. The portrait itself was vintage Diggs, as seen through the eyes of family, friends, and colleagues. In the portrait he was seated at a laboratory bench resting his elbow on the surface only a few inches away from a binocular, oil immersion microscope, with his right hand resting on his knee and holding a pencil. The expression on his face is of someone preparing to tell a humorous story or communicate an interesting finding. The group to honor Diggs met on May 28, 1961. Fred Kraus introduced those present, including the artist, the College of Medicine Dean Maston Callison, Lorraine Kraus, Ann Bell, Lou and Henry Packer, and Jimmy Hughes. Beatrice was there with their daughters, Alice and Peggy. The main speaker Aly Lipscomb spoke about what Diggs meant to her personally and to many others on campus. "We are agreed," she began, "that the impact of his character is imprinted sharply where it will do the most good--in the minds of his students and associates."[18] The portrait is a reminder of the man whom they all knew and loved for his kindness and his wit. He would be quoted "locally, nationally, and internationally not only for his sound and brilliant research in the field of hematology in general and sickle cell anemia in particular, but also for his "down home" farmer-type analogies which students so dearly love."[19] Included in his analogies was a description of

[18] Ibid.. See: Alys Lipscomb, "Presented by Dr. Alys Lipscomb at the Presentation of Dr. Diggs' Portrait on may 28, 1961." Typescript manuscript, p. 1, *The L.W. Diggs Collections*. See LWD 002-06-49.

[19] Diggs, *The Lemuel W. Diggs Collection*. See: Lipscomb, *Presented by Dr. Alys Lipscomb at the Presentation of Dr. Diggs' Portrait on may 28, 1961*, 1. See LWD 002-06-49.

the eosinophilic granulocyte that are "round, regular, sharply refractile and fall off the nucleus like a sack of potatoes would fall off a mule's back."[20]

Diggs taught medical students, but also nursing and medical technology students:

> … he taught them vocabulary, prefixes, suffixes and how to put them together. Testing his skill and their knowledge, he asked them a list of definitions once. Amongst the words included was "laminectomy." One of the logical answers was "A Caesarian section on a sheep."

Lipscomb started her professional career as a medical technologist. However, with Diggs's encouragement and support, she pursued her medical degree, after the attainment of which she enjoyed a long and successful career at the University of Tennessee. Along with a copy of her presentation remarks to Diggs for his files, she included a postscript with these words:

> You'll never know how important you have been in my life. You've always been there when I needed help. You gave me my first job. You showed me I could teach. You encouraged me to go to medical school. You introduced me to Dr. Haden, paving the way to my internship and fellowship. You gave me my second job. You have championed my cause through 50 years. The help you've given me is similar to the help you've given so many.[21]

This presentation was made when Diggs was sixty-one years old.

In 1955 Memphis Mayor Frank Tobey received a query from Danny Thomas, the Hollywood actor and star of the popular television series *Make Room for Daddy*, about constructing a hospital for treating underprivileged children. Thomas had been advised by his friend, Archbishop of Chicago Samuel Cardinal Strich, to build it in Memphis, because the cardinal had started his career in Memphis and considered Memphis to be his

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[20] Diggs, *The Lemuel W. Diggs Collection*. See: Lipscomb, *Presented by Dr. Alys Lipscomb at the Presentation of Dr. Diggs' Portrait on may 28, 1961*, 1. See LWD 002-06-49.

[21] Diggs, *The Lemuel W. Diggs Collection*. See: Lipscomb, *Presented by Dr. Alys Lipscomb at the Presentation of Dr. Diggs' Portrait on may 28, 1961*, 1. See LWD 002-06-50.

hometown. Thomas sent an advisor, who was welcomed enthusiastically by city representatives, including the mayor, who had a special interest in children's issues since his wife had suffered the miscarriage of their first child. Tobey promised the support of the city, which included donating the land to the hospital. In response, Thomas invited Tobey and his advisors to Hollywood for further discussions on the project and to sightsee at a movie studio. With so many positive developments, Tobey returned to Memphis, where he informed the medical and other city leaders of the prospect of such a hospital. The initial response from everyone was favorable. By May, Thomas himself was in Memphis talking to people and fundraising for the new hospital. The bond between Tobey and Thomas grew quickly in a short time. When Tobey suffered a severe heart attack in September, Thomas was deeply affected.[22]

Even though the mayor and some leading Memphians warmly welcomed the idea of a new hospital, not everyone felt that the idea was a good one. One objection came from those who felt that Memphis already had a strong medical center for pediatric diseases. The Le Bonheur Children's Hospital had been built, and after Tobey's death an addition was built to the Memphis City Hospital called the Frank T. Tobey Memorial Children's Hospital. In addition, the private hospitals in the city also had beds set aside for pediatric patients. In 1955, O.W. Hyman saw a possible solution this way:

> On the other hand, if patients admitted to the hospital are limited to those with certain diseases or groups of diseases, and if the hospital is so equipped as to provide special facilities for the specially skilled staff, then the hospital will serve a much wider area and will in addition provide

[22] G. Wayne Dowdy, *Crusades for Freedom :Memphis and the Political Transformation of the American South* (Jackson: University Press of Mississippi, 2010), 183. See pages 41-41, 45-46.

> treatment opportunities not otherwise made available by local community institutions.[23]

Hyman did not offer a way to make this a financially viable plan. The worry was that St. Jude would compete with Le Bonheur and the other existing hospitals, in effect reducing the number of patients for them and thus reducing the amount of teaching material for the medical students. It would also be a hardship on families traveling long distances, who would have to afford room and board during the long stays. Another difficulty seen by doctors, including Diggs, went to the heart of Thomas's desire to build a hospital with national prominence that was open to everyone. The difficulty was that such a hospital might be limited to only the local population, those in the vicinity of the hospital, and to treating only their diseases.[24]

Diggs had been a part of the plans for St. Jude from their inception. He was selected to be a member of the St. Jude Steering Committee along with James N. Etteldorf, a veteran pediatrician who started the pediatrics program at the university, to represent the Memphis and Shelby County Medical Society and the University of Tennessee. Ed Barry, a well-respected Memphis fundraiser noted for his work on behalf of Baptist Hospital and Methodist Hospital, chaired the steering committee. Its task was to turn Danny Thomas's dream into a reality: to create a world-class hospital that would help the underserved and underprivileged children worldwide. Thomas and the committee came to rely on Diggs's knowledge of childhood illnesses, such as sickle cell and leukemia, as well as his straightforward and clear approach to solving problems. In

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[23] James N. Etteldorf, "The James N. Etteldorf Collection," Manuscript Collection, The University of Tennessee Health Sciences Historical Collections. See page 1 of the letter from O.W. Hyman to Sol R. Rubin, March 25, 1955, document JNE 007-12-101.

[24] Ibid.

the first year or so, Diggs reconciled the dilemma of what kind of hospital St. Jude would be by suggesting that it focus on catastrophic childhood diseases and on becoming a research hospital. Diggs's participation was crucial: His ideas appealed to Thomas and the committee so much that they adopted them as the central foci and direction that the new hospital would take. The advantage for the local hospitals was that beds for long-term study would be at St. Jude, while beds for acute, short-term, and curable patients would be located at the local hospitals. In order for the new hospital to be open to any child, funding would come from donation and research grants; any child who fit into one of the research programs underway would be admitted to the hospital for free. "Since these diseases affect all races, all children will be admitted."[25] Staff members would be selected, "who are best qualified regardless of race or creed."[26] For St. Jude this meant that its patients could indeed come from national and even international locations. Thomas was grateful to Diggs for making the initial suggestion of a research hospital.[27]

St. Jude Thaddeus was the patron saint of hopeless causes. Perhaps it was Diggs's deep commitment to helping those afflicted with sickle cell disease that drew him to Thomas. Within this relationship Diggs formulated the idea that St. Jude could prosper as a hospital specializing in research into catastrophic diseases, which at once set it apart from other hospitals and designated a wider audience for it. It also relieved concerns that St. Jude might compete with existing hospitals, because with its catastrophic-illness

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[25] Walter Diggs, "Dr. L.W. Diggs and Civil Rights," Memoir, p. 1-4, *L.W. Diggs Collection.* See Diggs letter to H.F. Tamer May 13, 1961 in folder LWD 005-11.

[26] Ibid. See Diggs letter to H.F. Tamer May 13, 1961 in folder LWD 005-11.

[27] Hazel Fath, *A Dream Come True: The Story of St. Jude Children's Research Hospital and ALSAC* (Dallas, TX: Taylor Publishing Co., 1983), Danny Thomas, *Congratulations to Diggs for Civitan Award* , n.d.)

identity it would not draw away the acute care cases that the children's hospitals addressed, but at the same time, it would offer hope to those with difficult, chronic illnesses. Diggs made this insightful and farsighted recommendation to Thomas and the committee; his vision helped to change the direction of the hospital.[28]

There was excitement mixed with doubt at the idea of opening a new hospital in Memphis. Diggs was one of those who saw the project's potential, but he also had some understandable concerns about the project. The St. Jude Hospital was a bold initiative with few peers anywhere in the world. He was unsure that the project would evolve the way in which the steering committee envisioned, given the uncertainties that had been voiced by his medical colleagues. Diggs was drawn to "Danny's Dream" and its potential for a new way to practice medicine.

Danny Thomas sponsored a number of well-publicized fundraising events in Memphis that included prominent Hollywood stars. At one such event in 1957, Diggs and his wife bought tickets to a fundraiser that was held in the Russwood Park, the AAA baseball stadium across the street from the Baptist Hospital. He was reluctant to attend, but felt a duty to do so. "It had been raining," he would tell a gathering of St. Jude supporters a few years later, "and there was a very black cloud in the west with occasional lightning flashes and rolling thunder. A bad storm and heavy rain seemed imminent. Soon after that the winds changed. The skies cleared. Instead of a black and threatening cloud there was a bright evening star right over the area where the St. Jude

[28] "Danny's Dream," [cited 2009]. Available from http://www.stjude.org/stjude/v/index.jsp?vgnextoid=d7e8fa3186e70110VgnVCM1000001e0215acRCRD&vgnextchannel=bc67ef9e87018010VgnVCM1000000e2015acRCRD., Fath, *A Dream Come True: The Story of St. Jude Children's Research Hospital and ALSAC*, J. V. Simone, "A History of St Jude Children's Research Hospital," *British Journal of Haematology* 120, no. 4 (Feb 2003): 549-555.

Hospital was being built."[29] Despite the fact that the evening star was a naturally recurring event, he saw it as a sign that "the St. Jude cause was worthy and should be vigorously supported.[30]" This kind of epiphany would seem to be inconsistent with Diggs's Unitarian Universalist religiosity, but he unquestioningly accepted the "bright evening star" as a turning point for any remaining doubts that he had about the development of the hospital. His support of St. Jude solidified and his participation in its welfare would continue for the rest of his life.

Diggs's participation in St. Jude's creation was gratifying to him, but not without its headaches. From the beginning and through the sixties, everyone connected with St. Jude and the University of Tennessee Medical Units assumed that there would be close ties between the institutions. The addition of the St. Jude research powerhouse to the university's portfolio would be a welcome adjunct to the university's growing stature. The researchers at St. Jude could also benefit from having faculty status and access to the broader range of research that characterizes a university. These feelings were complicated by the fact that from the years of the mid-fifties much effort at both institutions had been expended on organizing and building St. Jude, but no formal affiliation agreement was concluded between the two institutions that clearly defined what their relationship would be. During the years of 1960 and 1961, Diggs and the steering committee were busy with a national search for St. Jude's first Physician-in-Chief, and concomitantly the star-shaped building was being constructed. Nevertheless, as the sixties progressed, the new

[29] Diggs, *The Lemuel W. Diggs Collection.* These comments are taken from his presentation to the second annual meeting of ALSAC on October 4, 1959.

[30] Ibid. See page 12 of document LWD 002-06-27.

research hospital felt increasingly independent and was unwilling to accept what it perceived as a relationship with an institution of lesser status.[31]

As the sixties progressed, the feelings by participants on both sides hardened to the point that what had started as a crack between them grew into a deep divide. In 1969 there was genuine concern on the part of university planners that the divide would be permanent. Diggs may have been the only person who stood in the good graces of both sides. In April he called upon the St. Jude Board of Governors to have a meeting between St. Jude and the University of Tennessee—the result of this meeting was the formation of a liaison committee. The St. Jude Medical Directory was hopeful: "I hope through Dr. Diggs' good offices, we can get discussions of the University of Tennessee--St. Jude relationship back to the faculty level."[32] While Diggs represented an acceptable intermediary on St. Jude's behalf, his role was not always viewed favorably or with pleasure by the university negotiators. The chair of the pediatrics department, upon hearing that the university was expected to "deal through Dr. Diggs," reportedly told Diggs that "he would not deal through him to St. Jude, but only through the Dean and Chancellor."[33] Additionally, low-key talks took place between the two sides that produced no concrete results. Yet neither side could give up entirely on the relationship, and hence the talks continued. In December of 1971, almost ten years after the opening of St. Jude, a formal affiliation agreement was painstakingly developed. Diggs's role was

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[31] Etteldorf, *The James N. Etteldorf Collection*. This account is found in box 7, folders 1 and 2.

[32] Ibid. See the letter from Donald Pinkel to James Hughes, April 14, 1969, JNE 007-01-88, page 2.

[33] Ibid. See Etteldorf's marginal notes in letter from James Hughes to Homer Marsh, April 18, 1969, JNE 007-01-74.

minor, but his support was for St. Jude, and his position sometimes provoked harsh criticism from his colleagues.

Diggs very likely saw St. Jude as an opportunity to participate in the creation of another research venue in the city that could carry out sickle cell research. He had had experience in organizing and managing departments when he was a resident at the newly built University of Rochester Strong Memorial Hospital. There he had organized the laboratories, and at the University of Tennessee and the Cleveland Clinics he had similarly organized their blood banks. It made sense to him that as resources became available, he would create another organization related to his central interest: a sickle cell center where all aspects of the disease--from the laboratory to the bedside to the home--could be given concentrated attention.

"Granting agencies," Diggs recalled, "considered SC [sickle cell] an unimportant disease involving blacks and not worthy of study."[34] However, beginning in 1953, an earlier supporter, the Herbert Herff Foundation, donated $10,000 to Diggs for basic research into sickle cell. Herff was the same Memphis philanthropist who had donated the initial funding for opening the blood bank in 1938. The work on sickle cell went well, and in the following year the foundation renewed its support to Diggs. This money made it possible for Diggs to hire a technical assistant, James Child, "whose main duty was to provide transportation for patients in the community and to assist in blood collection and examination in order to obtain information about hematological and chemical changes in

[34] Diggs, *The Lemuel W. Diggs Collection*.

relation the recurrent crises."[35] The transportation was Diggs's car, which Child used to bring patients without means to the clinic and take them home afterwards. For Diggs to arrive at such a solution—to transport critically ill and underprivileged black patients in his own car so that they could receive treatment—was extraordinary in the context of the times in which he lived and manifested his commitment to live by certain principles of fairness and compassion to all people, regardless of race or skin color. This helped to provide a group of patients who could serve as a foundation for Diggs's research, which meant that he could identify patients he could follow regularly for longer periods of time in order to learn more about their disease.[36] The money for this work was administered by the university and announced by O.W. Hyman, the university's executive officer. Diggs preferred to let the university handle the money as a way of demonstrating that every penny of the money was being accounted for and being used for the purpose for which it was given.

As the news of Diggs's efforts and reputation spread in the black community, more funds from local groups became available; these developments allowed his idea for a center to grow. Diggs was finally beginning to see a tangible outcome of his efforts at approximately the same time that Danny Thomas was campaigning to solicit funding for his hospital. Diggs worked together with D.B. Morrison in the Department of Laboratory Medicine. Part of the funding was used to send Diggs and his wife to Paris for an International Hematology Conference, at which he presented a paper on "The Sickle Cell

[35] L. W. Diggs, "The History of the Sickle Cell Anemia Program and Research in Memphis, Tennessee, 1929-1980," p. 1-13, The Lemuel W. Diggs Collection. See page 2 for quotation.

[36] Ibid.

Crisis."[37] By the late 1950s, Diggs was already managing a considerable number of sickle cell patients in the Memphis area that formed the basis of what would later become a sickle cell center. Patients were seen as sickle cell patients, but they could come to the clinic for any consultation or treatment. The center was only a clinic, and hence those requiring special or long-term care were referred either to another specialist or to the hospital.

The donation from Herff was influential, because it came with, and perhaps encouraged, contributions "by citizens of Memphis, mainly Blacks through social clubs, student and nursing organizations, church, labor and civic groups."[38] With the money provided by Herff and others, Diggs was able to hire another doctor, Alfred Kraus, to work with him in the clinic. Fred, as he was known, was a trained hematologist from the University of Chicago. He was interested in the various medical activities at the University of Tennessee, but had found a position at the Kennedy Hospital located on Getwell Road.[39] He came to Memphis with his wife Lorraine, who was a medical technologist, but used the opportunity to earn her doctorate at the university. At this time it was unusual for a woman to pursue a doctorate, as evidenced by the fact that first she had to be interviewed by the Dean of the School of Graduate Health Sciences, T.P. Nash, before she was admitted. Fred Kraus started working at the university in the mid-1950s.

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[37] The University of Memphis Library's Special Collections, *Memphis Press-Scimitar* Morgue File , series 80145.

[38] L. W. Diggs, "The Sickle Cell Program in Memphis," in *Unpublished Writings* (Memphis: Private, 1977), 10-20. See the third page of this paper for quotation.

[39] Alfred P. Kraus, Lorraine Kraus, and Jim Gibb Johnson, "Oral Interview with Alfred P. and Lorraine Kraus," Oral History, p. 1, The University of Tennessee Health Science Center Oral History Project, Memphis, TN.

He was specifically interested in sickle cell as a clinical disease, while his wife focused on the biomolecular aspects of the disease.

By 1961 the support for sickle cell research had increased enough to create the core of the center that Diggs had in mind. Along with Fred Kraus, there was a fellow supported by St. Jude, a Japanese resident, and two technologists. The group was also publishing on sickle cell hemoglobin and remedies for the disease.[40] In the following year the National Institutes of Health funded a one-year grant for $57,000, which was supplemented by local donations. The aim of the grant was to study chemical changes in sickle cell diseases at the time of vascular occlusion crisis.

In 1963 another doctor, Louis Barreras was added to the sickle center staff; he had fled his native Cuban home to live in the United States. He had specialized in the blood diseases of children at the University of Havana, in particular in acidosis and its management. The Cuban Revolution produced many changes in the hospital where Barreras worked, but when the man who scrubbed the floors told him he had been put in charge of the hospital, Barreras decided to leave. He told the authorities that his daughter had trouble with her spine, and that only a specialist in the United States could treat her. The Cuban authorities withheld Barreras's passport for four months until he promised to return after his daughter had received treatment. He agreed to this arrangement, but had no intention of making good on his promise. As soon as his family was out of Cuba, he

[40] L. M. Kraus, "Formation of Different Haemoglobins in Tissue Culture of Human Bone Marrow Treated with Human Deoxyribonucleic Acid," *Nature* 192 (Dec 16 1961): 1055-1057.

made his way to Ft. Lauderdale and from there to Memphis, where he could continue practicing medicine.[41]

The funds to hire Barreras, James Child, and others came from increasingly diverse sources. The philanthropy of Herbert Herff and Danny Thomas helped, but money also came from big sources like the National Institutes of Health beginning in 1963 and continuing for ten years, the U.S. Public Health Service beginning in 1962 and continuing for four years, and from local groups. In 1962 the USPHS awarded the Sickle Cell Center a $57,000 grant, which was used to hire Barreras, Iwao Iuchi from Japan as a hematology resident, Jeff Upshaw as a St. Jude Fellow, and Doris Sheldon as a technologist. In 1962 Ernestine Flowers and Maurice Tate joined the staff and would add to the knowledge about sickle cell in the home and at work; they would provide information that could be used to help patients adapt their illness to a more productive lifestyle by discovering the most effective way to treat the patient, the number of days lost in school or work, the risk of jobs and job training, and the best environment that would enable them to thrive. Part of the research conducted by the clinic included studying patients in their homes, which was at the heart of Diggs's goal, namely, "that the information will not only be beneficial to the physician treating the patient, but also to teachers, employers, health and welfare agencies, guidance councilors, and insurance companies."[42] The initial ALSAC grant that began in 1959 lasted for four years. A spin-off in 1963 from the ALSAC funding was the creation of a Hematology Laboratory to

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[41] "Cuban Doctor Doesn't Regret Freedom 'Fib'," *The Commercial Appeal,* December 9, 1962 .

[42] "More Funds Needed for Research in Sickle Cell Says Dr. Diggs," *Tri-State Defender,* June 13, 1964 p. 1. This article can be found in Sickle Cell Notebook A in: Diggs, *The Lemuel W. Diggs Collection.*

study coagulation disorders, which was also supported by the University of Tennessee, and was staffed by another person Diggs hired, Marion Dugdale, a recent graduate of Harvard Medical School.[43]

A local group of negro churches, clubs, and business and professional leaders led by Dr. Charles L. Dinkins, president of Owens College, donated $2100 with the hope of increasing that amount of money in the future. Their efforts soon produced $3700.[44] Other black groups that participated in this effort included The Practical Nurses and The Cope Club. The Cope Club donated a carousel slide projector for education and outreach purposes. The money that these groups provided was raised at a variety of social events. The Tri-State Defender, Memphis's most prominent black newspaper, carried an appeal for more funds from the community. These efforts were made because the black community saw the value of what Diggs was doing and wanted to help maintain a continuity of service by the Center at a time when funding for it was erratic. In 1966 similar local efforts led to the donation of two television sets for patients in the recently built William F. Bowld Hospital on the university campus.[45] Funds from local sources were also used to purchase wheelchairs. In 1968 the OsirUs Club hosted a fashion show to raise $100 for the Center. This support by local black organizations represented the

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[43] "Univ. of Tennessee: Dr. L. W. Diggs, Dept. of Hematology," *ALSAC News* (December 10, 1963 . See also: Marion Dugdale and Richard Nollan, "Interview with Marion Dugdale, M.D." Oral Interview, p. 1, The University of Tennessee Oral History Program, The University of Tennessee Health Science Center, Memphis.

[44] "Negroes Raise Fund: Sickle Cell Anemia Research to be Furthered at UT," *The Commercial Appeal* (June 8, 1963), "$3700 More is Needed to Reach Goal of First Sickle Cell Drive,"1963. These articles can be found in the Sickle Cell Notebook A in: Diggs, *The Lemuel W. Diggs Collection*.

[45] "Negroes Help Keep Memphis Anemia Center Open," *Jet* XXX, no. 5 (May 5, 1966: 29.

mark of progress in the understanding of sickle cell disease, in that some in the black community viewed it with suspicion. Some black leaders had concerns, "that there was a certain stigma attached to sickle cell disease and that our [the staff of the Sickle Cell Center] delving into it was a plot to make the race look bad."[46] The high rate of anemia among blacks was often cited as a reason to exclude blacks from the military and from working for the airlines. It was news when the first black astronaut candidate was rejected from the space program to return to his regular U.S. Air Force duties.[47] The same thing happened during World War II when Diggs had to argue in favor of blacks possessing the trait to be allowed to perform regular, but not stressful or high-altitude duties.

In 1964 the American Society of Clinical Pathology honored Diggs with its Ward Burdick Award "in recognition of his meritorious contributions to the science of Clinical Pathology."[48] The medal was awarded in a ceremony at the society's annual meeting on October 1. Two years later the Volunteers in Aid of Sickle Cell Anemia, Inc. gave Diggs its Humanitarian award "in recognition of his outstanding contributions and spirit of dedication in the field of sickle cell anemia."[49]

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[46] "'Sickle Cell' Fight Encourages Unit," *The Commercial Appeal* (September 4, 1967). This newspaper article can be found in the Sickle Cell Notebook A in: Diggs, *The Lemuel W. Diggs Collection*

[47] "Blood Disease is Keeping Many Negroes on Ground," *The Commercial Appeal,* June 4, 1965. This newspaper article can be found in the Sickle Cell Notebook A in: Diggs, *The Lemuel W. Diggs Collection*

[48] "Sickle Cell Center Added to U.T." *University Center-Grams* XVIII (February 1965): 1.

[49] "Humanitarian Award -- Aid to Sickle Cell Anemia, Inc." Photograph, The Lemuel W. Diggs Collection.

Both local and national newspaper articles published in the late 1950s and 1960s reported Diggs's various efforts to support research into sickle cell and the work of the Sickle Cell Center. The publicity about sickle cell during this time increased, giving status and value to Diggs's efforts. He also began speaking more openly about the disease as it compared to other diseases, such as polio. "Sickle cell disease," he is quoted in one newspaper article, "causes more paralysis and suffering than polio ever did."[50] He was tireless in promoting information about the disease; such a statement also indicates his compassion for his patients and is a reminder of how much suffering he witnessed virtually on a daily basis. Diggs wisely used the growing interest in the disease to campaign for support on behalf of research into the disease.[51]

The work at the Sickle Cell Center focused on the structure of the hemoglobin molecule. Perhaps the most significant contribution of the Center was the discovery in 1966 of a new form of the sickle cell hemoglobin, which was quickly dubbed "Hemoglobin Memphis." The discovery came when a sixty-year-old sickle cell patient caught the eye of Lorraine Kraus; this patient had a variation that seemed to make the disease less severe. He wrote: "This hemoglobin variant in the alpha chain, when combined with sickle cell hemoglobin apparently makes sickle cell anemia a less severe

[50] Hal D. Steward, "Strange Disease Strikes Negroes: Sickle Cell Anemia Said to Affect Significant Part of Population." See the Sickle Cell Notebook A in: Diggs, *The Lemuel W. Diggs Collection*

[51] Ibid. Cliff Smith, "Strange Sickle Cell Anemia 'Neglected': 14-Year Life Span," *[The San Diego Union],* March 26, 1968 , This newspaper article was found in Sickle Cell Notebook A, page 56.

disease."[52] What made this patient impressive were his age and the fact that he had the disease, but he experienced very few (if any) painful episodes. It was unusual for someone with the disease to live so long (because sufferers from sickle cell typically died earlier in life) and also to have such mild symptoms.[53]

Another significant contribution of the Sickle Cell Center was the investigation of carbamyl phosphate for a time, because it altered the hemoglobin in sickle cell patients so that the red cells did not sickle. However, despite the promise of the drug, it had undesirable side effects, such as neurological effects and cataracts found in test animals; consequently, it had to be abandoned.[54]

The Sickle Cell Center in the sixties and early seventies was a growing organization. It was not always funded evenly, but it had enough money for hiring the staff needed to do research, and care for and study the sickle cell patients in the program. The university provided the rooms for the center, and for this reason the Center was located in the Gailor Clinic. Although there was still little that could be done to ameliorate the effects of the sickle cell disease, new ways were being found to detect it.

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[52] L. W. Diggs, "XXXI. Clinical Pathology," in *History of Medicine in Memphis* (Memphis: Memphis and Shelby County Medical Society, 1971), 239-264. See page 252 for quotation.

[53] L. M. Kraus et al., "Characterization of alpha23GluNH2 in Hemoglobin Memphis. Hemoglobin Memphis/S, a New Variant of Molecular Disease," *Biochemistry* 5, no. 11 (Nov 1966): 3701-3708. , A. P. Kraus et al., "Hemoglobin Memphis/S. A New Variant of Sickle Cell Anemia," *Transactions of the Association of American Physicians* 80 (1967): 297-304, Diggs, *Clinical Pathology*, 239-264. , Kraus, Kraus, and Johnson, *Oral Interview with Alfred P. and Lorraine Kraus*, 1. . In the Diggs chapter, see page 252.

[54] Ibid., L. M. Kraus and A. P. Kraus, "Carbamyl Phosphate Mediated Inhibition of the Sickling of Erythrocytes in Vitro," *Biochemical and Biophysical Research Communications* 44, no. 6 (Sep 17 1971): 1381-1387. , L. M. Kraus and A. P. Kraus, "Carbamyl Phosphate Mediated Inhibition of the Sickling of Erythrocytes in Whole Blood in Vitro from Sickle Cell Anemia Patients," *The Journal of Laboratory and Clinical Medicine* 78, no. 5 (Nov 1971): 843-844.

Diggs participated in evaluating a new and simpler test produced by Orthro Diagnostics called Sickledex. It was simple enough for any laboratory technician to perform and read in five minutes, as compared to the standard sodium metabisulfate method, which was more complicated and could take up to four hours to complete. Electrophoresis was still required to determine whether the cells under observation were from someone with the trait only or from someone with the anemia. Sickledex was also reported to have fewer false positives and fewer false negatives, and this represented a real advantage. Diggs participated in the promotion of the new invention by first testing it in his laboratory and then reporting the results.[55] He and his staff also tested Sickle-Sol by Dade, Sickle Quik by Schering, and Sickle-IS by Hyland—these were found to be practical, readily available as screening procedures, and less expensive than hemoglobin electrophoresis tests. Diggs noted, "False positives and false negative tests could be reduced by the aggregation and separation modification with or without centrifugation." [56]

In summary, the Diggs Sickle Cell Center was able to follow the research and patient care concerns that were most important to Diggs. He continued to see patients without charging them, in order to keep a steady stream of returning patients for study, and also very likely for humanitarian reasons. The Center studied children with various forms of sickle cell and thalassemia in the home, using normal children and children with

[55] L. W. Diggs et al., "Abstract," *Proceedings of the 23rd Joint Annual Meeting of the American Society of Clinical Pathology and College of American Pathologists.* (1968). See also: D. M. Canning and R. G. Huntsman, "An Assessment of Sickledex an Alternative to the Sickling Test," *Journal of Clinical Pathology* 23 (1970): 736-737. , M. Susan Ballard et al., "A New Diagnostic Test for Hemoglobin S," *The Journal of Pediatrics* 76, no. 1 (1// 1970): 117-119. , R. G. Huntsman et al., "A Rapid Whole Blood Solubility Test to Differentiate the Sickle-Cell Trait from Sickle-Cell Anaemia." *Journal of Clinical Pathology* 23, no. 9 (1970): 781-783.

[56] L. W. Diggs and D. L. Williams, "Treatment of Painful Sickle Cell Crises with Papaverine: Preliminary Report," *Southern Medical Journal* 56 (May 1963): 472-474.

the trait as a control. High school football and basketball players with the trait were studied for two seasons in schools where the students were all black. Some therapeutic progress was also made. While studying the ability of the kidney to tolerate acid load when ammonium chloride was given, painful crises were produced in 9 of 14 patients.[57] A plastic box was built, into which an ulcerated leg could be inserted, exposing it to an atmosphere of oxygen, which made it possible to obtain the healing of skin ulcers that did not respond to the usual forms of treatment. Papavirene was found to be beneficial in abdominal crises, but it had too many side effects to be practical.[58] The home treatments of bone pain by warm fluids, hot baths, food, oral sodium citrate, and non-narcotic drugs were also useful, which helped to reduce the inconvenience and expense of emergency room and hospital visits. Drugs that could lower respiration, such as opiates and their derivatives, were discouraged as dangerous, in part because of the effect of lowered respiration on someone who was also anemic and because of the possibility of addiction. Diuretics were also banned. As part of the educational mission of the Center, a number of pamphlets and instructional programs were created under Diggs's supervision for parents, families, and patients. These materials were free to anyone and were distributed by the Center to lay organizations for educational programs in schools and churches in Memphis and other locations across the country.[59]

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[57] L. Barreras and L. W. Diggs, "Bicarbonates, Ph and Percentage of Sickled Cells in Venous Blood of Patients in Sickle Cell Crisis," *The American Journal of the Medical Sciences* 247 (Jun 1964): 710-718.

[58] Frankie L. Winchester, Alfred P. Kraus, and Memphis State University, *Sickle Cell Anemia Research in Memphis: Interview with Alfred P. Kraus, M.D., October 27, 1989* (Memphis, Tenn.: Oral History Research Office, Memphis State University, 1989).

[59] L. W. Diggs, *Background Information and Opinions Concerning the Sickle Cell Program in Memphis*, 1974.

By the mid-1950s the issues of Civil Rights for African-Americans were increasingly on the minds of many. For Diggs the issues that came through in these years were those of including black doctors in the mainstream of medical professional organizations, and of ensuring that the disorders affecting blacks were not misappropriated to serve racist ends. Sickle cell disease carried the stigma of racism, and Diggs learned to deal with it in the context of the university and the clinic. He apparently wrote a letter to the newspaper in 1960, calling for the integration of the Memphis public libraries, which were open to blacks only on certain days and at certain times. A year later he took another stand to end the discriminatory policy of the Memphis Zoo, which designated certain days when blacks could visit the zoo. The controversy over his acts led some to believe that he was under investigation by the FBI. His rejection of discrimination also led him to advocate for the hiring of Dr. Gene Stollerman to chair the Department of Medicine: Stollerman was a Jewish physician at a time when few physicians of this ethnicity were on the faculty. Diggs threatened to resign at the university if Stollerman was not offered the position.[60]

In 1956 Diggs spoke before members of the Memphis and Shelby County Medical Society to argue that black doctors should be included in the local professional groups affiliated with the American Medical Association. At this time the AMA did not prohibit black doctors from being members. However, it did require that in order to be a member of the AMA, the applicant first had to be a member of a local AMA affiliate, which nearly always excluded black doctors. This latter condition prevented blacks from joining the AMA and led to the formation of a black professional national organization,

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[60] Diggs, *Dr. L.W. Diggs and Civil Rights*, 1-4. See folder LWD 005-11.

the National Medical Association, which the AMA did not recognize.[61] Diggs felt compelled to try to convince his colleagues to remove the rule barring blacks locally. His reasons were based on an appeal to the professional self-interest of his listeners and the need for better healthcare for all. "Colored doctors," he said, "cannot keep informed as well without the stimulus and guidance of their fellow physicians. . . ."[62] Black doctors could stay better informed about the latest medical advances and provide the best therapy to their patients only if they could network as white doctors did. As a debater, Diggs knew how to be persuasive; in a reference to the national healthcare insurance debate, he pointed out that including black doctors would help in "slowing down as much as possible governmental control."[63]

More than this, however, Diggs wanted the local professional organization, the Memphis and Shelby County Medical Society, to be at the forefront of change. "The medical profession should take the lead in [honoring] professional skill and mental achievements."[64] Then, to emphasize the point, his last comment echoed an idea that would become familiar in Civil Rights rhetoric. "So that a man may be judged by what he knows and what he can do rather than by the color of his skin or where he lives."[65] He pointed out that the race line was already broken in sports and in the Army, and—just in

[61] Robert B. Baker et al., "African American Physicians and Organized Medicine, 1846-1968: Origins of a Racial Divide," *JAMA: The Journal of the American Medical Association* 300, no. 3 (2008): 306-314.

[62] Diggs, *The Lemuel W. Diggs Collection* See LWD 002-06-16. See also: W. Michael Byrd and Linda A. Clayton, "An American Health Dilemma: A History of Blacks in the Health System," *Journal of the National Medical Association* 84, no. 2 (1992): 189-200.

[63] Diggs, *The Lemuel W. Diggs Collection*

[64] Ibid.

[65] Ibid.

case all of this might fail to convince his audience--concluded his remarks with one last appeal. "Gentlemen--the Civil war [sic] is slightly over and we live in a world with Russia." At a time when America was experiencing a siege mentality based on the Cold War antagonism between the U.S. and the Soviet Union that pervaded the national thinking, Diggs appealed to the need for national defense. The country should avail itself of all of its resources and make the most efficient use of them. There is no record of the response to his comments, but it is unlikely that many opinions were swayed, or if they were, swayed enough to change the inclination to conform to the changes proposed by Diggs.

At the same time that Diggs was debating with the members of his own profession, he felt the need to respond to a question about racial separation, using sickle cell disease as a key instrument for segregation. Here he was on familiar grounds, but the issue raised came from a different, non-professional direction. In September of 1957 Diggs responded to a letter from Robert B. Patterson, who was at the time Executive Secretary of the Association of Citizens' Councils in Greenwood, Mississippi. With its call for "racial integrity and states rights," this association grew out of the reaction among whites to the Supreme Court's *Brown v. Board of Education of Topeka* decision of 1954.[66] Patterson apparently was seeking Diggs's approval of a statement that the sickle cell trait is "an indication of racial inferiority of the negro race."[67] Or, as Diggs

[66] Charles M. Payne, *I've Got the Light of Freedom: The Organizing Tradition and the Mississippi Freedom Struggle* (Berkeley, CA: University of California Press, 1995), Michael W. Fuquay, "Civil Rights and the Private School Movement in Mississippi, 1964-1971," *History of Education Quarterly* 42, no. 2 (07/01 2002): 159-180. See pages 34-35 in Payne.

[67] Scott Ware, "Cell Life Gives Wing to Spirit," *The Commercial Appeal,* December 2, 1975. A copy of this article can be found in the Sickle Cell Center Notebook B of Diggs, *The Lemuel W. Diggs Collection*.

interpreted it, that sickle cell disease was a reason "for or against integration or segregation."[68] He described himself as "a physician who is concerned with the health of all people, regardless of race or color and as a loyal Southerner, who does not consider it an honor to be asked to participate in propaganda of this type."[69] He expressed his disgust at being queried in this way, and underscored that study into understanding sickle cell disease "would be gravely interfered with if the Citizens' Councils placed emphasis on sickle cell disease in their published information or whispering campaigns."[70] Diggs pointed out to Patterson that people with any hereditary disease should not intermarry, and that some form of sickle cell disease, such as thalassemia affecting Mediterranean people or hereditary spherocytosis affecting Teutonic people, can be found in different races. "One might therefore, with equal accuracy, argue that intermarriage would degrade the Negro race."[71] The use of the *reductio ad absurdum* argument is an example of Diggs's debating skill that he further punctuates with a rhetorical flourish in the closing paragraph:

> I would not recommend that the Citizens' Councils play the "sickle cell string," for the notes will be discordant and will be as distasteful to the ears of reasonable and fair-minded white people as it will be unfair and hurtful to colored people.[72]

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[68] Ibid. See the letter (document LWD 002-06-23) from Robert B. Patterson to Diggs dated September 26, 1957.

[69] Ibid.

[70] Ibid.

[71] Ibid.

[72] Ibid. See page 2.

In his blunt, but even-handed way, Diggs does not argue against racism per se; rather, he advocates for a more diverse world than Patterson seems to imagine, a world that in Diggs's view simply would not include racism as an object in it. Though his words were measured, he made his point: "It's a medical problem, not a racial problem." His disgust was not as evident as it would be years later when he would recall his feeling at receiving this request. "I told them to go to hell."[73]

As most people, Diggs was stunned by the assassination of Dr. Martin Luther King, Jr. on April 4, 1968. In an unpublished letter to the editors of *Time* news magazine, (in which he was responding to an editorial) he wrote: "The majority of citizens of Memphis deeply regret the ruthless slaying of Martin Luther King."[74] Even more, though, he was taken aback by the characterization of the city as a "Southern backwater" and as the "decaying Mississippi river [sic] town of Memphis,"[75] and of its mayor as "intransigent."[76] Diggs was distressed by the assertion that the mayor had caused the situation by a failure "to meet the modest wage and compensation demand," which was the immediate reason for the return of Dr. King, "the conqueror of Montgomery, Birmingham and Selma."[77] His response to what happened in Memphis in late May and early April of that year was deeply personal. By the time that he wrote this letter, the unions had been on strike at the John Gaston Hospital for fifty-nine days. Only doctors

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[73] Ware, *Cell Life Gives Wing to Spirit.*

[74] Diggs, *Dr. L.W. Diggs and Civil Rights*, 1-4. See Folder LWD 005-11.

[75] "Nation: The Assassination," *Time,* April 12, 1968.

[76] Ibid.

[77] Ibid.

and nurses remained to care for the patients; all licensed practical nurses, orderlies, and staff members refused to work, which meant that all of the duties of the hospital--from kitchen to laundry to ward clean ups--had to be performed by the same doctors and nurses left on duty. Some patients were still admitted, but the emergency room was closed, which may have contributed to the short duration of the strike because new patients had to be diverted to the other Memphis hospitals. Some of the Gaston patients were moved to the nearby Veterans Affairs Hospital, while the remainder was transferred to the other private hospitals in town.[78]

As terrible as Dr. King's assassination was, the editorial failed, in Diggs's view, to make anything but a passing reference to the ensuing breakdown in civil, legal, and governmental order that was also part of the story. This troubled Diggs so much that he sought to restore that balance in his letter to the editors of *Time*. The editorial presented the events in Memphis from the point of view of the assassination and ensuing violence, but, Diggs points out, said nothing about the union that "ordered an illegal strike of the Sanitation Workers against the City of Memphis, dictated the amount of salary raise required and insisted on a dues check-off."[79] As Diggs saw it, the *Time* editorial described the labor dispute leading up to King's death as a minor labor dispute until, in Diggs's words, "it became hidden by the smoke and fire of racial violence."[80] The *Time*

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[78] Albert Biggs and Bill Robinson, *Oral Interview with Albert Biggs, III* (Memphis, TN: University of Tennessee, February 19, 1998), 1-20. , Maston Callison and Robert Summitt, *Oral Interview with Maston Callison*, ed. Robert Summitt (Memphis, TN: University of Tennessee Health Science Center, 1997), 1-14. At the time of the strike, Dr. Biggs was a UT urologist and Dr. Callison was Dean of the College of Medicine.

[79] Diggs, *Dr. L.W. Diggs and Civil Rights*, 1-4. . See Folder LWD 005-11.

[80] Ibid.. See Folder LWD 005-11.

editorial told only half of the story, namely that of the events leading up to and immediately after King's death, but said nothing of the illegality of the strike or the lack of consideration of the fact that the "funds of a municipality belong to the people and not to the Mayor."[81]

> There is good reason for municipal employees to organize and to develop a machinery (union) for presenting their grievances and needs. They also have a right to resign as individuals or as a group. The city or other governmental agency on the other hand must reserve the right and the obligation to maintain services for the good of the community as a whole and to fill positions vacated as soon as possible.[82]

That Diggs was deeply troubled by the events surrounding April 4th is clear. He, the hospital and medical community, and the city were shaken to their foundations by what had happened, and everyone had to find a way to make sense of it.

By December 1969 Diggs was ready to retire. He was as interested as ever in solving the mysteries of sickle cell disease and seeing the Sickle Cell Center grow; the work load for his retirement would be very much the same as before. The Center was staffed and functioning with Alfred Kraus as an excellent researcher able to take over the director's duties. In a 1968 newspaper article, Diggs observed: "We have about 1000 sickle cell victims from the Memphis area in our files and are following about 300 of them very closely. They come to us for free treatment when they are not in trouble [too ill to come to the Center]."[83] Diggs's patients could come to the clinic for any reason, and this meant that the clinic's staff would be able to see patients with sickle cell under a variety of circumstances. The advances made in understanding the disease were generally

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[81] Ibid.. See Folder LWD 005-11.

[82] Ibid.. See Folder LWD 005-11.

[83] Smith, *Strange Sickle Cell Anemia 'neglected': 14-Year Life Span.*

meager, but Diggs noted that the Center was able to stay ahead of the world's literature most of the time. He also noted with candor that, "compared to the problem, that's not saying much."[84] His biggest disappointment was that little had changed regarding the treatment of the disease. In the same newspaper interview, he noted:

> We are able to spare them [the patients] a lot of pain, save a few lives temporarily and spot some cases early enough to head off some complications. We have found that big doses of a vasodilator (a drug that improves circulation by expanding blood vessels) and avoiding dehydration and acidosis is the best treatment.[85]

Diggs noted that in 1910 the average life expectancy of sickle cell sufferers was fourteen years of age, and that by 1968 the life expectancy of these patients had not changed. Just as he did with the blood bank in 1945, he was ready to watch the Sickle Cell Center take its first steps into the world, while he stepped back to play a more supportive role that would allow him more time for his research. The advantage for him would be to continue exploring the natural history of the disease with fewer of the daily concerns of running the Center. What he could not anticipate was the degree to which these problems would increase as he and the Center entered the 1970s.

[84] Ibid.

[85] Ibid.

CHAPTER SEVEN

RETIREMENT

I have loved no darkness, sophisticated no truth, nursed no delusion, allowed not fear. – Sir William Osler quoting Matthew Arnold.[1]

The beginning of 1971 seemed to promise long-sought-after financial support for the Diggs Sickle Cell Center. In February, President Richard M. Nixon in his "Special Message to the Congress Proposing a National Health Strategy" declared sickle cell anemia to be a target for research, affirming that $6,000,000 would be designated in the following fiscal year for research to end this disease.[2] At the time, it seemed an unexpected and welcome gesture of federal largesse. However, Nixon was motivated less by principle than out of pragmatic considerations. His speech addressed the criticism that the federal government was indifferent to the health care problems of black Americans by underscoring that blacks suffering from sickle cell needed help, and, at the same time, deflecting attention away from his real purpose--to reduce the overall budget for the National Institutes of Health after the "excessive spending" of Lyndon Johnson's Great Society legislation. Nixon's proposal did not provide new money for sickle cell research, but rather relied on transferring funding from other NIH research programs. Cardiovascular researchers saw their funding decline and resented the intrusion of

[1] From "Empedocles on Etna." Regarding Diggs's commonplace book, see chapter 1, note 1.

[2] "Special Message to the Congress Proposing a National Health Strategy, February 18, 1971 " [cited 2012]. Available from http://www.presidency.ucsb.edu/ws/index.php?pid=3311#axzz1m6DoQ2nC.

politics into research matters.[3] Others pointed out the irony that grants given for sickle cell research were smaller in number than those given for hypertension, for example, which had a larger impact on blacks than sickle cell did. It was also pointed out that sickle cell research was related to other hematology studies already underway, and could be incorporated into those existing research programs without the need for creating a new research category. Nevertheless, in August of that year, Congress passed the amendment to the Public Health Service Act, which established sickle cell as an inherited disease. The Secretary of the Department of Health, Education and Welfare created the National Sickle Cell Disease Advisory Board in August, which would set up a program to make grants and contracts available for the development of voluntary sickle cell anemia screening and counseling programs primarily through other existing programs, such as the one already operating in Memphis.[4]

The President's announcement transformed sickle cell almost overnight into a national issue and made it more widely known than ever before. In 1972 the disease was featured in the film *A Warm December* directed by and starring Sidney Poitier; sickle cell was also featured on two popular television shows, *M*A*S*H* and *Marcus Welby, M.D.* Two hundred sports figures, including Willie Stargel and Dock Ellis of the Pittsburgh Pirates and boxer Muhammad Ali, lent their names to attracting attention and money to

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[3] Frankie L. Winchester, Alfred P. Kraus, and Memphis State University, *Sickle cell anemia research in Memphis: interview with Alfred P. Kraus, M.D., October 27, 1989,* (Memphis, Tenn.: Oral History Research Office, Memphis State University, 1989), see page 26-7. Keith Wailoo, *Dying in the City of the Blues: Sickle Cell Anemia and the Politics of Race and Health,* (Chapel Hill: University of North Carolina Press, 2001), 338, see page 193.

[4] William Hines, "Sickle-Cell Anemia: 'Stylish' Disease," *The Commercial Appeal*, 28 November 1971; Nicole S. Lewis, "Sickle Cell Threat," *The Commercial Appeal*; "Congress Against Sickle Cell," *Nature* 233 (1971): 517-518.

the cause of ending the disease by having all blacks screened for the genetic abnormality.[5] If there was no cure, then perhaps genetic counseling could provide the cure.

Despite the promise of attention and funding to support the Sickle Cell Center, Diggs and his colleagues would feel the unintended consequences of the federal bill and the pressures of Civil Rights in the 1970s. The new bill, called the Comprehensive Sickle Cell Center Grant, required 60% of the funding to be used for community services, including employing non-professional staff members, and the remaining 40% to be used for employing health professionals and conducting research. Education and research went hand-in-hand, often overlapping at the Center, but this new grant separated them without any clear guidelines as to how this would be done. The new funding required the employment of additional staff for which there were no job descriptions, no apparent need, and no provision for training. This uncertainty was compounded by the loss of the previous NIH grant supporting the Sickle Cell Center, with the result that one professional's job had to be terminated. Diggs assumed incorrectly that the previous grant, which had supported the medical care portion of the Center up to that point, would continue alongside the new one.[6] In effect, he and the Center's staff would have to recalibrate themselves and their services to fit these new federal guidelines.

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[5] Charles Thornton, "Science Unlocking Sickle Cell," *The Commercial Appeal*, January 1972, p. 13. This clipping was found in the Sickle Cell Center Notebook B in: *The Lemuel W. Diggs Collection*, Manuscript Collection. (The University of Tennessee Health Sciences Historical Collections,1999).

[6] L. W. Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis*, 1974.

The federal bill also provided benefits for the Center, such as training of new non-professionals in administrative matters, increasing public awareness on the frequency and symptoms of sickle cell, and training staff to help with education, counseling, and screening projects. But the program design stipulated by the grant did not fit Diggs's idea of how the organization should be structured., It created a working environment that did not operate smoothly.

Changes to the Center required by the new federal grant led to the creation of a Memphis Regional Sickle Cell Council, composed mainly of the parents of sickle cell patients and other laypeople. It was created after Nixon's health address to Congress in 1971 to assist in the application for the money that would fund a comprehensive sickle cell center. The purposes of this new council were to aid in finding new grant support for research, to support local fund raising efforts, and to inform the public about sickle cell disease.[7] Another group, the Research Coordinating Committee, was organized to enhance communications between the Memphis Regional Sickle Cell Council and the research community in Memphis and elsewhere, but by 1974 the Council was struggling to develop as an organization. It was not meeting with the other agencies with which it was supposed to coordinate efforts, its representatives failed to attend scheduled meetings, and there were no provisions for the election of a new liaison committee.[8]

Diggs grew frustrated with the overlapping responsibilities, the confrontations and accusations, the personality clashes, the poor communication, and the unwillingness to compromise—all of which resulted in an uncomfortable work environment for everyone.

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[7] Ibid and Thornton, *Science Unlocking Sickle Cell,* 13.

[8] Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis,* 16. See page 6.

There was even a rumor in the air that someone in the Sickle Cell Center was reporting on activities events in the Center to a local minister who was critical of the Center's work.[9] Grant requirements that blacks could work only in areas that were separated from those of the professional staff caused much of the tension. This separation of the research and educational components of the Center, and the requirement for the newly-hired to conform to university regulations were contrary to Diggs's idea of an optimally run organization. The situation led to a "town and gown" or a "people vs. the establishment" situation that also reflected the larger Civil Rights and protest movements characteristic of the decade of the 1970s. The Civil Rights movement was fragmenting, as the calls increased advocating violence over nonviolence; the infamous Tuskegee Syphilis Project had been concluded in 1972; and there was growing suspicion among blacks over the "true" intentions of sickle cell screening.[10] Diggs resented the intrusion into what he saw as the essential mission of the Center. "Individuals who are engaged in research should not be penalized by being forced to assume the impossible and Herculean task of having to solve racial, social, economic and other community problems in order to obtain funds for their investigations."[11]

As he had learned and practiced ever since his student days at Johns Hopkins and at the University of Rochester, Diggs knew well that the limited time given to researchers

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[9] Walter Diggs and Richard Nollan, *Interview with Walter Diggs,* ed. Richard Nollan, (Memphis, TN:, 2011)

[10] Wailoo, *Dying in the City of the Blues: Sickle Cell Anemia and the Politics of Race and Health,* 338., see pages 186-7. Mary L. Hampton et al., "Sickle Cell "Nondisease": A Potentially Serious Public Health Problem," *American Journal of Diseases of Children* 128, no. 1 (1974): 58-61.

[11] Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis,* 16. The quotation can be found on page 3 of this document found in: Diggs, *The Lemuel W. Diggs Collection,*

should be spent "in the laboratory and in the library rather than around council tables discussing administrative and community matters."[12] He was unhappy that the Center had moved away from its research and patient care mission. These distractions only interfered with the work of the Center. He exclaimed: "Community problems need to be solved but the burden of their solution should not be saddled on members of the faculty of one section of one department of one college of the University of Tennessee Center for the Healthy Sciences."[13]

If there were problems, there were also glimmers of light for Diggs and the Center. The school busing program in Memphis - part of the process to desegregate the school systems - could inform the public about the nature of sickle cell. In the case of busing, as Diggs knew, it was not enough to inform the public; key people, such as white teachers who might not have experience with children having sickle cell, also needed to be informed. In 1972, the Memphis Regional Sickle Cell Council worked with Parent Teacher Associations and high school principals to inform them not only of what the disease was, but to make them aware of the ways in which it might manifest itself to a teacher unfamiliar with sickle cell in a child. The goal of this effort was to ensure that students with the disease were not ignored, or even mistreated. Sometimes a teacher might recognize a student as lazy, when in fact he or she was not feeling well on the day in question. Likewise, coaches should understand and recognize that the strenuous

[12] Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis,* 16. The quotation can be found on page 3 of this document found in: *The Lemuel W. Diggs Collection.*

[13] Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis,* 16. The quotation can be found on page 3 of this document found in: *The Lemuel W. Diggs Collection.*

exercises they assigned their athletes could lead to low oxygen, which in a child ill with sickle cell might cause a crisis.[14] The success of this effort is unclear, but it allowed Diggs and the staff of the Center an opportunity to challenge the many misconceptions in the community about sickle cell anemia and its genetic trait. This was the kind of outreach that Diggs considered part of the Center's mission, and yet under the guidelines of the new grant, it represented a time-consuming distraction from the research and patient care that should have been the engine of the Center's work.

> We could not have planned, if we tried, a system that was more destined to cause trouble and to fail than the dichotomous (double headed Monster) system that was established. One cannot expect to win a football game with two quarterbacks calling plays at the same time. "A wheel cannot turn on two axles."[15]

Instead of focusing on the sick, the staff of the Sickle Cell Center saw its energy divided between research and education as separate activities, something that ran counter to Diggs's viewpoint. "The medical care of patients and the conduct of laboratory procedures and the research activities of necessity have to be located where facilities, equipment and specialty services are available. The Community portion of the program ideally should also be located in the same building so that communication can be facilitated and full used made of educational resources."[16]

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[14] The newspaper clipping "Busing Creates Sickle Problem" can be found in Sickle Cell Notebook B in: ibid.

[15] Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis,* 16. This quotation can be found on page 3 of the document found in: Diggs, *The Lemuel W. Diggs Collection*.

[16] Diggs, *Background Information and Opinions concerning the Sickle Cell Program in Memphis,* 16. This quotation can be found on page 3 of the document found in: Diggs, *The Lemuel W. Diggs Collection.*

Despite the challenges, Diggs continued his investigation into sickle cell's underlying mechanism. With his emeritus status, he was less involved with the Center's day-to-day operations and able to spend more time on the research and patient care that interested him. Along with Ernestine Flowers, he continued to investigate the long-term history of sickle cell anemia and activities related to it in the home. During this period they were working with forty-five families in order to find better ways to understand the mechanism of the disease.[17] Their work explored the multifaceted nature of the disease, involving how sickle cell could affect each individual patient differently in personal, financial, and social ways. Diggs believed that those with sickle cell were handicapped, but that they should also be able to support themselves, rather than be dependent on others. He recommended that people with sickle cell should be employed in jobs that avoided situations that could cause a crisis.[18]

Linus Pauling identified sickle cell as a genetic abnormality with an identifiable location in the body, namely, the globin portion of hemoglobin. Without an intervention that would cure or at least control the disease, many people thought that the best way to eliminate sickle cell was to prevent the genetic defect from being transmitted from parent to child. With the announcement by President Nixon of sickle cell as a target of national

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[17] ibid.; A. P. Kraus, *The University of Tennessee Center for the Health Sciences, Memphis, Tennessee: Comprehensive Center for research and Service in Sickle Cell Disease,* (Memphis, TN: the University of Tennessee Center for the Health Sciences, 1.. This brochure can be found in Sickle Cell Notebook B in: Diggs, *The Lemuel W. Diggs Collection*. Also: L. W. Diggs and Ernestine Flowers, "High School Athletes with the Sickle Cell trait (Hb A/S)," *Journal of the National Medical Association* 68, no. 6 (1976): 492-479. L. W. Diggs and Ernestine T. Flowers, *The Socio-Economic Problems in Sickle Cell Anemia* (Memphis, TN:, 1976). L. W. Diggs and E. Flowers, "High school athletes with the sickle cell trait (Hb A/S)," *Journal of the National Medical Association* 68, no. 6 (1976): 492-3, 479.

[18] Diggs and Flowers, *The Socio-Economic Problems in Sickle Cell Anemia,* 9.; L. W. Diggs and E. Flowers, "Sickle cell anemia in the home environment. Observations on the Natural History of the Disease in Tennessee Children," *Clinical Pediatrics* 10, no. 12 (1971): 697-700.

concern, many health care professionals and politicians considered requiring that all blacks be tested for the disease, and that they either be counseled against marriage, or that marriage licenses be refused to those testing positive for sickle cell. Genetics seemed to offer a way to eliminate the disease; at first, many people supported this view, including black organizations, such as the Black Panthers.[19] By the mid-1970s, as some states had enacted or were considering laws embodying this attitude, considerable confusion existed about the difference between sickle cell anemia and the sickle cell trait. Some of these laws were predicated on the assumption that both anemia and the trait were a disease, [20] a serious misunderstanding that Diggs had tried to clarify for forty years. The trait, he had written, was compatible with normal life. Many, but most notably Pauling himself, advocated mass screenings of anyone of African descent in order to identify carriers and to restrict or prevent their marriage or procreation. Pauling famously advocated marking sickle cell carriers with a tattoo on the forehead to identify them.[21] The outcry that ensued in black communities and from black organizations was widespread. Accusations of genocide were levied, and reports were published of people with sickle cell being fired from their jobs, or being denied employment or insurance, and of students with sickle cell being told not to participate in sports. Thus the disease also carried a stigma of sickliness and of racial inferiority. Some people began to wonder if mass screening singled out those who tested positive for ostracism at school or work, and this was based in part on

[19] Hampton et al., *Sickle Cell "nondisease": A Potentially Serious Public Health Problem,* 58-61.

[20] ibid.. See page 58.

[21] Melinda Gormley, "It's in the blood: The Varieties of Linus Pauling's Work on Hemoglobin and Sickle Cell Anemia" (Ph.D. diss., University of Oregon, 2007). See page 126.

the widespread confusion about the difference between the disease and the trait. Critics wondered whether screening would serve the purposes of genetics or genocide. The backlash to the screening laws led to the repeal of many of those laws.[22]

Diggs was aware of the social controversy and the backlash from the black community, and of the views of Pauling and others. He rejected universal screening of blacks from the beginning on ethical grounds. Any major effort to eliminate the disease, he believed, should be put into education, research, and medical care, not into "marking" an entire race of people. "The future hope of any hereditary disease is in genetic counseling, but this requires the training of genetic counselors who are well versed in the laws of biology and heredity and who are experts in human relations."[23] Genetic counseling should be voluntary for both marital partners, and they should be allowed to use the information in whichever way they chose. Diggs noted:

> One should never tell an individual what to do. The individual should be given the facts and leave it up to the person to choose what he or she wished to do. Genetic counseling and family planning are often misinterpreted as racial genocide, which of course is ridiculous, for it is the disease and not the counseling that is genocide.[24]

He knew of the controversy, and of the resistance that most people felt about being counseled. But that, he believed, would change. "In the future, counseling will have top priority, but at present it should be played with a soft key."[25] Characteristically, when he

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[22] William Cole, "Dr. Jackson's War on Sickle Cell," *The Smithsonian* June (1972): 67-70.

[23] Diggs, *The Lemuel W. Diggs Collection,*. See page 1 of the letter from Diggs to Loretta Jo Shaw, May 19, 1973, in LWD 002-08-09.

[24] Ibid.

[25] Ibid. See p. 2.

saw screening move away from a position of universal application, he chose to let it run its course until more reasonable heads could prevail.

If there was a positive aspect to the controversy around screening, it might have been the wide publicity that sickle cell received in the news media that raised awareness of the disorder. At the same time, the added attention also increased confusion about the disease and its sufferers. Diggs pointed out that testers often did not sufficiently inform those who were tested were as to what it was they were being tested for and, when the results were positive, they were not properly informed about what the test results meant. Forty years earlier, he had argued that the trait was consistent with a normal life, but it was still often confused with the anemia. This confusion led to "unjustified anxiety and fears, increased insurance rates and coverage, unemployment, and denial [of] educational and recreational opportunities."[26] Compulsory testing was enacted into law by many states before issuing marriage licenses. According to Diggs, this practice was misguided, because blacks as a population could not be defined by physical features, and because sickle cell also occurred in those of Turkish, Spanish, Greek, Italian, Arabian, and Indian ancestry. "In summary," he wrote in 1978 to a Mississippi nursing student, "it is my opinion that mass screening and financing of mass screening by tax funds is no longer justified and should be banned."[27] Diggs was not opposed to testing or to screening, but did feel strongly that they should be done on a voluntary basis and only to help individuals, not cure a race.

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[26] Ibid. See the letter from Diggs to Wilde Rinehart, October 19, 1978, item LWD 002-09-13.

[27] Ibid.

During this time, Diggs stayed in touch with Danny Thomas, who continued to express his appreciation for Diggs's role in the creation of the St. Jude hospital. "I am particularly grateful that you wrote about our interest in sickle cell anemia, and how far back you go with it, because I was having some trouble trying to convince a few of the black personalities in show business that through you we were in truth pioneers in the fight against that disease which seems to strike their race especially."[28] In 1975 the St. Jude Board of Directors appointed Diggs to their National Advisory Board.[29]

Throughout his career Diggs sought to maintain a comprehensive understanding of sickle cell disease by reading everything that was published about it. This was especially true of sickle cell and of blood banking. In his writing he typically included a summary of what was known about the topic he proposed to address, a feature of his writing that was also reflected in the thorough reference lists at the end of his articles. By the mid-1970s he completed the task that he had started in 1929 of compiling every article in any language that he could find on sickle cell. Over 3000 articles, reprints, and, in some cases, typescript copies from 1910 to 1970 were bound with the help of the Bluff City Medical Society Auxiliaries, which was made up of the wives of the black doctors in Memphis that constituted its membership. The collection comprised sixty-four volumes and was presented to the University of Tennessee Mooney Library. Additional sets were

[28] Ibid. See the letter from Danny Thomas to Diggs, January 15, 1975, item LWD 002-08-27.

[29] Walter Diggs, *Dr. L.W. Diggs and Civil Rights* (Memphis, TN: n.p., 2000), 1-4. See the letter from Edward Soma, Richard Shadyac, and Danny Thomas to Diggs, January 13, 1976, item LWD 002-08-24.

made for the Armed Forces Institute of Pathology and for the National Library of Medicine.[30] The articles were also reproduced on microfilm.

On April 11, 1972, the Southern Christian Leadership Conference honored Diggs at a dinner in Philadelphia by giving him its Martin Luther King Medical Achievement Award. Humanitarian awards were also included in the presentations. The event was a $100 per plate affair at which twenty-eight other recipients were also recognized. Coretta Scott King made the presentation of the awards. In 1978 the Virginia Press Association honored Diggs with its "Virginian of the Year Award."[31] He enjoyed the acknowledgement from his home state, and also the opportunity to return to the places where he had grown up and to visit with old friends.

In 1985 Diggs was startled to read in the local paper that St. Jude was reconsidering Memphis as a location for its hospital in favor of moving to the Washington Medical School in St. Louis. He was doubly surprised because he read it first in the newspaper, and because he was unaware that St. Jude was considering this move. The dramatic announcement on the front page of *The Commercial Appeal* immediately summoned his instinct to protect St. Jude. In part, this was born of the tension that existed between St. Jude and the University in the 1960s, in which Diggs was personally involved: the vexing issue was whether St. Jude should be an independent research institution or should be 'tied' to a university. Diggs wrote a short letter to the editors of the *Commercial Appeal*:

> The individual members of the St. Jude scientific investigative staff and the professional departments of the St. Jude children's Research Hospital

[30] Diggs, *The Lemuel W. Diggs Collection*. See the letter from Diggs to Colin Vor der Bruegge, August 16, 1976, item LWD 002-08-53.

[31] Ibid. See various letters in box 2, folder 09.

> should remain free to follow their own research leads. They should be allowed to plan to conduct their activities in a manner that, to them, seems best. They should not be dominated by Washington University, the University of Tennessee or by any other institution. They should not be forced to follow protocols established by committees other than their own. For the sake of the future health, happiness and prolongation of live of children with diseases not considered to be catastrophic, St. Jude should remain as an independent and autonomous unit. Research of all types basic, bio-medical and applied, should not be submerged or lost in any university complex, regardless of how big, prestigious and rich the absorbing institution may be.[32]

Diggs believed without question that St. Jude should remain in Memphis as an independent and autonomous unit. He believed in its research-driven and donor-funded model, its strong patient care orientation, and its position as the second location in the city for sickle cell research. He felt this so strongly that he believed it would be better for St. Jude to leave Memphis than to stay and compromise its core values. St. Jude, he felt, should continuously evaluate its position and, if circumstances warranted, move to whichever location would provide fertile soil for it to thrive. The essence of St. Jude, he would write to another St. Jude advocate, was the substantial support that it received because it was a research hospital, and the quality of care that its patients were given. Diggs's belief in St. Jude remained as steadfast as ever, and he was relieved when in February of 1986 St. Jude's Board of Directors agreed that the research hospital would remain in Memphis.[33]

After his retirement, Diggs continued to go into the office daily. Although no longer administratively involved in the operation of the Sickle Cell Center, he was

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[32] Ibid.. See LWD 002-10-06 published in the *Commercial Appeal* on August 29, 1985.

[33] James N. Etteldorf, *The James N. Etteldorf Collection*, Manuscript Collection. (The University of Tennessee Health Sciences Historical Collections: n.p., 2000). See the letter from Diggs to Albert Joseph, July 9, 1985, item JNE 002-19-01.

involved in the salient issues being considered there, in performing research, and in seeing patients. In late 1987 he was diagnosed with an intestinal malignancy, which was surgically removed. The tumor did not appear to migrate to any other part of his body. After the operation he informed his colleagues that he would be working at home and to contact him there, but he also reassured them that he was staying active by riding tractors, sawing wood, picking up pecans, and writing about sickle cell. Beatrice continued to help with his library work and typing.[34]

Diggs's reputation grew with each award and honor that he received. As a result, he started receiving mail from individuals asking for advice. Schoolchildren asked him for information about sickle cell disease that they could use in their assignments.[35] Occasionally he would hear from parents asking him to review a child's clinical records and comment on the quality of care that the child was receiving.[36] In each case he replied with his usual care and completeness, for he viewed each correspondence as an educational opportunity to talk about the language and the substance of sickle cell disease. He also corresponded with colleagues about events and people in their past.

In acknowledgement of his many awards, Diggs received notes from congressmen from Tennessee, Virginia, and New York. One came from Hugh Scott of Pennsylvania, who knew Diggs from his student days at Randolph-Macon College: "Can it be 66 years since you got me off the hook, after I'd invited two different girls to Commencement?

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[34] Diggs, *The Lemuel W. Diggs Collection.* See the letter from Diggs to Charles H. Hennekens, December 8, 1988, item LWD 002-10-42, the letter from Diggs to Graham Serjeant, August 10, 1989, item LWD 002-10-43.

[35] Ibid.

[36] Ibid.. For example, see the letter from Diggs to Peggy D. Friend, January 26, 1987, item LWD 002-10-28.

The one I took, I kept – and still have after all this time."[37] In another letter he summarized what he had learned in over fifty years of experience in the treatment of leg ulcers (a common complication of sickle cell), which reflected the range of remedies that had been tried over the years. "These have included antiseptic and antibiotic solutions, powders, salves and ointments of various types, vasodilator drugs, anticoagulants, proteolytic enzymes, table sugar, dressings consisting of clots of the patients own blood, cod liver oil, elastic sponges, bed rest, transfusions, oxygen chamber and pinch and full thickness skin grafts."[38] Patients without access to health care and often in desperation tried to treat themselves with "carbolated Vaseline, axle grease, crank case oil, shoe polish, turpentine and kerosene."[39] In the end, however, the most effective treatments were the simplest and the least expensive. "The best treatment in my opinion is soap, water and sterile dressings and the avoidance of strong medications of any kind."[40] Cost is important, Diggs was saying, but even more critical was the need to educate people to care for themselves rather than depend on care given in a doctor's office or the hospital. In 1991 Diggs received the Outstanding Citizen award from the Civitan Clubs, a volunteer service organization.[41] He received many congratulatory notes from colleagues, administrators, and friends, including one from Danny Thomas. The recognition came

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[37] Ibid.. See the letter from Hugh Scott to Diggs, December 4, 1986, item LWD 002-10-34.

[38] Ibid.. See the letter from Diggs to Titus H.J. Huisman, January 3, 1981, item LWD 002-09-35.

[39] Ibid.

[40] Ibid.

[41] "Civitan: About Us," [cited 2012]. Available from http://www.civitan.com/template.php?id=117.

with a proclamation from the mayor, declaring April 4, 1991 as "Lemuel W. Diggs Day" in the city of Memphis.

Perhaps one of the most poignant moments for Diggs in these later years was the retirement in 1991 of one of his closest colleagues at the University of Tennessee, Ann Bell. For both Lemuel and Beatrice it was emotional. "One of the best of many good things," he wrote her, "was your employment as 'Secretary' in the Department of Clinical Pathology, as it was then called, soon after your graduation with a BS degree from Randolph Macon College for women (1941)."[42] He then recalled the steps of her career at the university, including the students, the workshops, and the publications, especially *The Morphology of Human Blood Cells* in its fifth edition.[43] Beatrice wrote a letter that included a recollection of their trips together and the work that Ann had done with Dorothy Sturm to create the watercolor images for the department and for *Morphology*. Ann responded to Beatrice first, thanking her and crediting her and Diggs with supporting her throughout her career.[44] Five days later she wrote to Diggs describing the steps in her career, and attributing each of them to his mentoring and support. Upon being asked to co-author the *Morphology*, she said: "What a triumvirate we made as we produced five editions for Abbott!"[45] Bell expressed difficulty in finding the words to express her

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[42] Diggs, *The Lemuel W. Diggs Collection*. See the letter from Diggs to Ann Bell, November 24, 1991, item LWD 002-10-64.

[43] L. W. Diggs, Dorothy Sturm, and Ann Bell, *The Morphology of Human Blood Cells,* 5th ed. (Abbott Park, Ill.: Abbott Laboratories, 1985), 89.

[44] Diggs, *The Lemuel W. Diggs Collection,*. See Ann Bell's letter to Beatrice Diggs, December 30, 1993, item LWD 002-10-69.

[45] Ibid. See Ann Bell's letter to Diggs, January 4,1992, item LWD 002-11-01. Quotation can be found on page two.

feelings. "You [Beatrice] and Dr. Diggs made me feel that I belonged to the Diggs family and that has made me very happy for all of these years that we have worked together."[46] Ann would continue to work part-time at the university, but she devoted the remainder of her life to organizing and preserving Diggs's intellectual legacy.

Diggs remained active in his communications with colleagues and friends. In 1993 he once again entered the fray of the national health care reform debate led by Hillary Rodham Clinton. He made three broad recommendations to the Task Force on National Health Care Reform. The first was to teach interns and residents the cost of the diagnostic, prognostic, and therapeutic procedures that they order for their patients, and to educate the public that because cost is a factor, patients cannot automatically expect every procedure to be performed that may diagnostically be beneficial for them. Diggs's second recommendation was that rationing of health care services, as unpalatable as it seemed, would be necessary where resources were scarce or extremely expensive. In the third he emphasized that taxpayers should be responsible for essential and relatively inexpensive procedures, and for non-essential or elective procedures.[47] Diggs sent copies of his recommendations to colleagues; they were received warmly, and he also received a brief acknowledgement from the White House.[48] As he had done fifty years earlier in 1943 and more recently, Diggs argued in favor of medical reform on the grounds that it should in some ways change to conform with the larger social circumstances in which

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[46] Ibid. See Ann Bell's letter to Diggs, January 4,1992, item LWD 002-11-01. Quotation can be found on page three.

[47] Ibid. See the Diggs's letter to Hillary Rodham Clinton, April 2, 1993, item LWD 002-11-24, and the manuscript in LWD 002-11-25.

[48] Ibid. See the letter from Carol H. Rasco to Diggs, August 16, 1993, item LWD 002-11-34.

medicine had to operate. But he also continued to believe in the need for individual responsibility for at least part of the cost of this care, and some rationing of expensive and scarce resources. The doctor-patient relationship and the principle of treating each patient as a unique individual remained at the heart of his professional beliefs. At the same time, he preferred to see health care costs managed locally.

In late December of 1994 Diggs's health began to decline. He remained as active as possible, even planning and writing another article on sickle cell. He was thinking about the importance of postmortem examinations to "establish the cause of death and to discover new anatomical facts." [49] Diggs was active until about three weeks before his birthday, when he began to have trouble swallowing. He remained in bed and appeared to be near his end. However, in defiance of the inevitable, he lingered until his birthday on January 9, when he stopped breathing. "I think he really wanted to live to be 95," his daughter Alice observed.[50]

On the following day, the newspapers carried extensive stories about Diggs's life and achievements, each with a slightly different view. *The Commercial Appeal* mentioned sickle cell, but focused on the blood bank, St. Jude, his many awards, and comments by his friends and colleagues.[51] An editorial in the same issue reflected this perspective. By contrast, *The Tri-State Defender* mentioned Diggs's awards, but focused primarily on his lifelong effort to understand and treat sickle cell disease, his commitment

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[49] L. W. Diggs, *Sickle Cell Hemoglobinopathies: The Need for Postmortem Examinationas*, Unpublished papered., 1. This manuscript was completed posthumously by Ann Bell with the help of colleagues, though it was not published.

[50] Alice Diggs Sullivan interview

[51] James Kingsley, "Dr. Diggs dies at 95; sickle cell, St. Jude work serve as legacies," *The Commercial Appeal*, January 10, 2012 1995, p. B1.

to the physical, psychological, and social well-being of his patients, and his willingness to challenge the segregation laws by training black technicians.[52]

The funeral service for Lemuel Whitley Diggs was held on January 14 at the Church of the River, the First Unitarian Church of Memphis. Those who spoke at the service were Howard Horn, who had been named L. W. Diggs Alumni Professor of Medicine at the University of Tennessee; Ann Bell; Andrewnetta Hawkins Jones, a former employee; Dan Brookoff, a hematologist at Methodist Hospital; and Graham Serjeant, who was Director of the Medical Research Counsel Laboratory, University of West Indies, Jamaica. They all remembered their experiences with him and what he had meant to them as mentor, researcher, clinician, and human being. Those present were reminded that he kept a commonplace book, the one he had started as a medical student at Johns Hopkins, which contained the aphorisms and sayings of poets and scientists; when taken together, these items that he recorded and saved probably came as close as any document could to capturing the landscape of his personality.[53] Ann Bell announced the "cherished honor" of organizing all of Diggs's writings on sickle cell disease with the help of Dan Brookoff and Walter Diggs. "With these future plans," she said, "we want to make available to anyone interested in sickle cell disease the theories, ideas, and knowledge of this dedicated, compassionate, studious, kind and remarkable physician--Lemuel Whitley Diggs."[54]

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[52] Gabrielle C. L. Songe, "Tribute to Dr. L.W. Diggs: A Legendary Figure who made an Outstanding Contribution in the Field of Sickle Cell Disease," *[Tri State Defender]* (1995): 5A. This item can be found in LWD 004-22 of: Diggs, *The Lemuel W. Diggs Collection,*

[53] Lecture notes found in LWD 004-22 in: ibid.

[54] Ann Bell, *Memorial Service - January 15, 1995. Talk by Ann Bell*, autograph manuscript, 1995), 1. In LWD 004-22.

As a young man, Diggs knew that he wanted to be the best at whatever he chose to do in medicine. At first he gave some thought to surgery, but chose not to pursue it. As an undergraduate student at Randolph-Macon College, he decided to become a doctor. At the time that he made this decision, medicine was one of the most prestigious and highly regarded professions in the country, a profession where a person could excel to his / her greatest potential, and one that encouraged all of its practitioners to dedicate themselves entirely and without reservation to its goals. As a medical student, Diggs was encouraged not to allow any outside interests to distract him from his pursuit, but one interest that he started and retained throughout his life was the commonplace book in which he recorded the wisdom expressed by others that appealed to him and reflected his thinking about life and medicine. Along with the words of others, he added some of his own. One entry dated May 1, 1923, was entitled "My ambitions," in which he recorded what he wanted to achieve in his life. He wanted to be, he wrote, "a great doctor, not a famous one, to know more than any other man about my line in order to give my patients the greatest possibility of recovery."[55] He also wrote that he wanted to live in the South, to spend his life in the uplift of his country, and "to win the respect of men by sheer frankness, straightforwardness and ability, unselfishly rendered."[56] He wanted "to gain control over himself." He wanted to win the love of a "decidedly feminine girl"[57] to cherish above

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[55] L. W. Diggs, *Notebook of Collected Sayings,* Personal, [1924]). See page 54. This document is located in: Diggs, *The Lemuel W. Diggs Collection.*

[56] Diggs, *Notebook of Collected Sayings*. See page 54. This document is located in: Diggs, *The Lemuel W. Diggs Collection,*

[57] Diggs, *Notebook of Collected Sayings*. See page 54. This document is located in: Diggs, *The Lemuel W. Diggs Collection,*

anyone or anything else, for whom he could build a home and with whom he could raise healthy children to entrust to the world when he was gone. Finally, as a Virginian, he wanted "to become like Lee, and like the best of men, but not too good to see the best in the worse men."[58] Diggs lived up to these words and, perhaps more importantly, he embodied them throughout his life as an example to others.

Diggs was a moral and purposeful person, who wanted to be the best at what he did. By all accounts he succeeded. Even though Diggs's lifelong effort to find a cure for sickle cell anemia was unsuccessful—and to date a cure still has not been found—his accomplishments in the areas of sickle cell research, blood-banking, St. Jude Children's Hospital, and defending the dignity and rights of individuals of all races to receive compassionate and up-to-date medical care were the timeless qualities of a physician. His decision to pursue sickle cell research was not a political statement as well as a recognition of a scientific opportunity, which came with social and political baggage that he accepted and sought to overcome. Once the decision was made, he was committed to treating every aspect of the disease, including the social and political issues that were connected to it.

In many significant ways that mattered for the times in which he lived, Diggs stood apart from most of his contemporaries. Even though he operated within his professional domain, he expanded it when his pursuit of knowledge led him to the homes of sickle cell sufferers or required him to speak out against misconceptions about the disease or its carriers. We can view him as pursuing the best in his modest and

[58] Diggs, *Notebook of Collected Sayings*. See page 54. This document is located in: Diggs, *The Lemuel W. Diggs Collection,*

unassuming way, but in a very real sense the sum total of his contributions and their effects on the lives he touched were luminous.

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