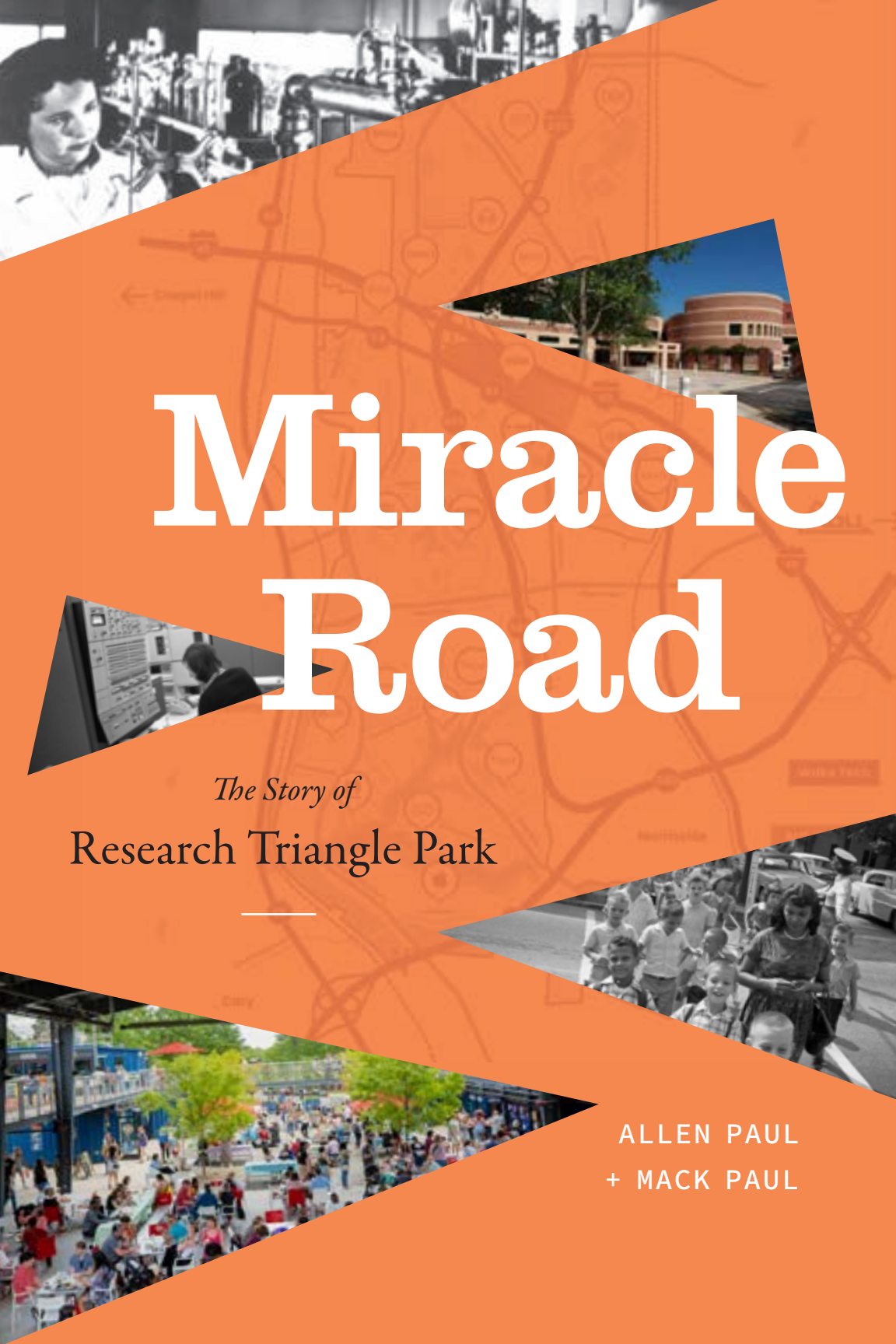




Miracle Road

The Story of
Research Triangle Park

ALLEN PAUL
+ MACK PAUL

Miracle Road



BUY

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Background art is a map of RTP.

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In loving memory, Allen Paul (1939–2026)

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PREFACE

Our lives began together in the long-gone Arbor Villa Apartments on Academy Street in downtown Cary, North Carolina. My parents took me there from Rex Hospital. At the time, my father reported for the Associated Press. Cary's population was about 3,500 souls while Raleigh's would not reach 100,000 for several more years. We entertained ourselves with trips to playgrounds and local swimming holes. My father honed his golf game on days when he was working the night shift.

Several years later, Dad jumped at the chance to work as a speechwriter in Washington, DC. At that time, Washington represented everything Raleigh was not: urban, sophisticated, and worldly. During a Cold War where the United States played global cop, Washington had a new, elevated role far beyond its roots as a swampy and sleepy government town. Conversations centered on jobs at the Pentagon or in the federal government and on Capitol Hill. My father felt at home there and constantly touted its merits—from “the *Post*” to “the ‘Skins’ (now the Washington Commanders) to Luigi’s Pizza on 19th Street. He loved every bit of it. Other family members soon migrated from North Carolina to the DC area.

The fact we left North Carolina so long ago made an idea during my third year of law school all the more implausible. While reading case law involving Duke Power, a strange question came to me. What about the Research Triangle? I had interned for a law firm in New York City, where I went to law school, and interviewed for jobs in Los Angeles and San Francisco. I planned to move to the West Coast upon graduation along with my new bride from Los Angeles. In the early 1990s, “Big Law” handed out job offers like candy. The choices were plentiful. While nearly all my classmates sorted through offers from large firms in tier-one cities, I booked a flight to Raleigh-Durham International (RDU) Airport to explore.

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I had only a hazy notion of Research Triangle Park (RTP). Based on the press, it was a place where scientists spun out technologies in a sunny, affordable, and congenial environment. At the time, pundits heralded a New Economy based on technology and innovation. Future growth would center on regions able to harness research for commercial applications. As a future service provider, I perceived RTP as a relatively safe long-term bet, offering a chance to be part of a place still unformed but promising. After returning from my visit to Raleigh, I had a vision while standing in line at a grungy market on Broadway. I could see Julie and me driving from a house along tree-lined streets to a beautifully stocked grocer with ample parking. The absence of decay and cantankerous customers was overpowering.

So, within a few months, we pivoted from our future life on the West Coast to the upper floor of a historic apartment near downtown Raleigh. It was not an easy adjustment. The lack of a vibrant and eclectic urban environment periodically stirred thoughts of a move. But each new friend, each new job, and the daily routines of a growing family deepened our ties to the area. The fundamental belief that RTP offered limitless opportunity persisted and proved true. Years later, my parents joined us, migrating back from DC. The area then had ample cultural offerings and superior health care. Not long after, my sister and her family joined us in Raleigh. And then my wife's parents arrived from Los Angeles. All of them saw the area as livable, attractive, and relatively affordable. Now our daughter, who benefited from an excellent education in the Wake County magnet system, has returned with her husband from Ireland. Both have found good job opportunities.

So goes the innumerable, individual decisions that bring roughly eighty new residents to the Triangle region each day. A seismic shift occurred in migration patterns after World War II. Moves now reflect the conscientious desire for place rather than the decision of a corporate boss. Workers seek areas with a dense labor market that allows them to move from employer to employer within the area when an opportunity arises.

That so many now choose the Triangle is all the more remarkable when reflecting on RTP's genesis as a strategy to reverse the migration of homegrown talent who left out of economic necessity. The record of decline experienced by industrial cities in the Midwest and Northeast simply demonstrates the immutable forces that ultimately determine the fate of any place. Whether a child born in Cary or Durham will choose to settle there is an intensely personal choice but, in the aggregate determines the fate of the region and affects us all.

—MACK PAUL

ACKNOWLEDGMENTS

Miracle Road: The Story of Research Triangle Park is first and foremost a collaboration. Many people from many professions have expended much time, talent, and energy to get it produced. None are more noteworthy than the nearly 170 people who were interviewed, each of them a primary source and each a leading citizen of the Park.

Indeed, their contributions are what set this book apart because embedded within what they told the authors is the powerful story of human struggles to create something new, something that changed the trajectory of an entire state. Although there are several excellent books on the Research Triangle Park, none of them has the same foundation as *Miracle Road*.

At the outset, a special word of thanks must go to Doug Edgeton, president/CEO of the North Carolina Biotechnology Center. The project would never have gotten off the ground without Doug's leadership. He and his talented staff took the lead in organizing the project and in securing the resources to underwrite it. To that end, we owe a debt of gratitude to all who provided gifts and sponsorships for the completion, publishing, and distribution of this work.

On Doug's initiative, a high-profile Oversight Committee was formed to evaluate book chapters as they were written and to open doors to high-level sources. Most recently, the Oversight Committee has been chaired by John Atkins, founder of O'Brien Atkins Associates, a leading RTP architectural firm. Other members of the Oversight Committee include Christy Shaffer, partner at Hatteras Venture Partners; Luther Hodges Jr., former US deputy secretary of Commerce and son of Gov. Luther H. Hodges; Fred Hutchison, founder of Hutch Law; Robb Teer, president, Teer Associates; and Smedes York, chairman, York Properties and former chairman of the Research Triangle Foundation. The Oversight Committee played an indispensable role in all aspects of the RTP book project.

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Sadly, the Oversight Committee lost two towering figures during its tenure: Its first chairman, Bob Ingram, died in March 2023. Bob was chairman/CEO of GSK, a leading international biopharmaceutical firm. He collaborated closely with Jim Goodmon, chairman of Capitol Broadcasting Company, in the revitalization of downtown Durham. We also lost Charles Hamner on July 4, 2025. Charles was widely considered to be the father of North Carolina's dynamic biotech industry, having recruited top scientists to the state during its formative period. He also worked tirelessly to recruit European firms to North Carolina alongside Gov. Jim Hunt, who died on December 18, 2025.

Enthusiastic kudos also should go to Preston Linn, who spent his career in RTP and who offered many useful ideas for the book. He participated in all Oversight Committee meetings. We are also indebted to Tom White of the Centennial Campus at North Carolina State University and former president of the Durham Chamber of Commerce. Tom was the first person—that the authors know of—to propose that a book be written on the history, importance, and future of Research Triangle Park. Tom continued to offer suggestions and make connections through completion of the book.

In a sense, the glue that held all the moving parts together over the life of the project was our project associate, Hannah Nicholson. She had just earned her master's degree in library science from UNC-Chapel Hill and quickly earned her spurs by assessing RTP holdings at every archive in the Triangle. She found transcripts, photos, and an assortment of other valuable items that are included in the book. Best of all, with the help of the authors and the Oversight Committee, she assembled a section describing the greatest technological accomplishments in RTP history. In doing so, Hannah proved herself to be an adept writer. Along with Hannah, we could not have completed this project without the hours of review, editing, feedback, and support of Mary Paul, a sister and aunt to the authors as well as an astute critic.

Last, but certainly not least, we want to thank Duke University Press, which dedicated so many talented people to this project. They included the insightful editorial input of Alejandra Mejia and Jessica Ryan; the enthusiastic marketing support of Cameron Ludwick and Laura Sell (along with the team at Pellien Public Relations); and the design talents of Courtney Richardson. We're deeply grateful to Dean Smith, director of the Press, who attended oversight committee meetings, provided encouragement, and kept us on track.

In light of the significant lifetime accomplishments of Bob Ingram and Charles Hamner, their service to RTP, and assistance in development of this book, we hereby dedicate this book in their honor.

INTRODUCTION

Not since 1903 and the Wright brothers' gift of wings had such a consequential takeoff occurred in North Carolina. On January 9, 1959, more than six hundred leaders from business, government, and academia packed into a ballroom at the Sir Walter Hotel in Raleigh. Governor Luther Hartwell Hodges addressed the audience. He announced successful efforts to raise private funding to establish a Research Triangle Park (RTP) in an area just south of Durham. (The esteemed Sir Walter Hotel—named for an audacious gambler whose Lost Colony simply disappeared in 1590—was often called the “Third House” of state government because so many legislators stayed there during sessions of the General Assembly.) Like the Lost Colony, RTP could have disappeared into the forest. But in just one generation, RTP proved to be a successful gamble, a new innovation center that sent stunning discoveries all around the world. In so doing, it became one of the largest and most successful research parks in the world.

And its unique character—best expressed in the Tar Heel state motto, “*esse quam videri*,” or “to be rather than to seem”—had much to do with that achievement. The “being” part was an inspired and resolute commitment by a leadership elite representing state government, business, and three tier-one research universities that made RTP an icon of a new approach to economic development, imbued with the core character traits of inventiveness and collaboration.

The scene at the Sir Walter feeds a myth about RTP—the notion that it sprang effortlessly from a forest of “possums and pines” to become an economic juggernaut that transformed a region and gained worldwide recognition for its discoveries. But great struggles to unify its founding constituencies had preceded Hodges's January 1959 announcement. And challenges in countless forms continue to this day.

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This book tells the RTP story in four parts. Part I traces RTP's rocky origins from first stirrings to life through IBM's momentous decision in 1965 to site a major facility in the Park, thus validating the still embryonic endeavor to the Fortune 500 and countless others. Part II follows the trajectory of RTP to its establishment as a global brand by the end of the twentieth century. Part III examines RTP since 2000, as it faced seismic changes in the tech sector and threats to its suburban design. It shows how RTP and its constituencies recalibrated to promote new industries and bring life-saving treatments to market. Part IV considers how RTP and its key partners in government, universities, and business prepare for new challenges and opportunities in the post-pandemic era.

Other major tech centers, such as Silicon Valley south of San Francisco and Route 128 in Boston, took off during World War II through massive federal spending on military research at universities such as MIT and Stanford, and those institutions were eager to embrace commercialization. Lenders and investors on the East and West Coasts backed risky tech ventures in those locales, producing a virtuous cycle of innovation that continues to this day. Unlike Silicon Valley and Route 128, RTP reflected a state's deliberate economic strategy.

Certainly, RTP benefited from a confluence of trends. Federal spending on research exploded after World War II. Further, locations in the South such as Huntsville, Alabama, and RTP would benefit from expansive new federal facilities sited in locations, in part, to solve political calculations in Washington, DC. A slow, steady stream of migrants began moving to the Sun Belt from other parts of the United States. The invention of air conditioning helped those transplants acclimate to the hot summers.

RTP's viability and success, however, rested on the persistent engagement and support from its partners in state and local government, businesses, and universities. State government provided leadership for the initiative, recruited companies to the state, provided needed infrastructure, and created a world-renowned workforce training program. The business community formed new institutions to acquire the land for RTP, encouraged start-up companies, and financed them. The cooperation between state government and business has continued to evolve policies to provide an attractive environment for the growth and relocation of technology companies.

While business and government readily embraced the vision for RTP, university leaders held back due to concerns that research for commercial purposes posed risks to academic integrity. To ensure the enthusiastic participation of university partners, leaders collaborated to establish the Research Triangle Institute (RTI) as a contract research entity under university control. RTI would go on to become one of the largest and most successful research institutes in

the world and provide an effective buffer between universities and commercial interests. As RTP grew in the 1970s and 1980s, academics began to see the advantages of consulting, research grants, and other benefits from their proximity to RTI and RTP more generally. Eventually, some academics became entrepreneurs, and a few created the largest homegrown companies in the region, employing thousands. Government support for university research labs produced Nobel Prize laureates and placed RTP on the map as a leader in life sciences. Legal changes have only made it easier for academics to take products, based on innovative research, to the marketplace.

Another important collaboration centered on RTP's relationship with surrounding communities. Its designers understood that RTP could not operate as an island. RTP's success depended on a region that put a high priority on housing for workers, transportation networks to access jobs, and quality schools for children. Workers demanded a high level of amenities in the form of outdoor recreation and cultural life to complement the area's mild climate and bucolic setting. Since its inception, RTP has led efforts to engage local governments, business, and civic leaders to think about the region and prepare for the growth generated by RTP by investing in infrastructure. Despite such planning efforts, regional growth has far exceeded that contemplated by the architects of RTP. That growth has presented some of the greatest challenges to the success of RTP. The Research Triangle area now comprises multiple counties, encompassing Alamance and Chatham Counties to the west, Granville and Franklin Counties to the north, and Johnston, Lee, and Harnett Counties to the east and south.

One other critical collaboration related to racial integration and desegregation. RTP's existence rests in large part on the ability of its leaders to navigate the South's legacy of slavery, war, and Jim Crow. When RTP got started, the South had a bad brand in the eyes of the nation. The 1954 decision in *Brown v. Board of Education of Topeka* would test whether the South could overcome its reputation and adapt to integration. Companies would not risk investments in facilities, equipment, and payrolls in areas with unstable race relations. North Carolina's ability to navigate desegregation became an advantage for RTP compared to neighboring Southern states. Black leaders counseled patience despite anger from decades of oppression. White leaders tamped down violence arising from fear over social change. By managing to mitigate unrest and build on the state's commitment to public education, leaders found a common ground that allowed RTP to flourish.

RTP now finds itself in the midst of wrenching changes. Urban planners criticize the validity of RTP's autocentric, office-park model. Do tech workers want

to continue working in such an environment? A global pandemic and growing demand for “work from home” have raised even more fundamental questions about the future of the office generally. Artificial intelligence threatens to displace broad categories of work, particularly in the field of technology. What sort of demand for physical space will exist in ten years? In response, RTP leaders are revising the rules that govern the development of its property. In the future, owners will have greater flexibility to create vibrant “innovation centers” to attract workers. Beyond these regulatory reforms, RTP’s success will depend on the continued engagement of government, universities, and businesses to adapt strategies to a rapidly changing world.

Given the period of its creation, growth, and recalibration, RTP reflects the story of many tech regions in the United States. Following World War II, these job centers transformed the American economy and society. In *The New Geography of Jobs*, economist Enrico Moretti argues that while comprising about one-third of the economy, the tech sector has an inordinate impact on prosperity in the United States for two reasons. First, it produces goods and services that compete in national and global markets. That fierce competition creates most of the nation’s productivity gains—the fundamental basis for raising living standards. Second, tech jobs have a profound effect on the local nontech economy. Moretti calculates that one tech job generates five nontech jobs (in both professional and nonprofessional services) compared to only 1.6 jobs with traditional manufacturing jobs. Why? High-wage tech workers have more disposable income; tech companies require more sophisticated business services; and such companies tend to locate near other tech companies to poach talent.¹ This explains the tremendous growth in jobs and wages in places like Austin, Texas; Boston; Seattle; Silicon Valley; and RTP. Nearly every state wants to attract tech companies as a path to economic growth.

Therefore, the story of RTP offers a case study of how one place pursued an inspired growth strategy. In 1952, when this story begins, North Carolina had certain advantages: three major research universities, a favorable business climate, and a relatively pristine environment. But it had even greater disadvantages: limited infrastructure, anemic industrial capacity, and a poorly educated workforce. That RTP helped to transform the region and state offers certain invaluable lessons—first among them that while timing has played a major role in its success, nothing mattered more than a cultivated commitment to improve on RTP’s model to succeed.

Before embarking on this story, a word about definitions. The book uses “RTP” or “the Park” when referring to the geographic footprint owned by the Research Triangle Foundation. This area comprises several thousand acres in

Durham County at its inception and now stretches over more than seven thousand acres in both Durham and Wake Counties. However, this book defines RTP as more than the footprint of the Park. It defines RTP as a set of strategies. In economic development parlance, RTP is known as a “big push,” a concerted effort over years to stimulate the growth of a new industrial sector. These strategies require a range of governmental policies: the cooperation of area universities; the creation of new institutions, including nonprofits; collaborations with existing institutions; and, finally, the collaboration and ingenuity of a myriad of local governments required to provide a support structure for the technology companies located in RTP and eventually outside its borders. This book looks at RTP through the lens of a strategy both to show the scope of its ambition and to consider its successes and failures. The chapters ahead will reveal this economic strategy through the stories of those who demonstrated the vision, leadership, innovation, patience, courage, and collaboration required to implement it over many decades.

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NOTES

INTRODUCTION

1. Enrico Moretti, *The New Geography of Jobs* (Houghton Mifflin Harcourt, 2013).

CHAPTER 1: BRAIN-DRAIN BLUES

1. John Wilson, "North Carolina's Research Triangle Park: An Investment in the Future," posted April 24, 2010, Vimeo video, <https://vimeo.com/11199745>.
2. V. O. Key, *Southern Politics in State and Nation* (Alfred A. Knopf, 1949), 205.
3. Key, *Southern Politics in State and Nation*, 207.
4. Key, *Southern Politics in State and Nation*, 211.
5. Mac McCorkle, "History and the 'New Economy' Narrative: The Case of Research Triangle Park and North Carolina's Economic Development," *Journal of the Historical Society* 12, no. 4 (2012): 496.
6. Transcript of oral history of Romeo Guest and William Saunders, January 27, 1980, RL.00486, Romeo Guest Papers, 1925–1987 and undated, David M. Rubenstein Rare Book and Manuscript Library, Durham, North Carolina.
7. Transcript, Romeo Guest Papers.
8. Alex Sayf Cummings, *Brain Magnet: Research Triangle Park and the Idea of the Idea Economy* (Columbia University Press, 2020), 26.
9. Romeo Guest to Senator Arthur Kirkman, January 6, 1956, in Romeo Guest Papers, box 10, Correspondence 1955; "Proposed Statement of Principles for the Research Institute of the Research Triangle," April 23, 1957, in RCP, box 11, Governor Hodges's Archival Papers, 1955–57.
10. Charles W. Wessner, ed., "Best Practices in State and Regional Innovation Initiatives: Competing in the 21st Century," National Institutes of Health, 2013.
11. Albert N. Link, *A Generosity of Spirit: The Early History of the Research Triangle Park* (Research Triangle Foundation of North Carolina, 1995), 13.
12. Romeo Guest, "Conditioned for Research," 1954, RL.00486, Romeo Guest Papers, 1925–1987 and undated, David M. Rubenstein Rare Book and Manuscript Library, Durham, North Carolina.