

**Roots:  
From Crop Duster to Airline;  
The Origins of Delta Air Lines to World War II**

by

James John Hoogerwerf

A dissertation submitted to the Graduate Faculty of  
Auburn University  
in partial fulfillment of the  
requirements for the Degree of  
Doctor of Philosophy

Auburn, Alabama  
December 13, 2010

Keywords: Delta Laboratory, Huff Daland, Delta Air Lines, B. R. Coad,  
Harold R. Harris, C.E. Woolman

Copyright 2010 by James John Hoogerwerf

Approved by

William F. Trimble, Chair, Professor of History  
James R. Hansen, Professor of History  
Alan D. Meyer, Assistant Professor of History  
Tiffany A. Thomas, Assistant Professor of History

## Dedication

This dissertation is  
dedicated to the memory of  
Dr. W. David Lewis  
Distinguished University Professor of History  
Auburn University  
(1931-2007)

## Abstract

Delta Air Lines (Delta) is one of the great surviving legacy airlines of the first century of flight. In the annals of American aviation history its origins are unique. Delta's beginning can be traced to the arrival of the boll weevil from Mexico into Texas in 1892. Unlike other national airlines that were nurtured on mail subsidies, Delta evolved from experiments using airplanes to counter the cotton weevil scourge from the air.

The iconic book on the subject is *Delta: The History of an Airline* authored by two eminent Auburn University history professors, W. David Lewis and Wesley Phillips Newton. This dissertation explores more closely the circumstances and people involved in Delta's early years up to World War II. It is chronologically organized and written in a narrative style. It argues Delta's development was the result of a decades-long incremental and evolutionary process and not the calculated result of a grand design or the special insight of any one person. Various individuals, influenced by diverse cultural, political, and economic factors, interacted to frame the outcome. The socio-technological system that is Delta today originated from a complex set of seemingly unrelated circumstances. The slightest variation might have modified, sidetracked, or even terminated the process.

The search for primary source material determined the methodology undertaken for this study. The investigation led to each of the cities where Delta had an early connection and to libraries and repositories across the United States and in South

America. A variety of diverse primary source materials, including government publications, newspaper articles, interviews, library subject files, and archival repositories, was accessed. Much of this information was unavailable to historians Lewis and Newton.

This study explains how in its early years a large American legacy airline evolved from a small crop dusting company chartered to help save cotton from the boll weevil infestation in the southern United States. More Broadly, it contributes to the understanding of the origins of commercial aviation in the United States and the world.

## Table of Contents

Dedication.....	ii
Abstract.....	iii
List of Illustrations.....	vi
Introduction.....	1
Chapter 1 Into the Delta.....	14
Chapter 2 Borgias of the Air.....	35
Chapter 3 A Corporate Pioneer in the Delta.....	53
Chapter 4 The Eagle and the Condor.....	76
Chapter 5 Insight.....	96
Chapter 6 Airmail and the West Coast Project.....	118
Chapter 7 Metamorphosis.....	144
Chapter 8 Delta Air Service, Inc.....	163
Chapter 9 Southern Stars.....	184
Conclusion.....	205
Bibliography .....	210

## List of Illustrations

Illustration 1 “Undesirable Citizens” .....	22
Illustration 2 B. R. Coad in his office at the Delta Laboratory .....	26
Illustration 3 Aircraft dusting Catalpa trees at Troy, Ohio .....	37
Illustration 4 Air suction type hopper before installation .....	45
Illustration 5 Air suction hopper installed in aircraft .....	46
Illustration 6 Assembly of ground based cotton dusting machines .....	54
Illustration 7 Aerial view of various duster machines in action .....	55
Illustration 8 George B. Post at demonstration event .....	68
Illustration 9 Collett Everman Woolman .....	83
Illustration 10 Huff Daland Duster aircraft in Peru .....	97
Illustration 11 Harold R. Harris meets Peruvian President Leguía .....	99
Illustration 12 Smoot Field .....	106
Illustration 13 Selman Field with shipping crates ready for Peru .....	108
Illustration 14 Harold R. Harris in Peru .....	112
Illustration 15 Tobin, Woolman, and possibly Stan Webber before flying to Ecuador ...	139
Illustration 16 Group in front of large duster .....	150
Illustration 17 Delta Air Service personnel with Travel Air 6000 .....	170
Illustration 18 Employee group photo taken May 13, 1933 .....	175
Illustration 19 Group posing with a Lockheed Electra on March 14, 1939 .....	189

Illustration 20 Thomas Prioleau (“Pre”) Ball (ca. 1936).....	191
Illustration 21 Eva Parrish (ca. 1940).....	195
Illustration 22 C. E. Woolman, Clarence E. Faulk, Pat Higgins.....	200

## Introduction

This study began with the planting of an idea in my mind by a comment of a Delta Air Lines captain made in approximately 1973. I was serving as a junior second officer aboard a Douglas DC-8 jetliner cruising comfortably above the flatlands of the Mississippi River Delta region on the way to Atlanta, Delta's major hub city in Georgia. Over Monroe, Louisiana, the senior captain made the comment to his fellow crewmembers, "There's Monroe, where Delta got its start."

The statement begged the question, how could this major air carrier have originated in such a small place? The stock answer bordered on mythology--the Mississippi Delta region gave its name to the airline which evolved from a small crop dusting company called Huff Daland Dusters under the tutelage of Delta's founder, Collett Everman ("C. E.") Woolman. But how did that happen?

A few years later, in 1979, Auburn University history professors W. David Lewis and Wesley Phillips Newton wrote *Delta: The History of an Airline (Delta)*. The book was written under contract for the company and the authors were granted unrestricted access to the corporation's business records, correspondence, and personnel. A complimentary copy was presented to each employee to commemorate Delta's fiftieth anniversary of the beginning of passenger service in 1929. A book signing was held for grateful employees patiently waiting in a long snaking line at the Jet Base, Delta's massive maintenance complex located between the runways at the Atlanta airport, where



Lewis and Newton graciously autographed hundreds of copies.

In the annals of American aviation Delta's beginning is unique. Unlike other national airlines promoted by federal government mail subsidies through the post office, Delta evolved from a crop dusting company organized to counter the cotton boll weevil scourge from the air. It was a private venture without government assistance. *Delta* is a comprehensive history of the company through 1979. Chapters one through five cover the early years to the outbreak of World War II.

I found these chapters interesting but the story sketchy. Overall *Delta* is an excellent study of the airline's first fifty years. It is only with those early years to the outbreak of World War II that I take issue. In fairness Lewis and Newton used what information they had available to position the airline broadly in the context of commercial aviation's development as an industry. They do this admirably, but there had to be more to the story of Delta's beginning. Woolman is a key figure, but to what extent is he responsible for the emergence of the airline? Harold R. Harris, George B. Post, Bert Raymond Coad, and Richard F. Hoyt are identified. Were their roles as significant as Woolman's?

An in-depth explanation of the circumstances and people involved in the development of Delta Air Lines was needed. Whereas Lewis and Newton take more of an outsider's perspective of Delta's early years, I take a closer insider look to address the question of Delta's origins. This paper is not a revisionist history. Rather I suggest the two perspectives are complementary. Seldom does either conflict or overlap with the other. For example, Lewis and Newton devote an entire chapter to the period from 1931 to 1934, characterized as the "doldrums." Delta failed to get a mail contract and reverted

to crop dusting in order to survive. Because I did not find new primary source material, my discussion on Delta's survival during this time is limited. Instead, I explore an aspect of Woolman's personality by his compassion for his friend, B. R. Coad, who was indicted for defrauding the government in 1931. Therefore, for the most complete understanding of Delta's early history, Lewis and Newton's book and this study should be read together.

This dissertation is a narrative history of the origins of Delta Air Lines to World War II. It is organized chronologically and argues the development of Delta Air Lines was the result of a decades-long incremental and evolutionary process and not the calculated result of a grand design or the special insight of any one person. Various individuals, influenced by diverse cultural, political, and economic factors, interact to frame the outcome.

The socio-technological system that is Delta Air Lines today is, in its origins, the result of a complex set of circumstances. The slightest variation of any one might have modified, sidetracked, or even terminated the process. Key words in the title, *Roots: From Crop Duster to Airline; The Origins of Delta Air Lines to World War II*, are *Roots* and *Origins*. The story of Delta is literally from the ground up--it begins with the boll weevil infestation in the South. The word *Origins* suggests multiple beginnings--one could choose among a number of points where the airline started. This paper begins with the boll weevil when it crossed into Texas from Mexico in 1892. World War II is a demarcation for two reasons. First, the war drastically affected Delta's and the country's fortunes and second, during and after the war more complete corporate records are available and were used by historians Lewis and Newton in their writing of *Delta*.

In addition to the development of commercial aviation, this study makes

connections between the histories of the southern social and economic condition when it discusses southern labor; scientific agriculture and the chemical industry with the use of calcium arsenate on cotton; southern industrialization with the evolution of crop dusting and airlines; technological innovation with the merger of aviation and agriculture to counter the boll weevil threat; and domestic and international business with the formation of airlines in North and South America.

*Delta: The History of an Airline* is the only scholarly work written on the origins of Delta Air Lines. The need for primary source material determined my methodology. Beginning in 1992 I sought out sources wherever they were likely to exist. The idea was to discover alternate sources beyond what was in Delta's corporate files and those used by Lewis and Newton. The search has taken me to each of the cities where Delta had a connection such as Ogdensburg, New York, Tallulah, Louisiana, Atlanta and Macon, Georgia, and many others. My travels extended to both coasts of the United States and to South America. In Seattle, Washington, I utilized the resources of the Harl V. Brackin Library at the Museum of Flight and on the east coast I visited the New York Public Library. In Lima I studied at the Biblioteca Nacional del Perú and in Santiago the Biblioteca Nacional de Chile. I was able to do this on my off time while serving as a pilot for Delta Air Lines or while on layovers between flights. After retiring from Delta in 2001, I began studies and continued my research as a graduate student at Auburn University.

In this quest I was fortunate to locate and access a variety of diverse primary source materials including government publications, newspaper articles, interviews, library subject files, and archival repositories. Discoveries in each of these categories

were insightful contributions to the subject. Some of the more important used are highlighted here.

The experiments conducted at Tallulah, Louisiana, during 1922 are thoroughly discussed in USDA, *Department Bulletin* 1204 (January 1924), “Dusting Cotton by Airplanes” by Bert R. Coad, Entomologist, Bureau of Entomology; E. Johnson, Agricultural Engineer, Bureau of Public Roads; and First Lt. G.L. McNeil, Twenty-Second Observation Squadron, U. S. Air Service. The conduct of these experiments and their successful outcome merged aviation and agricultural technologies and led to the formation of the world’s first aerial crop dusting company, Huff Daland Dusters.

For a number of reasons the publication, “Boll Weevil Control by Airplane,” *Georgia State College of Agriculture, Extension Division Bulletin* 301 (Nov. 1924) by George B. Post is significant. First, it discusses two individuals prominent in the experimental and early developmental stages of aerial dusting, George Post, of the Huff Daland Company in New York and Bert Coad, head of the entomological research laboratory in Tallulah. Second, it summarizes the advantages of the airplane over terrestrial application methods and outlines a crop dusting business plan. Third, the publication appears not to have been widely circulated, enhancing its significance to this dissertation as a contemporary source.

An invaluable source was found in newsprint. During the 1920s and 1930s national and local newspapers regularly reported aviation-related news. Events pertaining to the early years of crop dusting and passenger service were of interest to communities and reported in the papers. A visit to these places, especially the smaller cities, often yielded results from a review of papers only available on microfilm in the local library.

The first published use of the airplane in the aerial fight against insect pests appeared in *National Geographic* magazine (March 1922), “Fighting Insects With Airplanes, An Account of the Successful Use of the Flying Machine in Dusting Tall Trees Infested With Leaf-Eating Caterpillars” by C. R. Nellie and J. S. Houser. This success led to experiments conducted on low-growing cotton fields in Louisiana. Two journal articles discuss these aerial experiments: Eldon W. Downs and George F. Lemmer, “Origins of Aerial Crop Dusting,” *Agricultural History* 30 (1965) and T. C. Cleveland and C. R. Parencia, “History of the USDA Cotton Insects Research Laboratory Tallulah, Louisiana, 1909-1973,” *Bulletin of the Entomological Society of America* (1976). They hardly do justice for such a significant enterprise but are scholarly treatises and the annotated references were helpful to this study. The story of aerial applications is told in Mabry I. Anderson, *Low And Slow: An Insider’s History of Agricultural Aviation* (San Francisco, 1986) but, while it is a comprehensive and interesting history of crop dusting, its sources are unfortunately not cited and the bibliography is limited.

Oral histories are important sources and I interviewed several individuals from the period. Significant among them are three sessions conducted with Capt. Thomas Prioleau (“Pre”) Ball, who began his career with Delta Air Lines as a station manager in Charleston, South Carolina, and was one of the company’s earliest pilots. The Ball interviews are a prominent component of the final chapter of this dissertation. I was fortunate to meet Larry Michaud of the Louisiana Department of Agriculture and Forestry. Michaud interviewed Eugene (“Steve”) Stevens, one of the original duster pilots with Huff Daland Dusters, and he graciously shared his tapes, which I transcribed. Stevens’s comments provide a contemporary insight on events from an often contrary

perspective. He was one of the earliest crop duster pilots and quit Huff Daland Dusters to start his own crop dusting company. Useful interviews of other prominent individuals are found in the Delta Air Lines Corporate Archives.

A number of local libraries in cities with a Delta footprint have Delta Air Lines subject files. Of particular importance are the materials provided by the Ogdensburg, New York, Public Library, in its Huff Daland Collection. This collection has a helpful file of newspaper clippings arranged chronologically pertaining to Huff Daland Company, its aircraft, and people. Pictures of early Huff Daland models and other reference materials are also available.

I was fortunate to review the Harold R. Harris Papers at the Wright State University Department of Special Collections and Archives. These were accessioned in April 1990, and therefore were unavailable to Lewis and Newton at the time of their writing. Harris played a role in the early years of the evolution of Delta Air Lines and this dissertation would have been at a significant loss without the use of this collection. In particular the “Report to the President and Board of Directors of Huff Daland Dusters, Incorporated for 1927” by the operating managers and “South American Survey Trip” report by Harris were indispensable.

Finally, primary source material at the Delta Air Lines Corporate Archives rounded out the quest for original documentation on the evolution of Delta Air Lines. I am grateful for having been granted access to this repository; the dissertation could not have been completed otherwise. In particular, the archive provides the most complete documentation on C. E. Woolman. Other sources are the Woolman Papers in the Special Collections at Hill Memorial Library, Louisiana State University in Baton Rouge and the

Woolman file in the archives at the University of Illinois, Urbana-Champaign Library.

On a theoretical level, the evolution of Delta Air Lines fits within the historiography of technology by arguing that its early development was a consequence of human needs. Many individuals played a part and Delta's emergence corresponds to Thomas Parke Hughes's understanding of technology as being driven by society, for better or worse. Hughes, scholar, professor and author, defines technology "as a mode of creation" and in *Human-Built World: How to Think About Technology and Culture* he expounds on the theme that "humans have been engaged in creating a living and working place."<sup>1</sup> Although technology is the main thread in Hughes's history, it does not determine history's course. For better or worse it is up to society to apply technological solutions to its problems. Likewise, technology is the main thread in Delta's evolution but it was individual participants in society who collectively determined its course.

Delta evolved from the application of technology to the needs of society by individuals actively engaged in that society to solve society's problems. Planters were threatened by the boll weevil, and scientists responded by developing methods of control. Calcium arsenate was found to be an effective agent, but it was difficult to apply. The idea of using an airplane to dispense dust significantly applied the airplane's agility to solve the problem. Carrying passengers and mail took advantage of the airplane's speed to meet society's need of rapid transportation and communication.

Chapter one sets the geological, geographic, and cultural stage of the Mississippi Delta that is the namesake of the airline. The Mississippi River is the dominant feature

---

<sup>1</sup>Thomas Parke Hughes, *Human-Built World: How to Think About Technology and Culture*, (Chicago: University of Chicago Press, 2004), 177, 179.

and imposes its character on the region. The river's action flattened the land, nurtured the soil, and created the Delta. The river was tamed and the land cleared after the Civil War. Cotton was the dominant agricultural crop. This chapter proposes Southern planters feared the boll weevil would cause them to lose their labor and was a reason the government's laboratory was located in the Delta. The boll weevil threat, its consequences, and the role of the Delta Laboratory, under the direction of Coad, are essential for understanding the beginnings of Delta Air Lines.

If chapter one introduces the terrestrial background of Delta Air Line's evolution, chapter two brings the airplane into the history. The airplane was first used to dust trees in Ohio. The experiment was successful and suggested the possibility of using airplanes to dust low-growing crops. The flatlands of the Mississippi Delta were a logical site to undertake tests that required aircraft to fly low over the fields. The military provided training airplanes, and the facilities of the Delta Laboratory were made available for the experiments. The results from the first year of testing were astonishing, and, though they were first undertaken for cotton leaf worm control, researchers anticipated that aerial applications could be used to counter the boll weevil. Experiments undertaken the following year used more powerful military aircraft and confirmed dusting from the air was equally as effective against the boll weevil.

Chapter three focuses on the Huff Daland Company in Ogdensburg, New York. The chapter explores the reason it was located there, its success in building military aircraft, and the company's intent to produce commercial aircraft. George B. Post and Catherine FitzGerald were two early employees of the company who participated in the evolution of Delta Air Lines.



Huff Daland Dusters, the world's first crop dusting company, was formed as a subsidiary to the Huff Daland Company. When Huff Daland Company outgrew its facilities in New York, it moved to Bristol, Pennsylvania. Once there the company reorganized with the help of New York aviation financier Richard F. Hoyt and became Keystone Aircraft Corporation. The subsidiary, Huff Daland Dusters, retained its original name.

In chapter four the scene shifts to South America. The chapter begins with a discussion of the political and economic situation in Peru which foreign investors found attractive. Peruvian planters were having a problem with cotton pests and Pedro Beltran traveled to the United States to seek assistance. At the Delta Laboratory, Coad directed him to Huff Daland Dusters. The company decided to send a representative to Peru and asked C. E. Woolman to travel to Lima and seek a concession. This chapter includes a limited biography of Woolman. It discusses the reasons he was chosen to represent the company and his activities while in Peru.

Harold R. Harris followed Woolman to Peru with an expedition of personnel, equipment, and supplies. Chapter five addresses Harris's reception by Peruvian planters, military officers, and government leaders. Harris, an experienced military and civilian aviator, had a special insight into aviation possibilities in Latin America. While he was there the Army Air Corps Pan American Good Will Flight stopped in Lima on a survey flight around South America. Harris discussed the route and experiences with the military aviators. In the meantime, back in the United States, the Mississippi River flood affected Huff Daland Dusters's 1927 operations. When Harris left Peru he traveled on a circuitous route around the continent exploring the potential for airmail and mapping routes. On his

return to the United States he disembarked in New York with a map and a plan for developing air routes in South America.

Chapter six focuses on Harris's meeting with aviation financier Hoyt and Pan American's developer Juan Trippe to deliver his report. This chapter explores ties with the formation of Pan American Airways. Huff Daland Dusters's presence in Peru extended Pan American's route. Woolman returned to Peru with his family and a dual mandate. On the one hand he serviced the dusting contracts for 1928. On the other hand, he negotiated with the government for a mail and passenger concession. Then Woolman returned to the United States. Pan American joined with the W. R. Grace Company to form Peruvian Airways which was superseded by Pan American Grace Airways (Panagra). Harris went to Peru and became general manager of Panagra.

Chapter seven is an in-depth discussion of how Huff Daland Dusters became Delta Air Service. As the domestic air transportation system was being consolidated, the Huff Daland operating team, Harris, Woolman, and the company's comptroller, Irwin E. Auerbach, were not immediately able to buy the company's assets. Therefore, it was a surprise to Harris when he learned Hoyt was ready to sell. Woolman was in Peru, so it was up to Harris and Auerbach to negotiate a deal. While these talks were going on, Harris was appointed to manage Peruvian Airways and dispatched to Peru. When he and Woolman were away, Auerbach attempted to sell the company by himself. The betrayal was discovered when Woolman returned. He worked through the situation and Delta Air Service was established; Huff Daland Dusters was dissolved. Both Woolman and Harris shared the proceeds from the sale of the Peruvian assets. From now on Woolman's future was inextricably tied to the airline.

Delta Air Service was a short-lived firm. Chapter eight discusses the company's initial operations leading up to the beginning of passenger service in 1929 and it addresses the mystery of lost corporate records for the 1930s. The airline operated without a mail contract and was forced to cease operations when Postmaster General Walter Folger Brown gave the Southern Transcontinental route to American Airways. The company changed its name to Delta Air Corporation and survived by dusting cotton and providing aircraft services. At this time B. R. Coad was indicted for defrauding the government. When President Franklin D. Roosevelt restored cancelled mail contracts following the "spoils conference" fiasco, Delta commenced passenger service along an extended route from Charleston, South Carolina to Fort Worth, Texas.

The final chapter shifts the focus of the airline from Monroe, Louisiana to Atlanta, Georgia. Delta's trans-southern route connected the two, but Atlanta became the terminus, especially when Delta received a new north/south route from Cincinnati to Savannah. The ill-fated Stinson A trimotor led to the acquisition of new modern aircraft. Interviews with Ball provided a feeling for flying the route. This chapter addresses questions surrounding the move of Delta's corporate offices from Monroe to Atlanta and the problem of raising capital.

Delta's family tree depicts mergers and acquisitions of multiple airlines spanning the first century of flight. Only just recently, Delta Air Lines merged with Northwest Airlines to connect another branch of aviation development to its genealogy. Delta, in its present form, represents the evolution of an extraordinary transportation system. My study contributes to an understanding of Delta's origins and its maturation from a specialized crop dusting company to a corporation that subsequently grew into one of the

world's largest and longest surviving airlines.

## Chapter 1

### Into the Delta

The Mississippi Delta begins in the lobby of the Peabody Hotel in Memphis and ends in Catfish Row in Vicksburg.

David L. Cohn, *God Shakes Creation*

Historian James C. Cobb, in “The Most Southern Place on Earth,” begins his treatise by describing the Yazoo/Mississippi Delta region as a throwback to an earlier time. There, the soil and climate were ideal for King Cotton, the land is flat, and blacks, following the Civil War, still labored under a white planter class, no longer as slaves, but as sharecroppers. More than a place, though, Cobb observes, the Delta is a feeling. One does not go *to* the Delta rather, one travels “‘*into the Delta*’ [italics added] the implication being that of passage back in time, to a setting--that if such a thing were possible--seemed even more southern than the rest of the state.” Cobb reexamines southern “interaction with, rather than its isolation from the larger global and national setting,” and he discovers the Delta has become “a part of the world rather than a world apart.”<sup>1</sup> With this outward perspective in mind this chapter looks into the Delta to understand those factors that first influenced the merger of agricultural and aeronautical technologies to combat the boll weevil, and then led to the development of Delta Air Lines.

---

<sup>1</sup> James C. Cobb, *The Most Southern Place on Earth* (New York: Oxford University Press, 1992), vii-viii, xii.

The “Delta,” for the purposes of this dissertation, includes the regions of Mississippi and Louisiana. As the prehistoric seas receded, sediments filled in the “Mississippi Embayment, a declivity covering approximately 35,000 square miles that begins 30 miles north of Cairo to Cape Girardeau, Missouri--geologically the head of the Mississippi Delta--and extends to the Gulf of Mexico. At one time the gulf itself reached to Cape Girardeau.”<sup>2</sup> Because the Mississippi River drops only 290 feet in elevation, wending its way 1100 river miles from Cairo, Illinois, to the Gulf Mexico, the gentle slope would seem to tame the river’s power, but it is just the opposite. “The Mississippi is never at rest. It roils. It follows no set course. Its waters and currents are not uniform. Rather, it moves south in layers and whorls, like an uncoiling rope.” The turbulence is so complex that studies of flowing water gave rise to the new science of chaos in the 1970s.<sup>3</sup> Among other factors, the hydraulics are governed by the tremendous volume of water conveyed. With its tributaries, the Mississippi drains 41 percent of the contiguous United States.<sup>4</sup> Rain that falls as far west as Montana will disgorge into the Gulf of Mexico, as does rain from parts as far to the east as New York and Pennsylvania, via the Missouri, Ohio, and Mississippi rivers.<sup>5</sup> The immense volume of water is both a benefit and a liability, and delayed the Delta’s development.

Historically, seasonal high water crested the river’s banks and replenished Delta land with a layer of fresh topsoil and nutrients. The lush, dense vegetation that flourished

---

<sup>2</sup> John M. Barry, *Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America* (New York: Simon & Schuster, 1997), 39.

<sup>3</sup> *Ibid.*, 37, 38.

<sup>4</sup> Cobb, *Most Southern Place on Earth*, 3.

<sup>5</sup> Barry, *Rising Tide*, map 10-11.

from this enrichment promised high yields for cotton growers, but at a price. The land first had to be cleared, the swamps drained, and the Mississippi and its tributaries tamed. These difficulties delayed the effort until after the Civil War. Then, it took a special breed of men--men of means having foresight and a world outlook--to challenge the Delta. With their resources and vision, they organized the human and mechanical energy necessary to clear the land, prepare the fields, build the levee system, and develop the Delta for agriculture.<sup>6</sup>

The Percy family of Mississippi epitomizes this Delta planter class. Historian Bertram Wyatt-Brown writes, “The Percys helped to create the Deep South--not just as slaveholding frontiersmen, but as agents of change in the Post-War years.”<sup>7</sup> Another historian observes, “the wealth the Percys found in the delta’s swamps gave them the freedom to live the good life, [and] their wealth placed them above the criticism of the community. They usually knew what they wanted to do, and their wealth allowed them to do it.”<sup>8</sup>

Following the Civil War, many planters lost their land. Whether those who managed to hold on transformed themselves into a new entrepreneurial or industrial class is the subject of scholarly debate. Cobb agrees with C. Vann Woodward’s “general blueprint” that “survival or success as a planter described the experience of many prominent late nineteenth-century Delta planters whose interests and holdings actually

---

<sup>6</sup> Barry, *Rising Tide*, 97.

<sup>7</sup> Bertram Wyatt-Brown, *The House of Percy: Honor, Melancholy, and Imagination in a Southern Family* (New York: Oxford University Press, 1994), 4.

<sup>8</sup> Lewis Baker, *The Percys of Mississippi: Politics and Literature in the New South* (Baton Rouge: Louisiana State University Press 1983), 5.

made them some combination of planter and merchant, or lawyer.”<sup>9</sup> The Percys fall into this category. Their “occupations as planters, lawyers, physicians, militia officers, corporation lawyers, and bank directors complemented their energetic civic work,”<sup>10</sup> and LeRoy Percy (1860-1929) “inherited his father’s love of the delta.” As the attorney representing the Yazoo-Mississippi Levee District, he became knowledgeable of flood control methods and established valuable personal relationships, “thus binding his career to the Delta’s major concern, the levees.”<sup>11</sup> His many activities included service as United States Senator representing Mississippi.

Before the advent of the railroad, efficient transportation was confined to inland waterways. Mark Twain, in *Life on the Mississippi*, eloquently depicts the steamboat as the workhorse of Midwest expansion. With “about 1,250,000 square miles,” he writes, the Mississippi river basin was the “Body of the Nation.”<sup>12</sup> But water transportation limited interior settlement, whereas railroads, when they came, “not only encouraged widespread cultivation of cotton, but...increased the value of all land, improved or not, in the Delta counties, where on average, land prices rose by nearly 50 percent between 1880 and 1890.”<sup>13</sup> When Twain returned to the river in 1882, after an absence of twenty-one years, he noticed the change. There were few passenger steamboats left in operation on which to embark.

The railroad gave planters, such as the Percys, access to national markets and

---

<sup>9</sup> Cobb, *Most Southern Place on Earth*, 92.

<sup>10</sup> Wyatt-Brown, *House of Percy*, 4.

<sup>11</sup> Baker, *Percys of Mississippi*, 15, 17.

<sup>12</sup> Mark Twain, *Life on the Mississippi* (New York: Signet Classic, 2001), preface.

<sup>13</sup> Cobb, *Most Southern Place on Earth*, 82.



transformed “an essentially untamed wilderness frontier to a modern plantation kingdom.”<sup>14</sup> With their connections to banks, railroads, world markets, and Wall Street, Delta planters looked outward. As their ties to national and world economies solidified, it highlighted the Delta’s separateness as a region and contributed to “the Delta’s increasing socioeconomic and political isolation from the remainder of Mississippi.”<sup>15</sup>

Nevertheless, Delta land-holding elites continued to view themselves symbolically as planters. “The Delta owner of extensive lands lived, not on a farm, but on a plantation. He was known not as a farmer, but as a planter,” which linked him with “the antebellum past, reminiscent of the dream, if not always the reality, of what had been. It conjured up the lordship of the living and a touch of the romantic”<sup>16</sup> and “suggested aristocracy and inherited wealth, the habit of command, and a ‘cavalier dash that mocked the dull virtue of caution and scorned the pedestrian uses of compound interest piling up in the bank.”<sup>17</sup> More down to earth, though, a continuing concern for planters, whether in the Delta or elsewhere in the South, was with their labor.

In the aftermath of the Civil War, the value of slaves was lost and entrepreneurial incentives were redirected toward investment in land. “Laborlords” became “landlords.”<sup>18</sup> The potential return from the productivity and value of land, not slaves, was the new method of creating wealth, and cotton continued to be the dominant agricultural crop.

---

<sup>14</sup> Ibid., 124.

<sup>15</sup> Ibid., 141, 145.

<sup>16</sup> James C. Cobb, ed., *The Mississippi Delta and the World: The Memoirs of David L. Cohn* (Baton Rouge: Louisiana State University Press, 1995), 66.

<sup>17</sup> Cobb, *Most Southern Place on Earth*, 131.

<sup>18</sup> Gavin Wright, *Old South, New South: Revolutions in the Southern Economy Since the Civil War* (Baton Rouge: Louisiana State University Press, 1996), 49.

Cotton remained the foundation of the economic, social, and cultural life of the South.<sup>19</sup>

Ex-slaves were lured to southern states, including Louisiana and Mississippi, with promises of “enormous wages” and “images of opportunity and even lushness.”<sup>20</sup>

Gavin Wright’s *Old South, New South* economic interpretation explains the southern condition. The system that evolved was the result of market forces. After the Civil War, output per acre of land became paramount. Labor was now a variable cost that had to be covered by the value of the crops grown, and this fostered a new relationship between landowners and freedmen. Blacks and poor white sharecroppers lived and worked on the land for a share of the crop, which, in a vicious cycle at the end of the season, was used to pay off their account at the plantation store (owned by the planter) for expenses.<sup>21</sup> Sharecropping was, as Wright notes, a “balance between the freedmen's desire for autonomy and the employer's interest in extracting work effort and having labor when it was needed.” But, he adds, “sharecropping was a high-turnover system, and indebtedness did not prevent blacks or whites from frequently changing landlords.”<sup>22</sup> Similarly, Cobb finds that indebtedness was not “an absolute guarantee that a worker would stay put.”<sup>23</sup>

LeRoy Percy understood “the delta’s dependence on black labor ... [and he] hoped an influx of white settlers would eventually end it.” His experiment to bring Italian

---

<sup>19</sup> Ibid., 19.

<sup>20</sup> Leon F. Litwack, *Been in the Storm so Long: The Aftermath of Slavery* (New York: Vintage Books, 1979), 308.

<sup>21</sup> The southern cotton culture is discussed in Pete Daniel, *Breaking the Land: The Transformation of Cotton, Tobacco, and Rice Cultures Since 1880* (Chicago: University of Illinois Press, 1985).

<sup>22</sup> Wright, *Old South, New South*, 12, 85-86.

<sup>23</sup> Cobb, *Most Southern Place on Earth*, 105.

immigrants to the Delta failed, misunderstood and derailed by politics and purposeful misinformation. To one muckraker, Percy bitterly replied on the subject, “we made the mistake of supposing you were a reputable newspaper correspondent, instead of recognizing the fact that you were merely a common, cheerful, and industrious liar.”<sup>24</sup> When immigrants could not be attracted to the Delta, keeping labor in place was a nagging concern and a constant challenge.

The labor situation became even more critical as the boll weevil advanced across the South, averaging 40 to 160 miles per year.<sup>25</sup> It was first found near Brownsville, Texas, in 1892, where it had crossed the Rio Grande from Mexico. “Growers were totally defenseless and havoc continued to engulf one county after another. By 1922 the boll weevil had spread across most of the Cotton Belt.”<sup>26</sup> In Mississippi, LeRoy Percy “feared their arrival would trigger a panic that would be more harmful than the insects themselves. ‘One great danger to be guarded against,’ he warned, ‘is the stampeding of the Negro labor. This would bring about all of the loss that the weevil might ultimately cause, and could be fully as difficult to remedy.’”<sup>27</sup> The Delta became the center of the fight against the boll weevil.

Boll Weevil (*Anthonomus grandis* Boheman) is the common name for one of the group of “snout beetles” that infect cotton plants. The female punctures the buds and

---

<sup>24</sup> Baker, *Percys of Mississippi*, 31.

<sup>25</sup> C. R. Parencia, “One hundred Twenty Years of Research on Cotton Insects in the United States,” *USDA Agriculture Handbook* 515 (1978): 6.

<sup>26</sup> William A. Dickerson, Anthony L. Brasher, James T. Brumly, Frank R. Carter, William J. Grenfensette, and Aubrey Harris, eds., *Boll Weevil Eradication in the United States Through 1999* (Memphis: The Cotton Foundation Publisher, 2001), xxi.

<sup>27</sup> Baker, *Percys of Mississippi*, 31.

fluffy cotton bolls to lay her eggs inside. When the eggs hatch, larvae feed on the buds and bolls, which fall to the ground. Damaged bolls that remain on the plant are stunted or dwarfed. The life cycle of the boll weevil is about three weeks, allowing four or five generations to breed in one season. Since the 1870s, the United States government had helped farmers in fighting agricultural pests.<sup>28</sup> The cotton leaf worm and bollworm were the focus of early cotton investigations, but the boll weevil rose in priority when the magnitude of the threat to southern agriculture was realized. In 1901, Congress funded the first boll weevil investigation under the direction of W. D. Hunter, who was to remain in charge of boll weevil investigations until his death in 1925.<sup>29</sup> A research laboratory, first established in Victoria, Texas, was relocated to Dallas in 1905, and later moved to Tallulah, in the Louisiana Delta. Not wholly reliant on federal efforts, states took independent action. Georgia quarantine laws, adopted in 1903, prohibited importation of living boll weevils and required cotton seed grown in Texas and Louisiana to be fumigated. The Louisiana legislature established the Crop Pest Commission in 1904.<sup>30</sup>

In 1907 the pest crossed the Mississippi River, threatening the large plantations of the Mississippi Delta. By this time “all cotton growing states had previously enacted quarantines against the introduction of infested material, and the spread was almost entirely by natural dispersal.”<sup>31</sup> Weevils fly, but not far, seeking places of hibernation. Wind will affect the distance and direction they travel. Timbered regions, with an

---

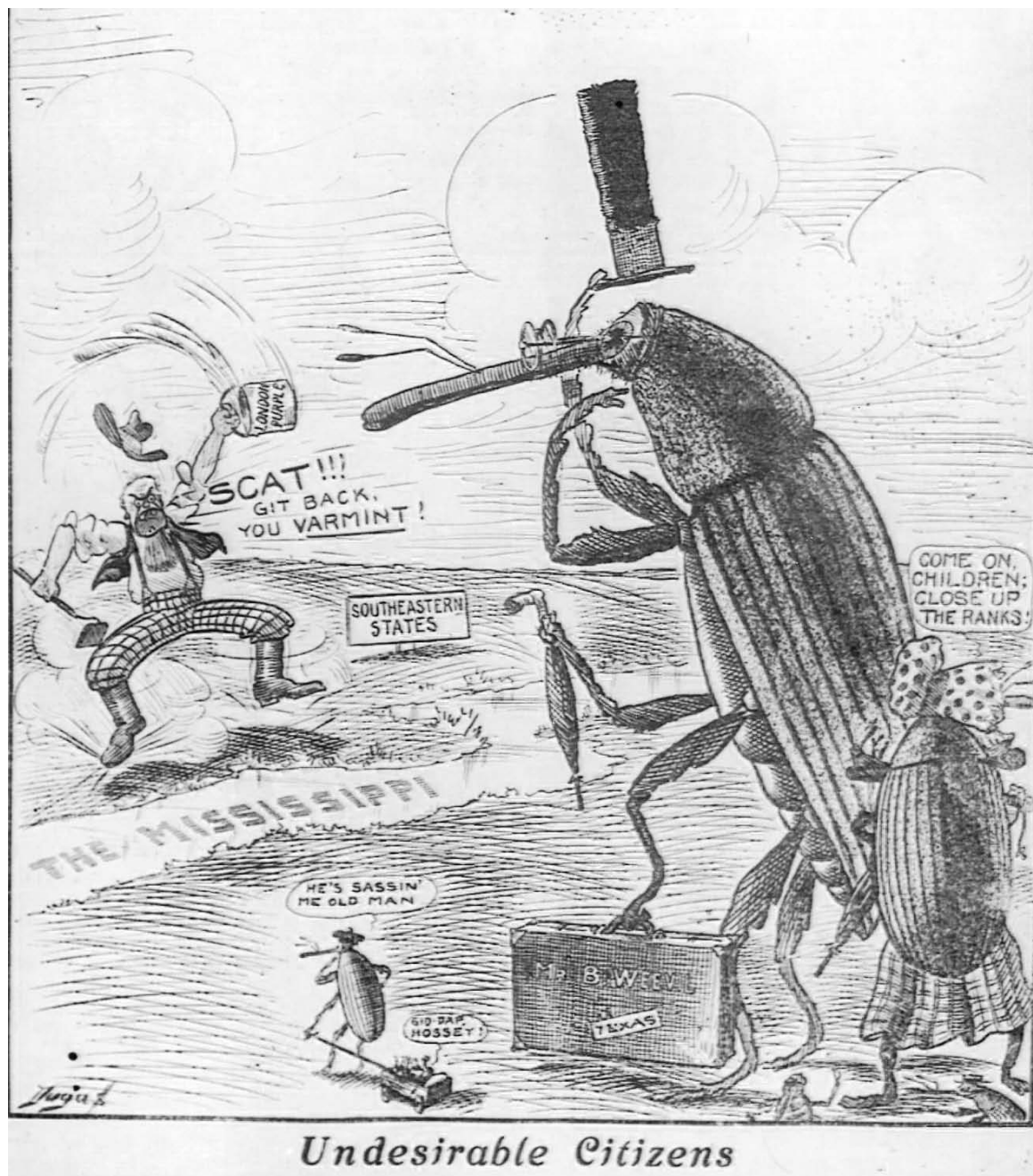
<sup>28</sup> Eldon W. Downs and George F. Lemmer, “Origins of Aerial Crop Dusting,” *Agricultural History* 30 (July, 1965): 123.

<sup>29</sup> Parencia, “One hundred Twenty Years of Research,” 3, 5.

<sup>30</sup> *Ibid.*, 5.

<sup>31</sup> *Ibid.*

abundance of Spanish moss, provide the best protection from cool winter temperatures, and, it was discovered, “hibernation in the fields [was] not of great importance, except in



This cartoon, illustrating the invasion of the boll weevil east of the Mississippi River, appeared on the cover of *The Cotton Journal*, March 25, 1909. Photograph courtesy of the Louisiana Department of Agriculture and Forestry.

more southern localities.”<sup>32</sup> LeRoy Percy, with his extensive holdings and favorable habitat for weevil propagation, promoted the government’s decision to relocate its research laboratory to the Delta.<sup>33</sup>

As the boll weevil continued to spread to new areas, it became more and more apparent that the “boll weevil problem” was a series of problems and that investigations should be conducted under different climatic, ecological, and agricultural conditions. Consequently, in 1909 the laboratory moved from Dallas, Tex., to Tallulah, La. This location was selected because it was near the southern edge of the Delta section where the boll weevil was expected to cause as much damage as anywhere in the South. The soils were fertile and with abundant rainfall plants normally continued to produce cotton until late in the season. Large areas of dense forest afforded good hibernation quarters, and with comparatively mild winters heavy infestations were the general rule.<sup>34</sup>

Founded in 1857, Tallulah is the parish seat of the largely agricultural Madison Parish. Known informally as the “Delta Laboratory,” the Tallulah site proved to be a key location in the battle against the boll weevil. In what was named the “Southern Field Crop Insect Investigations,” the laboratory operated under the Bureau of Entomology, United States Department of Agriculture (USDA).<sup>35</sup> Until methods of control or eradication were found, “one great service of the Bureau of Entomology was in determining the limits of infestation each season” and another, hibernation-cage tests, determined winter survival percentages for already affected areas. In addition, inspections taken at widely separated points each year, usually in early June, surveyed a specific number of plants to determine the ratio of cotton plants per weevil. The ability to forecast

---

<sup>32</sup> W. D. Hunter and B. R. Coad, “The Boll Weevil Problem,” *USDA Farmers Bulletin 1329*, (1923): 9.

<sup>33</sup> Baker, *Percys of Mississippi*, 31.

<sup>34</sup> Parencia, “*One Hundred Twenty Years of Research*,” 7.

<sup>35</sup> T. C. Cleveland and C. R. Parencia, “History of the USDA Cotton Insects Research Laboratory Tallulah, Louisiana, 1909-1973,” *Bulletin of the Entomological Society of America* (1976): 403.

weevil damage was not foolproof. Local weather conditions greatly influenced damage from subsequent generations, so laboratory representatives periodically updated their assessment as the season progressed.<sup>36</sup>

Because a poison was not immediately available, studies of the life cycle of weevils at first suggested cultural methods of control. Early planting and the use of fertilizer quickened plant maturity and damage was moderated if the cotton was harvested before the weevils could rapidly reproduce and cause significant loss. Immediately destroying the cotton stalks eliminated them as a hibernation habitat.<sup>37</sup>

Chemical methods of control were tested, but with little initial success. Lead arsenate poison in powdered form was used by William Newell, a Georgia state entomologist. The results of experiments conducted in 1908, 1909, and later, proved “erratic.” More heartening were experiments with calcium arsenate. In 1916, “the most striking results were obtained in a plot in a field of heavily infested cotton that was treated in August. The weevils were effectively controlled, and a fair crop produced of cotton the owner had abandoned as an absolute loss.”<sup>38</sup>

Calcium arsenate was “probably the first insecticide resulting from deliberately planned manufacture.”<sup>39</sup> The idea originated from William C. Piver, a University of North Carolina graduate and young entrepreneur in the insecticide industry. He reasoned

---

<sup>36</sup> Parencia, “One Hundred Twenty Years of Research,” 5; *Atlanta Constitution*, July 10, 1921.

<sup>37</sup> P.B. Haney, W.J. Lewis, and W.R. Lambert, “Cotton Production and the Boll Weevil in Georgia: History, Cost of Control, and Benefits of Eradication,” *University of Georgia Research Bulletin* 428, The Georgia Agricultural Experiment Stations College of Agricultural and Environmental Sciences, (1996): 10.

<sup>38</sup> Parencia, “One Hundred Twenty Years of Research,” 8.

<sup>39</sup> Lea S. Hitchner, “The Insecticide Industry,” *Insects, The Yearbook of Agriculture*, USDA (Washington., D.C.: Government Printing Office, 1952), 451.

if arsenic, the active ingredient in existing pesticides, could be combined with a more common and less expensive ingredient, such as lime, it would be cheaper to manufacture than other chemicals in use such as Paris Green (which contains a copper compound) or lead arsenate. Orders lagged for Piver's product until the Delta Laboratory began experiments utilizing calcium arsenate in killing boll weevils. "In 1918, on the basis of Government tests, a Federal Entomologist telegraphed Piver for 40 tons of the calcium arsenate - the largest single order he had ever received and a third larger than his yearly production."<sup>40</sup>

With further refinement, calcium arsenate unlocked the door to effective pest control, not only of cotton, but for other crops as well, and became "one of the most widely used materials throughout the Nation."<sup>41</sup> Research to improve the physical and chemical properties of calcium arsenate and rapidly expand its use against the boll weevil was almost entirely the result of work done at the Bureau of Entomology by its research laboratory in the Delta under the supervision of Bert Raymond Coad.<sup>42</sup>

So involved was Coad in the fight, that his name has become synonymous with the boll weevil, but his background remains mostly a mystery. What is known is that Coad was born on July 4, 1893, in Murphysboro, Illinois, and graduated from high school there. During the summer months in 1910, he attended the University of Illinois, taking two courses in the college of science, presumably never graduating.<sup>43</sup> His obituary in 1966 noted he was survived by his wife, two sons, two daughters, and seven

---

<sup>40</sup> Ibid.

<sup>41</sup> Ibid.

<sup>42</sup> Parencia, "One Hundred Twenty Years of Research," 9.

<sup>43</sup> Ellen Fearday, e-mail to author, March 16, 2000.



grandchildren.<sup>44</sup> Additional familial information on other formal education is lacking.

Where he was between the years 1910 and 1913, and how he ended up in the Delta, is not known. He is often identified as “Doctor Coad,” but evidence of an earned or honorary doctorate degree has not been discovered. Coad was the author or coauthor of many



B. R. Coad in his office at the Delta Laboratory, Tallulah, Louisiana. May 19, 1915.  
Photograph courtesy of the Louisiana Department of Agriculture and Forestry.

---

<sup>44</sup> *Delta Digest*, (April, 1966), 12.

government bulletins on the boll weevil. In these he was never titled, “Dr.” The appellation of “Doc” was probably first used informally, as a familiar term of respect, which then became the honorific. It appears he served an apprenticeship under the supervision of W. D. Hunter, and they coauthored several farmer bulletins. The number of bulletins Coad authored himself, the quality of his work, his leadership of the laboratory, and the esteem to which he was held by others, all attest to his credentials, whether formally or informally acquired.

Coad is described as a short, “solemn man (until you get to know him),”<sup>45</sup> and had “little patience with ceremony.”<sup>46</sup> He is seen most often in photographs with a pipe, and was a “good whiskey drinker.”<sup>47</sup> Apparently an avid sportsman, in 1922, he was elected president of the Bear Lake Hunt Club in Madison Parish. Housed in an elevated single-level structure with a wraparound porch, it was located approximately nine miles north of Tallulah and was likely a center of social activity as well as a base camp. With a membership limited to 100, the *Vicksburg Herald* reported in 1922, the “members are looking forward to a good year of hunting and fishing.”<sup>48</sup> President Theodore Roosevelt hunted there in 1907 and described the place in his inimical prose:

Our new camp was beautifully situated on the bold, steep bank of Bear Lake - a tranquil stretch of water, part of an old river-bed, a couple of hundred yards broad, with winding length several miles. Giant cypress grew at the edge of the

---

<sup>45</sup> *Madison* (Tallulah, Louisiana) *Journal*, May 1, 1926.

<sup>46</sup> *Delta Digest*, (April 1966), 12.

<sup>47</sup> Eugene (“Steve”) Stevens, interview by Larry Michaud, Feb. 1984, Casper, Wyoming. Tapes and transcript in possession of author.

<sup>48</sup> *Madison* (Tallulah, Louisiana), *Journal*, April 15, 1922.

water, the singular cypress knees rising in every direction round about, while at the bottoms of the trunks themselves were often cavernous hollows opening beneath the surface of the water, some of them serving as dens for alligators.<sup>49</sup>

Roosevelt was successful in tracking and shooting a bear on that outing. A few years earlier, during November 1902, Roosevelt and Stuyvesant Fish, president of the Illinois Central Railroad, were hunting bear in a similar setting across the Mississippi River, in the Sunflower River area of the Delta. Not one was found, except for one the guide captured, which he offered to Roosevelt. The president, sportsmanly refused to shoot the small black bear, prompting a German manufacturer to produce the first “Teddy’s bear.”<sup>50</sup> LeRoy Percy, a good friend of the president, was among the guests on the week-long hunt.<sup>51</sup>

Coad was hired by the Delta Laboratory on April 1, 1913.<sup>52</sup> Through November 1914, as an entomological assistant, he participated in studies of “the *Thurberia* weevil, *Anthonomus gradis* var. *thurberia* Pierce, a close relative of the boll weevil, in the ‘wild cotton’ of Arizona.”<sup>53</sup> Succeeding G. D. Smith as the director of the Tallulah Laboratory in 1915, Coad supervised the laboratory’s development of calcium arsenate into an effective agent.

During the first few years it was used, calcium arsenate was a crude product. First

---

<sup>49</sup> Theodore Roosevelt, “Louisiana Canebrakes,” *Scribners* 43 (January 1908): 55-6.

<sup>50</sup> Baker, *Percys of Mississippi*, 25; Barry, *Rising Tide*, 111.

<sup>51</sup> Baker, *Percys of Mississippi*, 25.

<sup>52</sup> Cleveland and Parencia, “History of the USDA Cotton Insects Research Laboratory, 1976,” 406.

<sup>53</sup> B.R. Coad, “Relation of the Arizona Wild Cotton Weevil to Cotton Planting in the Arid West,” *Bulletin of the USDA*, No. 233 (May 27, 1915): 2.

the chemists at the Tallulah Laboratory stabilized its physical and chemical properties; the dust formulation they developed was considered the best ever, from the standpoint of the quantities necessary for good plant coverage. Then the Tallulah chemists produced calcium arsenates with varying percentages of water soluble arsenic and calcium arsenates containing no free lime; however, none of these replaced regular calcium arsenate. Meanwhile, field experiments were being conducted in Tallulah and in many places throughout the cotton belt to determine the poundage of the chemical and the intervals between applications that would give the most returns.<sup>54</sup>

Once modified as an effective insecticide, it was then necessary to develop a method of applying calcium arsenate to the plants. Again, the Delta Laboratory was instrumental in finding ways to disperse the agent and experimented with various types of machinery. Initially these consisted of terrestrial devices, as at this stage aerial applications were not being considered. “With the cooperation and aid of the Bureau of Public Roads, engineers stationed at Tallulah developed a rotary-type hand gun that could be used to dust 8 acres of cotton every 4 or 5 days; a 2-nozzle traction machine for 75-150 acres; power operated machines for 200-300 acres; and tractor operated machines for still larger acreages.”<sup>55</sup> The laboratory designed and tested all types of machinery and any innovations, Coad stated, are “patented in the name of the public, which will prevent any manufacturer from naming anybody else.”<sup>56</sup> For example, the manufacturer of the “Root Saddle Gun,” claimed the device operated from horses or mules, was “constructed in accordance with the specifications of the Delta Laboratory United States Department of

---

<sup>54</sup> Cleveland and Parencia, “History of the USDA Cotton Insects Research Laboratory 1976,” 403.

<sup>55</sup> Ibid.

<sup>56</sup> Coad Testimony on Jan. 28, 1924, U.S. Congress, House, Subcommittee on Appropriations, *Agricultural Appropriations Bill, 1925, Hearings*, 68th Congress, 1st. Sess. (Washington, D.C.: Government Printing Office, 1924): 165.

Agriculture, Tallulah, La. They have endorsed its use.”<sup>57</sup>

As poisons and machinery evolved, the laboratory not only recommended utilizing the right equipment, but emphasized the importance that planters dust in a timely manner. Coad said:

We find every year that many farmers fail to realize their danger early enough and then start making desperate efforts to poison after the infestation has become very heavy. The [sic] scurry around trying to get calcium arsenate and dusting machinery, and nearly always there is considerable delay. Even when they get the poison and machinery, it is extremely difficult to control weevil infestation after it become [sic] severe. There are so many weevil stages present in the square and bolls that some of them come out every day and poison must be kept constantly on the plants if any good is to be done by it. This very greatly increases the expense of poisoning. Then, if there is even a short spell of rainy weather, such control that has been gained is lost and the farmer has gone to heavy expense for nothing.<sup>58</sup>

Depending on location, the combined cost of poison and machinery varied between five to fifteen dollars per acre. This expense was prohibitive for tenants and small farmers, and it was “these little farms [that] produce more than 75% of all cotton grown in the South” according to a report in the *New York Times* in 1921. Coad acknowledged the problem, stating it was “the subject of serious consideration,” and that he anticipated a four dollar rate with increased availability of the material and possible reductions in freight rates.<sup>59</sup>

And machines were not inexpensive either. Depending on the type, the cost could vary from fifteen dollars for a hand gun, to six hundred for a two-mule wagon. Coad

---

<sup>57</sup> *Madison* (Tallulah, Louisiana) *Journal*, April. 27, 1923.

<sup>58</sup> *Ibid.*, June 3, 1922.

<sup>59</sup> *New York Times*, Sept. 23, 1921.

hoped “that within the near future a dusting machine would be perfected that could be sold at a price that will fit the pocketbooks of the little farmers.”<sup>60</sup> In addition to the expense of material and equipment, applying the poison was costly and inconvenient. Calcium arsenate would only stick to plants when dew was present on the cotton stalks, which only occurred at night. Coad, considering these factors in 1921, at the time did not seem to have contemplated aerial applications as a solution.

While developments proceeded in the laboratory, farmers in Texas not only successfully combated the boll weevil but increased the yield per acre by 35 percent over pre-weevil days. The *New York Times* reported: “Controlling [the boll weevil] can easily be accomplished, as proven in the southwest, but can only be accomplished by intelligent, systematic, energetic, intensive cultivation, plus calcium arsenate poisoning, properly applied in those areas where infestation has reached more than 10 percent.”<sup>61</sup> LeRoy Percy applied calcium arsenate to some of his fields and, according to his son, William Percy; he achieved “a practically normal yield of high-grade cotton.”<sup>62</sup> Intense cultivation, with judicious application of calcium arsenate, was proving to be a successful strategy. Another was the crop diversification approach, innovatively applied in Enterprise, in Coffee County, Alabama.

Coffee County agricultural agent John Pitman traveled to Texas in 1913 to learn first hand what to expect from the boll weevil when it arrived in Alabama. Returning home to Enterprise, he encouraged farmers to switch to corn, potatoes, peanuts, and other

---

<sup>60</sup> Ibid.

<sup>61</sup> James A. Holloman, “Holloman gives Method Used by Texas Farmers for Mastering weevil,” *Atlanta Constitution*, July 26, 1922.

<sup>62</sup> *New York Times*, Sept. 23, 1921.

crops to “take better care of their land.”<sup>63</sup> When the weevil arrived, Coffee County ginned only 10,000 bales of cotton, each weighing 500 pounds, in 1915 instead of the expected 30,000.<sup>64</sup> Realizing the economic effect, Enterprise banker, H. M. Sessions convinced farmer C. W. Baston to plant his 125 acres in peanuts. At the end of the season in 1916, Baston had earned \$8,000, while Enterprise gins baled only 1,500 bales of cotton, down from 15,000 in 1914 and 5,000 in 1915. Thus encouraged, many farmers successfully followed Baston’s example the following year. To commemorate the community’s unexpected victory and economic windfall, a monument was erected in the town’s center in honor of the boll weevil. In changing farmer’s attitudes toward cotton, and substituting peanuts as the cash crop, the weevil brought prosperity to the region.<sup>65</sup>

The boll weevil did not respect Enterprise’s victory. Adjacent to Alabama, the arrival of the boll weevil in Georgia devastated that state’s cotton industry. From a high of 2.8 million bales ginned in 1914, the number decreased dramatically beginning with the weevil’s arrival in 1915, until only 600,000 bales were produced in 1923, even though Georgia leaders were proactive in insect control.<sup>66</sup> Through the auspices of the Georgia State Board of Entomology (GSBE), established in 1898, William Newell, Georgia state entomologist and secretary of the board of the GSBE, originated the idea of dusting cotton with powdered lead arsenate. He also experimented with “at least ten different insecticides.” In another effort, the GSBE sought to develop a resistant variety of cotton. By 1923, the boll weevil was the focus of GSBE investigations, and the state

---

<sup>63</sup> Roy Shoffer, *Pest of Honor: The Story of the World’s Most Unusual Monument* (n.p., 1988), 8.

<sup>64</sup> *Ibid.*, 10.

<sup>65</sup> *Ibid.*, 10-16.

<sup>66</sup> Haney, Lewis, and Lambert, “Cotton Production and the Boll Weevil in Georgia,” Abstract.

began distributing calcium arsenate to farmers at cost.<sup>67</sup> Looking ahead, Georgia's proactive policy was a likely factor with the location of the world's first aerial crop dusting company in Macon in 1926.

By 1922, the boll weevil had extended its reach to "almost all of the important cotton-producing sections," and the estimated annual direct loss was "now well in excess of \$200,000,000."<sup>68</sup> USDA Farmers' Bulletin No. 1329, "The Boll-Weevil Problem," by W. D. Hunter and Coad, summarized the recommended methods of direct and indirect control to date. The authors suggested cultural preferences, with poisoning as supplementary using specialized terrestrial or one or two mule-drawn traction machines. Interestingly, in light of the development of aerial applications to come, at this stage of mechanization to counter the boll weevil, engine-powered ground equipment was found to be "too complicated for satisfactory operation except by expert labor." Dusting, the bulletin suggested should be done in calm air and with moisture on the plants, meaning lots of night-time work for field hands. If that were not enough, in the event of heavy rain, dusting had to be repeated within twenty-four hours. Considering the fields would likely be too muddy, this might not be possible to accomplish.<sup>69</sup>

During the first two decades of the twentieth century, considerable progress was made in meeting the threat of the boll weevil. The bug would not be eradicated, but could be controlled by a combination of methods. Cultural, or indirect, methods supplemented by the direct application of calcium arsenate, were a solution, but, as with all change, new

---

<sup>67</sup> Ibid., 8, 12.

<sup>68</sup> W. D. Hunter and B. R. Coad, "The Boll Weevil Problem," *USDA Farmers Bulletin No. 1329* (Jan. 30, 1923): 2-4.

<sup>69</sup> Ibid., 16.



problems arose. Recommended methods of pest control were expensive and labor-intensive to implement. A new means to dispense poison efficiently and effectively was required. First used in the North against tree insects and brought to the Delta for testing against the ravenous weevil, the technology was the airplane. Its application innovatively merged agriculture and aviation.

## Chapter 2

### Borgias of the Air

The poisoner steers close to the brush, shoots his calcium arsenate, and mixes death with Miss Weevils morning tipple.

Harris Dickson, *Saturday Evening Post*

In the spring of 1921, the city entomologist for Cleveland, Ohio, had a problem. With the spray equipment he was using, C. R. Neillie was having trouble reaching the tops of large, closely spaced trees in a city park. It occurred to him that an airplane, or airship, could easily do the job. He contacted state agricultural authorities, and J. S. Houser, a forest entomologist with the Ohio Agricultural Experiment Station, was assigned to help him. Together they enlisted the assistance of the Army Air Service at McCook Field in Dayton, the service's aviation research and development center.<sup>1</sup>

Cooperation between the war and agriculture departments was not new. Army aircraft were already participating in diverse agricultural activities. Military planes were scouting for forest fires in California and Oregon, and the departments had even shared a common tragedy. Lt. William H. Tillisch, an army aviator, and E. L. Diven, with the Department of Agriculture along as an aerial observer in the aircraft, died on August 7, 1919, in a crash while looking for violators of Texas crop-control laws. During World War I, a cotton-free zone was declared to prevent the spread of pink boll worms from Mexico. Aerial searches proved to be much more rapid and successful in finding outlaw

---

<sup>1</sup> Downs and Lemmer, "Origins of Aerial Crop Dusting," 124.

cotton fields than ground patrols conducted on horseback The agricultural inspectors in Texas were enthusiastic with the results.<sup>2</sup>

Neillie and Houser, in their discussions for dispensing insecticides from the air, encountered mixed reactions. Some were favorable, but more often they were greeted with skepticism and “much good-natured chaffing.” Fortunately, the officials at McCook were supportive of the endeavor and “entered into the undertaking in a whole-hearted manner.” Major Thurman H. Bane, director of McCook Field, and Major Harold S. Martin, chief engineer, gave “priority over everything in the Field for one entire day.”<sup>3</sup> Mr. Etienne Darmoy, “a tough, intelligent little Frenchman”<sup>4</sup> designed a hopper, which “consisted of an irregularly shaped flat metal box with a capacity for holding a little more than 100 pounds of lead powder.” It was mounted outside the fuselage of a Curtis JN-6, adjacent to the observer’s position.<sup>5</sup> This was not a very aerodynamic arrangement, but it served the purpose. To operate the hopper, the observer opened a sliding gate at the bottom, and turned a crank which rotated a metering mechanism that fed the powder into the aircraft’s slipstream.

An outbreak of Catalpa Sphinx (*Ceratomia catalpae* Bdv) in a grove of catalpa trees belonging to Harry A. Carver presented Neillie, Houser, and the air service with the opportunity to put the idea to a practical test. Located about twenty miles from Dayton,

---

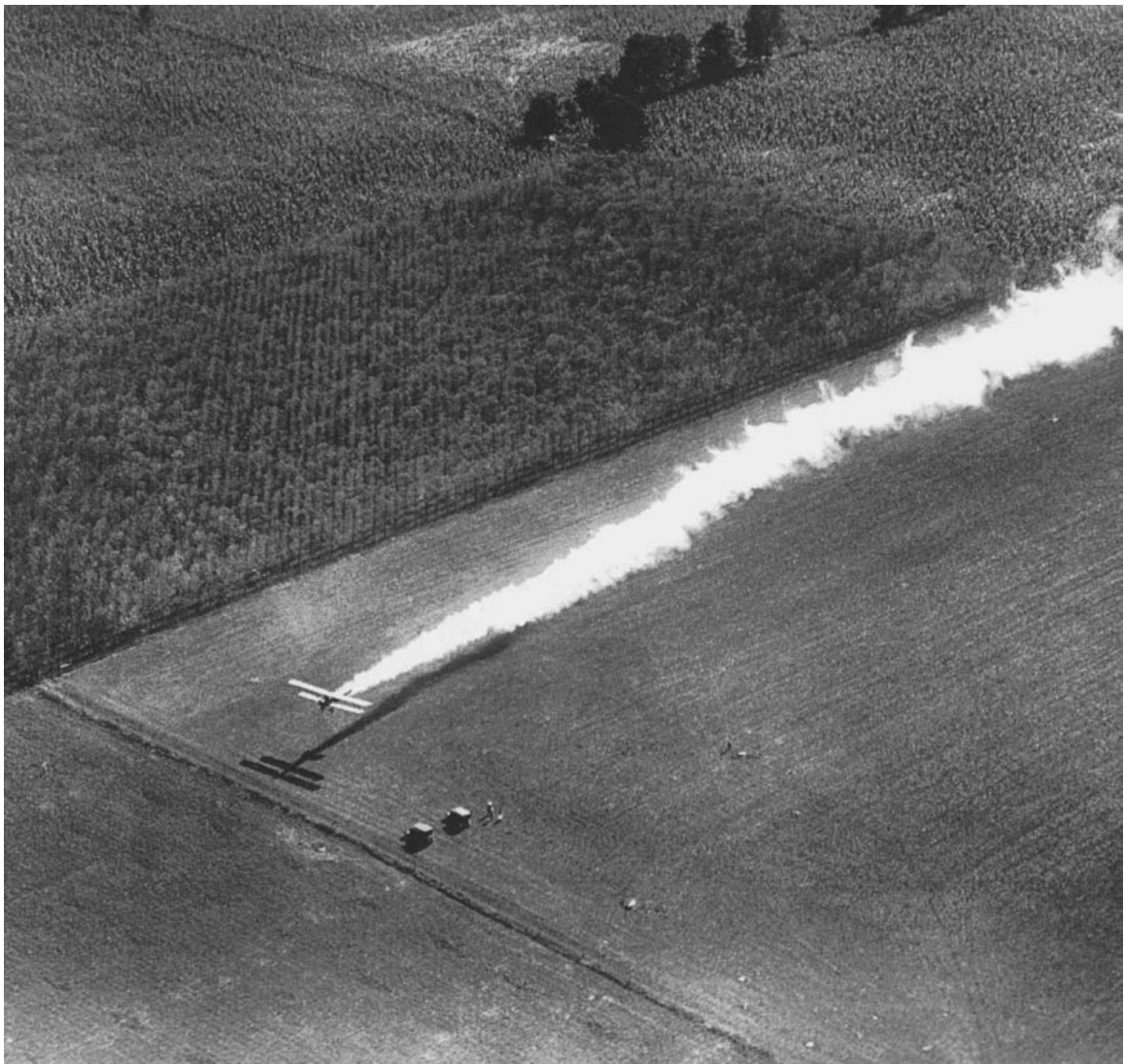
<sup>2</sup> Ibid., 123-24.

<sup>3</sup> C. R. Neillie and J. S. Houser, “Fighting Insects With Airplanes. An Account of the Successful Use of the Flying-Machine in Dusting Tall Trees Infested with Leaf-Eating Caterpillars,” *National Geographic Society* 2 (March 1922): 333. The article incorrectly identifies Lt. J. A. Macready as the “Acting Chief of the Flying Section.” He was Harold R. Harris’s assistant. Harold R. Harris to Mabry I. Anderson, Oct. 15, 1987, file 1, box 3, Harold R. Harris Papers, MS – 214, Wright State University Department of Special Collections and Archives (hereafter cited as Harris Papers, WSUSCA).

<sup>4</sup> Mabry I. Anderson, *Low & Slow: An Insider’s History of Agricultural Aviation* (San Francisco: California Farmer Publishing Company, 1986), 7.

<sup>5</sup> Neillie and Houser, “Fighting Insects With Airplanes,” 336.

near Troy, Ohio, the grove was situated on level ground, about 800 feet long and 325 feet wide, with trees 25 to 30 feet tall. The adjacent field was unobstructed, allowing for a low-flying airplane to pass by. Operating out of McCook on August 3, 1921, Lt. John A. Macready, with Darmoy handling the dispenser, made six passes, releasing some 175 pounds of poison in about 54 seconds. According to Neillie and Houser, “the plane flew



Airplane dispensing poison dust on a grove of Catalpa trees near Troy, Ohio. August 3, 1921. Photograph from author's collection.

at a speed of eighty miles an hour at an altitude of from 20 to 35 feet and in a line 53 yards to the windward and parallel the grove. The dense cloud of poison dust thrown out behind the moving plane was grasped by the wind and floated through and over the grove, covering the foliage in its passage.” The experiment was successful beyond everyone’s expectations. The material was placed with precision, and, carried by the wind, it dispersed throughout the grove. An assessment determined that less than 1 percent of the insects remained alive on the trees.<sup>6</sup> These results were circulated widely in agricultural and aviation journals, but developments forged ahead of the published reports.

Based on the Troy experiment Julius A. Truesdell, in a January 8, 1922, *New York Times* article, wrote that using aircraft to counter the cotton boll weevil was in the planning stages: “The Committees on Agriculture in House and Senate will this Winter take up and discuss an appropriation for the purpose of utilizing the available airplanes of the army in experiments over a wide area of test in spraying calcium arsenate to poison the weevil. The Department of Agriculture has taken up the matter and the details of the problem of airplane spraying are being examined in the light of up-to-date experience.”<sup>7</sup>

On February 8, Truesdell appeared before the House of Representatives Committee on Agriculture at a hearing on the “Use of Aircraft.” He identified himself as “a farmer from Bluemont, Va.” and declared, “I am not here representing anybody in particular--no associations, no chambers of commerce even, but just simply with an idea, and that is the use of the airplane to spray cotton and control the boll weevil.” The Troy

---

<sup>6</sup> Ibid., 337, 338.

<sup>7</sup> Julius A. Truesdell, “Spraying from Air,” *New York Times*, Jan. 8, 1922.

success, Truesdell said, “suggested to me--I suppose it has to a great many people--the use of the airplane to spray cotton.” While Truesdell does not claim to be the first, his is the earliest documentation of the idea. He testified that he had spoken with Coad (the transcript misspells his name, Cowles) who agreed, reportedly saying, “it presented a proposition that ought to be considered.”<sup>8</sup> L. O. Howard, chief of the Bureau of Entomology, Department of Agriculture, who followed Truesdell in appearing before the House committee, believed an arrangement could be worked out with the post office department or war department “to try an experiment with the use of the airplane--I think it can be done -- this coming season.”<sup>9</sup> In fact, flights were conducted in August with satisfactory results.

Support for the idea to dust cotton by air sprang from the *New York Times* story and Truesdell’s and Howard’s congressional testimony. In a *National Geographic* article (published subsequently to Truesdell’s testimony) Neillie and Houser echoed the idea that airplanes could be used to apply poison successfully to low-growing plants such as cotton.<sup>10</sup> Their concurrence likely originated from discussions with Truesdell, who had inquired about the Troy test, and was thus not an original idea of their own.

Coad, while he thought airplane dusting should be considered, later equivocated, saying, it “might sound foolish.” His attitude completely changed following tests he supervised in Tallulah late in August 1922. He declared “it proved fairly practical, and

---

<sup>8</sup> Julius A. Truesdell testimony, Feb. 8, 1922, U. S. Congress, House, Committee on Agriculture, *Use of Aircraft Hearings*, 67th Congress, 2nd Sess. (Washington, D.C.: Government printing Office, 1922), 5.

<sup>9</sup> L. O. Howard testimony, Feb. 8, 1922, U. S. Congress, House, Committee on Agriculture, *Use of Aircraft Hearings*, 67th Congress, 2nd Sess. (Washington, D.C.: Government Printing Office, 1922), 10.

<sup>10</sup> Neillie and Houser, “Fighting Insects With Airplanes,” 338.

not only that, it cost less to use an airplane than the ordinary ground machine.”<sup>11</sup>

Encouraged, he optimistically predicted “a great future for airplanes in insect control.”<sup>12</sup>

The airmen who flew in the Troy experiments, Lt. Macready and Darmoy, had not encountered any difficulties with the flight (other than the asymmetric drag from the hopper). Problems might arise from spraying low-growing crops, but the Troy flight was pretty straightforward: “What had been a big thing to them [the entomologists] had been a short, easy flying job for us.”<sup>13</sup>

The Troy success stimulated further experimentation. Truesdell reported:

It is on this decidedly interesting trial of the airplane in spraying that the Department of Agriculture is expecting to build up the plan to fight the cotton boll weevil. There are many details that stand in the way of such an effort. In the first place spraying for the boll weevil is done at night, when the dew has gathered on the plant and the insect in taking a drink, gets the poison into his “pantry.” At first the field men of the department said the idea of using the airplane for spraying cotton could not be made to work because of this condition. But the army air service men at once said the night flying under the suggested conditions was feasible.

“We have men trained for just this sort of flying.” said one officer who took up the subject. “We have observation planes, bombing plane, pursuit planes, all planned for night work, and the service is full of men who are equal to all that is called for in this proposition”<sup>14</sup>

The Delta Laboratory, centrally located in the heart of the Cotton Belt, in the flatlands of the Mississippi Delta, was a logical site to conduct low-level flight operations. The war department dispatched aircraft from Maxwell Field, at Montgomery,

---

<sup>11</sup> Bert R. Coad testimony, May 8, 1924, U.S. Congress, *Senate Subcommittee on Appropriations Bill 1925, Hearings*, 68th Congress, 1st. Sess. (Washington, D.C.: Government Printing Office, 1924), 157.

<sup>12</sup> Downs and Lemmer, “Origins of Aerial Crop Dusting,” 129.

<sup>13</sup> Anderson, *Low & Slow*, 7.

<sup>14</sup> Julius A. Truesdell, “Spraying from Air,” *New York Times*, Jan. 8, 1922.

Alabama, to augment the facilities and personnel of the laboratory. Flights operated not against the boll weevil, as contemplated, but against the cotton leaf worm (*Alabama argillacea*, Hubn.). An outbreak in July 1922 proved timely. Because the boll weevil affects internal parts of the cotton plant, applications would be more difficult to assess than from the more readily observable damage of leaf-feeding insects.<sup>15</sup> The preliminary experiments that took place during the summer were rewarding and led to a more ambitious program the following season.

The activities and accomplishments that took place in 1922 appeared in USDA, *Department Bulletin No. 1204*, January 1924, titled, "Dusting Cotton by Airplanes." The three authors and their affiliations, Coad, Bureau of Entomology; E. Johnson, Agricultural Engineer, Bureau of Public Roads; and Guy L. McNeil, First Lt., Twenty-Second Observation Squadron, U.S. Air Service; highlight the cooperative nature of the undertaking. In a footnote, the authors specifically acknowledge the help of several assistants in this epochal work: "In conducting the experiments described in this bulletin the writers were assisted by a number of men from the Delta Laboratory force at Tallulah, La. They are particularly indebted to the following: A. J. Chapman, R. H. Flake, S. B. Hendricks, R. L. Hodges, I. T. Jones, H. Kirkpatrick, P. D. Sanders, C. M. Smith, and M. T. Young."<sup>16</sup> Conspicuously absent from this list is C. E. Woolman's name. He is often identified in secondary literature as an assistant to Coad in the fight against the boll weevil, and his partner in the development of aerial techniques. An inspection of Woolman's field diaries from July 1916 through June 1919 and loose pages of his field

---

<sup>15</sup> Downs and Lemmer, "Origins of Aerial Crop Dusting," 129.

<sup>16</sup> B. R. Coad, E. Johnson, and G. L. McNeil, "Dusting Cotton From Airplanes," *USDA Department Bulletin No. 1204* (Washington, D.C.: Government Printing Office, 1924): 1.



diary from January to November 1922, do not mention working with or meeting with Coad, though Woolman frequently visited Tallulah.<sup>17</sup> More time will pass before Woolman played a role in the evolution of Delta Air Lines.

What is remarkable is the rapidity in which interdepartmental resources were arranged, and the wholeheartedness of the military's cooperation. The air service made a significant commitment to the project, and would have made more had funding been approved by Congress. When Truesdell appeared before the House committee, he testified that Gen. Mason Patrick, in charge of the Army Air Service, thought "the use of commercial aircraft as being a great auxiliary for the maintenance of the Air Service of the Army." In this light, Truesdell outlined a state/federal cooperative effort to utilize the aircraft's mobility to centralize operations and efficiently dust cotton.

It is not expected that this thing can be done by individuals. The entomologists ought to divide the cotton country up into districts. They ought to maintain in each district a headquarters. The States Relations Service ought to be coordinated with it and you can arrange to transfer any areas that are to be sprayed. The plane can go under its own motive power to any field within a considerable distance, and there can be reserve airplanes. The expense of it will be very slight if it is taken up by the State and Federal Governments and distributed over the acreage, much less than spraying individually, as is done now, which is very expensive.<sup>18</sup>

With the exception of the government's involvement, Truesdell's vision presciently described the economic benefit of centralized aerial applications, taking advantage of the aircraft's speed and mobility to offset high operating costs. Historian Pete Daniel argues a similar model, substituting capital for labor, would lead to the end of the cotton culture in

---

<sup>17</sup> "Field diaries." Collett Everman Woolman Papers, 1916-1979, Louisiana State University Libraries Special Collections (hereafter cited as Woolman Papers, LSULSC).

<sup>18</sup> Truesdell testimony, 7.

the post World War II period.<sup>19</sup> Large operators, using expensive machinery to farm large tracts of land, drove small cotton farmers out of business.

In 1922 two Hispano-powered Curtiss JN-6Hs, piloted by First Lt. Guy McNeil and First Lt. Charles T. Skow, were ordered to Tallulah from the Montgomery Intermediate Depot, Alabama, at Maxwell Field. Headquarters, 22<sup>nd</sup> Squadron released them on detached duty to the Department of Agriculture under the authority of a 4<sup>th</sup> Corps Area Headquarters letter, dated August 10, 1922.<sup>20</sup> McNeil and Skow were accompanied by three airmen and support equipment, including acetylene lights, which suggests night operations were contemplated, wind gauges, and other equipment. Skow participated from August 13 to August 26, when Lt. Simon replaced him.<sup>21</sup> A meadow, just outside of town on Shirley Plantation, served as a landing field and operating base.<sup>22</sup>

Together, Lt. McNeil, Coad, and Johnson worked out a plan of action and coordinated the air operation. They sought to answer two questions. First, could aircraft be maneuvered in such a way to over fly entire cotton fields? Second, could the dust be distributed in such a manner so as to reach all parts of the plants, adhere to the stalks, and control the insects?<sup>23</sup>

When they arrived, the aircraft were not configured for dusting. The Troy hopper could not be used because it remained in Ohio. In May flights were conducted against the

---

<sup>19</sup> Pete Daniel, *Lost Revolutions: The South in the 1950s* (Chapel Hill: University of North Carolina Press, 2000): 61.

<sup>20</sup> "Personal Report--Officers," Guy L. McNeil, August 1922, Call number 167.4115-8, IRIS No. 912098, Air Force Historical Research Agency (hereafter cited as AFHRA).

<sup>21</sup> "Personal Report--Officers," Charles T. Skow, August 1922, Call number 167.4115 -8, IRIS No. 912498, AFHRA; Coad, Johnson, and McNeil, "Dusting Cotton From Airplanes," 2.

<sup>22</sup> Downs and Lemmer, "Origins of Aerial Crop Dusting," 129.

<sup>23</sup> Ibid.

cankerworm on the “beautiful estate of John. L. Serverance” near Cleveland, Ohio, and, in June, a grove of catalpa trees was treated near Casstown, Ohio. A severe rainstorm limited the effectiveness of the May test, but the Casstown treatment was “very successful.”<sup>24</sup> Without the Troy hopper, attempts were made to release bags of calcium arsenate by hand over the side, or through a hole in the bottom of the airplane. This method was unsatisfactory. The Troy hopper was eventually shipped to Tallulah, but it arrived too late to be of much use. By then two improved models, internally mounted, had been fabricated.<sup>25</sup>

The new hoppers were mounted inside the fuselage, taking up half the space of the observer’s compartment. One model was termed the “hand cranked” type. The other had an “air-suction” arrangement, with a funnel facing forward into the air stream, which created a suction effect at the discharge end to draw the dust out. Each design required the operator to stand in the reduced space of the aft crew position. Once completed no further attempts were made to improve the crude hoppers or perfect the mechanical deliver of the dust during the course of experiments that summer.<sup>26</sup> Imperfect as they were, the new hoppers were used in the tests to verify aerial applications.

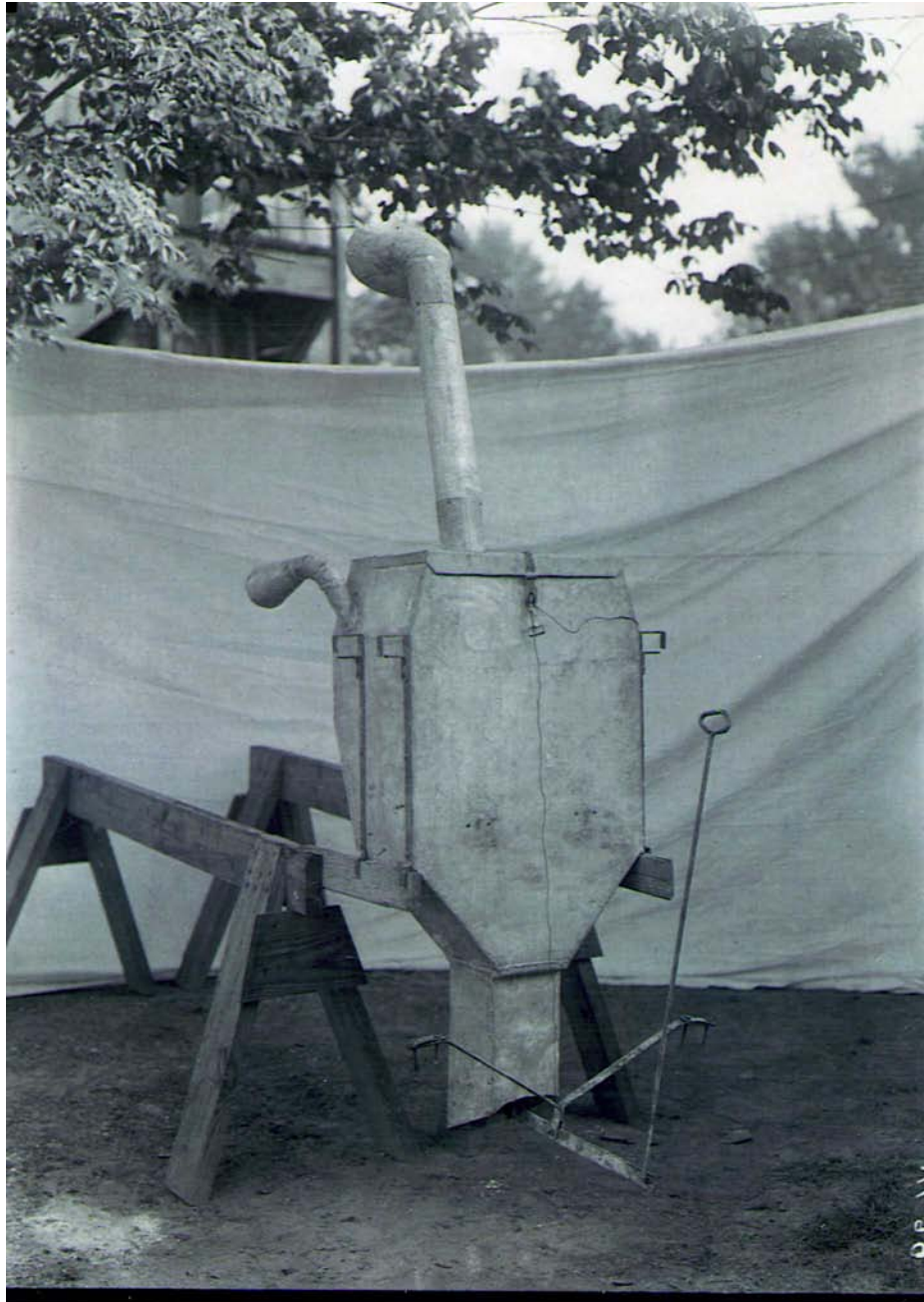
The Shirley and Hermione plantations near Tallulah were similar to many plantations heavily infected with leaf worms. They represented unique conditions and challenging flight operations and were therefore selected for the study. Shirley Plantation had smaller fields dotted with cabins, while Hermione Plantation permitted longer

---

<sup>24</sup> “Aircraft Declares War on Insects,” *The Slipstream Monthly*, 4 (1923): 24-25.

<sup>25</sup> Coad, Johnson, and McNeil, “Dusting Cotton From Airplanes,” 2, 7.

<sup>26</sup> *Ibid.*, 3-9.



Air suction type hopper before installation--note discharge handle on right. The unit and its operator were located in the rear cockpit of the aircraft. Photograph courtesy Louisiana Department of Agriculture and Forestry.



View of air suction hopper installed in Lieutenant McNeil's Hispano-powered Curtiss JN-6H. August 31, 1922. Photograph courtesy Louisiana Department of Agriculture and Forestry.

straight-line flights and the cabins were situated along the perimeter of the fields. A sketch map with the fields numbered identified sites targeted for the study. These maps were inadequate to the needs of pilots and researchers, and, as a part of the air service's contribution, reconnaissance photos were taken and mosaic maps created depicting the various test fields. Unfortunately these maps were not available until later, and "in arranging the program of work for the day, it frequently proved difficult to provide a description based on ground conditions which would exactly locate the area in mind. Such a mosaic map would also have been of great value in planning in advance the

methods of flight for each field.”<sup>27</sup>

With the aircraft properly equipped and other preparations completed as best possible, the moment of truth was at hand. The “first flights furnished an absolute surprise.” As it exited the plane, calcium arsenate was “immediately broken up into a circular cloud which was quickly blown down among the plants.” The combination of the aircraft’s wash and propeller blast overcame the “light breezes, or other slight air movements existing on the ground.” Flights continued under a variety of conditions, and careful records were kept, including readings “taken at five-minute intervals on both wind velocity and wind direction throughout the day for the period of the experiment.”<sup>28</sup>

The scientists were “astonished” to discover that adhesion of the chemical to plants was superior to that of ground equipment. The reason was not immediately understood, but this phenomenon obviated the need for night operations.<sup>29</sup> George Post wrote: “Reasons for this surprising adhesion were at first hand rather hard to find, but later tests have fully substantiated the correctness of the original observations, and it is now felt that the combined effect of the powerful air blast, and an appreciable amount of static electricity, formed during the violent ejection of the dust through the hopper orifice, are responsible for the usual results obtained.”<sup>30</sup>

The planes could be flown safely in the early morning and late afternoon. But “low flying during the middle of the day [was] dangerous on account of rough air, and

---

<sup>27</sup> Ibid., 9-12.

<sup>28</sup> Ibid., 9, 15, 16.

<sup>29</sup> Ibid., 21.

<sup>30</sup> George B. Post, “Boll Weevil Control by Airplane,” *Georgia State College of Agriculture, Extension Division Bulletin* 301 (Nov. 1924): 9.

the air temperature [was] such that the motors overheat very badly in a short time.” In conducting the flights, the fundamentals of crop dusting were established. Each field was studied and treated individually, taking into consideration the wind direction and speed. To treat a field, a pilot entered the field by diving to the proper altitude, skimming swiftly over the tops of the plants, releasing the pesticide, zooming upward at the end, turning around, and flying back and forth, covering the entire field from one side to the other. With experience, pilots developed techniques to maneuver the aircraft “to deliver dust into almost any field which would be encountered.” Flagmen directed pilots to insure thoroughness of treatment, but in almost all tests dust was applied unevenly due to faults in the feeders, necessitating repeat passes. Nonetheless, air applications were estimated to use two pounds of calcium arsenate per acre, whereas ground machines required five pounds. Coad, Johnson, and McNeil anticipated even greater efficiency would be achieved with an aircraft capable of carrying a larger payload, and with a more reliable dispensing system--one operated solely by the pilot.<sup>31</sup>

As the summer’s activities wound down, the results were encouraging. Pilots had demonstrated that aircraft could be operated successfully under a variety of conditions to dispense dust accurately and efficiently, at low altitude, during daytime. The question remained whether aerial applications would be successful against the boll weevil, but the prospects were promising. Following treatment for leaf worm control, “it was suddenly noted that cotton squares not infested with the weevils were becoming fairly common, and by the end of the experimental period both plantations were blooming rather freely wherever the poisoning had been done.” The demonstrations appeared to show less

---

<sup>31</sup> Coad, Johnson, and McNeil, “Dusting Cotton From Airplanes,” 21, 22-25, 31, 37.

poison was needed to treat leaf worms than would be necessary to control the boll weevil. Whether the boll weevil could be controlled by aerial applications remained uncertain, but the team thought “all records bearing on this question appear to furnish decidedly favorable indications of success.”<sup>32</sup>

With this encouraging information in hand, the Department of Agriculture appealed to Congress for \$5,000,000 to buy calcium arsenate to distribute to farmers at cost, and spread it by using army aircraft.<sup>33</sup> This subsidy would help small planters in particular, who found the cost “burdensome.”<sup>34</sup> But the money was not authorized, and the army was only able to send three aircraft to Louisiana in 1923.<sup>35</sup> Lt. McNeil was ordered to return to Tallulah, with “two flying sergeants and some enlisted men,” where he served as commander, Air Service Detachment, Delta Laboratory, from April through August.<sup>36</sup> The airplanes used for the second round of tests were DeHavilland 4B models, powered by a 420-horsepower (HP) Liberty engine, and capable of carrying between 500-700 pounds. “The greater lift and power of this plane makes it possible to climb much more rapidly, and thus it could more easily avoid obstructions than the Curtiss. On the other hand in some flying its much larger size might prove a handicap.”<sup>37</sup> Arrangements were also made by the Department of Agriculture to use the aircraft to take

---

<sup>32</sup> Ibid., 33, 40.

<sup>33</sup> “Army Planes to Fight Louisiana Boll Weevil,” *New York Times*, March 14, 1923.

<sup>34</sup> “The Fight for Cotton,” *New York Times*, June 10, 1923.

<sup>35</sup> “Army Planes to Fight Louisiana Boll Weevil,” *New York Times*, March 14, 1923.

<sup>36</sup> “Aircraft Declares War on Insects,” *The Slipstream Monthly*, 4 (1923): 27. “Personal Report - Officers,” Guy L. McNeil, April through August 1923, Call number 167.4115-8, IRIS No. 912098, AFHRA.

<sup>37</sup> Coad, Johnson, and McNeil, “Dusting Cotton From Airplanes,” 39.



aerial photographs of selected fields to compare the surveys with the figures in official reports.<sup>38</sup>

There were two objectives for the 1923 tests. The first was to show the airplane could be economically and efficiently utilized to combat the boll weevil on a community-wide basis. The other was to improve the delivery system. Better results were anticipated with the DH4B aircraft and a new dispenser. A. L. Morse, from the Engineering Division at McCook Field, was assigned to assist Coad in developing a more functional distributor. Morse reported, “most of our time has been spent in testing many types of ventilators and mechanical agitators used in distributing the powder. Calcium arsenate is being used as poison to fight the insects. ...Generally 350 pounds of the powder are carried aloft at each test.”<sup>39</sup>

The devices include the mechanical agitator, which prevents clogging of dust in the hopper, feed gates that equaled the width of the fuselage of the applicator aircraft and funnels or spreaders mounted underneath the fuselage and dust hopper to mix the dust with air and improve the uniformity of distribution of materials. The progress made under the supervision of Dr. Coad at the Delta Laboratory established aerial application of pesticides as a practical process.<sup>40</sup>

On the basis of the 1923 experiments, Coad went before Congress in 1924 seeking money to develop a more suitable airplane than the military types used to date. “You have to have a plane for different purposes the same as motor vehicles.” In his testimony Coad disclosed that commercial organizations were prepared to begin aerial

---

<sup>38</sup> “Photographs From Air to Fix Cotton Acreage,” *New York Times*, April 5, 1923.

<sup>39</sup> “Fighting Boll Weevil by Means of Airplanes,” *Aviation* (Aug. 20, 1923): 210-12; “Aircraft Declares War on Insects,” *The Slipstream Monthly*, 4, (1923): 25.

<sup>40</sup> Brian R. Baker, “Early Dusting Experiments,” *American Aviation Historical Society* (Summer 1969): 117.

dusting in Greenville and San Antonio.<sup>41</sup> The firms were not named, but it is likely there was only one firm and that was Huff Daland, Inc. in Ogdensburg, New York. George B. Post, a pilot with Huff Daland, traveled widely as he investigated commercial opportunities for his company.

“On invitation of Coad, [Huff Daland] had representatives at Tallulah as early as 1923 working on a special dusting airplane for agricultural officials.”<sup>42</sup> The airplane had to carry a good load, be highly maneuverable, and powerful enough to operate safely at low altitudes in confined areas. Several models and variations were tested in conjunction with the Delta Laboratory.

Post recognized the advantages of airplane dusting. It would use less calcium arsenate to cover a given field. It could be applied during daytime and it did not require dew, so night applications would be eliminated. The calcium arsenate could be dispensed immediately after a heavy rain, with no delay from muddy fields. A single aircraft would cover 200-1000 acres per hour, as opposed to 30 acres by other means. Each airplane would be so efficient that it could replace fifty to seventy-five horse carts, and, because the airplane was so highly mobile, it could operate throughout the Cotton Belt. With airplanes, farmers could respond immediately to an unexpected discovery of an infestation.<sup>43</sup>

Much as Truesdell anticipated, Post envisioned a decentralized commercial operation with small units operating relatively independently throughout a cotton

---

<sup>41</sup> Coad Testimony, 157, 162.

<sup>42</sup> Downs and Lemmer, “Origins of Aerial Crop Dusting,” 131.

<sup>43</sup> Post, “Boll Weevil Control by Airplane,” 5-7.

growing district. A centrally located repair depot would maintain the equipment and store aircraft over the winter. Post thought nine dusting units could be operated with three held in reserve. The nine units could treat approximately 65,000 acres per year. Dusting contracts would be obtained from farmers at a lower overall cost to them than previous methods.<sup>44</sup> This is essentially the plan that was implemented, to be discussed in the next chapter.

Encouraged, Coad addressed a letter to the Huff Daland Company in Ogdensburg, dated July 23, 1924. His purpose seems intended to lend scientific support for the viability of a fledgling company by confirming the airplane's effectiveness in the war against the boll weevil to assuage lingering doubts of corporate officials on the verge of investing hundreds of thousands of dollars on a new business venture. Coad wrote, "I would say that while airplane dusting is certainly in the developmental stage, the main features of whether or not it is successful and profitable have decidedly passed the experimental stage."<sup>45</sup> He anticipated the technology was mature enough to be expanded into commercial use.

---

<sup>44</sup> Ibid., 19-21.

<sup>45</sup>B. R. Coad to Huff Daland Dusters, Inc., July 23, 1924, in Post, "Boll Weevil Control by Airplane," 4-5.

## Chapter 3

### Corporate Pioneer in the Delta

[Richard F.] Hoyt was one of the of the earliest aviation financiers. In spite of his many and complicated financial transactions--a corollary of his principal business as a partner of Hayden, Stone--many fliers felt that he had a sportsman's interest in aviation, and had furthered its development.

Elsbeth Freudenthal, *The Aviation Business:  
From Kitty Hawk to Wall Street*

Following World War I the ready availability of a large numbers of surplus military aircraft reduced the availability of investment capital necessary to design and build new aircraft and retarded the advancement of the aviation industry. Nevertheless, some research and development did occur. A new private enterprise opened in Ogdensburg, in the Thousand Islands Region of New York, in 1920; it was the result of a United States Army competition to design an improved training aircraft.<sup>1</sup> Thomas H. Huff and Elliott Daland, both engineers, designed the winning entry. Huff was the president and Daland vice-president of Huff Daland Airplane Company. They joined with Joseph Leyare to use the vacant factory space of his Leyare Boat Works in "the construction of airplanes, hydroplanes and hydroairplanes."<sup>2</sup> Begun as a small enterprise in upstate New York, the company was to have a far-reaching and long-lasting influence on American aviation.

---

<sup>1</sup> *Ogdensburg Journal*, Nov. 15, 1920.

<sup>2</sup> *Ibid.*, April 26, 1920.

That Ogdensburg figured prominently in fostering the 1929 emergence of Delta Air Service in Monroe, Louisiana, is understood by historians, but it is important to keep in mind from the outset that this process was evolutionary and not the calculated result of a grand design or from any special insight. What is significant is that Huff and Daland were innovative aircraft designers and manufacturers who actively sought to adapt their military designs for commercial purposes. Their efforts propelled the Huff Daland Company to the forefront of American civil aviation. In seeking commercial applications,



Cotton dusting machines assemble at Scott, Mississippi. August 1920. Photograph courtesy Louisiana Department of Agriculture and Forestry.

the company modified one of its military models for agricultural purposes, after which a subsidiary, Huff Daland Dusters, under the management of George B. Post, became the world's first crop dusting company. Eventually this firm evolved into Delta Air Lines, one of the great enterprises in the first century of flight.



Mansford, Louisiana, September 21, 1925. Air view of different types of dusters: airplane duster, power duster, four-row mule, two row mule, saddle gun, and hand gun. Photograph courtesy of Louisiana Department of Agriculture and Forestry.

Why Ogdensburg? The *Ogdensburg Journal* credits R. J. Donahue, president of the National Bank of Ogdensburg, for bringing the availability of the Leyare Boat Works to the attention of Thomas Huff and his associate Causten Brown, the secretary treasurer

of the company.<sup>3</sup> Joseph Leyare had personal experience in aircraft construction from working with Curtiss during World War I, and had produced high-speed watercraft.<sup>4</sup> His vacant factory and a pool of skilled labor were immediately available. Because woodworking craftsmanship was a necessary skill in manufacturing boats as well as the aircraft of the era, the arrangement was mutually beneficial to Leyare, Huff, and the municipality. Another inducement to locate the company in the community came via the chamber of commerce, which “agreed to raise the sum of \$3000 to pay for the rental of the Leyare plant for a year and place it in readiness for occupancy.”<sup>5</sup> Incorporated in Delaware in 1920 and initially known as the Ogdensburg Aeroway Corporation, the firm had capital stock of \$150,000, but reportedly involved no local financing.<sup>6</sup>

Thomas Henri Huff was born in Glassboro, New Jersey, on June 22, 1892. He attended the University of Pennsylvania and the Massachusetts Institute of Technology, where he instructed in aeronautical engineering from 1915 to 1916. From 1917 to 1919 he was chief engineer at the Standard Aero Corporation where Elliot Daland was similarly employed from 1918-1919. Daland, born in Brookline, Massachusetts, on January 3, 1886, was educated in private schools and graduated from Harvard in 1909 with a B. A. degree. His advanced education included studies in applied science in 1910 and later, in 1918, aeronautical engineering at the Massachusetts Institute of Technology.<sup>7</sup> The

---

<sup>3</sup> Ibid., April 19, June 2, 1920.

<sup>4</sup> Ibid., April 26, 1920.

<sup>5</sup> Ibid., May 20, 1920.

<sup>6</sup> Ibid., June 2, 1920.

<sup>7</sup> Writers Program, Works Project Administration, *Who's Who in Aviation, a Directory of Living Men and Women Who Have Contributed to the Growth of Aviation in the United States 1942-1943*, (Chicago: Ziff-Davis Publishing Company, 1942), 102, 209.

*Ogdensburg Journal* was effusive in its praise of its new citizens and the opportunity they brought to the community: “The men connected with the project are thoroughly acquainted with their business, splendid gentlemen and are backing the enterprise with all their energy to make it a great, big humming success.”<sup>8</sup>

One early employee, hired as a stenographer, was destined to have a long career with Delta Air Lines. Catherine FitzGerald was born in Ogdensburg on September 21, 1897. Locally raised and educated at St. Mary’s Academy and the Ogdensburg Business School, by 1923 she was at work with Huff Daland, where she remained for two years until the company moved to Bristol, Pennsylvania, in 1925. A few months later she relocated to Monroe, Louisiana, in the Mississippi Delta, but for the time being she chose to remain close to home.

On June 30, 1920, George Post landed in Ogdensburg on a pioneering flight from New York City. Post shared the controls of an aircraft identified as a Huff Daland “Model F”<sup>9</sup> flying boat with Lt. Virgil McKennea. Post, like Catherine FitzGerald, had ties to the area. He was the nephew of Col. William H. Post and related to a Mrs. Edward Crabb, both prominent Thousand Islands area residents.<sup>10</sup> During the summer, the flying boat created a sensation, carrying passengers at Casino Island, near Alexandria, and at the Ogdensburg fair. News articles reflect the delight of passengers, and people envisioned establishing an air route to New York City. This publicity buttressed the already favorable opinion of the company, even before the production of machines began.

---

<sup>8</sup> *Ogdensburg Journal*, July 3, 1920.

<sup>9</sup> Most likely a Curtiss Model F Flying Boat as Huff Daland had not yet produced any aircraft of its own.

<sup>10</sup> *Ogdensburg Journal*, June 30; July 7, 22, 23, 1920.



George Birkbeck Post was born on January 9, 1897, in New York City. He attended Cornell University for three years studying mechanical engineering. He was briefly associated with the Standard Aero Corporation doing experimental work, coincidentally at the same time as Thomas Huff and Elliot Daland. He attended navy primary flight training at Bayshore, Long Island, in 1918 and continued with advanced training at Pensacola. He held Naval Aviator Certificate number 1198. Before joining Huff Daland, Post had accumulated several hundred hours of flight time in many different types of aircraft.<sup>11</sup>

Post was an initial director of the Huff Daland Aero Corporation, a subsidiary sales company incorporated in June 1921, to market a new commercial, three-passenger design.<sup>12</sup> He resigned from the parent Huff Daland Company in November and returned to New York, but early the following year, when a new military and passenger model was produced, joined Archibald Johnston and Philip H. Gray to open a sales office in Kansas City.<sup>13</sup> A few years later Post played a seminal role in the formation of Huff Daland Dusters.

Not until the fall of 1920--late, but nonetheless timely in meeting the army's deadline--did Huff Daland complete its first airplane under its initial army contract. Identified as the H-D 4 and powered by a 140-HP A. B. C. Wasp engine, "the fuselage is of special interest in that the lorogens [longerons] are carried directly to the upper wing, eliminating the use of the center section struts and wires. These give rigidity to the

---

<sup>11</sup> "Who's Who in American Aeronautics," *Aviation* (August 1921): 194.

<sup>12</sup> *New York Times*, June 17, 1921.

<sup>13</sup> *Ogdensburg Journal*, June 20, 1921; March 4, 1922.

structure, an additional factor of safety for the pilot and student. A special feature of the design is the entire absence of any wires. It is of the rigid trussed type with the struts of special Huff-Daland design.” The aircraft was shipped “by express” to McCook Field in Dayton, Ohio, for evaluation.<sup>14</sup> In January 1921 the local newspaper proudly noted that the factory was busy building seven airplanes, “one of them for a Boston party who expects to use it in passenger and freight service” and employed about fifty workers.<sup>15</sup> The company’s intent to provide commercial machines was evident from its earliest days.

In January 1922 Huff Daland won another competition and the government awarded a new contract, this time for an improved type of training airplane to be used by both the army and navy. The new design, named the “Petrel,” exemplified the company’s philosophy of simplicity in design to facilitate production and repair, and to reduce costs.<sup>16</sup> In a test flight, flown by Post with his sales associate Gray aboard, the “‘Petrel’ broke all records for speed and climb for a machine with a 90-horse power Curtiss motor.”<sup>17</sup> Favorable tests were conducted at McCook Field where Lt. Harold R. Harris, who would soon work with Huff Daland Dusters, served as one of the army’s test pilots.<sup>18</sup>

Harris was born in 1897 in Chicago, but raised in Los Angeles, California. He graduated from the California Institute of Technology and served in Italy as an army pilot

---

<sup>14</sup> Ibid., Nov. 15, 1920.

<sup>15</sup> Ibid., Jan. 20, 1921.

<sup>16</sup> Ibid., March 4, 1922.

<sup>17</sup> Ibid., March 9, 1922.

<sup>18</sup> Ibid., March 4, June 10, 1922.

conducting Caproni bomber operations during World War I.<sup>19</sup>

After World War I, from 1918 to 1925, Harris served as Test Pilot and Chief of Flight Test Research for the Army Air Corps at McCook Field. He played an active role in setting up and operating the first lighted airway, an 80-mile stretch of land between Columbus and Dayton, Ohio. In 1922, while a test pilot at McCook Field Harris, then a Lieutenant became the first [military] pilot in this country to resort to a parachute in an emergency when he bailed out of his disintegrating experimental pursuit plane near Dayton, Ohio. Also during this time Harris competed in many Aviation meets, and in 1926 held thirteen world flying records.<sup>20</sup>

Huff Daland expected to win the army competition with the Petrel and anticipated selling twenty commercial models in the coming year. Needing to expand its facilities, the company found extra space along the waterfront on Riverside Avenue.<sup>21</sup> The two plants operated simultaneously and hummed with activity from a rush order from the government for pontoons to be delivered by early spring. In addition to its aircraft orders this contract kept the plants working night and day.<sup>22</sup>

Almost out of the blue, so to speak, a new opportunity materialized for an agricultural aircraft. The *Ogdensburg Journal* reported on Dec. 19, 1923 that “T. Porter and Thomas Huff have been in Pensacola, Florida and Tallulah [sic], Miss. [sic], in connection with securing a contract for constructing machines to be used for spraying cotton fields with boll weevil exterminators.”<sup>23</sup> George Post had recently conducted tests with the Petrel on a visit to Tallulah, to determine its suitability for crop-dusting

---

<sup>19</sup> “Brief Biographical Sketch,” Harris Papers, WSUSCA.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid., March 14; June 10, 1922.

<sup>22</sup> *Ogdensburg Advance*, Nov. 8, Dec. 13, 1923.

<sup>23</sup> *Ogdensburg Journal*, Dec. 19, 1923.

purposes. He departed from Tallulah en route to Brooks Field at San Antonio, Texas.

About 200 miles into his flight, he had engine trouble and made a forced landing.

Although he escaped without injury, the severely damaged aircraft was shipped back to Ogdensburg for extensive repairs.<sup>24</sup>

Possibly this incident gave rise to the apocryphal story that Post had lost power while flying over Tallulah, precipitating an unexpected landing. This supposed chance meeting with Coad and Woolman at the Delta Laboratory caused Post to discover the crop-dusting experiments underway. So the story goes, when he returned to Ogdensburg he then encouraged Huff Daland to design an aircraft to meet the special needs of agricultural flying. Clearly Post, Huff, and Daland were already aware of the activities at Tallulah, and the decision to develop an agricultural aircraft would not have required Post's discovery. It is a testament to their decisiveness and the company's manufacturing capabilities, that one of Huff Daland's designs was quickly adapted for crop dusting purposes.

These features were described years later in a letter by Woolman to Loyd Stearman in response to Stearman's request for the characteristics of a successful duster design.

The most satisfactory airplane; and the airplane which is standard in our operations, is the old Keystone "Puffer," originally manufactured by Huff Daland Airplane Company, and which we have continued to build for our own use, and which seems to incorporate most of the desirable features; in fact, we have found nothing quite as satisfactory.

Generally speaking, a dusting plane should have a quick takeoff and a slow landing speed, good visibility (and I would emphasize this point), and should be very maneuverable. It should be ruggedly built, especially the landing gear which should be equipped with balloon or semi-balloon tires. It should have good load carrying capacity both from the standpoint of weight and cubic capacity

---

<sup>24</sup> Ibid., Dec. 11, 1923.

which should be located as near the center of gravity as possible. The opening of the dustbin should be sufficiently large and so located as to facilitate fast loading. The power plant should be ample for cruising at 80 or 90 m.p.h. with ample reserve for steep climbs in order to clear obstacles at the ends of the fields which are sometimes well over 100 ft. Gas capacity should be sufficient for four or five hours with the tanks located in the upper wings. Exhaust stacks should not exhaust over the top wing nor under the ship as sparks might ignite the inflammable dust.<sup>25</sup>

With the exception of balloon tires, a later modification, and perhaps the location of exhaust stacks, these features were incorporated to meet the design specifications resulting from experiments conducted in 1922 at the Delta laboratory under Coad's direction, using obsolescent aircraft on loan from the military.<sup>26</sup>

In April 1924, preparations were in progress for Huff Daland's new type of flyer.<sup>27</sup> Lt. Harris from McCook Field and Sgt. William McConnell from the Department of Agriculture, tested the prototype on July 28 and 30.<sup>28</sup> The airplane then left for Tallulah on August 4, piloted by Sgt. McConnell and accompanied by Harris and Daland. Daland was along to spend some time with Coad and others in evaluating the experimental activities underway at the Delta Laboratory.<sup>29</sup>

Huff Daland continued to design and test newer models. In February 1925, Harris tested a large duster aircraft under difficult conditions on the windy, ice-covered St. Lawrence River. Weather cancelled flight operations on the appointed day. A few days

---

<sup>25</sup> C. E. Woolman to Lloyd Stearman, April 19, 1944, copy courtesy Marie Force, Delta Air Lines Corporate Archives (hereafter cited as DALCA).

<sup>26</sup> Post, "Boll Weevil Control by Airplane," 12-15.

<sup>27</sup> *Ogdensburg Journal*, April 30, 1924.

<sup>28</sup> *Ibid.*, July 29, 30, 1924.

<sup>29</sup> *Ibid.*, August 4, 1924.

later more favorable flying conditions permitted the test to proceed.<sup>30</sup> On hand to observe the event were Flight Commander Hobbs with the Canadian Department of Aviation, Commander Zarr representing the Argentine air forces, and Elmer Johnson chief engineer at the Department of Agriculture laboratories at Tallulah, La. and other interested airplane representatives.<sup>31</sup> This duster was capable of carrying a heavier load, lessening the need for more frequent landings with the smaller model. Demonstrations on peach orchards in Georgia conducted in November 1924 and again in March 1925, had determined the need for a larger capacity. Oliver Snapp of the United States Peach Insect Laboratory, Fort Valley, Georgia, reported that “in order to make commercial airplane dusting of peach orchards more economical the capacity of the hopper in the ships should be increased” requiring a larger ship.<sup>32</sup> The test aircraft had the smaller capacity hopper.<sup>33</sup>

It was apparent Huff Daland was outgrowing its facilities in Ogdensburg. A larger factory was found in Bristol, Pennsylvania on thirty acres fronting the Delaware River.<sup>34</sup> The move was completed in September 1925, when the last three planes, built for the Argentine government, were shipped south as soon as they were finished, even before being test flown.<sup>35</sup>

During the five years Huff Daland was in Ogdensburg, the company improved

---

<sup>30</sup> Ibid., Feb. 27, March 2, 1925.

<sup>31</sup> *New York Times*, March 2, 1925.

<sup>32</sup> Oliver I. Snapp, “Airplane Dusting of Peach Orchards,” *Journal of Economic Entomology* 19 (June 1926): 453, 459.

<sup>33</sup> *Macon (Georgia) Daily Telegraph*, Nov. 25, 1924; March 5, 19, 1925; *Houston (Georgia) Home Journal*, March 5, 1925.

<sup>34</sup> *Ogdensburg Journal*, May 23, 1925; *Bristol (Pennsylvania) Courier*, May 21, 22, 1925.

<sup>35</sup> *Ogdensburg Journal*, August 27, 1925; “Announcing the opening of Huff Daland & Company’s new airplane factory at Bristol, Pa.,” *Aviation* (Oct. 5, 1925): 457.

manufacturing processes and advanced airplane performance and design.<sup>36</sup> The elimination of wire bracing by the use of stronger wing structures and the use of welded steel tubing in the construction of fuselages were two advancements.<sup>37</sup> The company continually looked for new nonmilitary, commercial uses of aircraft. An ambulance design, photo-mapping plane, and crop-dusting models were all contemplated or developed.<sup>38</sup> The careers of many people began with the company in Ogdensburg.

A person who played a little recognized role in the evolution of Delta Air Lines was Richard Farnsworth Hoyt. Notwithstanding his high profile in business, society, and sport, Hoyt is noteworthy for his promotion of aviation. As a New York banker and financier, Hoyt “was regarded as Wall Street’s aviation oracle, a gatekeeper of its inside paradise, the man to see about any proposition that had to do with aviation.”<sup>39</sup> In his capacity as a partner in the Hayden, Stone & Co, investment banking firm, with offices in New York and Boston, Hoyt played a crucial role in creating some of aviation’s giants such as Pan American Airways and the Curtiss-Wright Corporation. Not only did he help to broker deals, he held positions on several boards of directors. From his financial and executive perches, he wielded his power, influence, and vision.<sup>40</sup> And, almost inevitably it would seem, when Huff Daland outgrew its first home in upstate New York and moved to new quarters outside Philadelphia, Hoyt became involved in Delta’s evolution.

---

<sup>36</sup> For Huff Daland aircraft designs refer to Walt Boyne, “Huff Daland in 3-D,” *Wings* 7 (1977): 5-63.

<sup>37</sup> *Ogdensburg Journal*, Jan.17, 1922.

<sup>38</sup> *Ibid.*, May 10, 1923.

<sup>39</sup> Marilyn Bender and Selig Altschul, *The Chosen Instrument: Pan Am, Juan Trippe, the Rise and Fall of an American Entrepreneur* (New York: Simon and Schuster, 1982), 81.

<sup>40</sup> “Hoyt, Richard Farnsworth.” *National Cyclopedia of American Biography* 29 (New York: James T. White & Co., 1941): 160.

Hoyt was born on July 3, 1888, in Revere, Massachusetts. He attended the private Volkmann School and matriculated at Harvard where he graduated magna cum laude in 1910. That same year he became employed by the New York investment firm Hayden Stone & Co. as a clerk. During World War I he worked under Col. J. G. Vincent at McCook Field, where the army concentrated its engine and aircraft development program. With the knowledge of aviation gained during the war, and as a testament to his capability, he rose rapidly in the firm and was named a partner in 1919. As chairman of the board of Wright Aeronautical Corporation, in 1929 Hoyt helped facilitate the merger of Curtiss Aeroplane and Motor Company with Wright Aeronautical to form the giant Curtiss-Wright Corporation, with himself in position as chairman of the board.<sup>41</sup>

Hoyt's interest in aviation involved more than banking and finance. He took a personal interest in the field, becoming a pilot himself. In 1925 he served on the committee that arranged the New York Air Races held at Mitchel Field on Long Island.<sup>42</sup> He also served as chairman of the Committee on Aeronautics of the Merchants Association, which advocated the need for a New York City airport. "The western side of Manhattan, across the Hudson River, is in many ways the logical point for a landing field," he announced; "Our committee is inclined to believe that a point somewhere on the Jersey Meadows is by far the most desirable location."<sup>43</sup> An alternate site was Governors Island, but the army refused to release it. Hoyt argued that "commercial airports should be provided at public expense," so as to prevent any single company from

---

<sup>41</sup> Ibid.; *International Cyclopedia of Aviation Biography*, MS-167, file 30, box 13, Wright State University Department of Special Collections and Archives.

<sup>42</sup> *New York Times*, August 23, 1925.

<sup>43</sup> Ibid., Sept. 30, 1926.



“controlling service to the city.”<sup>44</sup>

Hoyt also donated money to help finance aerial pioneers. He backed the ill-fated attempt of the *American Legion*, piloted by Lt. Cdr. Noel Davis and Lt. Stanton Wooster, to cross the Atlantic in early 1927. Notwithstanding their unfortunate deaths on a test flight, he nevertheless praised Charles Lindbergh and Clarence Chamberlin and Charles Levine who were successful a few months later.<sup>45</sup>

In the meantime, success had propelled the Huff Daland Company into one of the largest aircraft manufacturers in the country. It relocated to the former Harriman Merchant Ship Building plant along the shoreline of the Delaware River at Bristol, Pennsylvania. By 1926, Huff Daland, facing an increased production tempo and higher development costs for newer models, needed new investment capital.<sup>46</sup> At a special meeting of stockholders held at 25 Broad Street, New York, new stock was proffered and fully subscribed. Not surprisingly, 25 Broad Street was the business address of Richard F. Hoyt.<sup>47</sup>

At the meeting Thomas H. Huff announced his retirement, and in November 1926 Edgar N. Gott, formerly of the Fokker and Boeing aircraft companies, was elected President and Chairman of the Board of Directors of the Keystone Aircraft Corporation,

---

<sup>44</sup> Carl Solberg, *Conquest of the Skies: A History of Commercial Aviation in America* (Boston: Little, Brown and Company, 1979), 120.

<sup>45</sup> The aircraft was built by Keystone in Bristol, Pennsylvania. *Ogdensburg Journal*, Dec. 30, 1927; *New York Times*, April 10, 27, June 27, 1927.

<sup>46</sup> Keystone Aircraft Corporation, “Concerning Our Plant and Activities,” *Keystone Aircraft Corporation*, (no date): no page, folder 5, box 1, RG01.01, DALCA.

<sup>47</sup> *Bristol* (Pennsylvania) *Courier*, Nov. 8, 1926.

the reorganized Huff Daland company.<sup>48</sup> Gott became a member of the Hayden, Stone group, signifying his close association with Hoyt.<sup>49</sup> The new company retained the objective of encouraging the commercial use of the airplane, and the duster subsidiary kept its original name. As the financial backer of Keystone and Huff Daland Dusters, Hoyt, it will be seen later, was instrumental in the emergence of Delta Air Lines.

Huff Daland Dusters emerged as a subsidiary of Huff Daland while it was still in Ogdensburg and before Hoyt took over. It was incorporated in Delaware on February 27, 1925, and its business was broadly stated to include “the carrying and transportation of passengers, goods, wares, and merchandise, for all kinds of commercial purposes, including agriculture and forestry, such as dusting, seeding, planting, and fertilizing, forestry patrol and survey, for aerial survey and photography, for any and all kinds of uses, for exhibiting or advertising purposes, *at any place within or without the United States*” [italics added in light of subsequent developments].<sup>50</sup>

The dusting firm was capitalized at \$250,000, and George B. Post was named a director and its general manager.<sup>51</sup> Its operation was headquartered in Macon, Georgia, where eighteen aircraft, twelve pilots, and twenty mechanics were under the direction of Harris. Dan E. Tobin was chief pilot, and Roger William Riis was advertising manager.<sup>52</sup>

---

<sup>48</sup> John H. Van Deventer, Jr., “The Story of Keystone and its Latest Contribution to the Advancement of Aviation,” *Air Transportation* (Jan. 19, 1929): 56; Keystone Aircraft Corporation, “Who’s Who in the Keystone Aircraft Corporation,” *Keystone Aircraft Corporation*, (no date): no page, folder 5, box 1, RG01.01, DALCA.

<sup>49</sup> *Bristol (Pennsylvania) Courier*, Oct. 5, 1928.

<sup>50</sup> “Certificate of Incorporation of Huff Daland Dusters, Inc.,” folder 1, box 1, RG01.01, DALCA.

<sup>51</sup> *Macon (Georgia) Daily Telegraph*, Feb. 12, 19, 1925.

<sup>52</sup> *Ibid.*, Feb., March 1924.

The business contracted with area farmers at a rate of \$7.00 per acre.<sup>53</sup>



From the cockpit of a Huff Daland Duster George B. Post is addressing a group of bankers and convention attendees near Macon, Georgia. Photograph courtesy Delta Corporate Archives.

In an *Aviation* magazine article, Roger Riis reported that the eighteen aircraft would be situated in nine separate places.<sup>54</sup> At each location, one of the two airplanes would be in reserve, while the other was working, and a pilot and the mechanics would live nearby. The nine bases, including the Macon site, were selected from more than forty surveyed. Harris was responsible for hiring the pilots and mechanics. Among those he selected were Tobin, N. L. Cote, Eugene Stevens, George Ott, Arthur Gray, Elliot Dunn, and, as chief of maintenance, Douglas Culver.<sup>55</sup> One potential pilot, interviewed at Kelly Field by

---

<sup>53</sup> Ibid., Feb. 12, 1925.

<sup>54</sup> Roger William Riis, "Commercial Crop Dusting, Details of the operations of the Huff Daland Dusters," *Aviation* 18 (May 25, 1925): 573.

<sup>55</sup> Ibid.,

Harris, Charles A. Lindbergh, turned down the \$2400 a year contract to dust cotton in Georgia because the pay seemed too low to him.<sup>56</sup>

Harris came to Macon as a consequence of arrangements made without his knowledge. Huff had met with Maj. Gen. Mason Patrick, head of the Army Air Service in Washington, who granted Harris a leave of absence from the army for a year if Harris agreed. Huff traveled to Dayton and approached Harris with the proposition, which he accepted. In February 1925, Harris left his position as chief of the Flight Test Branch, Engineering Division of the Air Service.<sup>57</sup> Harris recollected: “I must have known at the time but can’t remember now. Someone decided that the Duster headquarters should be in Macon, Georgia, so I moved to Macon from Dayton, Ohio.”<sup>58</sup>

Some background information is in order to understand the reasons why Huff Daland Dusters chose Macon for its headquarters in the first place, and to help explain why it stayed there so briefly before moving into the Delta. While experiments were taking place under the auspices of Coad at the Delta Laboratory, the state of Georgia took a proactive interest in directly assisting farmers. The Georgia Department of Agriculture credited cotton production as the most important factor in an estimated \$27 million increase in the total value of Georgia’s crops and praised the State College of Agriculture and other agencies for assisting farmers in 1924. The report declared: “During the year 1924, according to the best available statistics on the use of calcium arsenate alone, or in preparations for poisoning boll weevil, Georgia *was ahead of all the other states by a*

---

<sup>56</sup> A. Scott Berg, *Lindbergh* (New York: G. B. Putnam’s Sons, 1989), 79.

<sup>57</sup> *Ogdensburg Journal*, Jan. 5, 1925; unpublished manuscript “Draft Sept. 85,” 1, folder 7, box 3, Harris Papers, WSUSCA.

<sup>58</sup> “Draft Sept. 85,” 4, file 7, box 3, Harris Papers, WSUSCA.

*good deal* [author's italics]. The State board of Entomology endeavored to render every service possible in placing this poison at the disposal of Georgia farmers in time for its effective use.”<sup>59</sup>

This praise was justified when comparing the results of 1923 to 1924. In 1923, 3,844,000 acres of cotton were planted with an average yield of 82 pounds per acre. In 1924, there were 745,000 fewer acres planted, but the yield was 157 pounds per acre, a 91 percent increase.<sup>60</sup> Presumably a large measure of this success is attributable to the use of terrestrially applied calcium arsenate. Only a limited use of experimental aerial applications occurred in 1924. The board of trustees of the Georgia State College of Agriculture cooperated in organizing flight demonstrations at Athens on August 26 and at Cordele on August 28.<sup>61</sup> Later that year, in November 1924, Oliver Snapp, in charge of the peach insect laboratory in Fort Valley, cooperated with Huff Daland to conduct preliminary experiments to determine the suitability of aircraft in dusting peach orchards.<sup>62</sup>

Experiments continued into 1925, encouraged by the Georgia State College of Agriculture with the support of the Department of Agriculture, the state's Department of Agriculture, Board of Entomology, and Board of Health.<sup>63</sup> As a result of this exposure there was a great deal of interest in having Huff Daland Dusters locate in the state and

---

<sup>59</sup> J. J. Brown, “Annual Report of Georgia Department of Agriculture for 1924,” *Georgia Department of Agriculture* 99 (First Quarter 1925): 7-8.

<sup>60</sup> J. J. Brown, “Biennial Report of Georgia Department of Agriculture for 1925-1926,” *Georgia Department of Agriculture* 103 (First Quarter 1927): 56.

<sup>61</sup> Post, “Boll Weevil Control by Airplane,” 3.

<sup>62</sup> Snapp, “Airplane Dusting of Peach Orchards,” 450-51.

<sup>63</sup> Post, “Boll Weevil Control by Airplane,” 3.

help in the fight against the boll weevil and other pests. It stands to reason that Huff Daland Dusters would want to locate where there was institutional support and where it had garnered such favorable publicity. Another inducement was that the Chamber of Commerce of Macon had built a hangar at its airfield at Camp Wheeler for Huff Daland's use.<sup>64</sup>

Demonstration flights attracted a lot of interest for Huff Daland. It dusted peach orchards at Montezuma, Georgia, in March 1925.<sup>65</sup> "Growers in this section are enthusiastic over the demonstration," reported the local paper. "Mr. McHatton, of the State College, Athens, and Mr. Demaree of the federal government, working in the pecan industry, were here to witness the demonstration as more than a hundred growers looked on."<sup>66</sup> Harris claimed "complete satisfaction," and Snapp, "considered the world's leading peach authority," commended Huff Daland for the demonstration.<sup>67</sup> A total of 250,000 peach trees were dusted by early June.<sup>68</sup> Lynn McKenzie of Montezuma, Georgia, reported the success from dusting, "I have never shipped more beautiful peaches in all my life, and I might say that I received more per package than any other grower in Montezuma."<sup>69</sup>

Notwithstanding such effusive praise, the dusting of peach orchards in 1925 proved to be inconclusive. "Because weather conditions were unfavorable for the

---

<sup>64</sup> Riis, "Commercial Crop Dusting"; *Macon Daily Telegraph*, Feb. 19, 1925.

<sup>65</sup> Snapp, "Airplane Dusting of Peach Orchards," 451-52.

<sup>66</sup> *Macon (Georgia) Daily Telegraph*, Nov. 25, 1924.

<sup>67</sup> *Ibid.*, March 24, 1925.

<sup>68</sup> *Ibid.*, June 7, 1925.

<sup>69</sup> "How Huff Daland Airplanes Can Protect Your Crops," *Huff Daland Dusters, Bulletin No. 3*, folder 7, box 1, RG01.01, DALCA.

development of both curculio and brown rot,” Snapp reported, “the fruit from the orchards dusted from airplanes compared very favorably with that from orchards dusted from ground mule-drawn machine.”<sup>70</sup>

Pecan orchards were dusted in early May and found highly satisfactory by C. H. Gaddie, field agent for the State Bureau of Entomology and E. H. Decker, an Albany entomologist. But the bulk of dusting would be on cotton when the boll weevil became active.<sup>71</sup> The company planned to treat 60,000-65,000 acres from nine carefully selected separate locations.<sup>72</sup> By June, the company had signed contracts in Georgia, Mississippi, North Carolina, Alabama, and Louisiana.<sup>73</sup> The Laurinburg, North Carolina, unit advertised its readiness to begin dusting in Scotland County on July 6, 1925.<sup>74</sup> According to Woolman, another unit was located in Newellton, Tensas Parish, Louisiana.<sup>75</sup> Everything appeared to be in readiness for a busy season; all that was necessary was for the boll weevil to make its appearance.

Abruptly on July 8, 1925, the *Macon Daily Telegraph* reported that Huff Daland would cease operations in Georgia because there was insufficient business. “Officials of the company stated yesterday that less than 1000 acres of cotton had been dusted in Georgia near Vidalia this year which was not sufficient business to warrant continuing

---

<sup>70</sup> Snapp, “Airplane Dusting of Peach Orchards,” 453.

<sup>71</sup> *Macon (Georgia) Daily Telegraph*, May 11, 1925.

<sup>72</sup> Riis, “Commercial Crop Dusting,” 573.

<sup>73</sup> *Macon (Georgia) Daily Telegraph*, June 7, 1925; *Bristol (Pennsylvania) Courier*, June 11, 1925.

<sup>74</sup> *Laurinburg (North Carolina) Exchange*, July 1925.

<sup>75</sup> *Madison (Tallulah, Louisiana) Journal*, June 27, 1925.

their operations in the state.”<sup>76</sup> Expecting to dust 25,000 acres in Louisiana (with 12,000 already completed) and 15,000 in North Carolina, the company chose to reallocate its resources.<sup>77</sup> George Post said the decision was due to unforeseen business developments.

When we started here the company did not contemplate operating at such widely separate points and, in fact, it was a part of our program to concentrate our activities in one or two states. We found however, as the season progressed, that this was impossible and due to the demand of our service in various parts of the South, it was necessary to alter our plans and establish these two maintenance bases. Most of our personnel is now in the field and we are working out plans for the placing of our employees at points easily accessible to the sections where we will operate most extensively. Louis H. Kohler, auditor of the company will be in charge of the Louisiana base.<sup>78</sup>

Harold Harris, in his 1985 biographical notes, gives two reasons for the move out of Georgia: “(A) the cotton farms were small and (B) the cotton was not long ( 1 1/4" each strand) staple and consequently didn't have as good a price on the market as the staple cotton grown in the Mississippi Delta.”<sup>79</sup> It appears the company began operations early in 1925 with the intention to dust Georgia peach orchards, followed by the prospect of dusting pecan trees. While this business was significant, the real money was to come from cotton dusting, which would begin later in the season. Apparently the need never arose to make aerial dusting a necessity for farmers. Boll weevil infestations are not uniform year to year. A total of 3,662,000 acres of cotton were planted in 1925 with a yield of 155 pounds per acre. While 18 percent more acreage was planted compared to

---

<sup>76</sup> *Macon (Georgia) Daily Telegraph*, July 6, 1925.

<sup>77</sup> *Ibid.*

<sup>78</sup> *Ibid.*

<sup>79</sup> “1985 biographical notes,” 4, file 7, box 3, Harris Papers, WSUSCA.



1924, the yield per acre dropped only 1 percent, virtually unchanged.<sup>80</sup> In 1925 planters did not need aerial dusting.

Woolman and Coad are often credited with the decision to relocate from Macon to Monroe, but their role is unknown. Along with the sound economic reasons outlined above, Harris attributes the move to help from Travis Oliver, head of the Bank of Monroe, who convinced the city to build a small airport for Huff Daland to use. A dirt airstrip was built south of Monroe, known as “Smoot Field,” presumably the name of the previous owners of the property.<sup>81</sup> The move, Harris says, was “very worthwhile.”<sup>82</sup> But the question remains: why Monroe, and not Tallulah--where both Woolman and particularly, Coad, were familiar?

The likely answer is from competition, which in the business of aerial applications was quickly forthcoming. On October 6, 1925, the articles of incorporation of the “White Flying Dusters” located in Tallulah, Louisiana were filed. Article VIII gave the purpose: “The object and purpose of said corporation is for the operation of flying machines for commercial purposes and especially for the purpose of dusting agricultural crops and orchards with insect poison in the State of Louisiana and elsewhere.”<sup>83</sup> Small independent operators could quickly set up shop and begin operations close to where farmers required their services. Huff Daland Dusters may have been the first crop dusting company, but small independent operators eclipsed its lead.

When Huff Daland Dusters Company moved into the Delta it was a pioneer much

---

<sup>80</sup> J. J. Brown, “Biennial Report of Georgia Department of Agriculture for 1925-1926,” *Georgia Department of Agriculture* 103 (First Quarter 1927): 56.

<sup>81</sup> *Ouachita* (Monroe, Louisiana) *Citizen*, March 9, 1983.

<sup>82</sup> “1985 biographical notes,” 4, file 7, box 3, Harris Papers, WSUSCA.

<sup>83</sup> *Madison* (Tallulah, Louisiana) *Journal*, Oct. 24, 1925.

like the Percy family of earlier generations. It, too, had ties to cotton and an outward perspective. However its horizons stretched all the way to South America.

## Chapter 4

### The Eagle and the Condor

Such was the extent of Leguía's Yankeeophilia that he ordered a portrait of President James Madison hung in the presidential palace and actually declared July fourth a national holiday in honor of the United States.

Peter Flindell Klarén, *Peru, Society and Nationhood in the Andes*.

Key events leading up to the formation of Delta Air Lines occurred in South America. While there is justification to the argument that Huff Daland Dusters shifted operations to the Andean country of Peru to utilize its agricultural equipment more efficiently south of the equator, where the seasons are reversed, the full explanation is more complex. Even with the ease of transit through the Panama Canal, opened in 1914, the idea of shipping aircraft back and forth was not genuinely practical. The off-season was used to refurbish and repair equipment, and winter dusting opportunities, though limited, existed much closer to Monroe, in Mexico and California, than in South America. Also, the price of cotton in the world market was declining and competitive instincts were soon aroused locally by Huff Daland's presence. Therefore, to understand more fully the adventure in South America, one must look at the circumstances existing there that made it so attractive for the company to send men, equipment, and supplies to Peru as that nation sought to modernize.

In Peruvian historiography, the period from 1895 to 1919 is generally known as the "Aristocratic Republic," characterized by seeming political stability. The Civilista and

Democrata parties cooperated to overthrow the repressive regime of Andres Caceres, and then governed through an elite oligarchy, “an informal group,” as historian Peter Klarén writes, “known as the ‘Twenty-Four Friends,’ [that] met regularly at the exclusive Club National to discuss the management of national affairs.” Bound by “family and kinship” and “culturally and intellectually” oriented toward Europe, particularly France, these elitists “hardly knew the rest of the country.” One of its members, Augusto B. Leguía, following a term as treasury minister, served as president for four years, from 1908-1912. Subsequent discord within the dominant Civilista party and Leguía’s attempt to rig the 1911 congressional elections, permanently weakened the Civilistas and ended his presidency. He was exiled in London and New York where he used his time contacting business and financial leaders who would be helpful in reconstructing Peru’s battered post World War I economy. Leguía sat out the next seven years waiting for circumstances to change.<sup>1</sup>

The economic disruptions of World War I hit Peruvian workers hard. A falling standard of living provoked unrest, and a major strike in 1919 toppled President José Pardo’s government. Augusto Leguía returned from exile and once again became president, but now in opposition to his former Civilista party. He advocated a populist national agenda, *La Patria Nueva* (New Country), designed to marginalize political opponents and consolidate his power by appealing to a broader middle-class electorate.

Leguía was small in stature but large in presence. In his 1934 study of Leguía’s presidency, Arthur Metcalfe describes the man’s appearance:

---

<sup>1</sup> Peter Flindell Klarén, *Peru: Society and Nationhood in the Andes* (New York: Oxford University Press, 2000), 213, 214, 241.

Don Augusto, as he was sometimes called, was small and slight of appearance. A dapper little man, he dressed beautifully: slim feet in buttoned patent leather boots, skinny form well draped in a morning coat from London, a high silk hat which offset the too long sharp nose. Seen without the hat the nose gave the key to his being. The features were fox like: the chin was sharp, the mouth long, the bushy brows concealed eyes that glittered but did not warm. On the hands was black hair. Although the man was old the body was rhythmically agile and graceful.<sup>2</sup>

The eleven years of Leguía's rule from 1919 to 1930 "was dubbed the 'Oncenio' by Peruvians who took the term from the Spanish word for 'eleven' or 'once.'"

Following World War I, the United States replaced Great Britain as the primary investor in Peru and American capital fueled development of mines, agriculture, and urban development.<sup>3</sup> The "cornerstone of Leguía's economic policy was...promotion of the export-import model of growth."<sup>4</sup> Cultivated land no longer produced consumable crops but was planted with exportable agricultural crops, primarily sugar and cotton.

"Agriculture contributed greatly to the prosperity of the Peruvian economy throughout the oncenio, with sugar and cotton heading the list of most valuable exports"<sup>5</sup> Leguía's other projects included road building and 600 miles of railroad construction.<sup>6</sup>

Foreign ideological influences promoted free market capitalism and individual entrepreneurship in the country. The economic effects well suited Peru's elite, including

---

<sup>2</sup> Arthur V. Metcalfe, "The Dictatorship of President Leguía of Peru" (master's thesis, University of Southern California, 1934), 67.

<sup>3</sup> Lawrence A. Clayton, *Peru and the United States: The Condor and the Eagle* (Athens: University of Georgia Press, 1999), 74, 104.

<sup>4</sup> Thomas E. Skidmore and Peter H. Smith, *Modern Latin America*, 5th ed. (Oxford: Oxford University Press, 2001), 196.

<sup>5</sup> Gary Richard Garrett, "The Oncenio of Augusto B. Leguía: Middle Sector Government and leadership in Peru, 1919-1930" (PhD diss., University of New Mexico, 1973), 125.

<sup>6</sup> Skidmore and Smith, *Modern Latin America*, 196.

Leguía, himself a successful businessman who for a time was the general manager of the Peruvian-Ecuadorian-Bolivian branches of the New York Life Insurance Company. He spoke fluent English and was “at home with the American business mentality,”<sup>7</sup> As president he “strongly believed that Peru’s path to development lay in its ability to attract capital, technology, markets, and business know-how from advanced countries of the West.”<sup>8</sup>

Along with economic and class changes, the urban landscape in Lima was being transformed both socially and architecturally. The ruling elites modernized the city to conform to their European vision. During the *Oncenio* the streets were paved and widened, middle and upper-class houses constructed, parks created, and the city center cleaned up with new buildings, shops and hotels. “It became a showplace...to attract foreign investors and entrepreneurs on whom the administration was counting for an economic boost.”<sup>9</sup> Indeed, the caption of a photograph showing an intersection with a traffic light, taken by Huff Daland’s Harold Harris, reads, “the modern traffic system in Lima.”<sup>10</sup>

Not only was the early twentieth-century Lima cityscape being reconstructed physically, but elites, influenced by positivist ideology and European culture, tried to change the cultural landscape as well, primarily through sports and recreation. Leguía’s favorite recreation was “the regular Sunday afternoon horse races...at the Santa Beatriz

---

<sup>7</sup> Charles T. Goodsell, *American Corporations and Peruvian Politics* (Cambridge: Harvard University Press, 1974), 40.

<sup>8</sup> Klarén, *Peru*, 241.

<sup>9</sup> *Ibid.*, 250.

<sup>10</sup> Photograph Album, file 7, box 14, Harris Papers, WSUSCA.

Hippodrome” where “all Lima knew he would always be on hand.”<sup>11</sup> In modernizing Lima, venues were designated for public entertainment and, with the advent of electric lighting, nighttime hours were regulated. The “ruling class, happily ensconced in comfortable splendor in Lima, was thoroughly Eurocentric and Frenchified,” and to *Limeños*, “Lima represented ‘civilization.’”<sup>12</sup>

Along with the outward perspective of Peru’s leaders came a new airmindedness. This attitude encouraged North American and European aviation interests who thought all of “Latin America appeared to be one of the single largest potential markets for aviation exploitation” in the 1920s.<sup>13</sup> For example, in 1922 Capt. Walter Simon, an American who nevertheless served as the Assistant Director of Aeronautics for Peru, hoped “to bring about the establishment of air communications between Lima and Panama, which will mean the saving of much time and bring his country nearer northern business markets.”<sup>14</sup>

Having an American administrator in a Peruvian department was not unusual for Leguía. He “often argued that to elevate Peru to the level of the Western nations, the Peruvian would first have to acquire the skills and mentalities of the Westerner. To implement this notion, Leguía turned to the United States for economic and technical assistance. On one occasion he stated: ‘My hope is to put an American in charge of every

---

<sup>11</sup> Metcalfe, “The Dictatorship of President Leguía of Peru,” 71.

<sup>12</sup> Klarén, *Peru*, 214.

<sup>13</sup> Dan Hagedorn, *Conquistadors of the Sky: A History of Aviation in Latin America* (Gainesville: University Press of Florida, 2008), 130.

<sup>14</sup> *Aircraft Yearbook, 1923* (New York: Aeronautical Chamber of Commerce of America, Inc.), 187.

branch of our government.’”<sup>15</sup>

When they became aware of the cotton pest problem in Peru, the managers of Huff Daland Dusters were encouraged by “the relatively underdeveloped state of [Peru’s] economy and more important, the pro-American attitude of the Leguía regime.”<sup>16</sup> Other aeronautical enterprises had already recognized the potential and made inroads into the market. Jimmy Doolittle, representing the Curtiss Aeroplane Export Company, traveled through South America in early 1926 (and again in 1928) to demonstrate the fast, maneuverable Curtiss P-1 Hawk fighter, powered by the 400hp Curtiss D-12 engine.<sup>17</sup>

On the voyage south Doolittle’s liner stopped in Peru, though he did not demonstrate the Curtiss machine while there. Likely this was because Peruvian authorities were already committed to the rival Keystone corporation (Huff Daland Dusters’s parent company). Subsequently, in the face of strong German competition, Doolittle’s “salesmanship was responsible for the Chileans taking nine Curtiss planes.”<sup>18</sup>

A prominent aeronautical company of local origins had its beginning when Curtiss dispatched one of its mechanics, Elmer (“Slim”) Faucett, to Peru in 1920 as a service representative. He “entered the Civil Aviation School at Bellavista and obtained Peru’s civil pilot’s license No.1.”<sup>19</sup> Enterprising and charismatic, Faucett piloted the first

---

<sup>15</sup> Garrett, “The Oncenio of Augusto B. Leguía,” 150-51.

<sup>16</sup> Peter Boland Gushue, “Heavenly Influence: Panagra Airways in Peru, 1928-1949” (Ph.D. diss., University of Alabama, 1997), 16.

<sup>17</sup> General James H. “Jimmy” Doolittle, with Carroll V. Glines, *I Could Never Be So Lucky Again: An Autobiography* (New York: Bantam Books, 1991), 114, 117, 122.

<sup>18</sup> Wesley Phillips Newton, *The Perilous Sky, U. S. Aviation Diplomacy and Latin America: 1919-1931* (Coral Gables, Florida: University of Miami Press, 1978), 83.

<sup>19</sup> Herbert H. Moll, *Peruvian Civil Aviation* (Mineola, N. Y.: American Airmail Society, 2000), 33.



flight from Lima to Iquitos over the Andes on October 5, 1922.<sup>20</sup> With Peruvian financing, he started his own airline. In time locals “became familiar with the orange and white aircraft of Faucett Airlines, largely run and operated by Peruvians.” Perceived as one of their own, Peruvians held Faucett in high esteem.<sup>21</sup>

Powerful American business interests, in alliance with the United States government, countered “semigovernmental European air lines in South America” and challenged Faucett’s ambitions in Peru. This public/private relationship, characterized as the chosen instrument by authors Marilyn Bender and Selig Altschul in their study of Juan Trippe and Pan American, stemmed from the government’s perceived “need for one American foreign airline.”<sup>22</sup> Into this mix of personalities, favoritism, intrigue, and politics, in an extraordinary twist of circumstances, the small Huff Daland Dusters company proved to be the catalyst in producing, not one, but *three* remarkable twentieth-century aviation enterprises--Pan American Airlines, Pan American Grace Airlines (Panagra), and Delta Air Lines. And, if Huff Daland Dusters’s effect, though indirect, on Faucett is considered, the number is *four* airlines.

Foreigners arriving in Lima were immersed in the political, entrepreneurial, and culture milieu of Leguía’s *Oncenio*. Both C. E Woolman and Harold Harris, promoted to vice-presidents of Huff Daland Dusters, traveled to Peru, but not together or at the same time. Once there, they ensconced in the impressive new Hotel Bolivar, just recently opened in 1924. The hotel was the “meeting point for people of a certain status,” located

---

<sup>20</sup> Clayton, *Peru and the United States*, 132.

<sup>21</sup> *Ibid.*, 131, 133, 134.

<sup>22</sup> See Bender and Altschul, *The Chosen Instrument*; Elsbeth E. Freudenthal, *The Aviation Business: From Kitty Hawk to Wall Street* (New York: Vanguard Press, 1940), 168.

on the Plaza San Martin in the center of modernized Lima.<sup>23</sup> As events unfolded, these two extraordinary men were catapulted into long and successful aviation careers -- Woolman's with Delta Airlines and Harris, who remained in Peru for a number of years, with Panagra. Harris returned to the military during World War II where he rose to the rank of general. Following the war Harris served briefly as president of Northwest Airlines.



Collett Everman Woolman  
Photograph courtesy of Delta Air Lines Corporate Archives

Who was Woolman? The Woolman name can be traced back to Yorkshire, England, when in 1678 Quaker ancestors migrated to the colonies and settled in Crosswicks, Burlington City, New Jersey.<sup>24</sup> The name may have passed down from

---

<sup>23</sup> Moll, *Peruvian Civil Aviation*, 33.

<sup>24</sup> The John Woolman Memorial Association can be found online at <http://woolmancentral.com>, (accessed Oct. 17, 2010).

Quaker origins, but C. E. Woolman describes a pioneering heritage, perhaps reflecting another branch of the family: “He tells of his father’s family, Scotch Loyalists from the clan of McFarland, who settled in South Carolina early in American history, and of his mother’s family, early Kentuckians who farmed on land that is now part of the city of Frankfort. His parents were living in Bloomington, Ind., when he was born on Oct. 8, 1889, and later moved to Urbana, Ill., where he attended high school.”<sup>25</sup>

Collett Everman Woolman was born to Albert Jefferson and Daura Mae (Campbell) Woolman. He attended the University of Illinois, Champaign, on a scholarship, was a member of the Agricultural Glee Club, and played on the senior football team.<sup>26</sup> Woolman graduated with a B.S. in agriculture in 1912. On August 8, 1916, he married Helen H. Fairfield, a 1914 University of Illinois alumnus, in Champaign. She was a high school teacher and he was “engaged as United States district agricultural supervisor with headquarters at Baton Rouge, La.”<sup>27</sup> C. E. and Helen Woolman were living in Louisiana when two daughters were born, Barbara on June 3, 1922, and Martha on July 8, 1923.<sup>28</sup>

Woolman got an early introduction to aviation:

While an undergraduate in the University of Illinois, he worked his way to France on a cattle boat in 1910 to attend the world’s first aviation meet in Rheims [author’s note: the meet was actually held in 1909]. “On the way back,” Woolman

---

<sup>25</sup> Harold Rubin, “Boll Weevils Started His Air Line,” *Dixie, Times-Picayune States Roto Magazine*, Feb. 13, 1955; Collett Everman Woolman Papers, University of Illinois at Urbana-Champaign Archives (hereafter cited as UIUCA)

<sup>26</sup> Ibid.

<sup>27</sup> Newspaper clipping, Woolman Papers, LSULSC.

<sup>28</sup> Woolman Papers, LSULSC.

recalls, “I crossed with famed daredevil aviator Claude-Graham White. Most of my time was spent in the hold getting his engine in shape for a meet at Boston. I didn’t get to the meet ‘cause I was due back at school.” ...After graduating in 1912...he went “to farm the blacklands in Mississippi,” he says. He later took over 700 acres in Louisiana’s Red river valley, he recalls. “A Kansas City gentleman owned the property, and I supervised it.” ...“I decided Louisiana was to be the place I call Home.” Appointed County agent in Ouachita parish in 1913, he was promoted to district agent in North Louisiana in 1916. Woolman calls himself a “guinea pig,” for he says he was the first county agent in the state to hold a college degree.<sup>29</sup>

Woolman’s aviation career began in 1925 when he was hired by Huff Daland Dusters as an entomologist because he was familiar with local conditions, known to planters, and was able to negotiate dusting contracts. During the second year of operations more than 52,000 acres were treated using over 300,000 pounds of dust.<sup>30</sup> In 1926 Huff Daland Dusters expected to treat 90 to 100,000 acres of cotton in the South using twenty airplanes.<sup>31</sup> It was a propitious beginning, but at the time Woolman could not have anticipated the trajectory of his life that emerged from his association with this small crop dusting company.

By 1926 agricultural aviation was off to a good early start, and Huff Daland Dusters’s legacy for innovative aerial applications was assured. Generally Woolman is credited with having the idea of sending airplanes, personnel, and supplies south of the equator to take advantage of the opposing seasons. Rather, the idea came in the form of an inquiry from Peruvian planters on how to control infestations on their own cotton.

Agricultural pests are not endemic to the United States. As early as in 1909, Dr.

---

<sup>29</sup> Rubin, “Boll Weevils Started His Air Line,” Woolman Papers, LSULSC.

<sup>30</sup> Harold R. Harris to Colette E. Woolman, Oct. 6, 1926, file 14, box 1, Harris Papers, WSUSCA.

<sup>31</sup> *Bristol* (Pennsylvania) *Courier*, March 15, 1926.

C. H. T. Townsend traveled to Peru to recommend methods of countering common white scale.<sup>32</sup> On January 20, 1926, “Dr. W. D. Hinds, entomologist of the experimental station and extension division, Louisiana State University, left for Peru” to advise growers of methods to increase declining crop yields from insects.<sup>33</sup> According to author George N. Wolcott, Hinds “suggested dusting poison on the cotton plants...and was also largely instrumental in having *aeroplane application* [italics added for emphasis]” of calcium arsenate so widely adopted there.<sup>34</sup> Hinds likely educated planters on aerial dusting techniques being used in the United States.

When the large cotton exporting regions of coastal Peru became infested with the armyworm, the use of airplanes to deal with pests in the United States interested Peruvians. Sometime in 1926, Pedro Beltran, the politically connected owner of a large hacienda, traveled to the United States and inquired at the Department of Agriculture as to what could be done to control the pest. He was directed to the Delta Laboratory in Tallulah where, Harris recounts, Coad “suggested airplane dusting and there was only one commercial outfit that did that sort of thing. He recommended that Beltran talk to us [Huff Daland Dusters].”<sup>35</sup>

Huff Daland was interested. On one hand, Leguía’s pro-American economic policy was appealing. On the other hand, Beltran (later appointed ambassador to the United States and other high-level positions in Peru) could be expected to mediate with

---

<sup>32</sup> George N. Wolcott, “The Status of Economic Entomology in Peru,” *Bulletin of Entomological Research* 20 (August 1965): 225-27.

<sup>33</sup> *Madison* (Tallulah, Louisiana) *Journal*, Feb. 6, 1926.

<sup>34</sup> Wolcott, “The Status of Economic Entomology in Peru,” 226.

<sup>35</sup> “Panagra,” 12, Harris Papers, WSUSCA.

Peruvian authorities and planters. Woolman was sent to Peru to originate a concession and solicit contracts. In a 1979 interview, Harris praised Woolman as “a terrific salesman,” but cautioned, “he was basically an entomologist; he didn’t know anything about aviation.”<sup>36</sup>

Harris’s assessment begs the question of when Woolman became a pilot. A letter from the Aeronautics Branch, Department of Commerce, indicates he held “private license No. 22370 which has been renewed to expire Sept. 30, 1935.”<sup>37</sup> Barbara Woolman Preston observed that her father “didn’t have many hours and didn’t qualify for commercial [flying] or to fly passengers.”<sup>38</sup> Woolman may have learned to fly before records were required by the Air Commerce Act of 1926, but this is unlikely. Pilots are jealous of their flying time and talk freely of their experiences. They keep careful records of dates, equipment flown, engine, location, and duration in a personal logbook. A logbook is not among the records in Woolman’s files. Many years later, in addressing the question of whether Woolman “actually flew,” Harris observed he “may have ridden as a passenger with some of the dusting equipment at Tallulah in the experiments carried out by Dr. Coad” but “as far as I know had never flown.”<sup>39</sup> Virginia P. Welch, a University of Illinois graduate, recalls Woolman explaining at one of her alumnae meetings in Atlanta that he “got his start as a crop duster.”<sup>40</sup> This was not a purposeful

---

<sup>36</sup> Harold R. Harris interview, by Dr. Lawrence Clayton, Falmouth, MS. Nov. 5, 1979, transcript, folder, “Dissertation interviews w/former Panagristas,” box 1, RG 245, Peter Gushue Collection, Special Collections and Archives, RBD Library, Auburn University (hereafter cited as Gushue Papers).

<sup>37</sup> Department of Commerce to Collett E. Woolman, Sept. 29, 1935, Woolman papers, LSULSC.

<sup>38</sup> Barbara Woolman Preston, interview, Jan. 12, 1993, transcribed Sept. 27, 1999, DALCA.

<sup>39</sup> Harold R. Harris to Mabry I. Anderson, Oct. 15, 1987, folder 1, box 3, Harris Papers, WSUSCA.

<sup>40</sup> Virginia P. Welch, interview by author, Atlanta, Ga, July 21, 2009.

misrepresentation by any means, but without clarification, one might conclude he was a duster pilot, while in fact he was in the business of crop dusting. There is no question Harris flew duster aircraft and was therefore technically a duster pilot, but nevertheless, he acknowledges he “personally never did any commercial crop dusting” either.<sup>41</sup>

Notwithstanding Woolman’s limited background in aviation, Harris observed, “that didn’t make any difference; he was an excellent salesman.”<sup>42</sup> Woolman had a congenial personality, understood agricultural issues, and was familiar with cotton pests. He knew the company’s policies, had met with planters face-to-face negotiating contracts, and, by the time he went to Peru, knew enough about flying to evaluate the conditions there. These were reasons enough for Woolman, rather than Harris, who might also have been selected, to make the pioneering voyage south.

Another, perhaps more compelling reason is that George B. Post had left the company to help organize Free Bottom Craft in 1925.<sup>43</sup> His departure coincided with the move from Macon, Georgia, to Monroe. Harris then assumed Post’s responsibilities. As operations manager, it was more important that he remain in Monroe to supervise the season’s dusting activities and begin preparations for an anticipated expedition to Peru, if Woolman’s mission proved fruitful.

When he left Louisiana for Lima, Woolman must have stopped in Bristol, Pennsylvania, for consultations at the home office; he then traveled to New York where

---

<sup>41</sup> Harold R. Harris to Mabry I. Anderson, Oct. 15, 1987, folder 1, box 3, Harris Papers, WSUSCA.

<sup>42</sup> Gushue Papers.

<sup>43</sup> “International Cyclopedia of Aviation Biography,” file 21, box 22, MS-167, Wright State University Department of Special Collections and Archives. Post became president of Free Bottom Craft and in 1928 became vice-president and a director of the Edo Aircraft Corporation.

he was, using Harris's words, "treated so badly." This likely occurred with the Hayden Stone group. Richard Hoyt was the partner overseeing aviation affairs for the investment firm, but Hoyt's involvement with Peru at this time is not known, though his firm financed Huff Daland, Inc. and, by extension, its Louisiana subsidiary.

Whatever the problem Woolman encountered, the difficulty seems to have been smoothed over when Huff Daland, Inc. was restructured and recapitalized as Keystone Aircraft Company. The duster subsidiary, nevertheless, retained its original name and status under the new corporate umbrella. Referring to Woolman's treatment, Harris wrote, "my last information from Auerbach [Irwin E. Auerbach, Huff Daland Dusters comptroller], who is up there, seems to indicate that we will have extensive backing from now on and I believe that if that is definitely assured all will be well."<sup>44</sup> Woolman was by then in Peru.

Woolman sailed from New York aboard the Grace Line steamer *Santa Ana*. As the ship made its way out of the harbor on August 5, 1926, Woolman presumably was among the passengers at the rails watching as the Statue of Liberty passed slowly by. An ocean voyage in those days was a "splendid experience," commented Ellis O. Briggs, at the time a young vice-consul assigned to the United States Consul General's office in the port city of Callao, Peru. In his memoirs, he observed that transiting the Panama Canal was relaxing and memorable, "with a buffet on deck and a breeze off Gatun Lake, the white cranes on Barro Colorado Island so close you could almost touch them, and the Continental Divide at Culebra." There were few tourists, he noted, and travelers were

---

<sup>44</sup> Harold R. Harris to Colette E. Woolman, Oct. 6, 1926, "Crop dusting," folder 14, box 1, RG01.01, DALCA.



“the hewers of wood and the drawers of water--doers, not the time wasters.”<sup>45</sup> Or, perhaps, might not one of them have been an entomologist, whose voyage would usher in a new age of air transportation? Woolman’s mind must have been full of anticipation for the challenges ahead, the prospects for success or failure, and the weight of responsibility resting solely on his shoulders. A lot would depend on his good judgment as mail was slow, limited by the speed of a steamship.

On Wednesday, August 18, thirteen days out of New York, the *Santa Ana* anchored off Callao, the port serving Lima. Because docking facilities were not completed until the 1930s, passengers boarded launches and debarked on “an inadequate pier called Muelle y Dársena, where customs and baggage handling took place amid scenes of riotous confusion.”<sup>46</sup>

Woolman remained in Peru for about three months, and while there laid the groundwork for dusting operations and negotiated for an operating concession from the government. He sold contracts to planters and arranged for logistical support. A Peruvian agent, Pedro Martinto, “an importer of all sorts of things,” was retained. A newspaper advertisement announced that Martinto “had been appointed general representative for the firm, Huff Daland Dusters, Inc., dusters of arsenate by means of airplanes” and beseeched “all cotton dealers who wish to make the use of the services of said company for the next crop” to sign contracts.<sup>47</sup>

In Lima Woolman met with “various men of interest” in agricultural applications

---

<sup>45</sup> Ellis O. Briggs, *Proud Servant: The Memoirs of a Career Ambassador* (Kent: Kent State University Press, 1998), 20, 29.

<sup>46</sup> See scrapbook, Woolman Papers, LSULSC.

<sup>47</sup> “Misc. Speeches given by Harris,” folder 12, box 12, Harris Papers, WSUSCA; “Algodoneros,” file 8, box 1, RG01.01, DALCA.

including such prominent businessmen as Pedro Beltran, Alexander Howard, Oscar Remos, and “others of similar vision.”<sup>48</sup> In negotiations he bound Huff Daland Dusters to provide aircraft, personnel, equipment, and supplies “to dust the cotton fields of the Cañete and other valleys” in the coastal areas of Peru.<sup>49</sup> When his objectives were accomplished, Woolman departed Lima for the United States.

Back in Monroe, even before equipment was sent south, Manuel A. Rapier, a Peruvian contact, “anxious to receive all kinds of publications regarding cotton,” informed Woolman of potential competition. In a letter dated November 16, 1926, he wrote: “I have heard, although without reliable confirmation, that the aviator Faucett is trying to carry out just the same business.”<sup>50</sup> Remarkably, just as Huff Daland had discovered in Monroe when the White Flying Dusters was incorporated in Tallulah, Louisiana, competition in the business of aerial applications could quickly develop, even in Peru.

The virtues of crop dusting in Peru were extolled in an op-ed piece by Rapier that appeared in the November 17, 1926, issue of the newspaper *El Comercio*. Huff Daland Dusters, he wrote, would provide the required equipment and pesticides so that laborers would not have to be diverted from their regular work in the fields. The speed and efficiency of airplanes would replace the equivalent of 6000 workers. But this enthusiasm was apparently not universally shared. “Los espíritus retardarios” (critics) and “los timoratos profesionales” (cautious professionals), Rapier wrote in a politically charged

---

<sup>48</sup> “Summary of Huff Daland Duster’s Work in Peru to March 31, 1927,” *The West Coast Leader*, file 5, box 15, Harris Papers, WSUSCA.

<sup>49</sup> “Panagra,” 12, folder 1, box 7, Harris Papers, WSUSCA; *Aircraft Yearbook, 1927* (New York: Aeronautical Chamber of Commerce of America, Inc., 1927): 1163.

<sup>50</sup> Manuel A. Rapier to C. E. Woolman, Nov. 16, 1926, folder 8, box 1, RG01.01, DALCA.

statement, “do not trust that our national psychology could embody modern ideas and methods.”<sup>51</sup>

A response to Rapier appeared in the paper the following day, accusing him of publishing an advertisement for the new method of crop dusting. It argued that sending equipment and “the most experienced pilots” was a costly experiment. It would be better to use cultural methods first to determine the effect of irrigation, fertilization, and seed selection. Only after careful study should modern methods in agriculture be adopted generally, not only for cotton.<sup>52</sup> The opposition’s criticism appears to be scientifically and not politically motivated. Regardless of the possibility for incipient competition or scientific skepticism, contracts were securely in hand for the 1927 season and the dispatching of Huff Daland Dusters’s personnel and equipment was not delayed.

Woolman’s activities in Peru were succinctly summarized in a comprehensive report for the year 1927, prepared for the company’s board of directors. Of interest is paragraph two, which confirms that in going to Peru he had more than one objective in mind. In addition to crop dusting, Huff Daland, (soon to be Keystone) was scouting for aircraft sales to carry the mail. At this early stage any thought of forming an airline does not seem to have been contemplated, but the paragraphs give the details:

Survey and Advanced Sales:

In August 1926, Mr. Woolman went to Peru for the purpose of extending winter operations. Costs, flying conditions, and general facilities were investigated and payment plans, banking facilities and a satisfactory contract arranged. He was successful in contracting with the principal planters of Canete and Chincha valleys in sufficient amount to warrant the sending of personnel of seven, with five dusting airplanes. He also took the first steps toward procuring an

---

<sup>51</sup> Manuel A. Rapier, “The use of Airplanes in our Agriculture,” *El Comercio* (Lima, Peru), Nov. 17, 1926. Translation in author’s possession.

<sup>52</sup> *El Comercio* (Lima, Peru), Nov. 18, 1926.

introductory patent covering the use of airplanes in all dusting operations in Peru for ten years and secured the promise of the passage of a special law exempting our Company from import duties and fees on all dusting airplanes and insecticides.

Sales Contract for Keystone Aircraft Corporation:

In addition to his work for the duster organization, Mr. Woolman secured advanced information through the family of the President of Peru regarding the LaMerced-Iquitos Air Mail Route and conferred at length with Commander Grow of the United States Naval Mission, who is in charge of the project. Commander Grow became definitely interested in the Keystone equipment for this route, and this led to preliminary negotiations between Commander Grow and the Keystone factory.<sup>53</sup>

While Woolman was away, Harris, in the face of a “terrific drop in the price of cotton,” supervised operations in Louisiana and prepared for his trip to Peru. In a letter addressed to Woolman at the Hotel Bolivar in Lima, Harris summarized operations for the year. “We have dusted two-thirds more in 1926 than we did in 1925 with one-third less total flying time, even though we had an increase of 142% in the amount of dust used. The acres per hour dusted in 1926 are 132% greater than in 1925, even though we applied 46% more pounds per acre this year.” In a handwritten comment below his signature on the letter, Harris praises Woolman, “Congratulations on your selling work [in the United States].”<sup>54</sup>

In the same letter Harris informed Woolman, “the planes are practically ready to put into the crates,” and he expected “a definite go-ahead from New York...any day.”<sup>55</sup> In fact they shipped out of New Orleans on the steamship *Garfield*, scheduled to arrive in late December at Cerro Azul, a port serving the Santa Barbara Sugar Mill near the Cañete

---

<sup>53</sup> “Report to the President and Board of Directors of Huff Daland Dusters, Incorporated for 1927,” Oct. 26, 1927, Monroe, Louisiana, 1-2, file 3, box 15, Harris Papers, WSUSCA.

<sup>54</sup> Harold R. Harris to Collett E. Woolman, Oct. 6, 1926, folder 14, box 1, RG01.01, DALCA.

<sup>55</sup> Ibid.

valley.<sup>56</sup>

The details are lost to history, but Harris probably sailed from New York. As with Woolman's voyage, Harris must have enjoyed the trip. His photo album provides some insight. In Panama, he posted pictures of a flight over the canal and locks. At port calls at Talara and Salaverry, Peru, on December 19 and 20, 1926, the passengers viewed primitive street scenes. At Callao harbor on December 21 there is a picture of a launch, presumably the one used to carry passengers to shore. There is a picture of Pedro Mantero, who, the caption reads, "met us at the boat in his Sunbeam." Photos of the Hotel Bolivar and downtown Lima are dated the same day of the ship's arrival. Several pictures in the album are of a "Christmas eve 1926 party at the Army Flying School," in Las Palmas.<sup>57</sup> Likely the entire group was invited based on Harris's well-known reputation as a military aviator. Although the Huff Daland Duster mission was nonmilitary in purpose, he was well received by his brothers-in-arms.

The intervening days between Christmas and the New Year were spent preparing for the work at hand. "Landing fields were prepared, deposits of calcium arsenate made, gasoline supplies arranged, entomological surveys made, and the many and various details attended to, including the completion of the necessary banking facilities for payments under contracts."<sup>58</sup> Removing aircraft from the crates and assembling them

---

<sup>56</sup> *El Comercio* (Lima, Peru), Dec. 27, 1926. Photograph "Our planes in front of the Santa Barbara sugar mill," folder 27, box 2, RG01.03, DALCA.

<sup>57</sup> Photograph album, Harris Papers, WSUSCA.

<sup>58</sup> "Report to the President and Board of Directors," 2, Harris Papers, WSUSCA.

appears to have gone without a hitch. The first crop dusting was “done by pilot Alexander, on the Estate of Montalvan in the Cañete Valley” on January 1, 1927.<sup>59</sup>

---

<sup>59</sup> “Summary of Huff Daland Dusters’s Work in Peru,” Harris Papers, WSUSCA.

## Chapter 5

### Insight

If you've waited three weeks for a spare part after you've sent an expensive cable and then it comes wrong and you have to send a second cable twice as long and wait another three weeks, well, it's hell, he [Harold R. Harris] said feelingly.

Hudson Strode, *South by Thunderbird*

The Huff Daland Dusters project in Peru was well planned, well organized, and well executed, and Woolman and Harris each significantly contributed to its success. Woolman's preliminary survey laid the groundwork for Harris to complete the operation satisfactorily. For a small enterprise to seize an opportunity, send men and equipment so far on a risky venture, and have a profitable outcome was a remarkable achievement. By all indications Huff Daland Dusters, Inc. fulfilled its contractual obligations for 1927. Some additional flying was similar to experimental work done in the United States for the Louisiana State University and involved sugar cane. This dusting was to control the sugar cane borer in the Cañete Valley.<sup>1</sup>

Six personnel accompanied Harris to Peru: an entomologist, J. B. Pope; three pilots, Dan E. Tobin, Henry E. Elliott, and Marvis L. Alexander; and two mechanics, William C. Miles and William E. Beach. Five "Special Small Duster Type" ships, numbered 49, 55, 56, 58, and 60, were imported from Monroe. In a photograph of the

---

<sup>1</sup> "Report to the President and Board of Directors," 4, Harris Papers, WSUSCA.

aircraft, taken in front of the Santa Barbara Sugar Mill, the numbers appear prominently painted on the vertical stabilizers.<sup>2</sup> Each held 600 pounds of dust and was powered by a 200HP, nine-cylinder, air-cooled Wright Whirlwind radial engine. The Whirlwind engine, the Peruvian English language *West Coast Leader* proclaimed, was the same type “used by [Richard E.] Byrd and [Floyd] Bennett on the first flight over the North Pole” in 1926.<sup>3</sup> The comment was noteworthy at the time, as Lindbergh had not yet made his epochal transatlantic flight in his Whirlwind powered Spirit of St. Louis.



Huff Daland Dusters in Peru  
Photograph courtesy Special Collections & Archives Wright State University

The *West Coast Leader* explained that the ratio of three pilots (Harris did not do any commercial dusting) to five airplanes insured reliability, so that “no accident can delay the service.” In fact, the only damage reported through April was to “one bent tail post,” a testament to the skill of the pilots and the sturdiness of the aircraft. Alexander Howard, director-secretary of the Compania Agricola E Industrial De Canete, observed, “the steel tube fuselages of these special planes have stood up extremely well in the Peruvian climate, and the Oleo shock absorbing landing gear has proved its worth time

---

<sup>2</sup> Photograph album, Harris Papers, WSUSCA; Photograph: “Our planes in front of the Santa Barbara sugar mill,” folder 27, box 2, RG01.03, DALCA.

<sup>3</sup> *The West Coast Leader*, April 5, 1927.



after time in operating from rough fields with heavy loads.”<sup>4</sup> These specially designed agricultural aircraft were new to South America, but the North American pilots and mechanics did not find the stresses exceptional. The design had already been tested and proved reliable under trying conditions in the United States.

A demonstration flight was flown on January 1, the contractual date specified to begin the service. Flights to dust cotton in earnest “commenced during the last week in January, reaching their peak around March first, and drew to a close in the latter part of March.”<sup>5</sup> The work was divided, with Tobin servicing the Chincha Valley contracts, and Elliott and Alexander splitting the work in the Cañete Valley.<sup>6</sup> Most of the calcium arsenate was dispersed to eradicate the cotton leaf worm which, when it appears, quickly blankets an entire area so aerial applications are a particularly worthwhile countermeasure. A speeding airplane can swiftly and efficiently dispense poison to eliminate the pest.<sup>7</sup> Recognizing the advantage, Howard had high praise for Huff Daland Dusters. “The service proved so efficient that in no case had we to have more than one dusting per field, one of the chief advantages undoubtedly being the rapidness with which the poison was applied before any harm had been done by the worm.”<sup>8</sup> This reduced the cost of operations, highlighted in a summary report to the Board of Directors. “While the Company held contracts for 50,712 acre applications [repeat applications] on 23,391

---

<sup>4</sup> Ibid.

<sup>5</sup> Alexander Howard to Harold R. Harris, “Report to the President and Board of Directors,” 2-3, Harris Papers, WSUSCA.

<sup>6</sup> *The West Coast Leader*, April 5, 1927.

<sup>7</sup> Ibid.

<sup>8</sup> Alexander Howard to Harold R. Harris, “Report to the President and Board of Directors,” 3, Harris Papers, WSUSCA.

acres the efficient control secured in this country, where it never rains, made necessary the use of only 29,652 acre applications,” grossing \$108,299.45 income.<sup>9</sup> Harris, not surprisingly, “found cotton dusting in Peru a very satisfying experience.”<sup>10</sup>

The presence of especially designed commercial aircraft in Peru was a manifestation of Peruvian modernity not overlooked at the highest levels of the government. “At the personal request of President Leguía,” Harris commented, “an exhibition of airplane dusting was given. This exhibition was attended by the President, his Cabinet, high Army and Navy officials, and leading planters of Peru.”



Harold R. Harris meets Peruvian President Leguía.  
Photograph courtesy Special Collections & Archives Wright State University

---

<sup>9</sup> Ibid..

<sup>10</sup> “Panagra,” 12, file 12, box 12, Harris Papers, WSUSCA.

Huff Daland Dusters, Harris said, was “officially welcomed” by the president.<sup>11</sup> In a photograph of their meeting, Harris’s broad shoulders and stocky build contrasts sharply with the diminutive figure of President Leguía -- even while wearing his high silk top hat.<sup>12</sup>

The exhibition coincided with a ceremony to honor aviation graduates of the Escuela Militar de Aviacion held on January 29, 1927, at Las Palmas.<sup>13</sup> The Director of Aeronautics for Peru, Commandante Juan O’Connor, was likely an acquaintance of Harris. O’Connor was a graduate of the army’s flying school at Kelly Field in San Antonio, Texas, where he trained with Charles A. Lindbergh and Eugene Stevens, one of Huff Daland Dusters’s original pilots, hired by Harris in 1925.<sup>14</sup>

The demonstration was given by Harris and Alexander flying in formation and simulating the technique used to treat cotton by passing low over the ground, dispensing dust as they flew before the observers. Then Harris, an “experto piloto” according to newspaper accounts, performed some loops and other aerobatics against a blue sky, totally clear of clouds.<sup>15</sup> It must have been a good show. Harris reported that “the dusting exhibition so impressed the National Government that they immediately requested [Huff Daland Dusters] assistance in combating a serious infestation of caterpillars which were

---

<sup>11</sup> “Report to the President and Board of Directors,” 2, Harris Papers, WSUSCA. The quotation is attributed to Harris because he is the only person who could speak to this material in the report.

<sup>12</sup> Photograph album, Harris Papers, WSUSCA.

<sup>13</sup> *El Comercio*, Feb. 2, 1927. Ibid.

<sup>14</sup> Eugene Stevens, interview, Lawrence Michaud, Casper, WY, Feb. 1984, transcript in author’s possession.

<sup>15</sup> *El Comercio*, Feb. 3, 1927.

defoliating the trees of the beautiful public parks in Lima.”<sup>16</sup> This situation is reminiscent of Neillie’s problem and idea, in the spring of 1921, to use airplanes to spray the tops of trees in a Cleveland city park. His inspiration led to the development of aerial applications in agriculture. Harris recalled, “Lima wasn’t a very high-rise city in those days; I suppose the highest building was the hotel which was about five stories high,” which made dusting relatively easy and “we cut down on the defoliation very much.”<sup>17</sup>

While Harris was in Peru, an event occurred that had a significant bearing on the development of airways in South America. This was the U. S. Army Air Corps Pan American Good Will Flight under the command of Maj. Herbert A. Dargue. A flight of five Liberty engine powered Loening amphibians, each with a crew of two officers, was on a survey flight “to show the possibilities for establishing aerial transportation and communication in Latin America” when it landed at Las Palmas airfield in Lima to deliver a message from President Calvin Coolidge.<sup>18</sup> Unlike the chilly receptions and “unpleasant incidents” that had occurred in Mexico, Guatemala, and Colombia, the crews were warmly received by Peruvian officials. They and the United States ambassador, Miles Poindexter, met the crews at the field. That the United States was arbitrating the Tacna-Arica territorial dispute among Chile, Peru, and Bolivia, and because the United States supported the Leguía dictatorship added to the welcoming atmosphere.<sup>19</sup> A formal

---

<sup>16</sup> “Report to the President and Board of Directors,” 2, Harris Papers, WSUSCA.

<sup>17</sup> Harold R. Harris, interview, Alta May Stevens, Sept. 1, 1980, transcript in author’s possession.

<sup>18</sup> Maurer Maurer, *Aviation in the U. S. Army, 1919-1939* (Washington, D.C., Office of Air Force History, U.S. Air Force, 1987), 255-56.

<sup>19</sup> Newton, *Perilous Sky*, 94.

black-tie banquet at the Hotel Bolivar was given in their honor.<sup>20</sup>

The army officers on the Good Will Flight were “old Air Corps buddies” of Harris, and he “spent a good deal of time with them discussing the problems that they had encountered coming from the United States through Central America, Colombia, Ecuador and through Peru.”<sup>21</sup> These conversations gave Harris a unique insight into the challenges of establishing a commercial air link between North and South America. The army mission clearly demonstrated a route was practical, but whether it was also economical remained an open question. Two Loenings (only one of the original aircraft completed the entire circuit) returned to the United States in May 1927. In his report Dargue concluded “the future of airlines in Latin America was bright, but such lines would not at first pay for themselves. It would take time for the populaces to become accustomed to air travel.”<sup>22</sup> Perhaps the most important outcome of the flight was its effect on government policy. In a speech before the Inter-American Aviation Conference meeting in Washington, D.C., William P. MacCracken, Jr., assistant secretary of commerce for aeronautics, predicted “with the cooperation of business and industry, an airline would soon be established over a ‘major portion’ of the route covered by the Pan American Flight.”<sup>23</sup>

Apparently Harris was thinking along these lines as well. “No meeting, just wandering around,” he informally asked “various businessmen” if an airmail service would be of any benefit to them. From these conversations a certain amount of business,

---

<sup>20</sup> *Mundial* (Lima, Peru), Feb. 11, 1927.

<sup>21</sup> “Misc. Speeches given by Harris,” folder 12, box 12, Harris Papers, WSUSCA.

<sup>22</sup> Newton, *Perilous Sky*, 99.

<sup>23</sup> *Ibid.*

such as the “movement of funds,” was likely, but the main concern was whether the volume of mail would be sufficient to support such an endeavor. Harris was confident it “would pay its way in [the] final analysis,” but the problem would be with financing.<sup>24</sup>

Meanwhile, in the northern hemisphere during the spring planting season, the Mississippi River, swollen from winter runoff and unusually heavy rainfall, crested its banks and caused the infamous 1927 flood. Water broke through protecting levees and surged into the heart of the Delta. “At 12:30 P.M., Thursday, April 21, [Major John] Lee [the Vicksburg District Army engineer] wired General Edgar Jadwin, head of the Corps of Engineers, ‘Levee broke at ferry landing Mounds Mississippi eight A.M. Crevasse [a break in the levee] will overflow entire Mississippi Delta.’”<sup>25</sup>

The following day President Coolidge appointed commerce secretary Herbert Hoover to lead a national flood relief effort.<sup>26</sup> As overall administrator, Hoover set policy, but he delegated responsibility to local boards and the Red Cross for executing and overseeing the process. Thousands of refugees needed assistance. The Red Cross met the challenge and ran 154 tent cities, caring for 325,554 people. Mostly African-Americans lived in tents, some up to four months, while whites generally lived outside the camps. All were fed and clothed by the Red Cross.<sup>27</sup>

Huff Daland Dusters, suffering no damage from the flooding, augmented the Army Air Service effort and flew thirty hours in support of aerial relief operations. “With the oncoming flood survey trips were called for by the River Engineers in Monroe to

---

<sup>24</sup> “Misc. Speeches given by Harris,” Harris Papers, WSUSCA.

<sup>25</sup> Barry, *Rising Tide*, 201.

<sup>26</sup> *Ibid.*, 262.

<sup>27</sup> *Ibid.*, 286.

forecast the full danger and later, as the country became inundated, work was done in conjunction with the Red Cross in locating isolated families, the carrying of physicians, anti-toxins and medicines to the refugee concentration camps. Trips were also made for State Military Officials in charge of flood relief.”<sup>28</sup> The company’s generosity was widely appreciated, earning the dusters “a great deal of good will.”<sup>29</sup>

For his part in responding to the crisis, LeRoy Percy used his influence and political ties to keep Delta banks solvent and money flowing to planters during the emergency. But, he knew relief had to come quickly for Delta laborers.<sup>30</sup> As with the boll weevil threat Percy was fearful “the [overflowing] river would send blacks flooding north, stripping the Delta of labor.”<sup>31</sup> With his acquiescence LeRoy’s son, William Alexander Percy, was named head of a “special flood relief committee.” This position, “coupled with his chairmanship of the county Red Cross, gave Will near absolute control over the county during the emergency, and over the care of tens of thousands of refugees.”<sup>32</sup>

Will Percy wanted to evacuate blacks to safer ground and thought he had the support of other committee members, but his father undermined his decision. LeRoy feared the blacks would never return and lobbied behind his son’s back to have the evacuation plan rejected. Blacks were forced to remain in camps on the levees under poor conditions. When the floodwaters finally receded, black resentment for the way they were

---

<sup>28</sup> “Report to the President and Board of Directors,” 10, Harris Papers, WSUSCA.

<sup>29</sup> Ibid.

<sup>30</sup> Barry, *Rising Tide*, 206.

<sup>31</sup> Ibid., 304.

<sup>32</sup> Ibid., 302.

treated forever ended “the bond between the Percys and the blacks” in the Delta. In the opinion of one author, the Delta then became “the land where the blues began.”<sup>33</sup>

LeRoy Percy’s great fear was finally realized. “One man at a time, one family at a time, in an accelerating flood, blacks left Greenville and the Delta and did not return.”<sup>34</sup> As threatening as the boll weevil had seemed to Percy, it could be managed. On the other hand, the mighty Mississippi River, yet untamed and from the social and economic catastrophe it caused, proved to be Percy’s ultimate nemesis. He died two years later in 1929.

Drowned fields and falling cotton prices simultaneously challenged Huff Daland Dusters North American operation for the year. Only 7,800 acre applications were performed in the flooded region, compared to 45,000 the previous year. Planters, realizing a negative return on investment for the sale of cotton in 1926, experienced what amounted to a “financial depression.” As a consequence, growers were “not only unwilling, but unable to make any forward looking commitments” by signing advance contracts for 1927. Woolman, with the cooperation of the operating personnel, responded aggressively to the situation, and Huff Daland Dusters treated cantaloupes against powdery mildew in the Imperial Valley, California, and dusted truck farms in Mexico.<sup>35</sup> Cotton operations were conducted in Texas and near Shreveport. Opportunities though, as they materialized, were “more or less in the nature of emergency dusting as people were very loath to contract for service except as the Weevil or Leaf Worm put in their

---

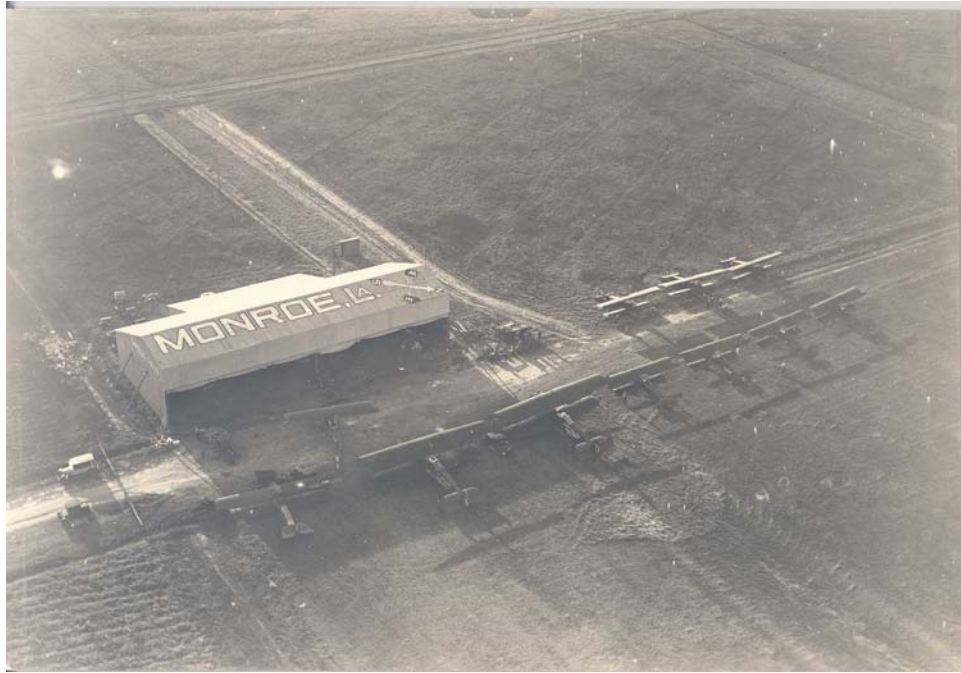
<sup>33</sup> Ibid., 334.

<sup>34</sup> Ibid., 416.

<sup>35</sup> “Airplane Cotton Dusting for Caddo,” *Shreveport*, Shreveport Chamber of Commerce, June 1927; “Another Service of the Airplane,” *Standard Oil Bulletin*, August 1926, folder 9, box 1, RG01.01, DALCA.



appearance.” To get a planter’s signature “was possible only at a considerable reduction of price” from \$4.85 to \$3.50 for three applications, including dust, under the standard contract.<sup>36</sup>



Smoot field. Note two large dusters in front of hangar.  
Photograph courtesy of Delta Air Lines Corporate Archives

As if the situation were not bad enough, the possibility of protecting late cotton was proscribed by a second rise of floodwater in the Delta in June.<sup>37</sup> Then, on July 18, a tornado completely destroyed the hangar at Smoot Field in Monroe, severely damaging ship number 61, which had just been refurbished and test flown, further handicapping normal operations. Two other aircraft belonging to the Department of Agriculture were also severely damaged. Most likely these were stored temporarily due to flooding at Scott Field in Tallulah. To make up for the government’s loss, Huff Daland Dusters sold the

---

<sup>36</sup> “Report to the President and Board of Directors,” 7, 8, Harris Papers, WSUSCA.

<sup>37</sup> Ibid., 10.

Pelican duster to the Delta Laboratory as a replacement, providing some additional income to the company.<sup>38</sup>

To help recover from the tornado, the city of Monroe immediately built a workshop and supplied three tent hangars, at no cost to the company. These proved to be temporary measures only. The limitations of Monroe's Smoot Field site gained urgency after Lindbergh's May 1927 flight to Paris. Overnight, communities across the country, including Monroe and others in the Cotton Belt, became more air-minded. The Memphis and Shreveport chambers of commerce made offers for Huff Daland to shift its operating headquarters to their respective cities. Shreveport's offer included a hangar and repair building "completely acceptable to you," available by January 1, 1928, and the local chamber of commerce was willing to cooperate "in the establishment of airmail express lines or commercial passenger lines."

Memphis, Tennessee promised "a dandy Municipal Field" with "free rent and sufficient hangars for five full years." R. B. Snowdon, chairman of the Chamber of Commerce Committee of Memphis, touted the location "as the center of the poisoning World. An office on Front St. with one man in it will sell more dusting contracts than all your traveling men and expenses put together."<sup>39</sup>

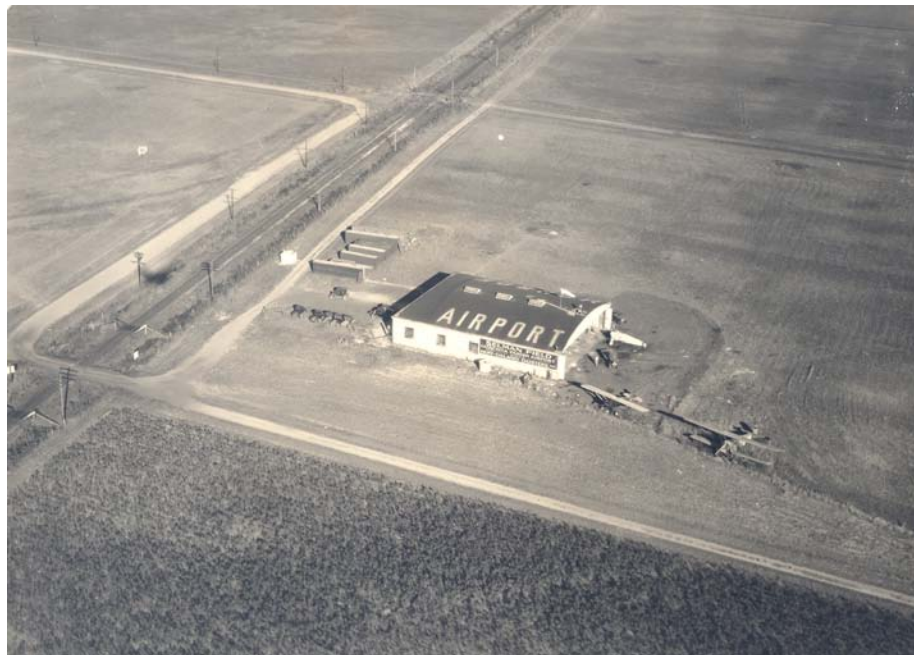
Monroe's proposal was more advanced than its challengers. The city and parish jointly bought a new 140-acre airport site five miles east of the city and plans were already approved for the "immediate construction" of a hangar. Theodore F. Terzia,

---

<sup>38</sup> Ibid., 12. The Pelican is described as "a convertible five-purpose Navy training plane suitable for all military requirements in its class" in a Keystone Aircraft Corporation publicity flyer, folder 5, box 1, RG01.01, DALCA.

<sup>39</sup> "Report to the President and Board of Directors," 15-17, Harris Papers, WSUSCA.

president of the Ouachita Parish Police Jury (similar to a county commission), anticipated airmail service “at some near future date.” Terzia emphasized “the landing field and hangar facility has already been inspected and approved by Lieut. Harris, Messrs. Woolman, Auerbach, Culver, and Dr. Coad...as well as numerous air pilots of the Kelly Field.” He praised the “splendid type of gentlemen that is and has been associated with” the Huff Daland Dusters organization and hoped the airport would “serve as a permanent home for your industry.”<sup>40</sup> The new airfield was named after Augustus James Selman who had died in an airplane crash shortly after the armistice and was “the only Monroe aviator to die in service during World War I.” Huff Daland Dusters relocated to Monroe’s new Selman Field in October.<sup>41</sup>



Selman Field with shipping crates ready for Peru.  
Photograph courtesy of Delta Air Lines Corporate Archives.

---

<sup>40</sup> Ibid., 15-18.

<sup>41</sup> *Ouachita* (Monroe, Louisiana) *Citizen*, March 9, 1983.

Due to the depressed agricultural situation in the United States, it was necessary to return only two of the five duster aircraft located in Peru to Monroe, at a considerable savings in shipping costs.<sup>42</sup> Storage costs were nominal. Lt. Cdr. Harold B. Grow of the United States Naval Mission estimated overhauling aircraft in Peru would cost approximately \$650, with materials and spares provided, versus \$3500 (all inclusive) per airplane in the United States. This was “not excessive by any means,” Grow wrote to Harris, though what work was done is not known.<sup>43</sup> All personnel, except Harris and the entomologist, J. B. Pope, returned to the United States. Alexander, on his way to the embarkation harbor at Cerro Azul, had a difficult time. “After haveing [sic] three flat tires, and abusing our vocabulary with each one, we managed to get here last night at eight o’clock.” His note to “Harry [Harris)]” covered last minute details before sailing, and he concluded with the pronouncement, “our boat does not arrive until Saturday morning, however, every thing is ready to go now.”<sup>44</sup>

Pope stayed on in Peru to make a “preliminary survey of those valleys to the north to which operations might be extended, and investigated the entomological problems and possibilities of our operations on cotton, sugar cane, and cocoa in the northern valleys of Peru and southern Ecuador.”<sup>45</sup> Harris stayed to arrange advanced contracts for 1928, extend the company’s customs and tax exemptions, and follow up on the sale of Keystone mail planes for the LaMerced-Iquitos Air Mail Route.

---

<sup>42</sup> “Report to the President and Board of Directors,” 7, Harris Papers, WSUSCA.

<sup>43</sup> Lt. Cdr. Harold B. Grow to Harold R. Harris, April 12, 1927, folder 12, box 1, RG01.01, DALCA.

<sup>44</sup> Marvis L. Alexander to Harold R. Harris, May 11, 1927, folder 12, box 1, RG01.01, DALCA.

<sup>45</sup> “Report to the President and Board of Directors,” 4, Harris Papers, WSUSCA.

In May and part of June, Harris closed contracts on 22,330 acres in Peru for the 1928 season. The acreage was about equal to that for 1927, but it was thought another 7,000 to 10,000 acres would be secured for the coming season. Because cotton prices had fallen below the cost of production, commitments were only possible at a reduced price of \$31.00 per fanegada, from \$43.00, although a performance bond and other “protective clauses,” previously inclusive, now required additional payment.<sup>46</sup> The conditions were all spelled out in a comprehensive Spanish/English language “Standard Contract for Airplane Dusting Service in Peru” agreement between Huff Daland Dusters, Inc. and the planter. Clauses stipulated the area of a “fanegada” was 30,000 square meters (7.41316 acres) and,

2. Identification of each field shall be by name of Hacienda and number of field according to map, sketch, photograph, or written description and such identification signed by both parties hereto shall become part of the contract.

3. Measurement of areas shall be upon the basis of statement of the Planter with privilege of checking by the Company.<sup>47</sup>

Pedro Martinto, Inc., a firm representing North American companies such as International Harvester, Inc. and Babcock & Wilcox, Ltd., was retained to handle Huff Daland Dusters’s interests, on a commission basis, when a company representative was not available in the country. This firm maintained offices and agents in agricultural districts and apparently was successful in securing some additional contracts. As of November 1, 1927, a total of 3567 fanegadas (26,443 acres) had been contracted for

---

<sup>46</sup> Ibid.

<sup>47</sup> “Standard Contract for Airplane Dusting Service in Peru,” folder 6, box 3, RG01.01, DALCA.

1928.<sup>48</sup>

Woolman, while on his 1926 survey to Peru, had petitioned for a government exemption of customs duties on airplanes, insecticides, and parts, and to “liberate” the company from paying any taxes. Harris followed up on this initiative during the operating season. After some delay, a law finally passed exempting the company from import fees and extended an “introductory patent” for taxes. President Leguía signed the papers, but the patent still required the signature of the Ministerio de Fomento at the close of the operating season. Regardless, a stipulation in the service contract permitted the company to claim an additional fee per fanegada from planters, to make up for the difference, if the exemption remained unsigned.<sup>49</sup>

Woolman had previously opened discussions with the government on the sale of mail planes for the LaMerced-Iquitos route. A cable from Keystone on January 27, 1927, to Huff Daland Dusters in Peru, presumably received by Harris, requested “every effort be made to close the contract” with Commander Grow. A meeting on March 9 resulted in a formal agreement with the Keystone Aircraft Corporation, but finalizing the details of the transaction and credits took considerably longer to complete.<sup>50</sup> In this and other matters, Harris, as the front man for Huff Daland and Keystone in Peru, likely spent most of his time in Lima and left it to the operating crews to work independently in the field. Apparently this was not a problem. *The West Coast Leader* had high praise for “Messrs. Elliot, Tobin, and Alexander, of the Pilot Staff of the Company, [who] answer every

---

<sup>48</sup> “Peruvian Contracts - 1928,” folder 3, box 3, RG01.01, DALCA.

<sup>49</sup> “Standard Contract for Airplane Dusting Service in Peru,” folder 6, box 3, RG01.01, DALCA.

<sup>50</sup> “Report to the President and Board of Directors,” 6, Harris Papers, WSUSCA. The contract was for the Keystone Pelican (Pronto) aircraft discussed in Chapter 6.

requirement of knowledge, training and experience” and the skilled mechanics who “keep the aeroplanes in perfect condition.”<sup>51</sup>



Harold R. Harris (on right) in Peru  
Photograph courtesy of Delta Air Lines Corporate Archives

As a final task, in returning to the United States, Harris made what he called a “cooperative survey trip for the Keystone Aircraft Corporation and the Huff Daland Dusters, Inc.” through Bolivia, Argentina, Uruguay, and Brazil. He stopped “at each nation’s capital long enough to determine whether there was any interesting crop dusting possibilities and particularly whether or not local people thought an airline would be a good idea to connect their center with the other world centers and minimize

---

<sup>51</sup> *The West Coast Leader*, April 5, 1927.

transportation time required.”<sup>52</sup> In his travels, Harris experienced the undeveloped state of transportation on the continent. “Nearly all internal lines of surface communication reach from their interior regions of agriculture and mineral production to seaports from which raw materials are shipped abroad. The land routes which connect one region of concentrated settlement with another, even within the same country, are poorly developed.”<sup>53</sup> How much time he spent in transit is not known, but Harris’s description of his route gives an indication that it was time consuming.

I traveled by steamer from Callao, the port of Lima, to Mollendo, the point where the railroad starts up into the Andes, to Puno on Lake Titicaca. I took the train from Mollendo to Lake Titicaca where I got on a small steamer<sup>54</sup> and made a night voyage to the Bolivian port, Guaqui, on the lake. I transferred to a railroad again and went down the short distance into La Paz, the capital of Bolivia. From La Paz, I took the train south on the altiplano, the level plain over 12,000 feet above sea level, to Uyuni, Bolivia. At Uyuni the railroad splits, the west branch going on to Santiago, Chile, and the east branch going across the Argentine to Buenos Aires. From Buenos Aires I took a night boat to Montevideo. From Montevideo I took the steamer to Santos in Brazil, the port of Sao Paulo. From Sao Paulo I took the train to Rio. From Rio, steamer to New York.<sup>55</sup>

Harris departed from Lima on June 15. He spent July, August, and September traveling and making contact with embassies, bankers, and businessmen.<sup>56</sup> His timing could not have been better. Lindbergh’s flight across the Atlantic in May was “widely

---

<sup>52</sup> “Report to the President and Board of Directors,” 6; “Draft Sept 85,” folder 7, box 3, both in Harris Papers, WSUSCA.

<sup>53</sup> William A. M. Burden, *The Struggle for Airways in Latin America* (New York: Arno Press, 1977), 8.

<sup>54</sup> It was probably the 228-foot-long *Inca* built in England and brought to Lake Titicaca in sections and assembled. See Stewart E. McMillin, “The Heart of Aymara Land,” *National Geographic Magazine*, Vol. 51 (February 1927): 256.

<sup>55</sup> “Draft Sept 85,” file 7, box 3, Harris Papers, WSUSCA.

<sup>56</sup> “South America Survey Trip,” 1, file 3, box 15, Harris Papers, WSUSCA.



reported throughout Latin America.”<sup>57</sup> No longer was flying something people did for thrills or an activity relegated to the military. Airplanes had a purpose. Lindbergh proved they could safely cover great distances across wide oceans and inhospitable land masses quickly and safely. In his travels, Harris, a record-holding pilot himself and aircraft company representative, benefited from Lindbergh’s acclaim.<sup>58</sup>

Harris was particularly praiseworthy of progress in Argentina.

Argentina has a keen air service, both in the Army and Navy. It has excellent, up to date machinery and the Army and Navy stations are very modern and remarkably well equipped.

When the Government factory starts production next year I believe the airmen will try for records in long distance flights on a big scale. The only reason they have not done so hitherto is because they do not want to use foreign equipment, but prefer to wait and make the distance records with their own national products.<sup>59</sup>

In 1925 the Argentine government began investing in equipment, airport construction, and the “establishment of an indigenous aviation factory in Cordoba.” Located approximately four hundred miles northwest of Buenos Aires, the facility was “the first aviation factory established in South America.” According to author Dan Hagedorn, “Argentina led all other Latin American nations by far in the advancement of military, naval, and civil aviation at this point.”<sup>60</sup> This fact was not lost on Harris.

In Buenos Aires, Harris contacted the Department of Agriculture and presented an offer to treat “their terrific locust pests.” Negotiations were well advanced and “a

---

<sup>57</sup> Hagedorn, *Conquistadors of the Sky*, 217.

<sup>58</sup> Obituary of Harold Ross Harris, *New York Times*, July 29, 1988.

<sup>59</sup> *Buenos Aires Herald*, July 24, 1927; “Newspaper and Scrapbook,” Harris Papers, WSUSCA.

<sup>60</sup> Hagedorn, *Conquistadors of the Sky*, 219.

program thoroughly worked out” when an outbreak occurred in the province of Cordoba. It seemed to be an ideal situation for Huff Daland, but the Minister of Agriculture “decided not to carry out this year the experiments proposed by you for combating the locusts by means of airplanes because the season is so advanced for this work.”<sup>61</sup> Locust control by airplane had been tried in Argentina the previous year but it was found “no real success has been secured by airplane dusting against locusts after they have reached the migratory stage.”<sup>62</sup> An unknown type of aircraft was used in Santa Fe province, “one of the earliest known instances of such work in mainland South America,” which, it should be noted, predated Huff Daland’s work in Peru.<sup>63</sup>

When he left Buenos Aires, Harris took the night boat across the Rio de la Plata to Montevideo, Uruguay. Curiously he chose to go by ship, although air service was available in trimotor Junkers G-24s on floats. Flights operated three times a week between March 4, 1926, and October 10, 1927.<sup>64</sup> Of all his travels in Latin America, this was the only segment he could actually have flown commercially. Undeniably he was aware of the opportunity because he studied the operation and determined the German company was “just about making expenses.”<sup>65</sup> Possibly he did not feel the \$20.00 fare was justified, or perhaps the airplane, capable of carrying four passengers, was booked.<sup>66</sup> Or, as a veteran of World War I flying Caproni bombers in Foggia, Italy, he was adverse

---

<sup>61</sup> J. E. Varanona to Harold R. Harris, August 27, 1927; “South America Survey Trip,” 3, file 3, box 15, both in Harris Papers, WSUSCA.

<sup>62</sup> “South America Survey Trip,” 3-4, Harris Papers, WSUSCA.

<sup>63</sup> Hagedorn, *Conquistadors of the Sky*, 219.

<sup>64</sup> *Ibid.*, 218.

<sup>65</sup> “South America Survey Trip,” 7, Harris Papers, WSUSCA.

<sup>66</sup> Hagedorn, *Conquistadors of the Sky*, 211.

to supporting the German-backed enterprise.<sup>67</sup> Possibly he simply had too much baggage. Whatever the reason, he could have opted for the flight, but did not.

At each major city Harris met with businessmen and bankers on the benefits of airmail service between Latin American capitals and the United States. In his discussions, he focused on the possibility of the mail “paying for itself in poundage [of] mail carried.”<sup>68</sup> Harris said his “inquiry among bankers and business men of South America indicated that no objection would be made to a charge of \$1.00 per letter for air mail between the United States and any point in South America and that the proposition, which I put before them, of guaranteeing a certain amount of business each trip would meet with favor.”<sup>69</sup>

Harris understood that airmail between major commercial centers was the key to air routes. William A. M. Burden, an authority on the development of commercial aviation in Latin America, points to late 1927 as the end of the pioneer period. Harris’s trip presages the period of trunk route development, which Burden says began in 1928.<sup>70</sup> With insight gained from his flying background and familiarity of conditions in South America, Harris drew an air route map “showing how to get started, and describing later expansion,” keeping in mind that “planes then had only about a 600 mile range.”<sup>71</sup> He further articulated a blueprint for development.

---

<sup>67</sup> Obituary of Harold Ross Harris, *New York Times*, July 29, 1988.

<sup>68</sup> “Misc. Speeches given by Harris,” Harris Papers, WSUSCA.

<sup>69</sup> “South America Survey Trip,” 14, Harris Papers, WSUSCA.

<sup>70</sup> Burden, *Struggle for Airways in Latin America*, 15.

<sup>71</sup> Harold R. Harris, “Sixty Years of Aviation History One Man’s Remembrance,” Lecture, Tenth Annual Northeast Historians Meeting, Windsor Locks, Conn. Oct. 12, 1974, IRIS #01042146, AFHRA.

I have made a preliminary study of various air mail routes from South America to the United States. While these lines present themselves as a comprehensive whole in their final development there is no reason individual sections may not be initiated and operated independently until such time as the fulfillment of the entire project seems feasible. On the attached map there is roughly indicated the most advantageous routes, taking all things into consideration, and the lines most easily and cheaply installed are numbered in order of their installation.<sup>72</sup>

Geography favored development of a west coast route to Latin America. The North American and South American continents are offset to each other so that “when a ruler or a piece of string is placed between New York and Buenos Aires, the straightest, shortest route is seen to follow along the Pacific coast of South America to Chile and over the mountains to Argentina.”<sup>73</sup> By flying point-to-point, even when aerial navigation was rudimentary and aircraft lacked endurance, an airline could efficiently serve population centers not connected by rail lines and transport mail and passengers in competition with slow “mail ships twelve days from Callao to New York.”<sup>74</sup>

---

<sup>72</sup> “South America Survey Trip,” 14, Harris Papers, WSUSCA.

<sup>73</sup> Bender and Altschul, *Chosen Instrument*, 117.

<sup>74</sup> Briggs, *Proud Servant*, 20.

## Chapter 6

### Airmail and the West Coast Project

Due to heavy fog at the mouth of the Gulf of Guayaquil we had to get down close and keep under it. Tobin flew a straight compass course and at times we were 10 to 15 miles out over the gulf which did not please either Woolman or myself, but Tobin knew what he was doing evidently.

Stan Webber, in a letter to his wife, July 30, 1928

The problem of financing airway development all but disappeared in the euphoric aftermath of Lindbergh's flight. "Business and government circles, hitherto conservative," historian William Burden writes, "became more sympathetic toward air transport projects."<sup>1</sup> Historian Robert van der Linden's view is less sanguine. He observes aeronautical investing as irrational; "part of the public feeding frenzy in the stock market."<sup>2</sup> Under the circumstances, Edgar N. Gott, president of Huff Daland Dusters in Bristol, Pennsylvania, made a pragmatic decision. In a letter dated September 30, 1927, he directed subordinates to submit a report on current and future operations for the company. Gott was apparently looking for ideas and opportunities, and who better to ask than the operations staff, which included Woolman, Harris, and Auerbach? The report, dated October 26, summarizes Huff Daland Dusters's operations through September and includes an analysis and recommendations for a significant "extension of

---

<sup>1</sup> Burden, *Struggle for Airways in Latin America*, 22.

<sup>2</sup> F. Robert van der Linden, *Airlines and Air Mail: The Post Office and the Birth of the Commercial Aviation Industry* (Lexington: University Press of Kentucky, 2002), 36.

activities.”<sup>3</sup> Harris attached a summary of his recently completed Latin American survey.

The report confirms that dusting operations were profitable. On an hourly basis, Huff Daland Dusters earned an average of \$298.50 per hour for dusting within the United States. In Peru the income was an extraordinary \$729.00 per hour. For all flying hours, including dusting and other activities, the average gross income was somewhat less--\$201.00 per hour in the United States and \$528.00 in Peru. These figures compare favorably to those from carrying the mail. “The average income for all air mail contracts, as disclosed in the June 30<sup>th</sup> figures issued by the Department of Commerce, [was] 55¢ per mile, or \$55.00 per hour, and for the Western Air Express--the most successful operator of \$1.40 per mile or \$140 per hour.”<sup>4</sup>

From these numbers it would seem that agricultural applications were worthwhile and should be expanded, but there were systemic problems with Huff Daland’s dusting operation. For one thing, pilot utilization was inefficient. Only 20 percent of pilot days were being used for actual dusting.<sup>5</sup> A considerable amount of pilot productivity was being lost from inactivity, and therefore was potentially available for other aerial purposes. Another problem was with the Huff Daland type of aircraft being used. The company operated two designs, a small type, the Petrel 31--powered by a 200HP Wright Whirlwind J-4--cost \$14,000 and a large type, the duster 1--with a 400HP Liberty engine--that cost \$20,000. The smaller one was useful for fields of all sizes. The larger machine was designed for fields with long, straight runs, but in practice it was found to be

---

<sup>3</sup> Irwin E. Auerbach to Edgar N. Gott, Oct. 25, 1927, in “Report to the President and Board of Directors,” Harris Papers, WSUSCA.

<sup>4</sup> “Report to the President and Board of Directors,” 19, Harris Papers, WSUSCA.

<sup>5</sup> Ibid. “Working days” predates “flying hours” as a measure of pilot productivity. Government regulations, labor contacts, and round-the-clock operations led to the change.

“capable of accomplishing less than 15% more dusting than the small duster in a given elapsed time and required increased maintenance and an increase in loading crew.”<sup>6</sup>

Although the small duster was more versatile, its cost was nonetheless significantly higher than newer machines currently being manufactured.

Competitors, seeking an edge, could choose from cheaper production models. Although half as capable as the Petrel 31, a suitable airplane might be bought at one-quarter the cost.<sup>7</sup> A single pilot, or small group of pilots, could easily get financing and undercut Huff Daland Dusters’s prices. For Huff Daland Dusters to continue to be profitable in such a competitive environment, the Gott report recommended the company replace its fleet with “cheap production airplanes and engines.”<sup>8</sup>

Pilot retention was a concomitant issue. Woolman, Harris, and Auerbach warned that “there is the constant danger of present personnel entering this field in competition with this company.”<sup>9</sup> With available financing and cheap aircraft, they cautioned, their pilots might be tempted to operate independently. In fact, an isolated example (not mentioned in the report) proved the point. Eugene Stevens, one of the original duster pilots hired by Harris in 1925, who, having had a falling out with him over a disputed \$60.00 Model T pickup repair bill, quit Huff Daland and started the Southern Dusting Company, Inc. He bought a WACO 9 for “about sixteen hundred dollars” and modified it

---

<sup>6</sup> Ibid., 20.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid., 24.

and three additional airplanes for dusting purposes.<sup>10</sup> Stevens operated out of Scott Field in Tallulah.

Looking to the future, the Gott report recommended duster management take steps to diversify its operation. “Chief among these is Air Mail, because of its present rapid expansion and the opportunity to enter this important field at a time when main arterial routes are still to be had.” The paper suggested the present aircraft inventory could easily be converted to use as mail planes until, at some point, they would be replaced with new, more specifically designed Keystone aircraft. In light of future developments, the authors’ recommendation was prescient: “the Operating Group has come to the conclusion that the Company should bid on air mail contracts, and hereby requests authority to do so.”<sup>11</sup>

To diversify the company’s operation even further, the report suggested opening a flying school, which would also permit “the carrying of passengers on short flights, or on special trips.” And the operations staff wanted permission to sell Keystone equipment “in such types of ships they [might] manufacture.” In the meantime “we believe it advisable to carry in addition the agency of some production type airplane of other manufacture.”<sup>12</sup> Preliminary negotiations, the report disclosed, had already been “in progress for some time with the Fairchild organization,” which would “add another source of income.”<sup>13</sup> The potential of aerial photography was probably the reason for these talks. The Fairchild

---

<sup>10</sup> Stevens, interview. \$33.55 is carried as a bad debt from Eugene Stevens in Account #70, Ledger Book, folder 2, box 2, RG01.01, DALCA.

<sup>11</sup> “Report to the President and Board of Directors,” 21-22, Harris Papers, WSUSCA.

<sup>12</sup> Ibid., 23.

<sup>13</sup> Ibid., 22.



Aviation Corporation was formed in November 1927 to market aircraft, engines, cameras, and aviation services in the United States, Latin America, and Europe.<sup>14</sup>

Diversification, to “supply the necessary foundation for large scale operation,” was the key underlying strategy of the Gott report.<sup>15</sup> Even when considering the loss of business from the Mississippi flood and the drop in world cotton prices, the company realized an operating profit of \$14,274.79 for the 1927 dusting season. Nevertheless, this was “not sufficient to absorb the entire overhead for the non-operating period.”<sup>16</sup> To be profitable the company had to broaden its revenue stream and to spread it out over the entire year.

The salient point of the Gott report, understood by its authors (as their subsequent actions suggest), was its argument in favor of scheduled commercial service with a mail subsidy and the potential of passenger revenue. A copy probably found its way to the desk of Richard Hoyt in New York. As the aviation expert with Hayden Stone, he represented the controlling financial interest behind the Keystone Aviation company, of which Huff Daland Dusters was a subsidiary. It was not immediately apparent at the time, but the Gott report signaled the beginning of the end for Huff Daland Dusters. Commercial aviation’s future was with scheduled air service, not crop dusting, and within a year Hoyt would divest the company from his portfolio.

Hoyt had a larger vision of aviation’s future than the Gott report contemplated and was a central figure merging the interests of Keystone, Huff Daland Dusters, and Pan

---

<sup>14</sup> Van der Linden, *Airlines and Air Mail*, 23, 52-53.

<sup>15</sup> “Report to the President and Board of Directors,” 24, Harris Papers, WSUSCA.

<sup>16</sup> *Ibid.*, 8-9.

American Airways, which led to the emergence of Delta Air Service, Peruvian Airways, and ultimately Pan American Grace Airways (Panagra). Hoyt's involvement can be traced back to the recapitalization of the original Huff Daland company into Keystone Aviation in 1926.<sup>17</sup> Ironically, given his preeminent role, he was not one of Pan American's original founders--neither was Juan Trippe, for that matter. An understanding of Pan American's early development is essential to the emergence Delta Air Service.

Pan American Airways began as a project of a group of American military officers, led by a concerned Army Air Corps intelligence officer, Major Henry H. ("Hap") Arnold, to prevent the award of foreign (over American) flight privileges of the Panama Canal by the Post Office Department. German interests were behind SCADTA, an early Latin American airline that sought authority to carry U. S. mail to Colombia through Cuba and Panama. According to Postmaster General Harry S. New, a contract could conceivably be granted to a foreign company, unless there was an American line capable of performing the service.<sup>18</sup> Arnold who would later testify for Gen. Billy Mitchell at his court martial for insubordination, decided to remain on active duty, thus forgoing what could have been an influential career in civilian aviation.<sup>19</sup>

Pan American Airways was incorporated in New York state on March 8, 1927, by John K. Montgomery, C. Grant Mason, Jr., and financier Richard B. Bevier.<sup>20</sup> On July 16, 1927, the Post Office awarded Montgomery a personal contract to carry U. S. mail

---

<sup>17</sup> *Bristol (Pennsylvania) Courier*, Nov. 8, 1926.

<sup>18</sup> Bender and Altschul, *Chosen Instrument*, 84.

<sup>19</sup> Douglas Waller, *A Question of Loyalty: Gen. Billy Mitchell and the Court Martial that Grippped the Nation* (New York: Harper Collins, 2004), 180.

<sup>20</sup> Newton, *Perilous Sky*, 110.

between Key West and Havana. This was later transferred to Pan American Airways. The contract stipulated that service had to begin by October 19 or it would be forfeited.<sup>21</sup> Juan Trippe and a cohort of aviation industrialists likewise coveted the route and had “secured from the Machado government some form of landing rights in Cuba that the Bevier-Montgomery group did not possess.”<sup>22</sup> Hoyt and Trippe, both pilots and acquaintances from prior dealings, combined to force a merger between Trippe’s Aviation Corporation of America and the Pan American people.

Now that they had control, Trippe and Hoyt still had to meet the October 19 deadline to begin the service or lose the mail contract. As the date drew inexorably closer, delivery of the ten-person Fokker FVII--single high-wing, trimotor, land planes--Pan American had ordered was delayed. As it turned out, it did not matter as the landing site, laboriously prepared on a low-lying swampy Key West island, was rendered unusable for wheeled aircraft from recent heavy rainfall. In a frenetic search the resourceful Trippe turned up a Fairchild FC-2 floatplane capable of inaugurating the service. Hastily he hired Cy Caldwell of West Indian Aerial Express and “in a melodrama rivaling any that might have emerged from the script of a Hollywood scenarist the company met the deadline.”<sup>23</sup> At 7:00 A.M., Caldwell showed up at his airplane, loaded seven sacks of mail, and was airborne at 8:04 A.M., as author Robert Dailey exclaims, to save “a tycoon and an Airline.”<sup>24</sup> Soon thereafter Hoyt became “one of the most active

---

<sup>21</sup> Robert Daily, *An American Saga: Juan Trippe and His Pan Am Empire* (New York: Random House, 1980), 29.

<sup>22</sup> Newton, *Perilous Sky*, 112-13.

<sup>23</sup> Newton, *Perilous Sky*, 114.

<sup>24</sup> Daily, *American Saga*, 35.

participants in the new arrangement, eventually to be named chairman of the board of Aviation Corporation of the Americas [not to be confused with Trippe's earlier Aviation Corporation of America], the holding company established in 1928 to control its operating subsidiary, Pan American Airways, Incorporated.”<sup>25</sup>

While the drama of Pan American's founding unfolded, Harold R. Harris was still touring Latin America. From Peru he traced a circuitous route to the United States, along the way evaluating the potential for dusting operations, conferring with air-minded people, and mapping out air routes. By the time Harris arrived in New York by steamer one afternoon early in October, he was well informed on the state of aviation and its prospects in the Southern Hemisphere. The following morning Harris met with Hoyt in his office. He spread his map and figures over the financier's big walnut desk and “hammered home the facts.”<sup>26</sup>

“There it is Mr. Hoyt. The first section we fly is Lima to Talara, with stops in Trujillo, Chiclayo and Piura. It's just along the coast and is practical as your granddad's pants. Then we'll go south to Mollendo, 530 miles. Then from Talara on up through Guayaquil and Buenaventura to the Canal Zone. That will be section three. Then from our base of operations in Peru we'll go down from Mollendo to Valparaiso, 1200 miles or maybe a little more. As soon as we get enough ships and pilots and mechanics, get our bases established and these first sections running smooth, one after the other, we'll put in number five, which goes over the Andes to Mendoza and Buenos Aires.”

“Good gosh!” said Mr. Hoyt, “Over the Andes!--Gimmie a telephone!” He asked for one Juan Trippe. While Mr. Trippe was on his way over, Mr. Hoyt was getting an earful of first-hand facts about ports and mileages and traffic, an eyeful of the short practical sections marked on Captain Harris's well worn map, and a lapful of airplanes and air bases, overhaul shops and greasy mechanics. All of this Mr. Hoyt gracefully unloaded over onto the quiet, soft spoken Mr. Trippe when

---

<sup>25</sup> Newton, *Perilous Sky*, 113.

<sup>26</sup> “Daddy of the West Coast Airlines,” *The South Pacific Mail*, Jan. 28, 1937, “Scrapbook,” Harris Papers, WSUSCA; Gushue Papers; Harris's travel expenses from June 15 to Oct. 15 are listed in the “Duster Journal,” 19, folder 3, box 2, RG01.01, DALCA.

he arrived. Mr. Hoyt pointed to Captain Harris's wrinkled map and said, "This fellow's two years ahead of us."<sup>27</sup>

While the date of Harris's meeting with Hoyt and Trippe is uncertain, the briefing and his route map quite possibly predated, and therefore helped, to shape the vision Trippe outlined to his board of directors at a meeting on October 13.

Trippe read a memorandum presenting a blueprint for the airline's development. Starting from Miami, one trunk line extended to Colón, in the Panama Canal Zone, and down the west coast of South America to Valparaiso, Chile. A second line emanating from Miami cut across Cuba to Puerto Rico and Trinidad, a stepping-stone to the east coast of South America. Trippe said they would organize a national corporation in Cuba to seek mail concessions on the island. In Central and South America, franchises and mail contracts would be secured by the purchase of interests in local companies.<sup>28</sup>

To Hoyt and Trippe, crop dusting was a side show compared to the potential of mail and passenger service in Central and South America. Coincidentally, though, with Harris back in the United States, in keeping with the tag-team pattern they had established, Huff Daland Dusters was prepared to send Woolman to Peru for the 1928 cotton-growing season. With emphasis shifting to airlines and airmail, Woolman was instructed to seek mail and passenger permits both within Peru and between Peru and the adjacent countries of Ecuador to the north and Chile to the south.<sup>29</sup> Discussions likely took place when Woolman was in New York before his departure. Harris, Woolman, Gott, and Trippe attended the Aeronautical Chamber of Commerce of America's banquet

---

<sup>27</sup> "Daddy of the West Coast Airlines," *The South Pacific Mail*, Jan. 28, 1937, "scrapbook," Harris Papers, WSUSCA.

<sup>28</sup> Bender and Altschul, *Chosen Instrument*, 86-87.

<sup>29</sup> "Draft, Sept. 85," 12, file 7, box 3, Harris Papers, WSUSCA.

on November 3, 1927, at the Biltmore Hotel. Congenially, Harris and Woolman were seated at table number one, and Gott and Trippe shared company at table number three.<sup>30</sup> Woolman, with his wife and children accompanying him, likely sailed sometime in November aboard a Grace Line steamship to Lima.<sup>31</sup> The line offered “direct fortnightly passenger service via fast luxurious ‘Santa’ Steamers--modern and spic and span throughout.”<sup>32</sup>

Barbara Woolman Preston, then five years old, remembers going through the Panama Canal and the small adobe house they occupied in Miraflores, on the coast near Lima. “We were a year in Peru when Daddy was working on the West Coast Air Line of Peru for Pan American.”<sup>33</sup> It rained the first time in seven years. “Just a little sprinkle,” she recalls, but it was enough for the foot to drop off a little cherub statue on the front porch.<sup>34</sup> Barbara was disappointed in the beach “because it was great big sharp rocks, and you couldn’t get to the water really because you’d get thrown against the rocks.”<sup>35</sup> Had she ventured into the surf, she might also have recalled the cold water of the Humboldt Current.

Expenses in Peru were “extremely high,” and to compensate Woolman’s salary was raised \$2.00 per day. He and his family lived on the economy for six months, he

---

<sup>30</sup> Woolman Papers, LSULSC.

<sup>31</sup> The exact date of their sailing is unknown. An entry in the “Duster Journal” refers to expenditures in Peru for Nov. and Dec. 1927. “Duster Journal,” folder 1, box 2, DL01.01, DALCA.

<sup>32</sup> *New York Times*, Nov. 6, 1927.

<sup>33</sup> Preston, interview, 1993.

<sup>34</sup> Barbara Woolman Preston, interview, Wesley Phillips Newton, Dec. 21, 1977, transcript, DALCA.

<sup>35</sup> Preston, interview 1993.

writes, as a “resident.” He kept careful records and, though they lived “on a reduced scale” (his thrift became legendary in later years), his accounting showed “actual living costs were increased \$152.46 per month over a like period in the States.” Upon returning to Monroe, Woolman requested reimbursement for the difference from Pan American, claiming he was assured his going to Peru “should not be at a personal financial sacrifice.”<sup>36</sup>

Woolman bought two cars; one, a Buick cost the equivalent of \$1036.03; and the other, a Ford, was \$588.14.<sup>37</sup> Presumably Woolman used the Buick for his own purposes and the Ford was for general company business. At his request, an “Authophonic [Orthophonic] Victor Phonograph” was bought in the United States and forwarded to him for his personal use. It must have entertained business guests in his home as well, because it does not appear that Woolman opened an office, but could have used that of Pedro Martinto, Huff Daland’s resident agent in Lima. To pay for the phonograph, \$95 was charged to his account. Auerbach instructed him to “please enter the amount as an item received on your monthly cash report.”<sup>38</sup>

In a “Memorandum to Mr. C. E. Woolman on Accounting for Peruvian Expedition, 1927-1928,” Auerbach requested all reports be “forwarded to the Monroe office monthly as soon after the first of the month as possible.”<sup>39</sup> To save on cable fees, telegraphic communications were written using the Five-Letter ABC Universal

---

<sup>36</sup> “Memorandum to Mr. Woodbridge,” Nov. 16, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>37</sup> “Duster Journal,” 100, folder 1, box 2, RG01.01, DALCA.

<sup>38</sup> Irwin E. Auerbach to C.E. Woolman, Monroe, La., Jan. 5, 1928, folder 11, box 1, RG01.01, DALCA.

<sup>39</sup> “Memorandum to Mr. C. E. Woolman on Accounting for Peruvian Expedition, 1927-1928,” folder 11, box 1, RG01.01, DALCA.

Commercial Telegraphic Code, Sixth Edition. Messages were composed and deciphered by consulting the listing for the meaning of artificial five-letter word groupings.<sup>40</sup>

Additional codes were created for company requirements. For example, Auerbach instructed Woolman to add “IJIER” for Trippe, “IJEVZ” for Grow, “IJBGE” for Air Mail, “IJELP” for Woolman, etc.<sup>41</sup> Sensitive communications were likely sent by mail.

At the beginning of the year, protecting cotton from infestations was an immediate priority for Woolman. Three thousand five hundred and sixty-seven fanegadas (approximately 25,000 acres) were under contract for 1928.<sup>42</sup> To augment the three aircraft not returned to the United States at the close of the previous season, two additional aircraft, parts and accessories, tools, and so forth, were shipped to Cerro Azul in December.<sup>43</sup> As the contract season wound down, the company expanded its reach to northern districts.

Before leaving Peru at the end of the season in 1927, entomologist J. B. Pope had investigated cotton-growing conditions in the northern valleys of the country. As a result, Pedro Martinto was successful in generating experimental work to rehabilitate degraded cotton production areas from infestations in the Piura district, near the border with Ecuador. This was an opportunity for Huff Daland Dusters to extend its operation, and Martinto was advised the prices to quote were “a reduction of approximately forty percent for additional applications and represent our interest in improving cotton

---

<sup>40</sup> Ibid.

<sup>41</sup> Irwin A. Auerbach to C. E. Woolman, Jan., 28, 1928, folder 11, box 1, RG01.01, DALCA. No examples of coded or decoded messages have been discovered.

<sup>42</sup> “Peruvian Contracts - 1928,” folder 3, box 3, RG01.01, DALCA.

<sup>43</sup> “Invoice, Huff Daland Dusters, Inc.,” Dec. 17, 1927, folder 7, box 2, RG01.01, DALCA.



conditions in the Northern valleys.”<sup>44</sup>

Dan Tobin flew a duster north to Paita, where he found the worms “stripping cotton twelve inches high so it looks as if we are going to do some good.”<sup>45</sup> He went right to work and shortly wrote to Woolman declaring, the “results I got on my first days dusting have simply been splendid.” Enthusiastically, he reported, “this dusting business is the rage up here right now.”<sup>46</sup>

Tobin, one of Huff Daland Dusters’s earliest pilots, was a Canadian seeking naturalization as an American citizen. Woolman, interceding on his behalf, asked Ellis O. Briggs, the American vice-consul in Lima, about his status. Briggs’s response assured Woolman that Tobin’s five-year residency requirement would not be “considered as broken by his temporary foreign assignments in connection with the field work of Huff Daland Dusters, Inc.”<sup>47</sup>

Briggs was well acquainted with Huff Daland Duster employees. Woolman and Harris were “frequent callers at the consulate general.” Mail was forwarded via the American consulate, and the company’s business activities involved the American embassy. Ambassador Miles Poindexter presented Woolman to President Leguía, “whose interest was immediate and potent” for establishing mail and passenger service between Peru and Panama.<sup>48</sup> Woolman’s credentials included a power of attorney signed by Gott,

---

<sup>44</sup> Huff Daland Dusters, Inc. to Pedro Martinto, Dec 23, 1927, folder 14, box 1, RG01.01, DALCA.

<sup>45</sup> Dan E. Tobin to C. E. Woolman, April 3, folder 14, box 1, RG01.01, DALCA.

<sup>46</sup> Dan E. Tobin to C. E. Woolman, April 6, 1928, folder 14, box 1, RG01.01, DALCA.

<sup>47</sup> Ellis O. Briggs to C. E. Woolman, April 17, 1928, folder 14, box 1, RG01.01, DALCA.

<sup>48</sup> Briggs, *Proud Servant*, 23; Newton, *Perilous Sky*, 139.

and certified by Enrique Marriott, and the Peruvian consul in Philadelphia. Woolman was named the company's "true and lawful representative for it and in its name, place and stead, to negotiate a contract or contracts with the Republic of Peru, or citizens thereof, or persons, firms, associations, or corporations resident, domiciled or qualified therein, for and in connection with the sale of aircraft, spare parts, and aircraft equipment, concessions, for air mail and transport, (both of passengers, express and freight) and airplane dusting, subject to confirmation at the home office of Huff Daland Dusters, Inc."<sup>49</sup>

In February, Woolman acknowledged his project was only in the "embryo stage," but a bill to operate a concession "would be sent for approval to the present [Peruvian] Congress."<sup>50</sup> He may not have been fully aware of what was taking place diplomatically behind the scenes in Washington through the Department of State and the American embassy in Peru. Secretary of State Frank B. Kellogg directed Ambassador Poindexter to aid and support Woolman in any way possible. By January, it was public knowledge that "Washington was definitely giving PAA strong encouragement" by helping it plan routes and conduct surveys.<sup>51</sup> But extending those routes to the southern continent, for the moment, was still problematic. Protecting the Panama Canal was strategically a more immediate concern than were foreign aviation inroads farther to the south. Then too, "Trippe had to overcome doubts among key colleagues that South America was worth the candle." The "beachhead" of pro-American elements in Peru helped Trippe tilt the

---

<sup>49</sup> "Power of Attorney," folder 8, box 3, DL01.01, DALCA.

<sup>50</sup> *New York Times*, Feb. 20, 1928, 5.

<sup>51</sup> Newton, *Perilous Sky*, 140-41.

opposition his way.<sup>52</sup>

Washington, D.C. and Trippe took advantage of Huff Daland's presence as a United States firm in Peru. Of note also was Navy Lt. Cdr. Harold B. Grow's position there as an American national "entrusted with making a recommendation to Leguía concerning a United States-Peruvian service." Historian Wesley Newton surmises that Huff Daland was a "stalking horse for PAA's, and Washington's future ambitions for the west coast of South America."<sup>53</sup> How much of these machinations Woolman was aware of is not known, but his actions would be the subject of some concern by Matthew E. Hanna, charge d'affaires ad interim, in light of competition from foreign enterprises seeking similar privileges.<sup>54</sup> Rudolf Beeck, a German a resident of Peru since 1910, petitioned the government to establish a commercial aviation company offering weekly service from Lima to Tumbes to the north, Ilo to the south, and Iquitos to the east. His letter of introduction is dated November 1, 1927, and the project was planned for 1928.<sup>55</sup> The Germans were aware of Peru's naval aviation route to Iquitos and their petition proposed to originate the air route from Callao. Washington was worried that President Leguía would sign a contract with the Germans.<sup>56</sup>

Officially Grow headed the United States naval mission to Peru, but on January

---

<sup>52</sup> Newton, *Perilous Sky*, 188-98.

<sup>53</sup> Ibid., 140-41.

<sup>54</sup> Ambassador Miles Poindexter departed from Lima on March 21, 1928; his replacement, Alexander P. Moore, did not arrive at his post until June 11, 1928.

<sup>55</sup> "Proyecto para la formación de la Compañía National Commercial de Transportes Aereos del Peru," folder 16, box 3, RG01.01, DALCA.

<sup>56</sup> Matthew E Hanna to Department of State, April 19, 1928, National Archives and Record Service, *Records of the State Department Relating to the Internal Affairs of Peru, 1910-1929* (Washington: National Archives and Records Record Service, General Services Administration, 1968), text-microfilm, roll 29 (hereafter cited as State Department).

3, 1928, he inaugurated the first domestic Peruvian airline, utilizing “American-built Keystone Pelican (Pronto) aircraft.”<sup>57</sup> Fourteen of the Prontos, powered by Wright J.S. 220HP motors, were bought by Peru the previous January. Six of them, capable of carrying 220 pounds of freight and two passengers each, were used to inaugurate a combined rail/air service to remote interior sections of the country.

Peru is divided geographically by the formidable Andes mountain range which stretches north to south along the western coast of the country. Air service to the remote eastern Amazon region of the nation was a major milestone.<sup>58</sup> By air “it took two days for correspondence to reach either Iquitos or Lima, a trip which previously took thirty-two days overland.”<sup>59</sup> Grow’s achievement and his “blond and vivacious wife” put him in good standing with the president.<sup>60</sup> This association helped advanced the development of a commercial air route to the United States.<sup>61</sup>

President Leguía assured Hanna in a meeting on April 19 that “persistent reports that the Peruvian Government has signed [a] contract with German aeronautical interests to operate in Peru are not true.” The “present intention,” Leguía continued, “is to enter into contracts with both American and German interests and let them compete. [Leguía] added that Woolman is seeking [an] exclusive concession which is not true of the

---

<sup>57</sup> Alexander P. Moore to Secretary of State, Dec. 22, 1928, State Department; Clayton, *Peru and the United States*, 129.

<sup>58</sup> Herbert H. Moll, *Peruvian Civil Aviation* (Mineola, N. Y.: American Airmail Society, 2000), 21-22.

<sup>59</sup> *Ibid.*, 21-22.

<sup>60</sup> Briggs, *Proud Servant*, 41.

<sup>61</sup> Clayton, *Peru and the United States*, 129.

German interests.”<sup>62</sup>

Events of late April and early May proved pivotal for Woolman. His proposal authorized the carrying of mail, freight, and passengers with weekly service to begin within one year. One hundred and twenty kilograms (265 pounds) of space was reserved for the government and payable at fifty percent of the tariff, whether used or not. The rights under the contract were transferable. Woolman wanted an exclusive concession, but President Leguía refused.<sup>63</sup>

On April 23, in the first of a two-part telegram to Washington, Hanna reported the exclusivity clause had been removed. Woolman, he said encouragingly, “has been told by the Minister of Gobernacion he can consider it [the contract] as good as signed.” At the same time, not so helpfully, the official said an agreement would also be signed with the German party. Woolman, Hanna advised, should have the “decisive advantage in [the] ensuing competition” if he acted quickly. Huff Daland had the aircraft and skilled pilots available, while the Germans did not.<sup>64</sup> In Section two of the telegram, though, Hanna tempered his confidence by questioning Woolman’s competence:

It would seem that the fate of the enterprise depends mainly on the energy and determination of the American company. There should be no delay in, one, completing the contract and in, two establishing the Paita service. If the company is not prepared to act with energy and possibly with some financial loss during the initial period it probably will have little or no chance to establish the service. In view of the [State] Department’s interest it may desire to bring the foregoing to the attention of the company.

STRICTLY CONFIDENTIAL. Americans who have assisted Woolman in this matter inform me that he had not been skillful in his negotiations, however

---

<sup>62</sup> Matthew E. Hanna to Department of State, April 19, 1928, State Department.

<sup>63</sup> Matthew E. Hanna to Department of State, April 21, 23, 1928, State Department.

<sup>64</sup> Matthew E. Hanna to Department of State, April 23, 1928, Section One, State Department.

his relations with the Embassy are very cordial but his ineptitude has made it difficult for the Embassy to cooperate effectively.<sup>65</sup>

The Americans referred to are not named, but, given his position, Grow could have been one of them. The state department forwarded the information and warning to Postmaster General New, who, given his close association with Hoyt and Trippe, and following Hanna's recommendation to bring it to the attention of the company, likely told them.<sup>66</sup> Seemingly to vindicate Woolman, only two days later Hanna telegraphed that President Leguía had informed Woolman "his contract will be signed very soon, possibly this week and intimated that [a] competing contract for coast service may not be granted." The German contract would be "to the interior and eastward in which," Hanna advised, "I understand they are interested."<sup>67</sup> Unfortunately his optimism was premature. The signing did not take place.

President Leguía was apparently unaware and surprised by Article 8, which reserved 265 pounds of space for the government and obligated it to pay whether occupied or not. Leguía refused a meeting with Woolman, and the "Minister of Government informed him that Article 8 must be removed." Hanna, in turn, informed Washington that Woolman had "eliminated it entirely and expects contract to be signed immediately. Subsequently he will have to reach an agreement on tariffs and enter into a contract with the Marconi Company for carrying the mail."<sup>68</sup>

Woolman's competition was active and effective. Rudolf Beeck, who represented

---

<sup>65</sup> Matthew E. Hanna to Department of State, April 23, 1928, Section Two, State Department.

<sup>66</sup> Secretary of State to Postmaster General Harry S. New, April 24, 1928, State Department.

<sup>67</sup> Matthew E. Hanna to Department of State, April 25, 1928, State Department.

<sup>68</sup> Matthew E. Hanna to Department of State May 7, 1928, State Department.

the German aviation initiative in Peru, published a letter in *El Tiempo* on May 5 stating that “his enterprise would be controlled by a Peruvian company which is in the process of formation and would be financed by Peruvian capital.” Reportedly Beeck enlisted one of the president’s son-in-laws to help in negotiations. On the other hand, Hanna observed, “Mr. Woolman appears to have had no Peruvian advisor except a rather obscure young attorney.”<sup>69</sup> Another rival, Elmer (“Slim”) Faucett, the first to cross the Andes by air, also vied for a concession, but lacked Washington political or Wall Street financial backing. Nevertheless his presence contributed to the swirl of aviation intrigue that engulfed Lima at the time.

Acting in his interim capacity between ambassadors, Hanna dutifully reported on the circumstances. Woolman was probably not being entirely forthright with him; guided to some degree by Trippe (and Hoyt), he did not want to disclose the extent to which he operated independently. In his negotiations, Woolman drew on his experience as a successful duster salesman. Harris noted that he “never told any lies, but he didn’t necessarily tell all the facts.”<sup>70</sup>

A key hand in the “poker like rivalry” was dealt in May when President Leguía put Grow “in charge of all Peruvian aviation, civil, commercial, and military,” replacing his own son, “hard-drinking” Juan Leguía, and a German officer. Almost coincidentally, on May 28, the Peruvian government awarded Huff Daland a concession to operate an international air service to the United States. An agreement still had to be negotiated with

---

<sup>69</sup> Matthew E. Hanna to Department of State May 15, 1928, State Department.

<sup>70</sup> Harris, interview, Sept. 1, 1980.

the British-owned Marconi Company, which controlled the mail concession.<sup>71</sup> While the talks were going on, an Associated Press story embarrassingly declared “Huff Deland Dusters Company has no contract with the United States to carry mail into the United States from Peru.”<sup>72</sup>

Woolman was not happy. He wrote Harris, “This was great stuff for the opposition and believe me they used it.” He asked Hanna that “prompt appropriate measures be taken to correct the impression it has occasioned.”<sup>73</sup> Indicative of how tightly American business and political interests were tied, Washington reacted quickly. Only two days later, on June 4, 1928, Secretary Kellogg telegraphed the embassy in Lima:

Of course there is no truth in the statement that a company holding a contract from Peru could not carry mail into the United States without a contract from the United States Government. It would require a contract to carry the mail on the return trip and...the Postmaster General would be glad to negotiate concerning such a contract with any American company capable of rendering the service. The call for this service was issued on Saturday.

You may communicate the above to the appropriate authorities of the Peruvian Government and if necessary issue a statement to the local press correcting the erroneous interpretation of conversation given by the Associated Press.<sup>74</sup>

Probably as a result of the state department’s almost immediate clarification, the Marconi agreement was quickly signed on June 5. Huff Daland Dusters could now operate its airline and carry the mail. On receiving the news Woolman was in the process

---

<sup>71</sup> Newton, *Perilous Sky*, 190.

<sup>72</sup> Matthew E Hanna to Department of State, June 2, 1928, State Department.

<sup>73</sup> Harold R. Harris to Robert W. Atkins, June 20, 1928, folder 12, box 1DALCA; Matthew E Hanna to Department of State, June 2, 1928, State Department.

<sup>74</sup> Department of State to United States Embassy in Peru, June 4, 1928, State Department.



of typing a letter to Harris. He exclaimed in capital letters (copied by Harris):

----W OW----  
PHONE JUST RANG AND THE MINISTER STATES THAT THE  
CONTRACT WITH MARCONI HAS BEEN SIGNED, SEALED AND  
DELIVERED.<sup>75</sup>

That evening Woolman attended a “reception for the new ambassador Moore and of course told acting Amb. Hanna and the other officials about the closing of the contract. A shout went up and we all repaired to the punch bowl. It has been a tight fight and they have all been mighty interested in the outcome.”<sup>76</sup>

By this time considerable funds had been spent by Huff Daland Dusters for the benefit of Trippe’s West Coast Air Mail Project. Gott instructed Auerbach, his comptroller, “to set up as an asset the cost of development of the South American Air Mail project” in the company’s books.<sup>77</sup> An agreement, dated June 20, 1928, granted an option to Aviation Corporation of the Americas to buy the Peruvian concessions from Huff Daland Dusters.<sup>78</sup>

As Trippe extended his route through Central America, according to his blueprint the next objective was to stretch the line south along the west coast of Latin America. There was still a lot to be done. With contracts for Peru in hand, Woolman went about the business of expanding his franchise north to Ecuador and south to Chile, with the purpose of connecting with Pan American Airways in Central America.

Information from the Department of Commerce disclosed that the Chilean

---

<sup>75</sup> Harold R. Harris to Robert W. Atkins, June 20, 1928, folder 12, box 1, RG01.01, DALCA.

<sup>76</sup> Ibid.

<sup>77</sup> “Duster Journal,” 110, folder 3, box 2, RG01.01, DALCA.

<sup>78</sup> Edgar N. Gott to Harold R. Harris, August 27, 1928, folder 12, box 1, RG01.01, DALCA.

government had agreed with a French company to operate an air route between Europe and Chile. The department thought there was the possibility for a “properly equipped [American] company, agreeing to use Chilean pilots” to get approval for an air route from the Chilean Post Office.<sup>79</sup> Woolman’s reaction to the advice was tepid. He appointed an agent in Santiago, Francisco Aguilera, to represent Huff Daland in seeking an exclusive concession “subject to the approval and acceptance of the Company.”<sup>80</sup> He was more proactive in the north.



Tobin on the left; Woolman on the right. Possibly with Stan Webber prior to their flight to Ecuador. Note satchel adjacent to cockpit.

Photograph courtesy of Delta Air Lines Corporate Archives

At the request of Trippe, Gott cabled Woolman on June 21 instructing him to seek a concession in Ecuador.<sup>81</sup> Woolman and Robert S. (“Stan”) Webber, an American businessman with Ingersoll Rand Company, departed from Lima on July 14 in a duster

---

<sup>79</sup> Ralph H. Ackerman to C. E. Woolman, June 23, 1928, folder 14, box 1, RG01.01, DALCA.

<sup>80</sup> C. E. Woolman to Francisco Aguilera, July 9, 1928, folder 14, box 1, RG01.01, DALCA.

<sup>81</sup> Edgar N. Gott to Harold R. Harris, August 1928, folder 12, box 1, RG01.01, DALCA.

piloted by Dan Tobin for Guayaquil to petition the Ecuadorian authorities for a mail permit. Woolman carried with him some airmail under authority of the company's newly won Peruvian west coast mail contract.<sup>82</sup>

The trip was taken in one of the duster planes, whose hopper, however uninviting, could be used to carry passengers.<sup>83</sup> Ellis Briggs experienced the discomfort when Harris gave him "his first flight in Peru--in the empty dust hopper of his plane, which afforded a poor view of the country and brought on an attack of sneezing."<sup>84</sup> Writing to his wife, Webber described the journey as a great adventure. The Peruvian portion of the flight was familiar territory for Tobin, having been up that way before to dust cotton in the northern valleys. Crossing the border with Ecuador by air was a new experience. Webber wrote:

Tobin had never been in Guayaquil and it is quite a tribute to his ability as a pilot that we came over Guayaquil through that nasty weather, hitting the town right on the nose. I did not know it until afterward, but Tobin went through his flying course at Kelly Field in the same class with Lindbergh, they graduated together. Anyone graduating from Kelly Field has earned his right to fly they tell me. Well, we made a turn of the town and crossed the river to Duran, made a very nice "zoom" of the field which pleased the natives and landed perfectly, coming up close to the hangars in the midst of a big crowd.<sup>85</sup>

From Guayaquil, Woolman and Webber traveled by train to Rio Bamba and by car to Quito, which left them "in a sort of daze trying to absorb so much scenery." They found Quito a city unspoiled by tourism, "due to the difficulty of getting there." The

---

<sup>82</sup> Matthew E Hanna to Department of State, July 17, 1928, State Department. "Procedente de Guayaquil Ayer en la Tarde Llego el Aviador Dan E. Tobin," *El Comercio*, July 18, 1928.

<sup>83</sup> Alexander P. Moore to Secretary of State, Dec. 22, 1928, State Department.

<sup>84</sup> Briggs, *Proud Servant*, 23.

<sup>85</sup> Stan Webber to his wife, July 30, 1928, Woolman Papers, LSULSC.

American minister, Dr. Bading, made arrangements for them to meet the president of Ecuador, Isidro Ayora. Webber translated for Woolman, who did not speak Spanish. Ayora, Webber wrote, “is not the personality that Leguía is, but was very nice.” He added that Ayora is not as pro-American as Leguía” and he did not grant Woolman his permit.<sup>86</sup>

Until such time as through service between the United States and Peru became possible, the idea was to connect mail with steamship lines at points along the coast. A major milestone occurred on September 13, 1928, when Huff Daland Dusters inaugurated scheduled passenger in a Fairchild FC-2, described in detail in a news report.<sup>87</sup>

The “Fairchild” airplane is a limousine-type monoplane, with capacity for five persons, including the pilot. It is painted dark green, except for the wings, which are canary yellow. It is driven by a Wright-Whirlwind 220 HP engine. It was specially constructed for this service in the plant of the same name, and is equipped with all the comfort required in a machine which will be used to transport passengers a great distance. It has glass windows on each side of the cabin. It has two great doors, one on each side of the fuselage, in the center of the cabin. It is equipped with a complete restroom. At the front of the cabin, a sliding door gives access to the pilot’s compartment, which is roomy, and fully equipped for command. It is shut in by the windshield and the roof of the compartment, which fully protects the pilot from wind and rain, without obstructing his vision. Other technical characteristics of the airplane are those corresponding to the most perfect machines of this type, since this is one of the most modern aircraft.<sup>88</sup>

Piloted by Dan Tobin, the flight left Lima at 10:45 with A. G. Harrott, temporary Postmaster General, Bejamín Romero, editor of the newspaper *El Comercio*, and some mail on board. Stops were made at Chimbote, Trujillo, Pimentel, Paita, and Talara where Harrott established air postal service offices. The service was scheduled to operate

---

<sup>86</sup> Ibid.

<sup>87</sup> Pan American-Grace Airways, Inc. donated the Fairchild FC-2 to the Smithsonian National Air and Space Museum, where it is on display.

<sup>88</sup> *El Comercio*, Sept. 13, 1928, folder 8, box 1, DALCA.

weekly and cut one day off the time for mail to reach Panama or New York. “A ceremony of inauguration was witnessed by several hundred persons, including official Americans in Lima and President Leguía, who placed the first sack of mail aboard the plane.”<sup>89</sup>

William (“Bill”) Howell, who was Panagra’s first employee, witnessed the event. “The plane took off in a cloud of dust. We spent a week shaking ourselves out.” The flight was not without incident. Howell filled in the details for Harris, who had not yet arrived in Peru at the time of the inaugural flight. Tobin, Howell told Harris, had “a little bit of a gas leak” above the cabin door but stopped the leak with some soap and a band of tape. Tobin announced, “that’s got it.”<sup>90</sup> Howell also reported a tragic incident, reflecting a lack of awareness of a propeller’s danger and the urgency to continue the flight that occurred at one of the stops. “While a speech was being made of welcome... I think at Pimentel, a drunken Indian walked into the propeller since the engine was not shut off. The engine didn’t even stop. It just killed the guy and kept right on going. They got the blood and guts off the airplane and kept on going with the first flight, to reach Talara before dark.”<sup>91</sup>

All the while, Trippe was busy working on his blueprint for aviation routes in Latin America. He and Hoyt joined with the W. R. Grace Company fifty/fifty to form Peruvian Airways Corporation, a Delaware company. The directors were William F. Cogswell, Richard F. Hoyt, Robert H. Patchin (a Grace vice-president) and Trippe, and

---

<sup>89</sup> Ibid.; Ellis O. Briggs to the Secretary of States, Sept. 17, 1928, State Department.

<sup>90</sup> “Draft Sept. 85,” file 7, box 3, 14-15, Harris Papers, WSUSCA.

<sup>91</sup> Ibid.

the officers included Trippe as president and Harris as vice-president and general manager.<sup>92</sup> The Pan American and Grace partnership exploited the franchise obtained by Woolman. Trippe said: “The Peruvian Airways Corporation has purchased from Huff Daland Dusters, Inc., an option covering its air mail concessions and contracts with the Peruvian Government. Mr. Harris is expected to arrive in Peru on or about September 25<sup>th</sup>. Application will be made to the Peruvian Government for transfer of the above concession and contracts to Peruvian Airways Corporation.”<sup>93</sup>

On November 26, 1928, the permits were transferred as requested.<sup>94</sup> Once again, permanently this time, Woolman and Harris changed places. Harris stayed on in Peru to manage Peruvian Airways, which shortly became Pan American Grace Airways (Panagra), and Woolman, when he returned to the United States, inaugurated a new service in the Mississippi Delta region to serve points across the south.

Privately Woolman, Harris, and Auerbach had hatched a plan to buy the Huff Daland Duster assets and start an airline of their own. Hoyt, as they soon found out, was willing to sell the company to them.

---

<sup>92</sup> J. T. Trippe to S. W. Morgan, Sept. 22, 1928, State Department; Bender and Altschul, *Chosen Instrument*, 117.

<sup>93</sup> J. T. Trippe to S. W. Morgan, Sept. 22, 1928, State Department.

<sup>94</sup> Alexander P. Moore to Secretary of State, Dec. 4, 1928, Ibid.

## Chapter 7

### Metamorphosis

There is nothing in a caterpillar that tells you it's going to be a butterfly.

R. Buckminster Fuller

When Peruvian Airways acquired its route permits, Huff Daland Dusters became irrelevant to financier Richard F. Hoyt and Pan American's president Juan Trippe.

According to W. David Lewis and Wesley Phillips Newton in *Delta:; The History of an Airline*:

Richard F. Hoyt, representing the controlling Wall Street interests, decided to liquidate the dusting operations of Keystone's Huff Daland subsidiary and to sell the assets involved. So far as Hoyt and his colleagues were concerned, Huff Daland Dusters had served its main purpose by helping to secure an airline foothold in Peru. This advantage was to be exploited by the chosen instrument of American aviation diplomacy, which the financiers had helped to design--Pan American Airways.<sup>1</sup>

Hoyt and Trippe cooperated with statesmen at the highest levels of the United States and Latin American governments to advance aviation on a global scale. Pan American was more than an airline; it was an instrument of American policy and operated, author Elsbeth Freudenthal argues, as an "imperialistic agent."<sup>2</sup> The airplane leapfrogged geographical and political barriers, linked continents, and projected

---

<sup>1</sup> Lewis and Newton, *Delta*, 17.

<sup>2</sup> Freudenthal, *Aviation Business*, 163.

American, influence, power, and modernity. For Hoyt and Trippe this was eminently more personally challenging and financially rewarding than exterminating insect pests.

Men of a like mind and similar acumen were busy consolidating the domestic air transportation system. William Boeing, of Boeing Airplane and Transport Corporation, joined with Pratt & Whitney's Frederick Rentschler to form United Aircraft and Transport Corporation (UATC). Clement Keys leveraged his interest in National Air Transport (NAT), Transcontinental Air Transport (TAT), Curtiss Aeroplane and Motor Company, and Wright Aeronautical Corporation to form North American Aviation (NAA), a holding company "more loosely organized than United Aircraft." Another company, the Aviation Corporation of Delaware (AVCO), was "a product of the machinations of some of the greatest financial minds [at one stage involving Hoyt] on Wall Street."<sup>3</sup>

This activity was not lost on Woolman, Harris, and Auerbach, who managed Huff Daland Dusters's daily operations and looked to the future. With roots deep in fertile Mississippi Delta soil, they saw an opportunity on their doorstep, albeit on a smaller scale than the large conglomerates. But, in a drama involving betrayal by one of their own members, a new enterprise rose from the cotton fields and took flight.

Carrying the mail was an idea Woolman, Harris, and Auerbach recommended in their October 1927 report to Huff Daland's president, Edgar N. Gott. They advised the company to enter "this important field at a time when main arterial routes are still to be had."<sup>4</sup> To proceed they needed Gott's endorsement, but his attention was being focused

---

<sup>3</sup> Van der Linden, *Airlines and Airmail*, 52.

<sup>4</sup> "Report to the President and Board of Directors," 21-2, Harris Papers, WSUSCA.



toward Latin America by Hoyt and Trippe.<sup>5</sup> As it turned out, this was not without some benefit for Woolman and Harris. For them, the Peruvian project ultimately proved a practical exercise in airline development.

With the domestic mail initiative unresolved, Woolman, Harris, and Auerbach expanded Huff Daland's American operations in other ways. In a memorandum to Harris (a copy was sent to Woolman in Peru), Auerbach outlined a "means of securing the maximum expansion with the minimum of capital investment and risk" by offering a "special limited commercial course" of instruction for training pilots. If a student completed the program successfully, the company would sell the newly certificated pilot an airplane and hire him, for all practical purposes, as an independent contractor.<sup>6</sup> Huff Daland Dusters became a Travel Air distributor and used one of its dual-control types for instruction.<sup>7</sup> Guy S. Gannaway, an early student, praised Huff Daland Dusters and its instructors: "I don't believe your school can be excelled anywhere and I will always be glad I learned to fly there."<sup>8</sup>

Aerial photography was another service initiated by Huff Daland Dusters, operating as the Fairchild Aerial Services agent in Louisiana.<sup>9</sup> The service was not restricted only to United States territory, but extended to Latin America as well. During

---

<sup>5</sup> Ibid.

<sup>6</sup> Irwin E. Auerbach to Harold R. Harris, March 13, 1928, "Memorandum to Harold R. Harris," folder 12, box 1, RG01.01, DALCA.

<sup>7</sup> "Huff Daland Company Will Engage in Photography and Sell Airplanes," *Aviation* (April 16, 1928): 982.

<sup>8</sup> Guy S. Gannaway to Huff Daland Dusters, Inc., May 8, 1928; "Learn to Fly at Delta Air Service School of Aviation"; both in folder 5, box 1, RG02.00, DALCA.

<sup>9</sup> "Huff Daland Company Will Engage in Photography and Sell Airplanes," *Aviation* (April 16, 1928): 982.

the months of May, June, and September, Henry Elliott flew photographic aerial mapping missions in the northern region of Peru, at Pimentel, Talara, and Casa Grande.<sup>10</sup>

The operating group's dedication and hard work during this period did not go unnoticed by their superiors. In July The Board Of Directors gave Woolman, Harris, Auerbach, and Catherine FitzGerald a combined total of one thousand shares of stock as "a bonus in recognition of past services and to encourage future services." Three hundred thirty shares were given each to Woolman, Harris, and Auerbach, and ten shares given to FitzGerald. The stock could not be sold and their proxy was assigned to Gott. After five years, though, the limitations were removed, so long as each continued as an employee.<sup>11</sup>

At some point in time (precisely when is unknown), in what Harris refers to as "our famous statement to the Board," Woolman, Harris, and Auerbach asked for an option to buy Huff Daland Dusters, Inc. The offer "was for a period of one year to purchase all of the capital stock, the outstanding account of the Keystone Aircraft Corp. and all the assets of the Company for the sum of \$65,000 payable 25% at the time the option is exercised and 25% annually thereafter."<sup>12</sup> Apparently this offer was not taken seriously by the directors at the time it was tendered.

Later, on August 24, 1928, Harris arrived in New York for a meeting with Trippe and unexpectedly found Gott already in his office. Harris was surprised to discover that at a noon board meeting Hoyt had informed them he "wanted to close out the dusters to the pilots on any terms...for forty thousand dollars, and all notes if necessary." Harris

---

<sup>10</sup> "Flying Time Reported by H. Elliott," folder 6, box 2, RG01.01, DALCA.

<sup>11</sup> Agreement dated July 1928, folder 4, box 2, RG01.01, DALCA.

<sup>12</sup> Harold R. Harris to Irwin E. Auerbach, August 25, 1928, folder 10, box 1, DL01.01, DALCA.

feigned disinterest but later observed to his colleagues Auerbach and Woolman that “it looked like a golden opportunity for us to do some good for ourselves.”<sup>13</sup>

Harris sent a telegram to Auerbach: “WE ARE BEING APPROACHED TO BUY DUSTERS OUT FOR FORTY THOUSAND NOTES WIRE YOUR IDEAS IMMEDIATELY STOP THEY WOULD LIKE SOME CASH BUT IT IS NOT NECESSARY REGARDS.”<sup>14</sup> He thought of reducing the earlier offer from \$65,000 to “\$40,000 payable in about the same way,” but cautioned it was probable “they will not be interested in the option business as they are seemingly trying to get out at once.”<sup>15</sup>

Coincidentally, Harris was considering a job with Pan American--this was probably the reason for his meeting with Trippe. “The Panam thing is still hanging fire,” he wrote Auerbach, “but it looks as though it was a go since they are talking of me getting Thursday’s boat. What a chance.”<sup>16</sup> His comment suggests Woolman and Auerbach knew of the offer and that, among themselves, they had an open dialogue of ideas and plans on both a personal and a business level.

Auerbach’s response was addressed to Harris at the Commodore Hotel, incidentally a location, in the day of rail transportation, conveniently situated adjacent to the Grand Central depot. He recommended they form a new company, and his advice displays a shrewd understanding of the financial issues:

BELIEVING BY FAR MOST ADVANTAGEOUS WAY FOR DISPOSING OF  
DUSTERS IS BY OPERATING GROUP ORGANIZING NEW COMPANIES

---

<sup>13</sup> Ibid.

<sup>14</sup> Harold R. Harris to Irwin E. Auerbach, August 24, 1928, folder 12, box 1, RG01.01, DALCA.

<sup>15</sup> Harold R. Harris to Irwin E. Auerbach, August 25, 1928, folder 10, box 1, RG01.01, DALCA.

<sup>16</sup> Ibid.

COMMA INSIST ON LONGEST POSSIBLE OPTION COMMA HAVE NET PURCHASE PRICE AT FIXED FIGURE EXCLUDING AMOUNT CLAIMED DUE FROM ACA [Aviation Corporation of the Americas] WHICH KEYSTONE CAN MORE EASILY COLLECT STOP ASSURE THAT PURCHASE AGREEMENT IS FREE OF ALL LEGAL ENTANGLEMENTS WITH OLD STOCKHOLDERS OR CLAIMS OF KEYSTONE AND PAYMENTS SPREAD OVER THREE YEARS STOP ASSIGNMENT OF PERU RIGHTS TO ACA MAY BE LIMITED TO REGULAR TRANSPORT AS PER YOUR MEMO STOP OUTRIGHT PURCHASE NOT FEASIBLE BECAUSE OUTSTANDING ACCEPTANCES AND PAYROLL REQUIREMENTS NECESSITATE ASSURED CAPITAL IN CONSIDERABLE AMOUNT IRWIN.<sup>17</sup>

In a detailed memo, presumably to himself, Harris reasoned Hoyt was “willing to go out of his way to assist the present operators in taking the Dusters over to see if they can make something of it,” because he saw Huff Daland as “more of a liability than an asset.” The physical assets, consisting mostly of airplanes, parts, and other equipment, Harris reasoned, were worth about \$15,000 in their current location and condition, and he thought the company might fetch \$40,000 as a going concern. If the group could get an option for a year, which might be enough time to reorganize the company to attract investors.<sup>18</sup> He, Auerbach, and Woolman would be the managers, but they needed to get the capital from stockholders.

Meanwhile, Auerbach tried to find an investor interested in buying Huff Daland Dusters in Monroe. In a letter to two local aviation enthusiasts, Prentice M. Atkins, a hardware dealer, and Travis Oliver, a banker, he solicited a clean sale of Huff Daland’s assets, absent liabilities and cash. Oliver was interested, but wanted “the local management of Lt. Harris and Mr. Auerbach continuing as heretofore.” Auerbach

---

<sup>17</sup> Telegram, Irwin E. Auerbach to Harold R. Harris, no date, folder 10, box 1, RG01.01, DALCA.

<sup>18</sup> “Memo Regarding Disposal of Huff Daland Dusters,” Aug. 28, 1928, folder 12, box 1, RG01.01, DALCA.

modified the offer, specifically including Woolman and proposing they buy the assets for \$40,000; \$20,000 subscribed by them, and \$20,000 backed by Oliver and his associates.<sup>19</sup>



Group in front of large duster. Coad third from left; Auerbach forth from left.  
Photograph courtesy of Tallulah Historical Society

These overtures were in vain, and Auerbach then divided the assets into two lots. Lot A was for material located in the United States and “the capital stock of Air Operations, Inc. [how this company fits into the picture is not clear], but not its assets.” Woolman, Harris, and Auerbach would buy Lot A for \$40,000, \$20,000 cash and \$20,000 in stock collateral of a new company. Lot B included the Peruvian assets and was valued at \$15,000. Auerbach expected he would travel to Peru to consummate the

---

<sup>19</sup> Irwin E. Auerbach to Travis Oliver, Sept.11, 1928, folder 10, box 1, RG01.01, DALCA.

sale of those assets locally.<sup>20</sup>

In essence this is the deal as it was finally consummated, but what began as a straightforward plan unexpectedly turned into a nightmare. In the crisis, Woolman's character and leadership was revealed, and Delta Air Service, Inc. was formed.

September and October were the critical months. Preceding the situation, but relevant to it, was the emergence of Peruvian Airways in Peru.

Sometime between late August and early September, Harris's future took a dramatic turn. Trippe formally hired him to be the general manager of Peruvian Airways, "an Air Mail and Passenger Line, under the joint ownership of the Aviation Corporation of the Americas and W. R. Grace and Co."<sup>21</sup> As a consequence, Gott saw his chance to reconcile the Dusters's account for expenses incurred while setting up the Peruvian mail franchise. He sent a letter to Harris, in his new capacity as general manager of Peruvian Airways, recommending the Aviation Corporation of the Americas or affiliated companies (that is, Peruvian Airways), "forthwith exercise the option granted them by our Company under date of June 20, 1928, and make definite arrangements to pay for the concession and its associated expenses."<sup>22</sup> Hoyt, who was the principal financier behind all the separate entities and the ultimate arbiter, approved a settlement for \$15,000, to cover all costs accrued up to September 1, but not including the purchase of the Fairchild airplane, which would be paid for separately. Thereafter, Huff Daland Dusters would charge Peruvian Airways for the salaries and expenses of its personnel and rent its

---

<sup>20</sup> "Memorandum to Mr. Richard F. Hoyt," Sept. 14, 1928, folder 10, box 1, RG01.01, DALCA.

<sup>21</sup> "Memo Regarding Disposal Huff Daland Dusters," August 28, 1928; Harold R. Harris to Edgar N. Gott, Sept. 3, 1928; both in folder 12, box 1, RG01.01, DALCA.

<sup>22</sup> Edgar N. Gott to Harold R. Harris, August 27, 1928, folder 12, box 1, RG01.01, DALCA.

airplanes and equipment under specific agreements.<sup>23</sup>

The entity that Harris managed, Peruvian Airways, was a partnership between Pan American and W. R. Grace & Company, the import/export firm run “from a bank like commercial structure in central Lima referred to as ‘Casa Grace.’”<sup>24</sup> This cooperative venture was Hoyt’s idea, because Grace had ties in “more than half of South America,” but “not the aviation side of it.” The advantages were mutually agreeable, and Hoyt arranged the financing and “put the deal across.”<sup>25</sup>

Trippe dispatched Harris to Peru with a comprehensive list of instructions. “In taking up your duties and responsibilities as Vice President and General Manager of the Peruvian Airways Corporation,” Trippe commanded, “you will follow, in general, the program hereinafter set forth.” Twenty-one points followed, beginning with an order to take the Grace Line steamer *Santa Luisa*, scheduled to sail from New York on September 13, or alternatively, connect with the *Santa Luisa* at the Canal Zone, from New Orleans.<sup>26</sup> On this trip, his second to South America, Harris was accompanied by his expectant wife Grace Clark Harris (their daughter Alta May was born in Lima on December 10) and his four-year-old son, Harold, Jr. Very likely, Harris first traveled to Louisiana to pick up his wife and young son, and then sailed from New Orleans in time to meet the *Santa Luisa* when it transited the Panama Canal.<sup>27</sup>

---

<sup>23</sup> Harold R. Harris to Edgar N. Gott, Sept. 3, 1928; “Proposed Letter from Pan American Airways of Peru to Huff Daland Dusters Inc.,” Sept. 3, 1928; both in folder 12, box 1, RG01.01, DALCA.

<sup>24</sup> Goodsell, *American Corporations and Peruvian Politics*, 51.

<sup>25</sup> “Background notes on incidents leading up to the formation and operation of Pan American-Grace Airways,” file 12, box 12, Harris Papers, WSUSCA.

<sup>26</sup> Juan T. Trippe to Harold R. Harris, Sept. 7, 1928, Harris Papers, WSUSCA.

<sup>27</sup> Alta May Stevens, e-mail message to author, April. 8, 2010.

Once Harris was in Peru, there were a few days between his arrival and Woolman's departure for them to bring each other up to date on what had happened in New York and Peru, and to discuss future plans. As they said goodbye, Woolman and Harris shook hands aboard the Grace liner *Santa Maria*, just before its sailing. Notwithstanding Harris's change in employment (though he still represented Huff Daland Dusters's Peruvian interests locally), he confirmed his commitment to Woolman and Auerbach, saying "it's the three of us and now for our wives and babies." Each understood the fate of Huff Daland Dusters, Inc. had been sealed. Nevertheless there was still a lot to be done, if they were to take it over.<sup>28</sup> Quite unexpectedly, the company's fate took an unanticipated and dramatic turn.

The stage was set on September 27 (Woolman was still in South America) when President Gott formally tendered an offer to Auerbach, "and/or your associates," an option to buy the company for \$15,000, cash and \$20,000 in collateral stock notes.<sup>29</sup> Inexplicably, the offer did not specifically mention Harris or Woolman by name. On October 22 Auerbach, claiming to represent Huff Daland Dusters, sent out sealed proposals to a list of contacts, unilaterally offering to sell the company for \$40,000 cash.<sup>30</sup> One of the parties, J. B. Ardis, President of Ardis & Company, Inc., in Shreveport, answered immediately and turned him down flat, writing, "we find it quite necessary in any line of business to even hope for success to have a perfect understanding

---

<sup>28</sup> Collett E. Woolman to Harold R. Harris, Oct. 26, 1928. Telegram, to C. E. Woolman, Oct. 4, 1928, both in folder 15, box 1, RG01.01, DALCA.

<sup>29</sup> Edgar N. Gott to Irwin E. Auerbach, Sept. 27, 1928, folder 10, box 1, RG01.01, DALCA.

<sup>30</sup> Huff Daland Dusters, Inc. to E. J. Bond, Oct. 22, 1928, folder 10, box 1, DALCA; A copy of Auerbach's offer to sell dated Oct. 22, 1928 is in folder 15, box 1, RG01.01, DALCA.



of the nature of the business, and yours is all foreign to us.”<sup>31</sup>

A couple of days after Auerbach had sent his offers, Woolman returned from Latin America to discover the betrayal. The details are recorded in a typed letter he began, but completed later, to Harris, in which he speaks of his confrontation with Auerbach. Shockingly, he wrote, “Auerbach seemed shot to pieces.” When Woolman asked what the problem was, Auerbach responded only that he was “not satisfied with the cooperation” he was getting from him and Harris and would not elaborate further. Auerbach, Woolman typed, “thinks he can put the whole thing over by himself, which he can’t, and will dispose of the Peru Co. to his own advantage, which he can’t, and is cutting our throats at the first chance he has had.”<sup>32</sup>

Woolman reacted immediately and proactively to protect his and Harris’s interests. A series of telegrams were exchanged:

To Harris, Woolman cabled: “AUERBACH DOUBLE CROSSING US ON SALE EQUIPMENT STOP CABLE GOTT TO CANCEL HIS OPTION ON EQUIPMENT MAKING SAME TO US RUSH.”

To Gott, Woolman asked, “WAS OPTION FOR SALE OF EQUIPMENT MADE TO AUERBACH PERSONALLY AND MYSELF (QUESTION) AUERBACH HAS THROWN US OVER COLD AND DEALING FOR HIMSELF STOP REQUEST YOU CANCEL ANY OPTION HE HAS MAKING SAME TO HARRIS AND MYSELF STOP....”

---

<sup>31</sup> J. B. Ardiss to Irwin E. Auerbach, Oct. 24, 1928, folder 10, box 1, RG01.01, DALCA.

<sup>32</sup> Collett E. Woolman to Harold R. Harris, partly drafted Oct. 26, 1928 and completed on Nov. 15, 1928. This letter appears to have been used as notes in a more formal letter “intended for Mr. Harris’s edification” from J. S. Woodbridge to Edgar N. Gott, Oct. 30, 1928, both in folder 15, box 1, RG01.01, DALCA.

Gott responded to Woolman: “UNDERSTANDING WITH HOYT AND OURSELVES WAS THAT YOU AND HARRIS WERE INCLUDED STOP OUR REPRESENTATIVE J S WOODBRIDGE ARRIVES MONROE FRIDAY MORNING MISSOURI PACIFIC TO ASSIST IN NEGOTIATIONS AND TO ACT FOR US IN ALL MATTERS STOP GET IN TOUCH WITH WOODBRIDGE AND BE GUIDED BY HIM STOP NO DESIRE TO CHANGE ORIGINAL INTENT STOP QUICKEST AND MOST SATISFACTORY SALE IS IN OUR ESTIMATION MOST IMPORTANT FACTOR....”

Woolman cabled Harris with the news: “AUERBACH DISCHARGED STOP WIRE APPROVAL YOU AND I TAKING FIFTY PERCENT OWNERSHIP LOCAL COMPANY KEYSTONE FINANCING US TWENTY THOUSAND OUR SHARE STOP OUR NOTE TO KEYSTONE BACKED BY OUR STOCK NO OTHER OBLIGATION STOP THIS ALLOWS PURCHASE PERUVIAN EQUIPMENT FIFTEEN THOUSAND.”<sup>33</sup>

When John S. Woodbridge arrived in Monroe he assessed the situation. He liked Woolman, Douglas Culver, the chief of maintenance, and M. D. (“Don”) Dice, Chief Pilot. “These three gentlemen have inspired me with the fullest confidence and I would accept without hesitation as being the strict truth anything that they would tell me.” On the other hand, prospective purchasers, planters, and financiers had soured on Auerbach. “As substantiation of this I would quote from Mr. Travis Oliver, President of the Central Savings Bank and Trust Company of this city, an exceedingly air-minded individual who impressed me as a straight shooter, and with whom we are almost compelled to deal if we

---

<sup>33</sup> These four cables are located in folder 15, box 1, RG01.01, DALCA.

dispose of the property locally. Mr. Oliver told both Mr. Fraser and Mr. Woolman that the local people would not have anything to do with the purchase of this equipment if Mr. Auerbach were in any way connected with it.”<sup>34</sup> To make matters worse, as a consequence of Auerbach’s offer, the rumor had spread the company was going out of business, and planters were reluctant to sign new contracts with the company.<sup>35</sup> On the surface, the outlook was not bright for Huff Daland Dusters, but Woodbridge was a good judge of character and had the keen eye of a businessman.

Woodbridge appraised the company’s equipment and supplies at \$43,735. But putting the ships in condition for the upcoming dusting season would cost about \$15,000. The aircraft were “strewed all over the floor of the hangar in various stages of apparent decrepitude, with fabric off most of them, and presenting a sorry sight.” To get things going, he recommended that Gott advance \$20,000 to carry the “organization through until money starts to come in from dusting.” The prospects were good. A heavy weevil infestation was predicted, and “responsible planters were crying to be signed up for the next season, right now.” Woodbridge wanted permission for Woolman to “go ahead and sign up his farmer friends, who cannot wait much longer... for whether the Company is owned locally or by Keystone Aircraft, the business ought to be secured at once before it is too late.” Woodbridge observed that Woolman had been “inexhaustible in his efforts on behalf of this entire sale business.” Then for Gott’s consideration, he added that the “Monroe group will trade,” but “they will probably want to cut the price, too, for they

---

<sup>34</sup> John S. Woodbridge to Edgar N. Gott, Oct. 29, 1928, folder 10, box 1, RG01.01, DALCA.

<sup>35</sup> John S. Woodbridge to Edgar N. Gott, Nov. 5, 1928, folder 10, box 1, RG01.01, DALCA.

know the equipment, and so does Coad, who is their advisor.”<sup>36</sup>

The Peruvian operation, managed by Harris, was similarly in limbo. A new company had to be organized in Peru, either as a branch of the American firm or as a national corporation, by the middle of December; “otherwise the ten-year option for dusting expires.”<sup>37</sup> December was critical for another reason: equipment and supplies had to be shipped in advance. Woolman advised a potential client, Alfredo Checa in Piura, Peru, that a timely commitment was necessary from him, “in order that the planes, poison, and men may be sent down from the states in ample time, and so that plans may be made for complete service.”<sup>38</sup> Harris underscored the urgency by pleading, “we need airplanes, personnel & supplies here as soon as possible & regardless of what may happen in the U. S. this work here must not be forgotten, as it is a real money maker.”<sup>39</sup> He did not know a plan was already being worked out among Woolman, Woodbridge, and Travis Oliver. The Peruvian business was a key component of the deal.

Woolman respected Woodbridge. He found him “a hell of a fine fellow and a square shooter” and he “worked with us trying to straighten things out.” The plan was for Harris and Woolman to buy Huff Daland Dusters’s domestic assets, with an option on the Peruvian assets, and form a new company. This was doable, Woodbridge reported to Gott, because Woolman is “firmly convinced that the profit he and Harris make on the Peruvian negotiations will almost be enough to meet their notes on this local sale.”<sup>40</sup>

---

<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> C. E. Woolman to Alfredo Checa, Oct. 3, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>39</sup> Harold R. Harris to Collett E. Woolman, Nov. 15, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>40</sup> John S. Woodbridge to Edgar N. Gott, Nov. 5, 1928, folder 10, box 1, RG01.01, DALCA.

Working together “day and night,” Woodbridge and Woolman got “the capital raised and expected to close the deal for the purchase locally.” Woolman informed Harris, “this gives us (you and I) a \$20,000 interest. [Elliot] Daland wired that if we were managing the new organization he would put \$5,000 in and has [since] mailed his check.”<sup>41</sup>

As an indication of his esteem in the Monroe business community, in a few minutes Oliver raised \$12,000 of the additional \$20,000 necessary to complete the deal and expected the rest as soon as he could communicate with planters.<sup>42</sup> Woodbridge wired Gott: “INCLUDING DALANDS FIVE THOUSAND NECESSARY TWENTY THOUSAND VIRTUALLY ASSURED LOCALLY NEW ORGANIZATION COMMENCING MONDAY TWELFTH SUGGEST BILL OF SALE AND CHECK TWENTY THOUSAND BE MAILED WOOLMAN AT ONCE STOP CUT OFF DATE CURRENT EXPENSES NOVEMBER TWELFTH.”<sup>43</sup>

During the crisis, Woolman did his best to keep Harris in the loop, but events were moving at such a rapid pace it was impossible to keep him fully informed in a timely manner. Harris understood, but could not mask his frustration: “Certainly glad to get your letter of December 4<sup>th</sup>,” he wrote, “which was the first real dope I had on the situation in Monroe. I certainly think you are a son of a gun for not keeping me more thoroughly informed but realize that you had a tough time with the reorganization.”<sup>44</sup> On

---

<sup>41</sup> Collett E. Woolman to Harold R. Harris, partly drafted Oct. 26, 1928 and completed on Nov. 15, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>42</sup> Travis Oliver to Edgar N. Gott, Nov. 8, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>43</sup> John S. Woodbridge to Keystone Aircraft Corporation, Nov. 8, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>44</sup> Harold R. Harris to Collett E. Woolman, Dec. 26, 1928, Ibid.

the other hand, Woolman was just as uninformed about Peru. "Have been anxious to hear how you are getting along with the formation of the Peruvian Huff Daland Company," he wrote, "as the only information I have is the letter I received the latter part of October, which outlined the plan worked out with Calderon."<sup>45</sup>

Woolman and Harris resolved these matters equitably in a spirit of cooperation developed over the years. Their relationship is exemplified by the sense of mutual trust and respect evident in their communications. Woolman concisely summarized the United States agreement for Harris:

To review, when Auerbach went hay wire the option to purchase was granted to us (yourself and myself) contingent upon our forming an American Company and obtaining sale for same for \$40,000. Although things were dead and, incidentally, financial conditions in the State have not been at all good, we put over the company with \$20,000 raised locally and \$20,000 advanced by Huff Daland Dusters to us for stock in the new Company--\$10,000 each--which made good our option on the Peruvian Company to purchase same for \$15,000.00 as of Nov. 12, 1928, the take-over date of Delta Air Service, Inc. from Huff Daland Dusters, Inc.

The notes which we signed were stock collateral notes and did not bind us personally or our personal assets beyond the stock in our names in the Delta Air Service, which did not jeopardize the security of our families. Under the terms of the option all money received from stock sold in the Peruvian Company of money realized from the Peruvian Company was to first apply against this twenty thousand dollars advanced and against the fifteen thousand dollars owed to Huff Daland Dusters for the Peruvian equipment. It was a very fair and liberal offer and the backing made it possible to put over the American Company which made possible the Peruvian proposition.<sup>46</sup>

Meanwhile, the Peruvian proposition was taking form. Harris informed Woolman that he was named vice-president and general manager of a new Peruvian dusting

---

<sup>45</sup> Collett E. Woolman to Harold R. Harris, Dec. 18, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>46</sup> Collett E. Woolman to Harold R. Harris, Mar. 27, 1928, folder 15, box 1, RG01.01, DALCA.

company in which A. Alvarez Calderon was president and A. Fernandez Solar, secretary. Accommodatingly, he wrote; "I have sent Monroe a copy of my letter to [Sidney] Newborg [Assistant Secretary, Huff Daland Dusters, Inc.] outlining this matter and presume the entire information is in the Monroe files. If not please let me know." As an afterthought, Harris added in a handwritten addendum, "Where's my radio?"<sup>47</sup> The imperative tone meant this was a transmitter/receiver intended for operational purposes, not a home entertainment device, and underscored the rapidity of advancing technology.

The crisis displayed Woolman's leadership and character as well as another dimension of his personality. In later years, his management style was characterized as that of a compassionate patriarch. An early example of his concern for his employees is evident in a suggestion he made to Harris. "It seems to me Culver has been pretty loyal to the organization and it occurred to me that it might be no more fair if we would assign him from our holdings in Delta Air Service, perhaps a thousand dollars worth of stock on the same basis we are getting ours. Personally I would be willing to allow half of this amount to go from my holdings, if it is agreeable with you. Think it over and let me know regarding it. I would also suggest that the same arrangement might be applicable to the case of Miss FitzGerald. Personally, I think it is right."<sup>48</sup> This was agreeable with Harris.<sup>49</sup>

Notwithstanding that Woolman had consummated the sale of Huff Daland's American assets honorably on a fifty/fifty basis with Harris, he was a nonetheless a

---

<sup>47</sup> Harold R. Harris to Collett E. Woolman, Dec. 26, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>48</sup> Collett E. Woolman to Harold R. Harris, Dec. 18, 1929, folder 15, box 1, RG01.01, DALCA.

<sup>49</sup> Collett E. Woolman to E. N. Gott, March 27, 1929, folder 15, box 1, RG01.01, DALCA.

cautious businessman and did not take his financial stake in the Peruvian equipment for granted. Because he and Harris were “operating so far apart and with communications so difficult, “he wrote to Gott, “it is only business that I have a statement from you as President showing my fifty percent interest in the Peruvian enterprise and equipment just as I have already arranged for Harris to have in the Delta Air Service, Inc. an equal share with me.”<sup>50</sup> His caution was only prudent.

Leguía used easy credit to bolster Peru’s economy, but in late 1928 fears of excessive government spending, waste, and corruption caused American banks to restrict further loans to Peru.<sup>51</sup> The impending financial consequences were not immediately evident and, from Woolman’s distant perspective in March 1929 the outlook still looked promising. He optimistically estimated the Peruvian concession might yield a profit of \$10,000 for each of them at the conclusion of the dusting season. As the year progressed, the economic circumstances in Peru deteriorated. By December, the financial situation, according to Harris, was “extremely unsatisfactory.”<sup>52</sup> Harris sold the Peruvian assets for what he could get, under pressure by planters who “planned to enter the dusting business themselves in case we would not choose a figure which they considered reasonable.” As he wrote to Woolman, in exchanging the money “I was able to get exactly \$30,000...and have sent you through the National City Bank your portion of it. I trust that this will be a welcome Xmas present to you as it has been for us.”<sup>53</sup>

Ultimately, all that remained of Huff Daland Dusters was a dormant corporation.

---

<sup>50</sup> Collett E. Woolman to E. N. Gott, Jan. 7, 1929, folder 15, box 1, RG01.01, DALCA.

<sup>51</sup> Klarén, *Peru*, 266.

<sup>52</sup> Harold R. Harris to Collett E. Woolman, Dec. 3, 1929, folder 15, box 1, RG01.01, DALCA.

<sup>53</sup> *Ibid.*



On July 15, 1930 the Board of Directors recommended the company be dissolved and for that purpose they scheduled a special meeting for August 22, 1930. The minutes are not available, but presumably at the meeting the stockholders approved a resolution terminating the company's charter.<sup>54</sup>

Thus, the brief seven-year existence of Huff Daland Dusters, Inc. came to a close. Its role in the development of aviation was important. Aerial applications continued to grow and expand into a major mechanized component of the modern agriculture revolution. Harold R. Harris remained in Peru as general manager of Panagra, successor to Peruvian Airways. And, significantly, Huff Daland Dusters successor company, Delta Air Service, while maintaining its dusting heritage and guided by Woolman, began scheduled passenger service, but without a mail contract. The timing could not have been worse.

---

<sup>54</sup> "To the stockholders of Huff Daland Dusters, Inc.," Woolman Papers, LSULSC.

## Chapter 8

### Delta Air Service, Inc.

He [Woolman] did not want to fly from Birmingham to Los Angeles; he wanted to fly where he was flying, and I was determined to have an operation all the way from Atlanta to Los Angeles, because I knew from what we had discovered that a short line could not pay the expense of maintaining a ground force and the supervisory force that would be necessary.

Walter F. Brown testimony,  
*Senate Investigation of Air and Ocean Mail Contracts*

A new company, Delta Air Service, Inc., replaced Huff Daland Dusters. Choosing the name, it appears, was done quickly, in a matter of days, probably without much deliberation, and forced by the rapidity of events following Auerbach's betrayal. A bill of sale, dated November 15, 1928, was properly signed and notarized by Huff Daland Dusters, Inc., but for some reason it does not name a buyer--that space is blank. Possibly there was some uncertainty whether to list Woolman and Harris as the buyers, or wait and insert a company's name later. In fact, two days later, the Articles of Incorporation were prepared for Delta Air Service, Inc.<sup>1</sup> The incorporators were Douglas Y. Smith, Travis Oliver, and C. E. Woolman, and, while they may have legally named the firm, tradition holds that Catherine FitzGerald, the secretary, chose the name for "the lush Mississippi Delta region in which the enterprise was based."<sup>2</sup>

---

<sup>1</sup> "Bill of Sale, November 15, 1928," folder 2, box 1, RG01.01, DALCA; "Articles of Incorporation of Delta Air Service, Inc.," folder 1, box 1, RG02.00, DALCA.

<sup>2</sup> Lewis and Newton, *Delta*, 21.

Delta Air Service was incorporated in Louisiana, domiciled in Monroe, and initially capitalized for \$80,000.<sup>3</sup> Writing in 1983, historian W. David Lewis observed that Delta “is the only major airline operating today that was nurtured on small-town capital.”<sup>4</sup> The initial board of directors was composed of three stockholders, all from Louisiana: Douglas Y. Smith (10 shares), president; C. E. Woolman (100 shares), first vice-president; and Travis Oliver (25 shares), secretary-treasurer. In recognition of Harold R. Harris’s financial interest, he was temporarily named a second vice-president.<sup>5</sup>

Woolman was also general manager of the new company. He and Harris were equal shareholders, but, in Harris's absence, it was left to Woolman to administer the company’s affairs. Despite the challenges of reorganizing the business, his letters to Harris convey a sense of optimism. “It really looks mighty good,” he wrote encouragingly in October. He thought the chances of winning a contract to inspect the levees after the great flood in 1927 for the Mississippi River Commission were good, since the bid was “within reason.” In addition, the company started survey flights for Standard Oil using a Travel Air acquired from Doug Culver for “\$1.00 and other valuable considerations.” He concluded on a hopeful note: “We seem to be started well over the hill and going strong. Have 5000 A. [acres] signed in Texas and are starting this week in Texas.”<sup>6</sup>

Two months later, Woolman wrote Harris. “The contract for Mississippi river flying was not let, but new bids were submitted.” He lowered the bid to \$39.93 per hour

---

<sup>3</sup> “Articles of Incorporation of Delta Air Service, Inc.,” folder 1, box 1, RG02.00, DALCA.

<sup>4</sup> *Atlanta Journal and Constitution*, Nov. 6, 1983.

<sup>5</sup> “Articles of Incorporation of Delta Air Service, Inc.,” folder1, box 1, RG02.00, DALCA.

<sup>6</sup> Woolman to Harris, Oct. 26, 1928, folder 15, box 1, RG01.01, DALCA.

by buying factory rebuilt pontoons instead of new ones. He thought they would still “make a profit of about nine thousand dollars, writing off one entire plane and 20% on the reserve; incidentally, having some income during a time when it will be most welcome.”<sup>7</sup> Woolman saved a dollar whenever he could.

In March, Woolman observed, “Delta Air Service is coming along pretty well.” Slightly more acreage was contracted for in April than in the previous year and a contract was signed for approximately 13,000 acres with the Delta & Pine Land Company. He noted, “the Wharton [Texas] unit shows signs of developing into a two plane unit,” and three Travel Airs were sold “under our contract for ten and [we] have a number of good prospects.” A new hangar was under construction in Monroe, and, he added poignantly, “we are carrying a few passengers [on a charter basis]...which is helping our income a little.”<sup>8</sup>

Pat L. Higgins (who was to become operations chief) was hired as an “instructor in our Flying School, which has opened this week. Incidentally, he is a high type of fellow and a good pilot.” In a rare personal note Woolman informed Harris that he “decided to move Mrs. Woolman and the kids to Monroe [from Baton Rouge]. Helen was up here this weekend and picked out a house which we have engaged.”<sup>9</sup>

Woolman was busy “taking over some of Auerbach’s duties, and trying to keep the field work going, along with raising capital for operations and so on.” Modestly, he told Harris, I am “making a poor substitute for you.” When people asked when Harris

---

<sup>7</sup> Woolman to Harris, Dec. 18, 1928, folder 15, box 1, RG01.01, DALCA.

<sup>8</sup> Woolman to Harris, March 27, 1929, folder 15, box 1, RG01.01, DALCA.

<sup>9</sup> Ibid.

would be returning, Woolman gave a “‘stock’ answer of ‘not before the season is over in Peru.’”<sup>10</sup> But Harris never returned, and in the years to come Woolman’s and Delta’s futures were inextricably entwined.

In their research, historians Lewis and Newton discovered some of Delta’s business papers for the 1930s were missing. They found “a strange ten-year gap which apparently came about as a result of when they were transferring the records from Monroe to Atlanta,” where the headquarters relocated in 1941. Despite having full access to all of Delta corporate records, Lewis and Newton found “none of [the] papers from 1930 to 1940.” A more likely scenario is the records were never moved to Atlanta at all, but remained in storage at Selman Field and were destroyed when the airfield was taken over by the United States Army Air Force during World War II.<sup>11</sup>

Catherine FitzGerald might have shed some light on the missing years, but, fearing a faulty memory she, as the “oldest living Delta employee,” declined to be interviewed by Lewis and Newton. Her reticence may have come as a result of the circumstances surrounding her employment. As a young woman in her early twenties, she was asked to leave Ogdensburg and move to Monroe, but demurred. Eventually, with her family’s blessing, she decided to accept Huff Daland Dusters’s offer of employment to replace an indiscreet secretary, who was “telling their business all over town.”<sup>12</sup> From the beginning, she understood the company’s private matters were--well--private.

FitzGerald served as Woolman’s private secretary for forty years. As a youngster

---

<sup>10</sup> Ibid.

<sup>11</sup> Preston, interview, 1977; Paul Talbott email message to Marie Force, August 14, 2110. The author did not find the records during research for this dissertation.

<sup>12</sup> Catherine FitzGerald, interview, John N. White, 1976, transcript, DALCA.

living in Monroe, Woolman's daughter, Barbara, remembered her as the "loveliest, softest spoken person I had ever known."<sup>13</sup> Barbara believed the reason for FitzGerald's reticence toward Lewis and Newton was because "she just wouldn't know what she ought to say and what she ought not to say."<sup>14</sup> Fortunately, for historians, FitzGerald did agree to talk to John N. White of the Delta Marketing Department, but his interview might not have been available to Lewis and Newton. A slightly edited transcript is now available to researchers, but it does not shed any light on the important question of why Delta Air Service began a passenger service without the benefit of a mail contract.

Lewis and Newton suggest that "Woolman was not thinking primarily in terms of airmail at the time; his thoughts were centered on creating a passenger carrier."<sup>15</sup> If true, this represented an extraordinary risk. Fundamentally, Woolman must have understood the importance of a mail contract. This awareness is borne out in the 1927 report to Gott, which he helped to write, recommending Huff Daland Dusters bid on airmail contracts, and from his experience in Peru, seeking a mail concession, in 1928. Regardless of the risk from proceeding without a government subsidy, Woolman, with support of the company's shareholders, established a passenger air service.

To get started, Delta needed financing and airplanes. John S. Fox, son of a wealthy pulp and paper mill pioneer was a businessman and investor from Bastrop, Louisiana. He agreed to a financial arrangement allowing Delta to buy the assets of his Fox Flying Service in exchange for stock, "making him the largest stockholder by far" in

---

<sup>13</sup> Preston, interview, 1977.

<sup>14</sup> Ibid.

<sup>15</sup> Lewis and Newton, *Delta*, 22.

the company. The deal included a Travel Air monoplane and five additional airplanes on order.<sup>16</sup> With Fox's backing, Delta had the financing and equipment necessary to begin a passenger line.

Few regulatory formalities existed to start a flying business in 1929. The nation's air transportation system was growing, but in a haphazard and uneven manner. The Air Commerce Act of 1926 empowered the federal government to certify aircraft and pilots operating in interstate commerce, but otherwise did not play a role in regulating airlines. Delta was free to choose its route, establish fares, and determine its schedule.

Delta Air Service's route stretched from Dallas, Texas, to Birmingham, Alabama, with intermediate stops in Jackson, Monroe, and Shreveport. The type of airplane used was a Travel Air 6000, a single-engine, high-wing monoplane with a capacity for six persons--including the pilot--in an enclosed cabin. For its day, it was considered an advanced aircraft, advertised as "A Deluxe Monoplane combining Pullman Car comfort in air travel with proven performance and dependability."<sup>17</sup>

The passenger line extended out of Monroe, to the east and west. At the time the city was a center of industrial development known as the "gas and carbon-black capital of America." Nearby, hundreds of gas wells fed a pipeline stretching from Houston to Atlanta. Carbon-black, a waste by-product of gas production, was used in paint, ink, and tires--in which the use of carbon-black in treating the rubber doubled the longevity from 4,000 to 8,000 miles.<sup>18</sup> Just as cotton planters had developed an outward perspective

---

<sup>16</sup> Ibid., 23.

<sup>17</sup> *Aero Digest* 10 (May 1928): 819.

<sup>18</sup> Ralph A. Graves, "Louisiana, Land of Perpetual Romance," *National Geographic* 57 (April 1930): 447.

following the Civil War, road, rail, and industrial links bound Monroe to the outside world. To aviation visionaries such as Woolman, so the airplane would do the same for people, express, and mail. But when Delta Air Service first began, there was no mail, only a limited capacity for cargo, and, as pilot Luke Williamson recalled of the early years, “the passengers were mostly men...few women travelers, and no babies.”<sup>19</sup>

Ironically, as progressive as aviation was in the late 1920s, the Vicksburg Bridge spanning the Mississippi River, then in its final stages of construction, was likely more anticipated by people than the prospect of air travel. An early pilot observed that flying was “new to the American public, as such and not enough people would go and get in one of those crazy things, just to take them from here to yonder. The average guy...said heck, the trains are running, the buses are running, and I’ve got an automobile. Why should I get in one of those contraptions and go somewhere?”<sup>20</sup>

For two years, people had watched the Mississippi River bridge being built and waited expectantly for it to be completed. When it opened in 1930, highway and rail traffic sped over the river, where previously it had floated across on ferries. Its importance is underscored by the fact that it was the only bridge for 850 river miles below Memphis, and, as such, it funneled commerce from all points of the compass, via U.S. Highway 80, a transcontinental highway U. S. Highway 67, a north-south trunk road and the Illinois Central Railroad, much of it passing through Monroe.<sup>21</sup>

Delta Air Service inaugurated its scheduled passenger service with a departure

---

<sup>19</sup> *Delta Digest*, Dec. 1946, 12.

<sup>20</sup> Stevens, interview.

<sup>21</sup> “History of the Vicksburg Bridge,” unpublished essay in author’s possession.



from Dallas on June 17, 1929. Leaving Monroe, the traffic manager, John Fox and pilot John D. Howe completed the inauguration, flying to Jackson, Mississippi, without any passengers or express. From the air, the Vicksburg Bridge was an unmistakable landmark for Howe as he visually ascertained his position while navigating a direct course to Jackson. When he brought the Travel Air in for a landing, Jackson City Mayor Walter A. Scott was at the airfield, and Fox and Howe received an enthusiastic welcome. Community dignitaries feted the duo at a banquet that evening. At first, flights operated three days a week, but Fox said “five new planes are being built and that within a very short time the schedule will take in Birmingham and Atlanta.”<sup>22</sup> Delta eventually increased the number of its flights to operate a daily schedule.



Delta Air Service personnel with Travel Air 6000.  
John Howe and Woolman are on the left.  
Photograph courtesy Delta Air Lines Corporate Archives

Unfortunately, Delta's destiny, like other small independent carriers, was soon caught up in events on a national level that were beyond its control. In Washington, Walter Folger Brown, Herbert Hoover's postmaster general, applied Theodore

---

<sup>22</sup> *Jackson (Mississippi) Daily Clarion Ledger*, June 18, 1929.

Roosevelt's progressive New Nationalism philosophy--that industrial monopoly in the public interest was good--to air transportation.<sup>23</sup> Brown's vision was to forge a cohesive national air transportation system out of the hodgepodge of existing routes and airlines. Historian F. Robert van der Linden argues that Brown acted reasonably and in a predictable manner to create a viable, although oligopolistic, air transport system.<sup>24</sup>

Brown formed the Interdepartmental Committee of Civil Airways to rationalize the process of establishing new airways and the new transcontinental routes. In December 1929, the committee recommended a southern transcontinental air route to connect "Atlanta to Los Angeles and San Diego via Birmingham, Jackson, Shreveport, Dallas, Fort Worth and El Paso." Flights were expected to begin the following summer and, when beacons were installed by the Department of Commerce, the route could be flown at night.<sup>25</sup>

The report encouraged Woolman, who now unmistakably understood a mail subsidy was essential to earning a profit. The company was losing money. In 1929, Delta Air Service earned a net profit of \$20,121.85 from dusting and other operations, but the passenger line lost \$32,603, 37.<sup>26</sup> Still, Woolman noted, "we are staying on the passenger line as the route is recognized as a Southern Transcontinental and with the Watres Bill now before Congress we have great hopes of coming in for poundage space for air mail

---

<sup>23</sup> The counterpoint was Wilson's progressive New Freedom philosophy--that monopoly is inherently bad.

<sup>24</sup> Van der Linden, *Airlines and Air Mail*, ix, xi.

<sup>25</sup> *New York Times*, Dec. 12, 1929.

<sup>26</sup> Cornel & Company Audit, Nov. 12, 1928 to Dec. 31, 1929, dated Feb. 24, 1930, folder 7, box 2, RG02.00, DALCA.

over the run.”<sup>27</sup> The Watres Act, approved by Congress in April 1930, tied mail rates to the space made available on aircraft (rather than the weight of mail actually carried) to encourage airlines to operate larger passenger-carrying equipment. The bill also exchanged airmail contracts for long-term route certificates.<sup>28</sup>

The Watres bill gave Postmaster General Brown broad authority, permitting him to use his own discretion in redrawing the aviation map. Brown called for a conference of airline managers at the Post Office Department in Washington on May 19, 1930, but Woolman was not among the invitees. In what became known as the “spoils conference,” Brown forced route swaps and mergers to achieve his goal of three transcontinental air routes.<sup>29</sup>

Woolman, hearing of the meeting, rushed to Washington, “where he put up a gallant but losing fight to secure the mail carrying contract for his line.”<sup>30</sup> Brown favored large, well-capitalized companies, and Woolman’s appeal of Delta’s pioneering equity in the route it operated did not sway him. He told Woolman “that it would be far better from the standpoint of the Post Office Department, to have three single organizations crossing the continent rather than a large number of smaller organizations.”<sup>31</sup>

Aviation Corporation of New York (AVCO) received the certificate for the Los

---

<sup>27</sup> Woolman to Harris, April 22, 1930, folder 1, box 2, RG02.00, DALCA.

<sup>28</sup> Nick A. Komons, *Bonfires to Beacons: Federal Civil Aviation Policy Under the Air Commerce Act, 1926-1938* (Washington: U.S. Dept. of Transportation, Federal Aviation Administration, 1978). Reprint (Washington, D.C.: Smithsonian Institution Press, 1989), 201.

<sup>29</sup> Komons, *Bonfires to Beacons*, 202-203.

<sup>30</sup> *Monroe News Star*, Oct. 20, 1930.

<sup>31</sup> Senate Special Committee on Investigations of Air Mail and Ocean Mail Contracts, *Investigation of Air Mail and Ocean Mail Contracts*, 73rd Cong., 2nd sess. (Washington, D.C. Government Printing Office, 1934), 1597-1611.

Angeles-Atlanta, southern transcontinental route. Its subsidiary, American Airways, began passenger service in October, using “huge tri-motor transports capable of carrying hundreds of pounds of mail as well as passengers.”<sup>32</sup> These aircraft contrasted with the small single-engine equipment Delta was operating over the southeastern segment of the transcontinental route. Not only was AVCO permitted to fly across the entire length of the route, it immediately placed larger aircraft into service. Just as before when Huff Daland Dusters’s fate was sealed by men with a larger agenda, so too was Delta Air Service sacrificed by Brown in his quest to rationalize the nation’s air system.<sup>33</sup>

Postmaster General Brown’s objective of bringing order to a chaotic system disenfranchised small independent lines. Brown, though, was not unsympathetic to Delta’s plight and pressured AVCO to pay a fair price for its assets. On July 25 Woolman sold Delta Air Service for \$143,000; about “\$8.50 per share, which more than fair market value.”<sup>34</sup> At a special meeting of Delta’s Board of Directors in Monroe on October 31, 1930, the sale was approved and the company was dissolved.<sup>35</sup> The *Monroe News Star* carried the dismal news:

Travis Oliver, secretary-treasurer of the Delta Air Service, of Monroe announced this morning that the company’s passenger service between Birmingham and Fort Worth has been discontinued. Competition of southern transcontinental air mail planes which carry passengers as well as mail was given as the cause of discontinuance. “It is impossible for a small company to compete with the mail carrying line,” stated Mr. Oliver. “Hence our only recourse was to discontinue

---

<sup>32</sup> *Jackson (Mississippi) Daily Clarion Ledger*, Oct. 2, 1930.

<sup>33</sup> For a discussion of Woolman’s efforts to stake Delta’s claim and how Brown managed to push his agenda, see Lewis and Newton, *Delta*, 24-28.

<sup>34</sup> Van der Linden, *Airlines and Air Mail*, 165.

<sup>35</sup> Minutes of Special Meeting, Oct. 31, 1930, folder 7, box 1, RG02.00, DALCA.

passenger service.”<sup>36</sup>

Despite the primitive nature of air travel at the time, Delta’s operating record was exemplary. There were no fatalities and only a few incidents. The company was praised for its passenger operation during 1929 and 1930:

High compliments were paid to the Delta company by the government officials and the Aviation Corporation for the efficiency, economy, and safety features which marked the operation of the Delta line throughout its history as a passenger carrying agency. In all of its service the Delta line never experienced a major accident of any kind and only twice were any of the ships obliged to make a landing for any minor reason. On both of those occasions the ships were brought down on emergency landing fields with no inconvenience to the passengers. This record was held to be unexampled in the entire history of aviation in the United States.<sup>37</sup>

The agreement between Delta Air Service, Inc. and AVCO transferred Delta’s physical assets and its name, Delta Air Service, as well.<sup>38</sup> In its stead Delta Air Corporation was organized, and bought back the dusting equipment from AVCO for \$12,500.<sup>39</sup> The management team remained essentially the same: D. Y. Smith, president; Woolman, vice-president; Oliver, treasurer; and Catherine FitzGerald, secretary. FitzGerald’s appointment, as female member of the board of directors, was historic. The board also included Malcolm S. Biedenharn and Prentiss M. (“Print”) Atkins, both early Delta investors.<sup>40</sup> Woolman was interviewed by the *Monroe News Star*, “Whether we

---

<sup>36</sup> *Monroe News Star*, Oct. 20, 1930.

<sup>37</sup> *Monroe News Star*, Dec. 12, 1930.

<sup>38</sup> A. O. Cushney to C. E. Woolman, Oct. 16, 1930, folder 5, box 2, RG02.00, DALCA.

<sup>39</sup> Sales contract between Southern Air Fast Express, Inc., and Travis Oliver, Trustee, Nov. 3, 1930, folder 5, box 2, RG02.00, DALCA.

<sup>40</sup> Lewis and Newton, *Delta*, 32.

will be able to carry out our program will depend largely on the support we receive from the public, Mr. Woolman said. But we have every confidence that the Delta Air Service [he probably used the old name from habit] will continue to operate along the lines for which it was originally established, that of scientific control of those pests which are a menace to agriculture.”<sup>41</sup> The next few years proved to be a bleak and trying period for the company and its employees.



Employee group photo taken May 13, 1933  
Catherine FitzGerald, center; Woolman third from right  
Photograph courtesy of Delta Air Lines Corporate Archives

Historians Lewis and Newton characterize the years between 1930 and 1934 as a period of listlessness, inactivity, and recession, in a chapter appropriately titled “Doldrums.” The essential point of this period is that the business was able to hold on, and it survived.<sup>42</sup> The company dusted, acted as a fixed-base operator, sold oil and gas to transient fliers, stored airplanes, did maintenance, and so forth. With the exception of an

---

<sup>41</sup> *Monroe News Star*, Dec. 19, 1930.

<sup>42</sup> Lewis and Newton, *Delta*, 30.

occasional transient pilot, once the crop dusters left early in the morning “there was nothing happening at the airport in the middle of the day.” Money was tight, too. Barbara Woolman recalled that neither her father “nor FitzGerald drew a salary for a year or two years, something like that.”<sup>43</sup>

As if the news of Delta’s failure to win the mail contract was not enough for the community to digest, B. R. Coad, the head of the USDA’s Delta Laboratory in Tallulah, was indicted for defrauding the government. On March 12, 1931, Coad, along with F. W. McDuff, his administrative assistant, was charged with conspiracy to defraud the United States government by padding the payroll of the Bureau of Entomology. Eugene Stevens, an original duster pilot, remembered, “they were putting in some false vouchers for mule hiring...and personnel and what not, out in the fields.”<sup>44</sup> The indictment listed 872 counts for activities occurring between 1925 until 1931. Print Atkins, a Delta director, posted the \$10,000 bond for Coad’s recognizance, pending an October 5 trial date.<sup>45</sup>

Coad and McDuff claimed they did not intend to defraud the government or obtain funds for their own personal gain or benefit, and asked for leniency.<sup>46</sup> On October 6, in the United States District Court, Monroe, Coad and McDuff pled guilty to ten counts, and were each sentenced to one year in the Caddo Parish jail in Shreveport on one count, and five years suspended sentence for the rest, during good behavior. Thus they avoided a trial and the possibility of a felony conviction. As it was, they were convicted

---

<sup>43</sup> Preston, interview, 1977.

<sup>44</sup> Stevens, interview, 1984.

<sup>45</sup> U.S. V. B. R. Coad and F. W. McDuff, District Court of the U.S. Monroe, Docket 6040 (1931). The case record is on file at the National Archives-SW Region, Fort Worth, Texas (Shreveport accession 021-54A0589, location A0902111).

<sup>46</sup> *Madison* (Tallulah, Louisiana) *Journal*, Oct. 9, 1931.

of a misdemeanor offense and, following a ten-day grace period to arrange their affairs, were incarcerated on October 16, 1931.<sup>47</sup>

Coad quit the laboratory on January 27, and McDuff resigned on February 2.<sup>48</sup> Eugene Stevens recalled, “it was kind of a general joke down there you know [inflating the payroll]. But finally it became no general joke. [When] the FBI got into the picture, it ceased to be a joke.”<sup>49</sup> The community was apparently sympathetic to their situation. McDuff opened a filling station in town with a relative.<sup>50</sup> Woolman’s compassion for his friend and his family is evidenced when Coad was hired as an entomologist for the dusting business, but it is unclear precisely when, and under what conditions. It was probably during the “doldrums” period, but there are no personnel records to substantiate the date. Historians Lewis and Newton place the date “at some point in 1931,” but Coad was “confined in the Caddo Parish jail for a term of one (1) year dating from the 16<sup>th</sup> day of October, A.D. 1931.”<sup>51</sup> The earliest he could have been hired, then, was late in 1932.

When Coad completed his sentence in 1932, he may have worked for Delta on a seasonal basis, just as did other employees (such as the pilots), as there were few permanent employees at the time. The point is that Woolman was concerned enough to

---

<sup>47</sup> U.S. v. B. R. Coad and F. W. McDuff, District Court of the U.S. Monroe, Docket 6040 (1931).

<sup>48</sup> Cleveland and Parencia, “History of the USDA Cotton Insects Research Laboratory Tallulah, Louisiana, 1909-1973,” 406-407.

<sup>49</sup> Stevens interview, 1984.

<sup>50</sup> Ibid.

<sup>51</sup> Lewis and Newton, *Delta*, 37. U.S. v. B. R. Coad and F. W. McDuff, District Court of the U.S. Monroe, Docket 6040 (1931). In later years, when the company was on a more secure financial footing, a system was set up to recognize employees for their years of service, but Coad’s awards are inconsistent. According to the company magazine, the *Delta Digest*, in 1948 he was given a 15 year service pin, meaning he was hired in 1933. But then, he was awarded a 20 year pin in 1956, placing his hire date in 1936. His 25 year pin was presented in 1957 and 30 year award in 1962, pointing to 1932 as a hired date.



look after Coad and his family during a difficult time, and brought him on board. When the airline renewed passenger service in 1934, and Woolman became preoccupied with running the airline, Coad took charge of the dusting division. They maintained cordial relations for the rest of their lives.<sup>52</sup> Woolman's compassion is perhaps one reason Coad's transgression never tarnished his reputation.

Delta managed to hang on until 1934, when it was again caught up in political events beyond its control, this time with a better outcome. The airline was resurrected and Delta was permitted to carry passengers and mail. The change came when Franklin D. Roosevelt, victor in the 1932 presidential election, appointed James A. Farley to replace Walter Folger Brown as Postmaster General. There were high expectations for aviation from the New Deal, but "what ensued was neither in line with his original plans nor with the optimistic expectations of the air carriers."<sup>53</sup>

Senator Hugo L. Black--a progressive Alabama Democrat who believed in Wilson's New Freedom philosophy that monopoly was inherently bad--conducted hearings to investigate the awarding of mail contracts under Brown. Brown was a progressive too, but believed monopolies in the public interest were good. Woolman's testimony on Delta's treatment buttressed Black's findings on aviation monopolies, indicting Brown's heavy-handed, seemingly dictatorial actions.<sup>54</sup> The Black Committee report charged collusion between Brown and the airlines and recommended that Roosevelt cancel the domestic contracts. With the assurance of the chief of the Army Air

---

<sup>52</sup> *Delta Digest*, April 1966, 12.

<sup>53</sup> Komons, *Bonfires to Beacons*, 226.

<sup>54</sup> Senate Special Committee on Investigations of Air Mail and Ocean Mail Contracts, *Investigation of Air Mail and Ocean Mail Contracts*, 73rd Cong., 2nd Sess. (Washington, D.C.: Government Printing Office, 1934), 1597-1611.

Corps, Benjamin D. Foulois, that the army could fly the mail, Roosevelt cancelled all domestic mail contracts. Army pilots proved not to be experienced in the challenges of scheduled mail flying. Disaster quickly followed, when several Army planes crashed with some pilot fatalities. Roosevelt was roundly criticized over his handling of the airmail scandal.

To extricate himself from this situation, Roosevelt allowed new temporary contracts to be put up for bid. To be eligible, no prior contractors were allowed to participate, but the government did not object when companies simply changed their names. For example, American Airways became American Airlines and Eastern Air Transport became Eastern Airlines. Delta was unaffected by this stipulation, as it had already changed its name to Delta Air Corporation and did not hold a contract. Another condition precluded any officers of companies that had attended the “spoils conference” from being affiliated with the new companies.<sup>55</sup> While Woolman had attended, he was not an invited participant. Nevertheless, to prevent any suggestion of impropriety, he resigned from the board of directors.<sup>56</sup>

Politics aside, Robert van der Linden argues that Brown’s actions were within the authority granted him by Congress and, in light of the Roosevelt administration’s subsequent policy, he “regulated the industry and its oligopolies in virtually the same manner as the Civil Aeronautics Board later would.”<sup>57</sup> Roosevelt essentially reinstated Brown’s plan. “After the smoke had cleared, the large financially stable firms were once

---

<sup>55</sup> Komons, *Bonfires to Beacons*, 263.

<sup>56</sup> Marie Force, e-mail message to author June 27, 2005.

<sup>57</sup> Van der Linden, *Airlines and Air Mail*, xi.

again carrying the bulk of the nation's airmail over a rational route system that followed Brown's original network."<sup>58</sup> One striking difference was small Delta winning authority to operate along the route it had pioneered years earlier.

In April, the Post Office extended the southern transcontinental route from Atlanta to Charleston, South Carolina, as its eastern point of origin. The route was divided in half, with each segment, Charleston to Fort Worth, Fort Worth to Los Angeles, bid separately. Three airlines submitted competing bids for the eastern section.<sup>59</sup> Of these, Delta's was the lowest at 24.8 cents per airplane mile; Eastern's was 41 cents; and American's 43.5 cents.<sup>60</sup> Following an investigation by the Post Office to determine the status of Delta Air Corporation, Delta was awarded the contract. The *Charleston News and Courier* followed the story and announced: "The Delta Air Corporation of Monroe will start flying the mail over the Charleston-Dallas route 'within fifteen to twenty days,' Travis Oliver, secretary, said today after being notified from Washington that the company's bid had been formally approved by the post office department. Five tri-motor planes of the same type as employed by the American Airways corporation, which formerly carried the mails over the trans continental route, will be in service."<sup>61</sup>

In the remarkably short span of two months, Delta's managers organized the operation and began scheduled service. The aircraft were acquired from American Airlines and a new cadre of pilots hired and trained. Pat Higgins was the chief pilot. Other early pilots included Don Dice, Charles Dolson, Lee McBride, and Andrew Dixon.

---

<sup>58</sup> Ibid., 286.

<sup>59</sup> *Charleston News and Courier*, April 5, May 6, 1934.

<sup>60</sup> *Charleston News and Courier*, May 26, 1934.

<sup>61</sup> *Charleston News and Courier*, June 10, 1934.

Before beginning service, they were required to fly the route to familiarize themselves with land features and regular and emergency airfields.<sup>62</sup> Passengers were assured of the reliability of the aircraft and the qualifications of the pilots in a Monroe newspaper report:

The ships to be used in the service are seven and eight passenger Stinson monoplanes, each powered with three 215-horsepower Lycoming motors. All of them equipped with practically all instruments known to modern air navigation, including radio facilities. All of Delta corporation's pilots have several thousand more hours flying experience than required by the transport airline ratings they hold, Mr. Woolman said. All of them are experienced in blind and instrument flying.<sup>63</sup>

The company received final authorization from Roy Keely of the United States Department of Commerce.<sup>64</sup> With Don Dice as pilot-in-command, Delta initiated its scheduled mail service between Atlanta and Dallas on July 4, 1934. The *Monroe News Star* called the "resumption of service...Uncle Sam's Fourth of July gift to Monroe--and all the other similarly honored on the Charleston-Dallas division of the southern transcontinental route."<sup>65</sup> Service between Charleston and Atlanta was slightly delayed "pending a report by the bureau of aeronautics of the department of commerce as to whether improvements were necessary at any of the landing fields."<sup>66</sup> Flights began on July 8 when Charles H. Dolson piloted a Stinson Tri-Motor to Charleston accompanied by Leigh Parker, traffic manager, who announced passenger service would begin in two

---

<sup>62</sup> *Monroe News Star*, June 20, 1934.

<sup>63</sup> *Monroe News Star*, August 5, 1934.

<sup>64</sup> *Ibid.*

<sup>65</sup> *Monroe News Star*, July 4, 1934.

<sup>66</sup> *Charleston News and Courier*, July 6, 1934.

or three weeks. The inaugural passenger run was flown by George Shealy on August 5.<sup>67</sup>

Passengers had the option of connecting at several points along Delta Air Lines “Trans-Southern Route.” By connecting with other carriers passengers could fly to Washington, New York, Miami, Memphis, St. Louis, Chicago, New Orleans, Houston, San Antonio, and points west.<sup>68</sup> Eastern Air Transport had contemplated the concept of a hub-and-spoke model as early as May 1930, at the time when Postmaster General Brown was rearranging the aviation map. Eastern was vying for Delta’s route to the west, which would tie into its north/south operation. Woolman disclosed in his testimony before the Black Committee that Eastern “felt it would be a very splendid operation to them, as it would hub out of Atlanta and could be handled both to the north, south, and west, and I think their chief claim to the route was that they could make it an economical operation.”<sup>69</sup> Nevertheless, Brown gave the route to AVCO.

Contract Air Mail (CAM) route 24, the route Delta won in 1934, intersected in Atlanta with Eastern’s mail routes from New York to New Orleans and Chicago to Jacksonville. Intersecting routes were designed to insure the smooth flow of mail and passengers onward to multiple destinations.<sup>70</sup> Thus a passenger leaving Monroe at 2:35 p.m. would arrive in Atlanta at 7:30p.m. There, the passenger would connect with Eastern

---

<sup>67</sup> *Charleston News and Courier*, July 8; Aug. 5, 1934.

<sup>68</sup> “Schedules and Fares,” July 1, 1935, Delta Subject File 1940-1949, Mississippi State Archives, Jackson, MS.

<sup>69</sup> Senate Special Committee on Investigations of Air Mail and Ocean Mail Contracts, *Investigation of Air Mail and Ocean Mail Contracts*, 73rd Cong., 2nd Sess. (Washington, D.C.: Government Printing Office, 1934).

<sup>70</sup> *Charleston News and Courier*, May 6, 1934.

Airlines departing at 8:00 p.m. and arrive in New York City at 5:45 in the morning.<sup>71</sup>

Such a trip was long and arduous.

In 1934, Delta and Eastern published a joint schedule from New York to Dallas via Atlanta. You first rode in an Eastern T-34 Condor to Atlanta and then connected to a Delta Stinson Trimotor for the rest of the journey. And what a journey it was! You took off and landed 15 times; you spent 19 hours enroute; you bounced around in the hot air thermals at 3000 to 5000 feet strapped into a wicker chair with a sickness cup handy. You went blindly through thunderstorms and frequently diverted to alternate airports. Bad as it was, it was still progress. An alternative was black soot or flat tires and a journey 4 to 5 times as long.<sup>72</sup>

From these humble beginnings in the years leading up to World War II, the structure of a modern airline emerged. Delta and Atlanta benefited symbiotically. Atlanta became the anchor city, giving Delta Air Lines a safe harbor from which to compete against the larger, more established air carriers.

---

<sup>71</sup> *Monroe News Star*, August 5, 1934.

<sup>72</sup> Arthur Ford, interview by author, Atlanta, Georgia., Sept. 5, 1996; Delta/Eastern Joint Schedule, Delta Timetable Collection, DALAC.

## Chapter 9

### Southern Stars

ATLANTA MUNICIPAL AIRPORT: The “Hub of Southeastern Aviation”--where planes arrive every thirty minutes--and serve seven points of the compass. Large crowds gather twice a day to view the arrival and departure, within a space of only a few minutes time, of seven large passenger ships; and this spectacular sight is known as the famous “Merry-Go-Round.”

Postcard caption (ca.1941)

Long before Atlanta became a crossroads of the air--indeed, long before it became a city--it was preordained a hub. “Early travelers could journey north up either side of the Appalachian Mountains, as well as, to the south, east, and west, without facing any real obstacles.” For hundreds of years native Americans, traveling the river valleys and following the Peachtree and Etowah trails, converged on the area, and “this accessibility led to Atlanta’s founding as a rail head.”<sup>1</sup>

Just as railroad lines radiate from Atlanta, so do air routes, to all points of the compass. Asa Griggs Candler, founder of the Coca-Cola Company, chose a relatively flat piece of land on which he built an automobile racetrack in 1909. The racetrack was a convenient landing field for early aviators and their primitive machines. As aviation progressed, the airport’s boundaries expanded outward from Candler’s original 300-acre purchase to accommodate larger and more sophisticated airplanes, and ever-increasing

---

<sup>1</sup> Betsy Braden and Paul Hagan, *A Dream Takes Flight, Hartsfield Atlanta International Airport and Aviation in Atlanta* (Athens: University of Georgia Press, 1989), 1, 4.

numbers of operations.<sup>2</sup>

Today, Atlanta and Delta are figurative binary stars, orbiting the New South's powerful economy. The city and the airline support, and benefit, each other, but this symbiotic relationship was not preordained and evolved gradually. Delta's origins were in the Mississippi Delta, and it was drawn to Atlanta by its location, reasonable climate, entrepreneurial and economic dynamism, and visionary leadership. Atlanta is situated almost at the geographic center of the southern states; Richmond, Dallas, and Miami are nearly equidistant.<sup>3</sup> Woolman continued as general manager of the resurgent passenger line. His contemporary in Atlanta was William B. Hartsfield, "an early and lifelong proponent of aviation...who eventually became the city's mayor. He foresaw that Atlanta and aviation would grow together and steadfastly worked to that end."<sup>4</sup>

In the 1930s, both Delta and Eastern Airlines served Atlanta, but they were not direct competitors. Contract Air Mail (CAM) routes were monopolies, determined by the post office, and the Post Office encouraged cooperation among carriers. While Delta flew to the east and west, Eastern's destinations were north and south, with Atlanta as an intersecting terminal. This protected network allowed airlines to eke out a profit from carrying passengers and grow. Significantly, Delta's passenger business increased 675 percent from 1935 to 1941. The airline lost money only in 1935 and again in 1941, when the expensive Douglas DC-3s were acquired.<sup>5</sup> Delta's example underscores the point that

---

<sup>2</sup> Braden and Hagan, *A Dream Takes Flight*, 4.

<sup>3</sup> ATL-RIC, 474nm; ATL-DFW, 633nm; ATL-MIA, 517nm.

<sup>4</sup> James J. Hoogerwerf, "Mighty Hartsfield," *Southern Aviator* 6 (March 1995): 20-24.

<sup>5</sup> *Atlanta Journal*, April 14, 1941. Lewis and Newton, *Delta*, 76, Appendix 1.



air transportation was “a depression proof industry.”<sup>6</sup>

As the airlines grew, airports had to keep up. Shortly after Delta won the CAM 24 contract, Monroe officials improved the facilities at Selman Field. According to the local newspaper a new hangar could “accommodate at least three of the Delta Air Corporation’s big Stinson airmail ships, without dismantling any of the equipment or accessories.”<sup>7</sup> Other changes brought the airport up to “class A” status of the Department of Commerce, to avoid the risk of abandonment “as a port of call on the transcontinental airmail route.”<sup>8</sup> Lighting for night operations was a necessary and significant enhancement. A rotating beacon identified the airport, boundary lights outlined the landing field’s perimeter, and obstacle lights warned pilots of hazards. Bright lights lit up the apron area and a powerful Sperry arc light flooded the entire field for takeoffs and landings.<sup>9</sup>

Because the old Stinson-Ts Delta had acquired from American were outdated and incapable of night flight, Clarence E. Faulk, Delta’s new president, announced the company would buy three specially-equipped Stinson-A trimotor airplanes.<sup>10</sup> “The dignified bespectacled” Faulk had “put up nearly half of the \$22,000 down payment”<sup>11</sup> While these were brand new airliners, their fabric covering and strut-braced wings were visual indications of an obsolescent design. Yet, as the following description claims,

---

<sup>6</sup> Komons, *Bonfires to Beacons*, 223.

<sup>7</sup> *Monroe News Star*, August 21, 1934.

<sup>8</sup> *Ibid.*, Feb. 22, 1935; March 20, 1935.

<sup>9</sup> *News and Courier* (Charleston, South Carolina), Dec. 12, 1931.

<sup>10</sup> *Monroe News Star*, March 20, 1935.

<sup>11</sup> Lewis and Newton, *Delta*, 52.

“America’s Fastest Trimotor” was an improvement over the rudimentary Stinson-Ts.

To make your trip more enjoyable you may smoke, relax or chat in normal tones in the Stinson’s sound deadened cabin while the aerial panorama unfolds swiftly through wide safety glass windows which permit direct downward view. Wide deeply tufted reclining chairs, insulated in rubber, are adjustable to three positions. Foot rests, adjustable to two positions, help you find the most comfortable position. A scientifically designed heating and ventilation system changes cabin air every four minutes and in addition each passenger has an individual heat and ventilation control, reading light, ash receiver, attendant call button, window curtains and parcel rack. A large lavatory with running water is located in the rear of the cabin.<sup>12</sup>

At about this time, Delta began advertising its route as the “Trans-Southern Route.” The new Stinson-As flew two night schedules for the six-hour flight between Atlanta and Dallas: “The Texan” flew westbound, as trip No. 3, and the other flew eastbound, as trip No. 4.<sup>13</sup> Mrs. Eugene Talmadge, wife of Georgia’s governor, christened the first airplane out of Atlanta as “The Georgian.”<sup>14</sup> For two weeks, government authorities permitted only mail to be carried. Once the airplanes and crews were certified, on July 19 Woolman, general manager, announced “the passenger-carrying service will go into effect immediately.”<sup>15</sup>

Delta’s Stinson-As proved to be an ill-fated trio of airplanes--all their endings were ignominious. Shortly after beginning passenger service, tragedy struck on the night of August 14, 1935, when Delta suffered its first fatal air crash. An eastbound Stinson-A crashed near Gilmer, Texas, at about 11:45 p.m. The official report blamed the loss of a

---

<sup>12</sup> Delta Subject File, 1940-1949, Mississippi State Archives.

<sup>13</sup> Ibid.

<sup>14</sup> *Monroe News Star*, July 1, 1935.

<sup>15</sup> Ibid., July 19, 1935.

propeller, which created an imbalance, causing the left engine to separate from its mount.<sup>16</sup> Pilot Andy Dixon and his assistant Herbert Bulkeley (in one report he was identified as a “courier,” which was not the same as a copilot), and two passengers perished.<sup>17</sup>

Approximately a year later, Capt. Charles Dolson (who replaced Woolman as president on his death in 1966 and ultimately rose to the position of Chairman of the Board) survived a crash in a second Stinson-A, while taking off on a test flight from Atlanta.<sup>18</sup> Thomas Prioleau (“Pre”) Ball recalled:

The airplane had just been worked on and he was flying it by himself. He took off on this test flight and, as far as I can remember now, there was either...a bolt or a fitting that sheared at the attach point between the wing structure and the center section. Actually the wing itself rotated one direction or the other and the airplane rolled. He hit the trees right off of the west end of the runway. Charlie’s back was badly hurt. He was in bed most of a year in a body cast. He survived it. Of course that airplane was junk.<sup>19</sup>

One night, some time later, Capt. George Shealy and copilot Ball flew the remaining Stinson-A to Fort Worth and left it there as a reserve for the western leg of the route. Ball said he “never saw it again.”<sup>20</sup> According to FitzGerald, the airplane was sold, and the very next day, it burned up in a fire in Miami, Florida.<sup>21</sup>

---

<sup>16</sup> *Air Commerce Bulletin*, June 15, 1936, 92.

<sup>17</sup> Lewis and Newton, *Delta*, 53.

<sup>18</sup> *Atlanta Journal*, Sept. 15, 1966; Lewis and Newton, *Delta*, 54.

<sup>19</sup> Captain T. P. Ball, interview by author, tape recording, Atlanta, Georgia., (hereafter cited as Ball interview), Sept. 6, 1995.

<sup>20</sup> *Ibid.*; both the *Atlanta Journal*, August 27, 1936 and *Atlanta Constitution*, August 28, 1936, reported Pullman Norton was flying with Dolson as a copilot or assistant and was unhurt. Dolson logged one minute for the flight. Bonnie Peet (daughter) interview by author, Roswell, Georgia., July 23, 2004.

<sup>21</sup> FitzGerald, interview.



Front Row L-R: George Hill, Claude P. Lyle, E.G. "Pete" Jones, A. B. Henny, Carl Nesbit, Wayne Lydon, Vernon Gillette, T. J. "Squire" Helms, Robert D. Poole, Earl Forth, David Chupp, Dick Bingham, Arthur Ford, Bill Coats, Robert White  
 Middle Row L-R: Nipton "Nip" Hill, Earnest "Sweatpea" Jackson, G. J. (J.D.) Dye, "Skid" Henly, Harold Valentine, A. D. Clark, O. B. Deere, Bill Stevens, Jack Langford, Jake Morse, Harold Millican, Sam Everett, J. T. "Tut" Harper, H. A. "Ham" Moreau, Grover Presnell, W. L. "Jack" Bernard, Lamar Grover  
 Back Row L-R: Bill Miles, J. D. Crane, Gene Christian, "Jug" Wilson, Clark French, Ken Ward, Pat Higgins, Helen Callahan, Bob Weeks, Grif Connell, George Cushing, Bob Spalding, Charlie Payne, Hugo "Dutch" Krantz, "Red" Bounderant, Jack Gross, Roy White, H. D. Wigly, Jim Spratlin

The group posing with a Lockheed Electra on March 14, 1939 includes about 80-85% of all Delta's employees. Source: Gene Christien.  
 Photograph courtesy of Gene Christien.

Delta needed a new airplane to replace the Stinsons. The first truly modern airliner was the Boeing 247. It transported United Air Lines passengers "fifty percent faster than the competition...with unprecedented comfort and safety." Competitors wanted to buy it, but the first thirty Boeings were built exclusively for United.<sup>22</sup> Therefore, Douglas designed the DC-1, which quickly evolved into the DC-2. These modern aircraft were revolutionary designs incorporating stressed aluminum skin, cantilever wings, NACA cowled engines, controllable pitch propellers, and retractable

---

<sup>22</sup> F. Robert van der Linden, *The Boeing 247: The First Modern Airliner* (University of Washington Press, 1991), 1; T.A. Heppenehimer, *Turbulent Skies: The History of Commercial Aviation* (New York : John Wiley & Sons, 1995), 52.

main landing gear to improve aerodynamic efficiency.<sup>23</sup>

Another new airplane was the Lockheed Electra, smaller than the Boeing and Douglas airplanes, but better suited to Delta's limited operation as a regional carrier. In December 1936, the new, all-metal, twin-engine, Model 10B Electras replaced the obsolescent Stinson-As and Ts.<sup>24</sup> They required two pilots and could accommodate ten passengers. The economics were favorable. Fritz Schwaemmle, one of the newly hired copilots explained: "You start out initially with a seven passenger plane [the Stinson-T] and then you get a ten passenger airplane; that's a 30% increase in the number of seat miles that are available." The Electra was faster too, "so you're grinding out more seat miles per hour."<sup>25</sup>

Another new copilot, Pre Ball, was destined to rise high in the company hierarchy, and become Director of Operations.<sup>26</sup> His extraordinary flying career, like many others of his time, spanned the era of flight from barnstormers to jumbo jets. Ball's long career with Delta started with the award of CAM 24. Pre was born in Charleston, South Carolina, in 1906. He learned to fly in 1929, in a Curtiss Jenny with an OX5 engine, when airplanes were just bare bones, the instruments basic, and the performance limited. He earned his transport license, and in 1930 became the manager of Charleston's municipal airport. In 1932 he was a partner in Hawthorne Aviation, a fixed base operator at the airport. In addition to running the airport and managing the fixed

---

<sup>23</sup> Komons, *Bonfires to Beacons*, 211.

<sup>24</sup> Lewis and Newton, *Delta*, 54.

<sup>25</sup> Fritz Schwaemmle, interview by Delta Air Lines, Dec. 7, 1973 (transcribed May 31, 2007), 4 DALCA.

<sup>26</sup> Captain T. P. Ball, interview by author, Atlanta, Georgia., (hereafter cited as Ball interview), Oct. 3, 1994.

base operation, he served as the station manager for Eastern Air Transport, later Eastern Airlines.<sup>27</sup>



Thomas Prioleau ("Pre") Ball (ca.1936)  
Photograph from author's collection

In 1934, Ball took on another duty as Delta's Charleston station manager. "I had to be there all the time because I had airplane transient pilots who spent the night and wanted to leave early in the morning. So, I had to be up long before dawn everyday. I got to the airport before daylight. I stayed there until around 7-8 o'clock every night to pick

---

<sup>27</sup> Ibid.

up the last people who came in as transients who were going to spend the night.”<sup>28</sup>

Ball heard Delta was hiring pilots and drove to Atlanta looking for a job. He was hired in 1936 and recalls flying the southern route as being memorable. At first he flew the eastbound trip from Atlanta to Charleston with stops in Augusta, Georgia, and Columbia, South Carolina, and returning to Atlanta, all in the same day. Stops were quick, just enough time to let passengers off and on, and to exchange mail bags. “As a matter of fact,” he recalled, “usually our flight plans were pretty damn good. We would usually get within 5-6 minutes.” Fueling was done in Atlanta or Charleston.<sup>29</sup>

At first westbound trips were navigated visually during the day or by following beacon lights at night. When radio ranges were installed at various stations along the route, electronic navigation permitted all-weather flying, night or day, and instrument approaches to runways. Still, a lot of the time flying was visual--close to the ground. Ball recalled the routes became very familiar.

We could see cattle. We could see the farms that people had. We could see the smoke on the ground. We were flying at 3-5-7000 feet. We could always tell things like that. We could tell which way the wind was blowing. We could see it. We really knew the country. We knew the towns that we flew over. We recognized each little village. We saw the crossroads. We saw the railroad crossings. All these things were a very familiar part of your day to day life.<sup>30</sup>

Landing at Monroe was special. Not only was it the home office and a place to catch up on company news, but Woolman, the general manager, could be counted upon to greet the crew personally. “Every time we would land and taxi up, if Mr. Woolman

---

<sup>28</sup> Ibid.

<sup>29</sup> Ball Interview, Sept. 6, 1995.

<sup>30</sup> Ball, interview, Oct. 3, 1994.

was at the airport, he would be out talking to us. We got all of our information about the progress of the airline, its financial situation, what was happening, what was good and what was bad. How he wanted us to operate and all that sort of stuff came on those visits with Mr. Woolman.”<sup>31</sup>

Mechanical problems were few, but weather could be troublesome. In an Electra, Capt. George Shealy and Ball encountered a severe thunderstorm after passing Birmingham, en route to Dallas. Ball described the incident:

We got into weather, actually we flew through a tornado that wiped out the town at the same time I called in to report over it. We went into that thing. After that, all hell broke loose. We just hung on. We kept the wings level as best we could. Finally, we broke out in a hole. It was perfectly clear. We had a ceiling above us, lightning in all four quadrants, brilliant! You could see the ground, just as clear. There was Aliceville.<sup>32</sup>

The *Birmingham Age-Herald's* morning edition, in bold headlines, announced “Nine Die As Twisters Hit State. Aliceville Struck. The storm struck Aliceville, Ala. in Pickens County about 10 miles southwest of Carrolton taking a reported toll of 10 dead, many injured and at least 15 buildings, including residences, demolished.”<sup>33</sup> Without radar or more accurate weather forecasting and reporting, Shealy and Ball were unable to avoid the hazardous weather.

An unusual feature in the cabin of the Electra was a hump in the cabin between the wings--this was the wing spar. While there was a door to the cockpit, the crew did not always keep it closed. Interested passengers or flight inspectors could sit on the hump and

---

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

<sup>33</sup> *Birmingham Age-Herald*, April 8, 1938.



lean forward to talk to the crew while in flight. One passenger, Ball remembers, was Howard Hughes, who rode with him two or three times and chatted with the crew while sitting on the hump.<sup>34</sup> Amelia Earhart and Eleanor Roosevelt were other well-known passengers who flew Delta.<sup>35</sup>

Although the Douglas DC-3 was a more advanced airplane, Delta bought four DC-2s from American Airlines as a temporary measure until the company could afford DC-3s. With the purchase of the DC-2s, and then the DC-3s, Delta marked another milestone in its evolution. Delta hired cabin attendants, then known as stewardesses.

In early 1940, Delta's new Chief Stewardess, Laura Wizark, set about hiring registered nurses willing to staff the newly acquired fourteen-passenger DC-2s. Cabin attendants raised the quality of Delta's service to a higher level. Eva Parrish was in Delta's first stewardess class and remembers, "we had classes in charm, passenger service, airline safety, meteorology, Delta routes and schedules, and ticketing of passengers. Delta sent each of us to Antoine's Beauty Salon at Rich's Department Store in Atlanta for hair styling best suited for the small stewardess caps."<sup>36</sup> Birdie Bomar had the distinction of becoming Delta's first stewardess taking to the air.<sup>37</sup>

---

<sup>34</sup> Ball, interview, Sep. 6, 1995.

<sup>35</sup> Lynn D. Field, ed. *From Travel Air to Tristar, the First Fifty-Years of Delta Air Lines* (Miami : Halsey Publishing Co.), 11; Lewis and Newton, *Delta*, 62

<sup>36</sup> Eva Parrish Fitch, "Personal profile of Eva Mae Parrish Fitch," unpublished in author's personal collection.

<sup>37</sup> Lewis and Newton, *Delta*, 72.



Eva Parrish (ca.1940)  
Photograph from author's collection

The cornerstone of an attendant's in-flight duty is safety, but cabin service became an important element of the airline's marketing program.<sup>38</sup> Sybil Peacock Harmon recalled her duties:

When the flight was called, I would stand by the door. The passenger would come up the steps, give me his or her name and I would check it off my manifest. They would then enter and take a seat anywhere on the plane, we had no seat selection! When all the passengers had boarded, the ramp agent would come up to me and hand me the papers for the pilots. He and I would agree on the number of passengers on board, he would then close the door and we were ready to go! Before take-off, I would pass chewing gum around to all of the

---

<sup>38</sup> Helen E. McLaughlin, *Footsteps in the Sky: An Informal Review of U.S. Airlines Inflight Service, 1920-Present* (Denver: State of the Art, Ltd., 1994), 4.

passengers. This was to make them chew and in turn salivate. The swallowing action would relieve pressure on the ear drum as we passed through various altitudes. Even so, there was a lot of trouble with ears in those days. After take-off, we would go around and greet each passenger to put him at ease. For refreshments, I would serve hot coffee or Coca-Cola. We served boxed meals out of Jackson Mississippi on both east and west bound flights. Some of these dinners were not too good and often contained greasy fried chicken, not the best meals if the weather turned rough!<sup>39</sup>

Harmon developed a unique intuition for passenger assistance in rough air:

There was a lot of motion sickness in those days. The lower altitude where we flew contained the more unstable air and we experienced a lot of bumpy weather. ...One of my most delicate and difficult jobs was to judge by his color when a passenger was sick enough to get the "Burp Cup." This way he would not smell up the airplane if he got sick. Act too soon and you would put ideas into his head, act too late and you had a cleaning job.<sup>40</sup>

Life for a pilot or stewardess--then as today--revolved around his or her flight schedule. Ball recalled, "there were fewer copilots originally than there were captains. So, the copilots had to absorb this extra flying and I used to fly anywhere from 90 to 110-115 hours per month. So, I was flying all the time in the beginning. So, I must have made 3 or 4 round trips to Charleston and back each week."<sup>41</sup>

Then as now, seniority determines one's bidding priority. The most senior pilot or stewardess selects his or her schedule first and everyone else follows in seniority order. Seniority is a cornerstone of union organization and was officially adopted by Delta Air Corporation for its pilots with their representation by the Air Line Pilots Association. Unlike pilot negotiations with other airline managements, Delta's pilot contract was

---

<sup>39</sup> Sybil Peacock Harman, "Delta's First Stewardesses," unpublished in author's personal possession.

<sup>40</sup> Ibid.

<sup>41</sup> Ball, interview, Oct. 3, 1994.

signed on July 11, 1940, without any acrimony and in record time. Unionization was an anathema to southern businessmen and Dolson later observed, 'I don't think Mr. Woolman ever forgave me for getting ALPA started on Delta.'<sup>42</sup>

Seniority, according to the contract, "shall be based upon the length of service as an air line pilot with the company."<sup>43</sup> Pay and working conditions, equipment flown and schedules, all follow from this basic precept. Don Dice, a former pilot for Standard Oil Company, with a seniority date of June 16, 1934, was number one on the list.<sup>44</sup> On a side note, John Howe, who inaugurated Delta's service to Jackson, Mississippi, as Delta's first pilot on June 17, 1929, did not return to the company after it began flying again in 1934. Had he done so, he would have been number one on the seniority list. Instead he made a successful career of flying for the Army Air Corps, later the United States Air Force, retiring as a brigadier general, and was inducted in the Arkansas Aviation Hall of fame.<sup>45</sup>

By 1940, Delta was established as a reliable regional carrier operating across the southern tier of states. Three events presaged continued growth. First was the integration of the DC-3 into Delta's fleet. The DC-3 was the first aircraft capable of operating profitably carrying passengers without having to rely on a mail subsidy. Second, in 1941 Delta was approved for route extensions to Cincinnati, Ohio, to the north and Savannah, Georgia, to the south.<sup>46</sup> And third, Delta decided to move its headquarters from Monroe

---

<sup>42</sup> "ALPA Celebrates 50 years at Delta," *The Widget* (June 1991): 1, 4.

<sup>43</sup> Delta Pilot Contract, August 1, 1940, 11. in author's possession.

<sup>44</sup> *Madison* (Tallulah, Louisiana) *Journal*, March 23, 1929.

<sup>45</sup> Speech made by Charles M. Taylor, presenting the name of Brig. Gen. John D. Howe for induction into the Arkansas Aviation Hall of Fame, Nov. 9 1984, in author's possession.

<sup>46</sup> Lewis and Newton, *Delta*, 77.

to Atlanta. This was a logical decision based on the facilities available at the Atlanta airport and because the city lay at the intersection of its two routes.

As commercial aviation grew, municipal authorities competed to attract air service to their own communities. Monroe remained a Delta destination but circumstances conspired to remove Delta's headquarters from the city of its roots and place it in Atlanta. Monroe officials may not have fully understood the challenge they faced in competing with the formidable William B. Hartsfield, Atlanta's airminded mayor. On the other hand, they may have known but were unable to match Atlanta's resolve.

In Atlanta, Mayor Hartsfield and airport manager Jack Gray petitioned the Works Progress Administration to lengthen the runways and improve the terminal at no cost to the city.<sup>47</sup> In 1936 these improvements were underway as Delta moved its maintenance and operations divisions to Atlanta. Half of Eastern's hangar space became available when Eastern moved its maintenance and operations departments to Florida.<sup>48</sup> Four years later, in 1940, Eastern cancelled Delta's hangar lease, forcing Delta to find new quarters. Atlanta and Delta officials agreed to share the cost of a hangar, with office space attached, and executed a long-term lease agreement.<sup>49</sup> The new structure could accommodate Delta's DC-2s and DC-3s and provided ample office space.

Atlanta's runways still lacked the length needed for the larger DC-2s and DC-3s. Even the smaller aircraft had problems. As Ball, flying the Lockheed Electras, said, "in

---

<sup>47</sup> Braden and Hagan, *A Dream Takes Flight*, 95.

<sup>48</sup> *Ibid.*, 93.

<sup>49</sup> *Atlanta Constitution*, Nov. 5, 1940.

fact, even in Atlanta, in the summertime, when you've got ten passengers and you have full tanks of gas in the thing, you are right up to your maximum gross weight....that plane was lucky to get airborne."<sup>50</sup> Famed aviator Eddie Rickenbacker "in no uncertain terms [said] the city must add more hangars and land. 'Atlanta needs a five-thousand-foot runway to be any good as an airport.'"<sup>51</sup> Aircraft performance is degraded by high temperatures requiring a longer runway to get airborne. The Civil Aeronautics Authority (CAA) agreed and admonished airport authorities following two incidents in 1939 when aircraft went off the end of the runways.<sup>52</sup>

As war clouds loomed, Atlanta had a leg up on Monroe. Candler Field was apparently of more immediate importance to the nation's military preparedness than Selman Field and, when Atlanta became an airbase on October 4, 1940, it got priority for federal spending.<sup>53</sup> Not until spring 1942 was Monroe's Selman field taken over by the Army Air Corps and expanded to serve as a navigation training school.<sup>54</sup>

Many Delta stockholders were prominent Monroe businessmen and early investors in the risky new airline industry. Some, such as the Biedenharn family, would have preferred to keep Delta in Monroe, but by the time the issue came up for a decision the move to Atlanta was warranted. Atlanta was a hub, Delta's routes crossed there, it was a maintenance base, and occupying the new administrative space would replace the crowded conditions of the old office building at Selman Field. Another factor was the

---

<sup>50</sup> Ball, interview, Sept. 6, 1995.

<sup>51</sup> Braden and Hagan, *A Dream Takes Flight*, 93.

<sup>52</sup> *Ibid.*, 99.

<sup>53</sup> *Ibid.*, 104.

<sup>54</sup> *Ouachita* (Monroe, Louisiana) *Citizen*, March 9, 1983.

access to capital.



C. E. Woolman, Clarence E. Faulk, Pat Higgins  
Photograph courtesy of Delta Air Lines Corporate Archives

Raising capital was a major hurdle. In 1939 Delta needed money to expand and buy modern equipment. Between December 1939 and March 1940, Delta proffered privately issued stock to Monroe investors and other interested parties, such as the pilot group. Ball recalled, “You could buy ten shares at \$10 a share. I was flying as reserve captain at that time, so that must have been 1939.”<sup>55</sup> Atlanta stockbroker Richard W. Courts, Jr. was unaware that the issue had not been registered by the Security and Exchange Commission (SEC), and was one of the few outsiders to buy shares. Some individual investors subsequently resold their stock to secondary parties, unwittingly

---

<sup>55</sup> Ball, interview, Sept. 6, 1995.

placing themselves in the position of brokers.<sup>56</sup> These activities remained undisclosed until 1941 when 60,000 new shares were offered, and Courts's firm, Courts & Co., was retained to market them. In their book on Delta, historians Lewis and Newton concluded:

There was no implication that Delta had knowingly broken the law; its legal advisers in Monroe were simply unfamiliar with the technicalities surrounding the operations of a firm that was all too plainly outgrowing the city that had been its birthplace. On the other hand, as Courts pointed out, the SEC was sure to become aware of the earlier issue when Delta attempted to register the new one, and officials of the company would in fact become liable to criminal prosecution.<sup>57</sup>

The need of southern industry for a regional investment banker was a concern of Richard W. Courts who founded Courts & Co. in 1925. His father, Richard W. Courts, Sr., joined him as a partner and together they “determined to build a firm which could supply equity capital to southern corporations.” Fundamental to their vision was a faith in southern businessmen and their conviction the New South would prosper and grow industrially and financially.<sup>58</sup> Under the circumstances, absent fraudulent intent, prosecution of Delta management was unlikely, but the prospect was nevertheless alarming.

The Senate Banking and Currency Committee investigation, conducted from 1932-1934, and known as the “Pecora Hearings,” established disclosure of material facts as the fundamental precept underlying the Securities Act of 1933.<sup>59</sup> The Securities Exchange Act of 1934 created the Securities and Exchange Commission (SEC) and

---

<sup>56</sup> Lewis and Newton, *Delta*, 78.

<sup>57</sup> Ibid.

<sup>58</sup> Courts & Co., *Courts & Co. Celebrating 35th Anniversary, 1925-1960* (Atlanta: 1960): 5.

<sup>59</sup> Joel Seligman, *The Transformation of Wall Street: A History of the Securities and Exchange Commission and Modern Corporate Finance* (Boston: Houghton Mifflin Company, 1982), 39.



empowered it “with broad authority over all aspects of the securities industry. This includes the power to register, regulate, and oversee brokerage firms, transfer agents, and clearing agencies as well as the nation's securities self regulatory organizations (SROs).”<sup>60</sup> The idea behind registration and disclosure was to give investors the information necessary to make an informed decision as to the soundness of an offering.<sup>61</sup>

Courts brought the Delta matter to the attention of the SEC, and not finding any evidence of fraud, the SEC applied a remedy that would assure full disclosure.<sup>62</sup> It mandated a prospectus be distributed to all stockholders to disclose the facts and make an offer to repurchase the shares with interest. Rescission could have wrecked Delta’s financial structure, but fortunately none of the subscribers demanded their money back.<sup>63</sup>

The new issue of 60,000 shares was successfully placed, although not without some difficulty. Eventually Courts persuaded R. J. Reynolds, the tobacco heir, to buy a large block in June 1941.<sup>64</sup> He took particular satisfaction from his company’s success in underwriting Delta’s common stock. According to *Time* Magazine, it was “one of the biggest air-line underwritings ever handled by a single investment banker. Courts & Co. bossed by smart, wise Richard Winn Courts Jr. hung the ‘sold out’ sign on 60,000 shares of Delta Air Corp. common, priced at \$9.50 a share.” This “meant \$495,000 with which

---

<sup>60</sup> U. S. Securities and Exchange Commission, “The Laws That Govern the Securities Industry”: <http://www.sec.gov/about/laws.shtml> (accessed July 1, 2010).

<sup>61</sup> Ibid.

<sup>62</sup> The author’s search for an SEC case was assisted by Tim Dodge and Harmon Straiton at the RBD library, Auburn University, but did not reveal any SEC case involving Delta under the circumstances outlined.

<sup>63</sup> Lewis and Newton, *Delta*, 80.

<sup>64</sup> Ibid.

to bolster working capital, reduce debts, [and] look ahead.”<sup>65</sup>

Historians Lewis and Newton attribute the stock imbroglio to the unfamiliarity with the intricacies of stock dealings of a small company’s management and legal advisors situated far from the nation’s financial center.<sup>66</sup> Given the non-punitive remedy imposed by the SEC, this interpretation is plausible, but a more fundamental structural cause, articulated by SEC commissioner William Douglas, may have been a determining factor.

Douglas “believed the principal obstacle to small business finance was not the cost associated with an SEC filing [as critics of the SEC were arguing], it was the unwillingness of investment banks to make a firm commitment to underwrite the smaller firms’ securities.”<sup>67</sup> Good advice may not have been readily available under any circumstances to Delta’s managers. The unwillingness of large brokerage houses to back small firms was not lost on at least one southern opportunist eager to help small businesses in the region.

Although Delta’s management may have broken SEC rules, the situation was probably not as threatening as it was thought at the time. In such situations, absent indication of fraud or deceit, the SEC offered an interpretative and advisory service. In this regard the SEC’s Sixth Annual Report stated that “during the past fiscal year, thousands of requests for such assistance have been responded to by correspondence and

---

<sup>65</sup> *Time*, June 23, 1941.

<sup>66</sup> Lewis and Newton, *Delta*, 78.

<sup>67</sup> Seligman, *Transformation of Wall Street*, 202.

in conferences.”<sup>68</sup> Under the guidance of Court, acting in the capacity of the company’s investment advisor, and without allegations of fraud or deceit, the remedy was a relatively routine matter for the SEC.

The concern of rescission was real, but unlikely. The affected shares were not widely distributed and the people that held them were closely associated with the airline. Rescission would have negatively affected the company’s future and maybe even many of the stockholders jobs at Delta. As the nation built up its military defenses in response to world events, the investors could expect future economic growth and thus would not have wanted to place the company’s future in doubt

By 1941, the fates of Atlanta and Delta were closely bound. The December 7 attack on Pearl Harbor and America’s massive involvement in World War II transformed the nation, the city, and the airline. But, as historians Lewis and Newton observe, Delta entered the war “with the foundations for future growth already established.”<sup>69</sup>

---

<sup>68</sup> *Securities and Exchange Commission, Sixth Annual Report of the Security and Exchange Commission for the Fiscal year Ending June 30, 1940* (Washington, D.C.: Government Printing Office, 1941), 137.

<sup>69</sup> Lewis and Newton, *Delta*, 84.

## Conclusion

At the outbreak of World War II, Delta was established as a small regional carrier. Its employees managed, serviced, and maintained ten modern aircraft--five Electras and five DC-3s--serving the southern states.<sup>1</sup> It was a modest enterprise in comparison to the major trunk lines but in its development it had surmounted almost impossible odds. That a passenger airline would evolve from an agricultural pest migrating from Mexico in 1892 was improbable to foresee. The outcome resulted from the emergence of agrarian and aviation technologies and the effect of cultural, economic, and political factors.

The process of Delta's evolution was incremental, moving from stage to stage dependent on circumstances and the individuals involved. First, calcium arsenate was synthesized under the direction of B. R. Coad at the Delta Laboratory. Then, Ohioans Nelly and Houser with the assistance of the Army Air Service at McCook Field discovered airplanes could spread dust effectively from the air. Finally, a crop dusting company, Huff Daland Dusters was formed that evolved into a passenger carrier, Delta Air Service, Inc.

Delta Air Lines was not the result of a plan or an idea of a single person or group of people with special insight. Its creation was the result of a series of ideas and events that intersected and were acted upon by many individuals over an extended period of time. Each contributed to Delta's evolution. The path was distinct from the development of American commercial aviation fostered by the post office. In the annals of American

---

<sup>1</sup> R. E. G. Davis, *Delta, An Airline And Its Aircraft* (Miami: Paladwr Press, 1990): 48.

commercial aviation history, Delta's genesis is therefore unique.

Delta Air Lines literally and figuratively grew from the ground up. As the boll weevil migrated across the South, methods were found to counter the threat. The fight centered in the Mississippi Delta region with the "Southern Field Crop Insect Investigations" study conducted at the Delta Laboratory, Bureau of Entomology, USDA, in Tallulah, Louisiana. Under the direction of B. R. Coad, calcium arsenate proved to be an effective agent to kill the boll weevil, but its application by ground-based machinery was slow and laborious. When technologies of aviation and agricultural merged the problem was resolved. As a result, a new industry--aerial applications--was founded. Historian Pete Daniel, though, argues the combining of science and mechanization (including machinery other than aircraft) was not without consequence. Capital intensive and scientific farming led to "government intrusion into agriculture," which by the 1950s "drove off millions of farm laborers" from the land.<sup>2</sup>

Ironically the first use of aircraft to spread poison occurred far away from the cotton fields of the south. It was in Ohio on a grove of Catalpa trees near Troy. The experiment was so successful it suggested using aircraft on low-growing plants. Tests with military aircraft conducted at the Delta Laboratory in 1922 and 1923 verified the concept. Coincidentally, about the same time the Huff Daland Company in Ogdensburg, New York, was exploring commercial uses for aircraft. Thomas Huff and Elliot Daland grasped the potential for crop dusting as a business opportunity. They were leaders in testing and designing specialized crop dusting machines.

A subsidiary company, Huff Daland Dusters, Inc., was incorporated primarily to

---

<sup>2</sup> Pete Daniel, *Toxic Drift: Pesticides and Health in the Post-World War II South* (Baton Rouge: Louisiana State University Press, 2005): 7.

treat cotton, but could also protect other agricultural crops as well, such as peach and pecan trees, and vegetables. A business plan, outlined by George B. Post and endorsed by Coad, was implemented in Macon, Georgia, in 1925, but proved unsuccessful there, so the company relocated to Monroe, Louisiana. Two significant individuals in Delta's evolution, Harold Harris and C. E. Woolman, joined the duster company at this time.

Both Harris and Woolman traveled to Peru to secure and operate a dusting concession for Huff Daland Dusters. The idea to extend operations south of the equator--where the seasons are reversed--did not originate with Woolman as is commonly understood. A Peruvian planter, Pedro Beltran, representing cotton growers in Peru, came to the United States seeking help to counter agricultural pests affecting cotton yields on Peru's haciendas. Coad directed him to the Huff Daland Dusters company, and Woolman was sent to Peru to acquire a concession and negotiate contracts.

When Woolman returned to the United States, Harris took his place and in 1927 dusted cotton with aircraft, men, and supplies shipped to Peru from the United States. On his way home Harris conducted a survey on the status of aviation in Latin America and drew up a map of potential air routes that he presented to Juan Trippe and Richard Hoyt upon his arrival in New York. Simultaneously, but unknown to Harris, Tripp and Hoyt were in the planning stages of Pan American Airways.

The tie between the origins of Peruvian Airlines, Panagra, Delta Air Lines, and Pan American was confusing. The Delta corporate archives and Harold R. Harris collection were invaluable in unraveling the sequence of events. The discussion in chapter seven places Woolman's and Harris's roles in context. Up to this point Harris was the general manager of Huff Daland Dusters, but when he was hired by Trippe his

position changed by default. His departure left Woolman nominally in charge. Woolman organized Delta Air Service under trying circumstances following Irwin Auerbach's betrayal. From that point forward Woolman's and Delta's future were inextricably bound. Woolman's part in Delta's operations was obscured, however, by the lack of information resulting from the lost records of the 1930s.

In the year 2029, Delta Air Lines will celebrate its one-hundredth anniversary of passenger service. If the past is any indication of the future, the coming years will be as turbulent for the company and the industry as it has been from its inception. Indeed, after the Airline Deregulation Act of 1978 was enacted Thomas Petzinger, in *Hard Landing: The Epic Contest for Power and Profits That Plunged the Airlines into Chaos*, underscores the point.<sup>3</sup> During the deregulated era, in addition to unregulated competition, executives have dealt with the controller's strike, recessions, accidents, fuel cost spikes, bankruptcies, and wars. The attacks on September 11, 2001, precipitated a cycle of distress that drove many airlines out of business and led to Delta's bankruptcy. In 2010 the industry's recovery remains tenuous. The future is always uncertain and to survive Delta will have to adapt and evolve as it has in the past.

As a final observation this study focuses only on the understanding of Delta's early years up to World War II. It complements the study by historians W. David Lewis and Wesley Phillips Newton, *Delta: The History of an Airline* that tells Delta's history through 1979. A useful addition to the historiography on Delta Air Lines will explore the ramifications of deregulation on the airline and the further development of commercial aviation.

---

<sup>3</sup> Thomas Petzinger, Jr., *Hard Landing: The Epic Contest for Power and Profits That Plunged the Airlines into Chaos* (New York: Three Rivers Press, 1996).

In closing, the past eighty-one years have witnessed the evolution of a mega-carrier from improbable origins. In one year Delta Air Lines will carry more than 160 million passengers to “367 destinations in 65 countries on six continents.” Its 70,000 worldwide employees and more than 700 aircraft operate 13,000 daily flights.<sup>4</sup> Remarkably, Delta Air Lines rose from the ground to this status when a small bug crossed from Mexico to Texas in 1892.

---

<sup>4</sup> [http://www.delta.com/about\\_delta/corporate\\_information/index.jsp](http://www.delta.com/about_delta/corporate_information/index.jsp) (accessed Sept. 5, 2010).



## Bibliography

### Primary Sources

#### Archives:

Air Force Historical Research Agency, Maxwell AFB, Alabama

Delta Air Lines Corporate Archives, Atlanta, Georgia

Louisiana State University Libraries Special Collections, Baton Rouge  
Collett Everman Woolman Papers, 1916-1979

National Archives and Records Service

*Records of the Department of State Relating to the Internal Affairs of Peru, 1910-1929.* Accessed at RBD Library, Auburn University.

Ogdensburg Library Archives, Ogdensburg, New York

Special Collections and Archives, RBD Library, Auburn University, Alabama  
RG 245, Peter Gushue Papers

University of Illinois at Urbana-Champaign Archives  
Collett Everman Woolman Papers

Wright State University Special Collections and Archives, Dayton, Ohio  
MS-167, International Cyclopedia of Aviation Biography  
MS-214, Harold R. Harris Papers

#### Interviews:

Ball, T. P. Interview by author, Sept. 6, 1995.

Ball, T. P. Interview by author, Oct. 3, 1994.

FitzGerald, Catherine. Interview, John N. White, 1976.

Ford, Arthur. Interview by author, Sept. 5, 1996.

Harris, Harold R. Interview by Dr. Lawrence Clayton, Nov. 5, 1979.

Preston, Barbara Woolman. Interview by Wesley Phillips Newton, Dec. 21, 1977.

Preston, Barbara Woolman. Interview, Sept. 27, 1999.

Schwaemmle, Fritz. Interview by Delta Air Lines, Dec. 7, 1973.

Stevens, Eugene. Interview by Larry Michaud, Feb. 1984.

Welch, Virginia P. Interview by author, July 21, 2009.

### **Published Primary Sources:**

- \_\_\_\_\_. "Aircraft Declares War on Insects." *The Slipstream Monthly* 4 (July 1923): 14-27.
- \_\_\_\_\_. *Aircraft Yearbook 1923*. New York: Aeronautical Chamber of Commerce of America, Inc. 1923.
- Coad, B.R. "Relation of the Arizona Wild Cotton Weevil to Cotton Planting in the Arid West." *Bulletin of the USDA* 233 (May 27, 1915): 1-12.
- Coad, B. R., E. Johnson, and G. L. McNeil, "Dusting Cotton From Airplanes." *USDA Department Bulletin* 120. Washington D.C.: U.S. Government Printing Office. 1924.
- Coad, B. R. Testimony, Jan. 28, 1924, U.S. Congress, House, Subcommittee on Appropriations, *Agricultural Appropriations Bill, 1925, Hearings*, 68th Congress, 1st. Sess. Washington, D.C.: Government printing Office, 1924. 165.
- Coad, B. R. Testimony, May 8, 1924, U.S. Congress, *Senate Subcommittee on Appropriations Bill 1925, Hearings*, 68th Congress, 1st. Sess. Washington, D.C.: Government Printing Office, 1924. 157.
- Brown, J. J. "Annual Report of Georgia Department of Agriculture for 1924." *Georgia Department of Agriculture* 99 (First Quarter 1925).
- Brown, J. J. "Biannual Report of Georgia Department of Agriculture for 1925-1926." *Georgia Department of Agriculture* 103 (First Quarter 1927).
- \_\_\_\_\_. "Fighting Boll Weevil by Means of Airplanes." *Aviation* 15 (August 20, 1923): 210-212.
- Graves, Ralph A. "Louisiana, Land of Perpetual Romance." *National Geographic*

- Magazine* (April 1930): 393-482.
- Holloman, James A. "Holloman gives Method Used by Texas Farmers for Mastering Weevil." *Atlanta Constitution*, July 26, 1922.
- \_\_\_\_\_. "Hoyt, Richard Farnsworth." *National Cyclopedia of American Biography* 29 (1941): 16.
- Hunter W. D., and B. R. Coad. "The Boll Weevil Problem." *USDA Farmers Bulletin* 1329 (Jan. 30, 1923).
- Howard, L. O. Testimony, Feb. 8, 1922, U. S. Congress, House, Committee on Agriculture, *Use of Aircraft Hearings*, 67th Congress, 2nd Sess. Washington, D.C.: Government Printing Office, 1922. 10.
- McMillin, Stewart E. "The Heart of Aymara Land." *National Geographic Magazine* (Feb. 1927) 213-56.
- Neillie, C. R., and J. S. Houser. "Fighting Insects With Airplanes. An Account of the Successful Use of the Flying-Machine in Dusting Tall Trees Infested with Leaf-Eating Caterpillars." *National Geographic Magazine* (March 1922): 333-38.
- Post, G. B. "Boll Weevil Control by Airplane." *Georgia State College of Agriculture, Extension Division Bulletin* 301 (Nov. 1924): 1-22.
- Riis, Roger William. "Commercial Crop Dusting, Details of the operations of the Huff Daland Dusters." *Aviation* 18 (May 25, 1925): 573.
- Roosevelt, Theodore. "Louisiana Canebrakes." *Scribners* 43 (Jan. 1908): 47-60.
- Truesdale, James A. "Spraying from Air." *New York Times* (Jan. 8, 1922): 85.
- Securities and Exchange Commission. *Sixth Annual Report of the Security and Exchange Commission for the Fiscal Year Ending June 30, 1940*. Washington, D.C.: Government Printing Office (1941).
- Senate Special Committee on Investigations of Air Mail and Ocean Mail Contracts, *Investigation of Air Mail and Ocean Mail Contracts*, 73rd Cong., 2nd sess., 1934.
- Snapp, Oliver I. "Airplane Dusting of Peach Orchards." *Journal of Economic Entomology* 19 (June 1926): 450-459.
- U. S. v. B. R. Coad and F. W. McDuff, District Court of the U.S. Monroe, Docket 6040 (1931).
- Van Deventer, John H. Jr., "The Story of Keystone and its Latest Contribution to the

Advancement of Aviation.” *Air Transportation* (Jan. 19, 1929): 54-55.

\_\_\_\_\_. *Who's Who in Aviation, a Directory of Living Men and Women Who Have Contributed to the Growth of Aviation in the United States, 1942-43*. Chicago and New York: Ziff-Davis Publishing Company, 1942.

### **Unpublished Primary Sources:**

Garrett, Gary Richard. “The Oncenio of Augusto B. Leguía: Middle Sector Government and leadership in Peru, 1919-1930.” PhD diss., University of New Mexico. 1973.

Gushue, Peter Boland. “Heavenly Influence: Panagra Airways in Peru,” 1928-1949. Ph.D. diss., University of Alabama. 1997.

Metcalfe, Arthur V. “The Dictatorship of President Leguía of Peru.” Master’s thesis, University of Southern California. 1934.

### **Newspapers and Magazines:**

*Aero Digest*

*Aircraft Yearbook*

*Aviation*

*Atlanta Constitution*

*Atlanta Journal*

*Atlanta Journal & Constitution*

*Birmingham Age-Herald*

*Bristol Courier*, Bristol, Pennsylvania

*Buenos Aires Herald*, Buenos Aires, Argentina

*El Comercio*, Lima, Peru

*Delta Digest*

*Jackson Daily Clarion Ledger*, Jackson, Mississippi

*Laurinburg Exchange*, Laurinburg, North Carolina

*Macon Daily Telegraph*, Macon Georgia

*Madison Journal*, Tallulah, Louisiana

*Monroe News Star*, Monroe, Louisiana

*Mundial*, Lima, Peru

*New York Times*

*News and Courier*, Charleston, South Carolina

*Ouachita Citizen*, Monroe, Louisiana

*Ogdensburg Advance*, Ogdensburg, New York

*Ogdensburg Journal*, Ogdensburg, New York

*West Coast Leader*, Lima, Peru

### **Secondary Sources:**

Anderson, Mabry I. *Low & Slow: An Insider's History of Agricultural Aviation*. San Francisco: California Farmer Publishing Company, 1986.

Baker, Brian R. "Early Dusting Experiments." *American Aviation Historical Society* 14 (Summer 1969): 115-24.

Baker, Lewis. *The Percys of Mississippi: Politics and Literature in the New South*. Baton Rouge: Louisiana State University Press, 1983.

Barry, John M. *Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America*. New York: Simon & Schuster, 1997.

Bender, Marylin and Selig Altschul. *The Chosen Instrument: Pan Am, Juan Trippe, the Rise and Fall of an American Entrepreneur*. New York: Simon and Schuster, 1982.

Berg, A. Scott. *Lindbergh*. New York: G. B. Putnam's Sons, 1989.

Boyne, Walter. "Huff-Daland in 3D." *Wings* 7 (Dec. 1977): 55-63.

Briggs, Ellis O. *Proud Servant: The Memoirs of a Career Ambassador*. Kent,

- Ohio: Kent State University Press, 1998.
- Burden, William A. M. *The Struggle for Airways in Latin America*. New York: Arno Press, 1977.
- Clayton, Lawrence A. *Peru and the United States: The Condor and the Eagle*. Athens: University of Georgia Press, 1999.
- Cleveland, T. C., and C. R. Parencia. "History of the USDA Cotton Insects Research Laboratory Tallulah, Louisiana, 1909-1973." *Bulletin of the Entomological Society of America* (1976): 403-407
- Cobb, James C. ed., *The Mississippi Delta and the World: The Memoirs of David L Cohn*. Baton Rouge: Louisiana State University Press, 1995.
- Cobb, James C. *The Most Southern Place on Earth*. New York: Oxford University Press, 1992.
- Daily, Robert. *An American Saga: Juan Trippe and His Pan Am Empire*. New York: Random House, 1980.
- Daniel, Pete. *Breaking the Land; The Transformation of Cotton, Tobacco, and Rice Cultures Since 1880*. Chicago: University of Illinois Press, 1985.
- Daniel, Pete. *Lost Revolutions: The South in the 1950s*. Chapel Hill: University of North Carolina Press, 2000.
- Daniel, Pete. *Toxic Drift: Pesticides and Health in the Post-World War II South*. Baton Rouge: Louisiana State University Press, 2005.
- Davis, R. E. G. *Airlines of Latin America Since 1919*. McLean, Virginia: Paladwr Press, 1997.
- Davis, R. E. G. *Delta: An Airline And Its Aircraft*. Miami: Paladwr Press, 1990.
- Doolittle, General James H. "Jimmy" with Carroll V. Glines. *I Could Never Be So Lucky Again: An Autobiography*. New York: Bantam Books, 1991.
- Dickerson, William A., Anthony L. Brasher, James T. Brumly, Frank R. Carter, William J. Grenfensette, Aubrey Harris, eds. *Boll Weevil Eradication in the United States Through 1999*. Memphis: The Cotton Foundation Publisher, 2001.
- Downs, Eldon W., and George F. Lemmer. "Origins of Aerial Crop Dusting." *Agricultural History Society* 30 (1965): 123-35.
- Freudenthal, Elsbeth E. *The Aviation Business: From Kitty Hawk to Wall Street*.

- New York: Vanguard Press, 1940.
- Goodsell, Charles T. *American Corporations and Peruvian Politics*. Cambridge: Harvard University Press, 1974.
- “Georgia: History, Cost of Control, and Benefits of Eradication.” *University of Georgia Research Bulletin* 428 (1996).
- Hagedorn, Dan. *Conquistadors of the Sky: A History of Aviation in Latin America*. Gainesville: University Press of Florida, 2008.
- Haney, P.B., W.J. Lewis, and W.R. Lambert. “Cotton Production and the Boll Weevil in Georgia: History, Cost of Control, and Benefits of Eradication.” *University of Georgia Research Bulletin* 428, The Georgia Agricultural Experiment Stations College of Agricultural and Environmental Sciences (1996).
- Hitchner, Lea S. “The Insecticide Industry.” *Insects, The Yearbook of Agriculture, USDA* (1952). 451-53.
- Hughes, Thomas Parke *Human-Built World: How to Think About Technology and Culture*. Chicago: University of Chicago Press, 2004.
- Klarén, Peter Flindell. *Peru: Society and Nationhood in the Andes*. New York: Oxford University Press, 2000.
- Komons, Nick A. *Bonfires to Beacons: Federal Civil Aviation Policy Under the Air Commerce Act, 1926-1938*. Washington, D.C.: U.S. Dept. of Transportation, Federal Aviation Administration, 1978. Reprint, Washington: Smithsonian Institution Press, 1989.
- Lewis, W. David and Wesley Phillips Newton. *Delta: The History of an Airline*. Athens: University of Georgia Press, 1979.
- Litwack, Leon F. *Been in the Storm so Long; The Aftermath of Slavery*. New York: Vintage Books, 1979.
- Maurer, Maurer. *Aviation in the U. S. Army, 1919-1939*. Washington, D.C.: Office of Air Force History, U.S. Air Force, 1987.
- Moll, Herbert H. *Peruvian Civil Aviation*. Mineola, N. Y.: American Airmail Society, 2000.
- Newton, Wesley Phillips. *The Perilous Sky: U. S. Aviation Diplomacy and Latin America 1919-1931*. Coral Gables, Florida: University of Miami Press, 1978.
- Parencia, C. R. “One hundred Twenty Years of Research on Cotton Insects in the United States.” *USDA Agriculture Handbook* 515. Washington D.C.:

- Government Printing Office. (1978).
- Petzinger, Jr., Thomas. *Hard Landing: The Epic Contest for Power and Profits That Plunged the Airlines into Chaos*. New York: Three Rivers Press, 1996.
- Rubin, Harold. "Boll Weevils Started His Air Line." *Dixie* (New Orleans: Times-Picayune States Roto Magazine), Feb. 13, 1955.
- Seligman, Joel. *The Transformation of Wall Street: A History of the Securities and Exchange Commission and Modern Corporate Finance*. Boston: Houghton Mifflin Company, 1982.
- Skidmore, Thomas E. and Peter H. Smith. *Modern Latin America*. 5<sup>th</sup> ed. Oxford: Oxford University Press, 2001.
- Twain, Mark. *Life on the Mississippi*. New York: Signet Classic, 2001.
- Van der Linden, F. Robert. *Airlines and Air mail: The Post Office and the Birth of the Commercial Aviation Industry*. Lexington: University Press of Kentucky, 2002.
- Waller, Douglas. *A Question of Loyalty: Gen. Billy Mitchell and the Court Martial That Grippd the Nation*. New York: Harper Collins, 2004.
- Wolcott, George N. "The Status of Economic Entomology in Peru." *Bulletin of Entomological Research* 20 (August 1965): 225-31.
- Wright, Gavin. *Old South, New South: Revolutions in the Southern Economy Since the Civil War*. Baton Rouge: Louisiana State University Press, 1996.
- Writers Program, Works Progress Administration. *Who's Who in Aviation, a Directory of Living Men and Women Who Have Contributed to the Growth of Aviation in the United States 1942-1943*. Chicago: Ziff-Davis Publishing Company, 1942.
- Wyatt-Brown, Bertram. *The House of Percy: Honor, Melancholy, and Imagination in a Southern Family*. New York: Oxford University Press, 1994.