Haverford College

The Spectacle of Progress:  
Lincoln Beachey and the Stunt Flying Epoch

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History 400: Senior Thesis Seminar  
Department of History  
April 14, 2003
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Acknowledgements

Who is Lincoln Beachey? I certainly had never heard of him upon my visit to the Smithsonian Institution in the fall of 2002. When I met archivist Kristine Kaske at the National Air and Space Museum Library, I had only a vague conception that my topic was early aviation in the United States. With her help, I identified Beachey as a case study worthy of exploration. She and the other archivists at the Air and Space Museum and Garber facility were indispensable in my search for primary materials on the obscure aviator. Aviation historian Carroll Gray was also extremely helpful in my search for sources on the elusive Beachey. Her own book on the aviator is forthcoming.

I would like to thank my advisors, professors Paul Jefferson and Emma Lapsansky, for showing genuine interest in my topic. They challenged me to recognize the full potential of this project. They were always eager to discuss research strategy and offer opinions about the writing and framing of my thesis. I would also like to acknowledge my friends at Haverford for their emotional support, editorial assistance, and companionship on late night trips to Wawa. Finally, I want to thank my family for accruing long-distance telephone charges by frequently calling to ensure my sanity.
Preface

In one of the first history classes I took at Haverford College, my professor opined that history is an ongoing dialogue about the human past, an eternal and indefinite discourse. With the exception of objective facts about specific events and times, the process of learning about and conveying history is highly subjective. History often tells us as much about the intellectual, social, political, philosophical and emotional context of its author as it does about the subject of the author’s work.

Historical inquiry is an active engagement with sources that are inherently problematic and offer only fragmentary information. The focus of the author’s work and the methods by which he (in my case) frames the topic and analyzes the sources are all the result of a subjective intent. In other words, the historian must make inferences based on imperfect information about a topic whose genesis is the expression of a personal bias or interest. This is not to demean history as a discipline, but to acknowledge that it is fundamentally one person’s interpretation of the past that, if well researched, is a significant, if small, contribution to human understanding.

The reason that I call this to the reader’s attention is that it is something that increasingly occupied my own thoughts as I tackled the research and writing of a subject with which I am personally attached. I have been an aviation enthusiast all my life and a pilot since the age of sixteen. Not coincidentally, many of the aviation historians I have come across are flying buffs themselves. As I read the opinions of these authors, I noticed the degree to which their arguments were shaped by their specific interest in aviation. This is accentuated by the fact that aviation is such a broad topic that can be examined from many angles. It embraces both the natural sciences (specifically physics)
and the social sciences. Thus, an historical approach to aviation can take various forms and address many different aspects of the field.

What I have attempted to do is fuse multiple readings of aviation history through the story of one particular pilot, Lincoln Beachey, who engaged the sensational, technological, mythical, and practical aspects of flight. While I argue that his career as an exhibition pilot was more influential than it has been given credit for being, I do not want to exaggerate his importance. He is but one of many aerial entrepreneurs in a long and cumulative process of theory and practice.

The airplane emerged out of thousands of years of human curiosity with flight. In ancient times, the phenomenon was first explained through religion and myth. People then began to experiment with primitive flying contraptions. As scientific method was applied to the study of aeronautics in the nineteenth century its progress increased rapidly. People achieved lighter-than-air flight in manned balloons. The wing began to take shape and was applied to model gliders. Each discovery was expanded upon by subsequent research. Finally, all of the theory and experiments resulted in the powered, heavier-than-air airplane, and the Air Age proceeded.

Beachey was heir to this long history of human attempts at flight. His career came at a critical juncture. Human flight was passing from dream to reality, and it was up to his generation to figure out what to do with it. Focusing on Beachey’s era thus allows for an expansive reading of the history of human flight, from when it was myth to when it became a functional part of modern society.

As a blend of aficionado and historian, I hope to convey the excitement of an era of aviation that was rife with possibilities.
Introduction

Today, we think nothing of flying thousands of miles to conduct business, visit relatives, or spend leisure time vacationing halfway around the globe. The ability to travel these vast distances, by air, is truly one of the greatest social and technological accomplishments of the twentieth century. In the span of only ninety years, this new and revolutionary means of transportation has changed how we perceive the world and has conquered heretofore unconquerable obstacles of time and distance. Perhaps the greatest achievement of the industrial age, heavier-than-air, powered flight, went from birth to maturity in an unprecedented short period of time.

F. Robert van der Linden, *Airlines & Air Mail*

The rapid development of aviation technology has caused a blurring of the historical record. Aviation has become such an integral part of modern transportation, commerce, and war that we take for granted how recent an accomplishment it is. Insofar as we consider aviation in an historical light, the Wright brothers and Charles Lindbergh are the convenient icons of aviation’s past. The inventions of the former represent the dawn of the Air Age and the historic flights of the latter represent glorious application of the airplane. However, their complementary historical relationship presents a myopic view of aviation history. The development of aviation was a cumulative process made possible by the contributions of numerous inventors, aviators, and entrepreneurs. It must be recognized that the Wrights and Lindbergh’s historical prominence has overshadowed the stories of many lesser-known pioneers of the sky.

Lincoln Beachey is one of these lesser known aviation figures who deserves to be acknowledged as one of the greatest American proponents of the Air Age. Although a national celebrity between 1911 and 1915, today he is unknown to all but a few aviation historians. Lincoln Beachey’s present anonymity is unfortunate because he represents a group of early aviators, known as “exhibition pilots” and “birdmen,” who played a vital role in transforming American popular opinion about aviation. These early aviators
participated in air exhibitions throughout the country, captivating the public with their aerial stunts. Their showmanship behind the controls of early flying machines intrigued a skeptical American public and raised awareness about the reality of heavier-than-air flying machines. Exhibition flying laid the foundation for aviation’s growth in the United States by exciting the American public, opening up the civilian market for aviation, and encouraging government investment. As the most illustrious pilot of the exhibition epoch, Beachey exemplifies an episode in the development of aviation when danger, adventure, entertainment, and technological achievement were all part of the competitive sport of flying.

Beachey was perpetually at the forefront of American aviation. He began his career in 1905 as a pilot of lighter-than-air machines called dirigibles. Although it was two years after the Wright brothers’ first heavier-than-air flight, airships and dirigibles were a public craze at the time. Beachey, however, recognized the technological superiority of heavier-than-air flying machines and was among the first to learn how to fly these primitive airplanes. He quickly mastered the art of flying and pioneered numerous stunts. Between 1911 and his death in 1915, he was the most celebrated American stunt pilot, commanding the highest salary and largest audience of any aviator. As a member of the Curtiss Exhibition Company, he pushed the limits of airplane performance by devising stunts that defied previously held notions of what was aerodynamically possible. In so doing, he tested the hypotheses of airplane engineers and helped them to refine their designs. He also devised maneuvers that illustrated the applicability of airplanes to war, mail service, and transport.

1 Technical terms such as “dirigible” are defined in the glossary in Appendix A.
The prewar exhibition pilots were the champions of a new, aerial frontier. Their public image was imbued with the romanticism of the centuries-old dream to conquer the sky. As there was no viable civilian or government market for airplanes because of their novelty and expense, exhibition pilots marketed aviation as entertainment. During the exhibition era, aviation was, “Rooted in the carefree happy-go-lucky tradition of show business . . . .”² Beachey created a legendary persona for himself and became a national hero, hailed as “The Man Who Owns the Sky.”³ Between 1910 and 1915, international air meets were convened in cities throughout the country and smaller aerial performances were held at local fairs and carnivals. Here, millions of Americans got their first glimpse of heavier-than-air flight while exhibition teams profited from ticket sales.

Stunt flying was a dangerous business. Airplanes – constructed of wood, fabric, and wire – were fragile and pilots had limited experience. Many aviators, including Beachey, died while performing stunts. Historians have criticized the exhibition pilots for accentuating the danger of aviation. They claim that the casualties of exhibition flying made the public reluctant to view aviation as safe or practical. It is true that Beachey and his fellow pilots pioneered a type of flying that was dangerous. However, the element of peril was as much a catalyst to public interest as it was to apprehension. While the press and public called Beachey “The Flying Fool,” he was a “fool” that attracted millions of curious onlookers.⁴ People may have come to air meets expecting a crash, but after seeing Beachey perform, most audiences left in awe of his mastery of

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flight. Additionally, danger was an unavoidable part of early aviation because of the lack of government regulation or subsidization of the field. While the exhibition pilots practiced a risky art, their flights sustained the aviation industry prior to World War I.

Beachey was a reflective man who was concerned about the continued development of American aviation. He publicly discussed aviation’s future in America, attesting to its capability as a means of commerce and waging war. He challenged the government to get more involved in its progress. Paradoxically, the man made famous by his “daredevilry,” was also an advocate of air safety. He was determined to prove to America that flying was safe and useful.

Exhibition flying died out during World War I but returned again in the barnstorming era of the 1920s. The similarity between barnstorming and exhibition flying is deceptive. Prewar exhibition flying introduced the nation to heavier-than-air flight and was dominated by three exhibition teams: the Wright Exhibition Company, The Curtiss Exhibition Company, and the Moisant International Fliers. Postwar barnstormers, on the other hand, were displaced ex-military pilots called “gypsy fliers.” They were far less organized than the exhibition teams and traveled between small towns, performing stunts and selling rides. The growth of barnstorming was made possible by the huge surplus of military airplanes, which enabled entrepreneurial pilots to temporarily perpetuate stunt flying in the face of increasing government regulation of the air.

Prewar exhibition flying created a place for aviation in America. It demonstrated the value of airplane technology. Government investment during World War I enhanced this technology, which paved the way for its use in commerce after the war. The demands of the air mail service and passenger-carrying operations required increased
regulation of aviation, culminating in the Air Commerce Act of 1926.\textsuperscript{6} The ensuing commercialization of aviation effectively ended exhibition flying’s dominance of the field. Appropriately, Beachey’s death while performing a high-speed dive over the San Francisco Bay in 1915 foreshadowed the demise of exhibition flying. With its foremost representative gone and a war approaching, the field took a back seat to the more practical applications of aeronautical technology.

\textbf{Methodology}

Lincoln Beachey’s contributions to the development of early aviation are mostly confined to the United States. However, it is problematic to approach the history of aviation with an American optic because the development of aviation was an international undertaking. Although this investigation focuses on a group of American aviators, it is important to note that they did not conquer the sky alone. The nations of Europe and Canada had their own cadres of stunt pilots who exhibited aviation technology in their countries, as well as in the United States. Most literature on the subject focuses equally on European, Canadian, and American aviation pioneers. However, focusing solely on the development of aviation in the United States, during the first quarter of the twentieth century, allows for a closer, more comprehensive analysis of a group of American aviation pioneers – the exhibition pilots– who served a unique role in the development of aviation in \textit{this} country.

\footnotesize{\textsuperscript{5} Dwiggins, \textit{The Barnstormers}, 2.  
\textsuperscript{6} The Air Commerce Act of 1926 was passed by Congress and made law on May 20 of that year. It placed the regulation of air commerce firmly in the hands of the federal government for the first time. The objective was to “stabilize civil or commercial aviation so as to attract adequate capital into the business and to provide it with the assistance and legal basis necessary for its development” (John H. Frederick, \textit{Commercial Air Transportation}, Revised ed. [Chicago: Richard D. Irwin, Inc., 1946], 243).}
Beachey is a particularly interesting case study of the era because he was an introspective person. His name appears in the by-line of two different documents entitled “The Genius of Aviation” [1914?] and “The Pacemaker for Death Quits!” [1913].\(^7\) It is probable that his publicist authored “The Genius of Aviation,” but the fact that Beachey distributed it at air shows indicates he endorsed its content.\(^8\) Beachey likely wrote “The Pacemaker for Death Quits!” because it is his farewell address before temporarily retiring in 1913. Regardless of their origin, both documents provide excellent documentary evidence of Beachey’s consequential career. While they promote Beachey, they are not self-serving publicity stunts.

“The Genius of Aviation” and “The Pacemaker for Death Quits!” reflect Beachey’s personality, vision, and opinions about various aspects of aviation. Along with contemporary newspaper accounts that describe his performances and secondary sources that elaborate on his career and the historical context, these two primary documents illustrate the powerful influence that exhibition flying had on early aviation in the United States. Although Beachey died before the war and never witnessed regulated, commercial aviation, his writings and career illustrate how aviation passed from spectacle to utility.

**Setting the Scene for Beachey: The Airplane is Born**

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\(^8\) “The Genius of Aviation” is an intelligently written and provocative opinion piece. It focuses on Beachey’s significance to the development of aviation. Beachey’s fame could have been the impetus for the “real” author to use the aviator’s name to bring credibility to his/her statement. The author of the document had to be intimately acquainted with Beachey and his career because the pamphlet makes many references to his accomplishments. For simplicity’s sake, I will refer to Beachey as the author of these documents throughout the ensuing text.
The Wright brothers’ powered flight at Kitty Hawk on December 17, 1903 is one of the turning points in the history of modern technology. The event went largely unnoticed and the press coverage it received was inaccurate. “On the whole, the world was supremely indifferent to what might be occurring on the sand dunes of North Carolina.”9 The Wright’s first successful flight occurred only nine days after the second failure of Samuel Langley’s flying machine. Langley, Secretary of the Smithsonian Institution, was the most accomplished aeronautical researcher of the time. In 1898, the United States War Department granted him $50,000 to develop a powered, heavier-than-air flying machine.10 The fact that this flying machine ended up in the Potomac River rather than in the air ignited widespread criticism of research into aviation.11 Because it occurred so soon after Langley’s failure, the Wright brothers’ success did not receive adequate or accurate press coverage.12 According to Bilstein, “For the next five years,
the Wrights’ Promethean achievement remained virtually unknown, and several contemporary accounts that surfaced were badly garbled.”

An antagonistic relationship existed between many newspapers – such as the *Washington Post, Chicago Tribune,* and the *Boston Herald* – and the pioneers of heavier-than-air flight technology at the turn of the century. The only notable exception was William Randolph Hearst’s interest in German engineer Otto Lilienthal’s hang gliders. Ironically, the skepticism of the American press grew as aeronautical engineers came closer to solving the problem of dynamic flight. The late nineteenth century was laden with technological achievements in aviation, heralding the dawn of the Air Age. During the 1890s alone, Octave Chanute wrote a comprehensive summary of aviation technology entitled *Progress in Flying Machines,* Otto Lilienthal demonstrated efficient wing design on gliders, and Samuel Langley invented an unmanned, powered, biplane model that flew 3,300 feet. Americans, whose impressions were colored by the pessimistic reports they read, were for the most part ambivalent to this progress in aviation. The press thus perpetuated a general sentiment of uncertainty about aviation in the United States at the turn of the twentieth century.

While the newspapers’ criticism of Langley’s failed attempts illustrates the popular skepticism towards aviation, the fact that Langley was funded by President McKinley’s administration demonstrates there was official recognition of the

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14 Bilstein asserts that the *Washington Post* “gleefully reported Langley’s lack of success,” while the *Chicago Tribune* “had known all along that God intended mortal men to remain grounded until the roll was called in Heaven.” The *Boston Herald* “recommended that Langley redirect his efforts toward submarine development, since his handiwork seemed to have more affinity for water than air” (Ibid).
15 Hearst purchased a hang glider from Lilienthal and hired people to fly it over beaches in New Jersey and Staten Island. Hearst realized that reporting these flights in his newspaper would increase its circulation. Frank Wicks, “First Flights,” *Mechanical Engineering-CIME* 122:7 (July 2000) (Downloaded from InfoTrac OneFile, February 8, 2003), 1.
technological revolution that was brewing. Although Langley’s flights resulted in failure, his research demonstrated a strong scientific understanding of aeronautics. Langley’s experimentation was grounded in the research of Sir George Cayley (1773-1857) of Yorkshire, England. Cayley was the first engineer to design an aircraft with fixed, rather than flapping, wings. In so doing, he separated the source of lift (the wings) from the source of propulsion (the engine). Although Cayley proved the effectiveness of fixed wings by constructing glider models, he was unable to demonstrate powered flight for lack of an adequate source of propulsion. In 1809-1810, he published a paper entitled “On Aerial Navigation,” which “laid the foundations of aerodynamics and flight-control, upon which the whole vast science of flying is founded.” The Wright brothers were heirs to this prior research. They were the first to successfully synthesize the ideas of engineers like Cayley, Chanute, Lilienthal, and Langley into a successful design.

Although the Wright brothers were annoyed by their shoddy press coverage, they were very pragmatic men with a keen interest in profiting from their invention. They realized that they would need to improve upon their design before it could be put to any practical use. The Wright flyer had only covered a distance of 852 feet during the longest

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16 Ibid., 1-2.
17 It is widely accepted that Langley was a victim of unfortunate luck rather than any major flaw in the design of his flying machine. The catapult he employed to launch his machine was responsible for its failure to fly. In 1915, Glenn Curtiss successfully flew Langley’s machine, demonstrating that the design was in fact aerodynamic. Unfortunately, Langley died in 1906 and, thus, never witnessed this affirmation of his work. Lester J. Maitland, Knights of the Air, with a foreword by General C.P. Summerall (Garden City, NY: Doubleday, Doran & Company, Inc., 1929), 34.
18 Steam power was the only option at the time. While steam engines could propel vehicles on the ground, they were too heavy to be used in flight. Ibid., 26-27.
19 Gibbs-Smith, Aviation, 23.
20 Simonson notes that, although the Wright brothers were initially only motivated by their scientific interest in proving that heavier-than-air flight was possible, they were quickly drawn to the economic aspects of their discovery. G.R. Simonson, “The Demand for Aircraft and the Aircraft Industry, 1907-1958,” The Journal of Economic History 20:3 (September 1960): 361.
of its successful trials on December 17, 1903.\textsuperscript{21} It was the first functional, powered, heavier-than-air flying machine, but it was hardly a robust design. The Wrights wisely chose to remain secretive about their progress so as to keep the press at bay and lessen the risk of someone exploiting their design. Between 1903 and 1908, very few people were allowed to visit their workshop, and the brothers “refused to give out descriptions of their methods or pictures of their machine.”\textsuperscript{22} They did not want to risk the embarrassment that Langley had experienced, so they patiently refined their design back at home in Dayton, Ohio during the years immediately following their flights at Kitty Hawk, North Carolina.

Because there was no civilian interest in airplanes, the Wright brothers shrewdly identified the military as the best initial market for their invention. The military could provide them with the most financial support, and receiving the government’s endorsement would promote expansion into the commercial sector.

While the Wright brothers perfected an airplane design that would appeal to the military, the reality of human flight remained shrouded in myth for the general public. There was, to be sure, a segment of knowledgeable Americans who read publications like \textit{Scientific American} and were, thereby, aware of the progress being made in aviation. But the public at large believed powered, heavier-than-air flight was still unfeasible. In other words, aviation at the turn of the twentieth century occupied a sphere of suspended

\textsuperscript{21} Freudenthal, \textit{Flight into History}, 82.

\textsuperscript{22} Freudenthal classifies the Wright brothers as part of “the new, practical generation” of aviation entrepreneurs. To the dismay of researchers like Octave Chanute, the Wright brothers did not disclose the specifics of their design because they were more interested in the financial implications of their invention than the scientific ones. The Wright brothers did, however, send a written account of their first flights to the Royal Aeronautical Society and the French publication \textit{L’Aérophile} so as to clear up the inaccuracies of previous reports. Ibid., 85-86.
reality. While it was technologically viable, it had no market because the majority of Americans were unaware of its existence.

Only ninety-nine years later, not only is the public familiar with heavier-than-air flight and its uses, aviation has become an integral part of our increasingly global society. The cover of the November 2002 issue of Airways, a global review of commercial flight, bears the headline “Airbus A340-600 Enters Service.” The very existence of this internationally distributed publication devoted entirely to commercial aviation is a testament to the prevalence of aviation today. Additionally, the technical jargon used in the article about the A340-600 airliner demonstrates the technological sophistication of modern airplanes. This jet-propelled aircraft can carry 380 passengers and 44,000 pounds of cargo between London and Johannesburg, at eighty-three percent of the speed of sound, without stopping.23 When compared to the Wright’s first flight, which lasted twelve seconds, covered a distance of only one hundred twenty feet, and barely held one person aloft, the A340 evidences unbelievable technological maturity. While the A340 is a highly sophisticated airplane, which is more directly controlled by computers than by human input, it is kept aloft by the same principles of aerodynamics that held for the Wright’s flyer. The A340 represents the ultimate fruition of the Wright brothers’ dream. It is a functional, efficient airplane with widespread commercial applications. The aerospace industry, of which it is a part, is one of the largest industries in the world, generating huge revenues.

The question, then, is how aviation got beyond the stagnant infancy of the Wright era and into such a rapid pace of development. Two conditions needed to exist for

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aviation to get on the track of technological development that brought it from the Wright flyer to the Airbus A340-600 of today. The first condition was knowledge of the physics of flight, which had been pursued since the fifteenth century. The second condition was widespread popular support and enthusiasm for aviation, which did not become a reality until the years of exhibition flying abutting World War I. In this light, the Wright brothers’ achievement should be viewed as the culmination of centuries of scientific inquiry and experimentation surrounding human flight. Equivalently, their achievement may be understood as the enabling factor for the second condition to take place.

While the Wrights’ secrecy during the five years following their historic flight at Kitty Hawk allowed them to virtually monopolize airplane technology, it impeded public acceptance of aviation. “Even though heavier-than-air machines were now more than five years old, very few people had seen one. Reports of flyable airplanes were regarded with extreme skepticism, or were disregarded completely.” The Wright brothers drew criticism from their former supporters for not divulging their methods. Aeronautical researchers believed it was the Wrights’ duty to the scientific community to furnish their flying machine for all to see. The Wright brothers, however, did not receive a United States patent for their invention until 1906 and were thus very wary of revealing the design. They focused solely on making their flying machine suitable to military use, namely aerial surveillance. The Wright brothers’ determination to contract with the

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24 Leonardo da Vinci’s experiments with flight in the fifteenth century represent the first scientific approach to aviation. His theories were flawed, but his methods of experimentation were empirically based. Gibbs-Smith, *Aviation*, 8.
25 In this case, “human flight” refers to the pursuit of controlled powered flight in heavier-than-air machines. Humans flew lighter-than-air balloons as early as 1783 and gliders by the early 1800s. The Wrights, however, “achieved the first sustained controlled flight made by a human in a powered airplane: . . .” (Bilstein, *Flight in America, 1900-1983*, 12).
27 Freudenthal, *Flight into History*, 141.
government eventually led to a deal with the United States Army for $25,000 and a $5,000 bonus in 1908.28

While the Wright brothers’ had ignored the American public, other businessmen and aviation pioneers had not. Alexander Graham Bell’s Aeronautical Experimentation Association, which he founded in 1907, emerged as a direct competitor to the Wright brothers. In contrast to the secrecy of the Wrights, the Aeronautical Experimentation Association actively sought public attention. “They hoped to make a public flight before the Wrights, and truly launch aviation in America.”29 Bell hired Glenn H. Curtiss to lead his team of researchers and to be the group’s chief aviator. On June 20, 1908, Curtiss flew an AEA biplane, named June Bug, a distance of 1,266 feet. Then, on July 4, 1908, Curtiss and the AEA won the Scientific American award for making the first, “official,” public flight in excess of one mile horizontal distance.30 The public reception was extraordinary and the press, for once, enthusiastically embraced the news of a heavier-than-air flight.31 Glenn Curtiss received the first American pilot’s license for his accomplishment. The challenge to the Wright brothers was clear. The public had seen the June Bug but had only heard rumors of the Wright brothers’ flying machines.

The Wright brothers were reluctant to become involved in public displays of aviation. They were so focused on maintaining a monopoly on heavier-than-air

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28 On December 23, 1907, the War Department announced that it would hold a competition for heavier-than-air flying machines and award a contract to the designers of the aircraft with the best performance characteristics. The minimum specifications required by the government were so stringent that only the Wright brothers’ machine stood a chance of satisfying them. The announcement was a welcomed relief to the Wright brothers, who had been astonished by the United States government’s apparent disinterest in aviation up to that time. The Wrights had even begun selling their design abroad to the French, who were much more enthusiastic about their achievement than the Americans. Freudenthal, Flight into History, 169-170; Maitland, Knights of the Air, 65.
29 Marrero, Lincoln Beachy, 33.
30 Bilstein, Flight in America, 1900-1983, 16.
technology that they filed suit against a number of other aviation pioneers who exhibited flying machines for public audiences, including Curtiss. These legal actions impeded progress in American aviation and created great competition between the Wrights and Curtiss. “The arguments pro and con the Wrights’ lawsuits affected everyone interested in aviation, and the differences of opinion became so heated that aviation circles were split into two opposing camps: Curtiss and Wright….“ While the legal battles flared in court, competition for aviation supremacy in the United States played itself out on the exhibition circuits.

By 1910, the age of heavier-than-air exhibition flying had arrived. Exhibitions of lighter-than-air dirigibles and airships had been popular during the first decade of the twentieth century. The appearance of heavier-than-air machines renewed the public’s interest in aviation shows. Although the Wrights had initially focused on the military in lieu of promoting aviation as spectacle, they realized that if they wanted to compete with Curtiss and international inventors, they would need an exhibition team.

The Wrights and Curtiss established flight schools to train pilots to fly their new machines in aerial exhibitions. Freudenthal identifies this as a major transition in early aviation. With the advent of the exhibition teams, the torch was passed from the inventors to the pilots. “The story of aviation was no longer the story of Wilbur and Orville Wright. It became, from now on, the story of Curtiss’s first pupil, Charles F.

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31 The press reported the specifics of the flight, including detailed information about the June Bug itself. *New York Times*, 5 July 1908.
32 The Wright brothers were so adamant about protecting their patent that they even filed suit against foreign pilots who exhibited heavier-than-air flying machines in the United States. In one such incident in 1910, the Wrights filed suit against British aviator Claude Grahame-White, forcing him to either fly their airplane or pay heavy royalties if he exhibited other flying machines. Freudenthal, *Flight into History*, 235.
33 Ibid., 234.
Willard, and the Wright’s first civilian pupil in America, Walter S.Brookins . . .”35 The Wrights hired Roy Knabenshue, a former dirigible aeronaut, to lead their exhibition team. Under his command they began touring in 1910 and grossed 1 million dollars annually – “Aviation had become profitable.”36 The fact that Knabenshue gave up his fame as a dirigible pilot to fly the Wrights’ machines illustrates that exhibition flying presaged a new state of the art in flight technology.

The pilots who exhibited heavier-than-air flying machines in aerial performances gained immediate notoriety and were dubbed “birdmen” and “stunt flyers.” They were the first aviators to explore the capabilities of these primitive airplanes and to demonstrate them to public audiences. The spectacle of heavier-than-air flight was the beginning of a new era of aviation. It was the fulfillment of all the experiments, hopes, and dreams of people across numerous countries – humans had finally conquered the sky.

A young dirigible aeronaut by the name of Lincoln Beachey was noticed the trend in exhibition flying. Although he was a recognized leader in lighter-than-air flight, he decided to give it up in favor of the new heavier-than-air flying machines that began to steal the show at air meets. It proved to be a smart decision for, after a few early mishaps in these new flying machines, Lincoln Beachey became Glenn Curtiss’s premier pilot. In this role he set the pace for American exhibition flying in the years preceding World War I.

34 The Wrights were wary of the “circus” nature of aerial exhibition: “Although the Wrights were more inclined to deal with the U.S. Army than the circus, military purchases were not numerous and the civilian market was necessarily limited” (Bilstein, Flight in America, 1900-1983, 17).
35 Freudenthal, Flight into History, 236.
Bound to Be Airborne: Lincoln Beachey’s Early Years

Beachey was a San Francisco, California native born on March 3, 1887. He was the son of William C. and Amy Beachey, and had a brother named Hillery. Beachey grew up during an era of great technological progress in aviation. In Germany, Otto Lilienthal made myriad successful glides from heights of 50 to 100 feet, covering distances in excess of 250 yards. Samuel Langley’s experimentation in flying began in the same year of Beachey’s birth. His model biplane made its first successful flight two months after Beachey’s ninth birthday.

While these technological breakthroughs hinted at the approach of heavier-than-air flight, the turn of the twentieth century was the age of the lighter-than-air dirigible. In 1901, Alberto Santos-Dumont shocked the world and won 125,000 francs by flying his dirigible around the Eiffel Tower in less than 30 minutes. His flight demonstrated a level of control never before seen in lighter-than-air flying machines. Consequently, Dumont’s dirigible kindled public interest in airships and sparked lighter-than-air exhibitions throughout the world.

When lighter-than-air flying came to the San Francisco Bay Area, Beachey got involved. While working in the construction of airships he met Thomas S. Baldwin. At the time, Baldwin was a local San Francisco legend, famous for his experimentation with parachutes. He became interested in lighter-than-air flight after hearing of Dumont’s dirigible flight in Paris. In 1904, he began work on the first dirigible built in the United

38 Maitland, Knights of the Air, 28.
39 The flight occurred in May 1896. Ibid., 33.
States, which he named the *California Arrow*.\textsuperscript{41} Through his association with Baldwin, Beachey joined the project.\textsuperscript{42}

Baldwin introduced Beachey to a fraternity of entrepreneurial inventors and aviators who played a vital role in the development of American exhibition aviation. Two of these influential men were Glenn Curtiss and Roy Knabenshue. Baldwin tracked down Glenn Curtiss in order to procure a motor for his dirigible. At the time, Curtiss was a young mechanic who designed light motors for bicycles. Until meeting Baldwin, he had not considered applying the motors to aircraft. “The visit of the balloonist began a new cycle in Curtiss’s life.”\textsuperscript{43} After building a motor for Baldwin’s dirigible he became a leading designer of motors for dirigibles as well as airplanes. His eventual association with Alexander Graham Bell propelled him to the forefront of the early airplane industry. He also became a leading promoter of exhibition flying in the United States.

The other notable figure who got his start with Baldwin was Roy Knabenshue. Knabenshue was a balloonist from Toledo, Ohio whose experience and physical attributes made him the ideal candidate to fly Baldwin’s dirigible. Dirigibles like the *California Arrow* were very flimsy machines that required agile, small individuals to fly them. Roy Knabenshue fit the description and was hired by Baldwin. After flying for Baldwin for a short time, Knabenshue decided to become an independent operator. His

\textsuperscript{41} Maitland, *Knights of the Air*, 89.
\textsuperscript{42} Beachey’s Aviation Hall of Fame award mentions his involvement in the construction of the *California Arrow*. The Aviation Hall of Fame, “Award,” 1966, located in the Lincoln Beachey Biographical File, CB070700-01, Archives Division, National Air and Space Museum, Smithsonian Institution, Washington, D.C.
\textsuperscript{43} Maitland, *Knights of the Air*, 89.
decision to break from Baldwin led to a successful career as an aeronaut and, eventually, as the manager of the Wright Exhibition Team.\footnote{Whitehouse, The Early Birds, 128.}

Knabenshue’s departure gave Beachey his first opportunity to fly in aerial exhibition. While working for Baldwin, Beachey developed his skills as a showman. He was recognized as one of the best aeronauts while still only a teenager. Beachey realized that exhibition performances were about more than just the act of flying. In order to capitalize on the novelty of flight, one needed to excite the crowd with skillful maneuvers. In 1905, Beachey performed at the Centennial Exposition of Lewis and Clark’s Expedition in Portland, Oregon. Here he devised a number of ways to thrill a crowd with his behemoth dirigible. Beachey stole the show by landing on the roof of the Chamber of Commerce building in downtown Portland.\footnote{Marrero, Lincoln Beachey, 24-25.} It was an exciting introduction to exhibition flying, but Beachey was dissatisfied with how small a fraction of the earnings he was allowed to keep.\footnote{Ibid., 25.} Encouraged by his successful performance in Portland, he decided to set off on his own.

Beachey received some early assistance from Roy Knabenshue, but soon demonstrated his ability to succeed by himself. With his own dirigible, which he named the Rubber Cow, Beachey traveled the country and participated in exhibition events.\footnote{Martin Caidin, Barnstorming (New York: Duell, Sloan and Pearce, 1965), 17.} He was a daring and consummate performer who knew how to bring attention to his flights. In particular, Beachey’s knack for contriving unique aerial feats to thrill the public gained him wide acclaim. He became so adept at lighter-than-air flight that he challenged the preeminence of his mentor, Knabenshue.
Knabenshue had to share headlines with a growing number of professional aeronauts, including Lincoln Beachey, who took two airships in 1906-1907 on an international junket ranging from Montreal, Canada, across the United States, and down to Mexico City.48

His international journey of 1906-1907 is evidence that, even as a young aeronaut, Beachey was motivated to test the limits of aircraft capabilities. When heavier-than-air flight began to emerge as the state of the art, Beachey was poised to transfer his fame from the dirigible to the airplane.

As heavier-than-air machines joined the exhibition circuit, the dirigible’s popularity began to fade. They were cumbersome, slow machines that lacked the sex appeal of agile, powered airplanes. The fact that Beachey dubbed his ship the Rubber Cow is indicative of his own frustration with the limitations of lighter-than-air technology.

After witnessing an impressive demonstration of the capability of airplanes at the Los Angeles Air Meet in 1910, Beachey decided to pursue heavier-than-air flight. The air meet attracted an audience of 20,000 on January 10, 1910. Despite the appearance of Roy Knabenshue and Lincoln Beachey in their dirigibles, “The crowds flocked, instead, to see Glenn Curtiss and Louis Paulhan race aeroplanes.”49

Louis Paulhan was a particularly exuberant French pilot who thrilled the audience by making a mockery of Beachey and Knabenshue. The wording of the New York Times account of the event illustrates the technological disparity between the dirigibles and Paulhan’s airplane. While the crowd watched the “frail, cigar-shaped” dirigibles drift along during their segment of the show their attention was averted by the loud approach

of Paulhan.50 “Just when Knabenshue and Beachey were passing over the grand stand…there was a sudden shout and out of the gully shot Paulhan, the motor of his Farman machine humming at a tremendous rate.”51 The stunts Paulhan performed in his Farman biplane were far superior to anything the dirigibles could do. Paulhan stole the show and instilled in Beachey a desire to give up his dirigible and fly for real.

Although heavier-than-air flight had been around since 1903, the Los Angeles Air Meet was the first significant exhibition of it. The Los Angeles Daily Times described the air meet in terms that suggest a very recent acceptance of heavier-than-air flight:

> From the Aviation Field one carries away an impression of the easy superiority of the aeroplane to the forces of gravity. For many centuries ‘as difficult as flying’ has been the figure of speech to denote impossibilities. But, when one witnesses these marvelous machine-birds in the act of flying, the surprise is that it seems easy, not difficult.52

The deceptive ease of heavier-than-air flight made Beachey all the more confident in his ability to switch aerial genres. His career decision indicates he had a drive to be the best airborne performer.

The Los Angeles Air Meet of 1910 was as consequential to the progress of heavier-than-air technology in general as it was to Beachey’s career in exhibition flying. As the first large-scale, American air meet to include numerous airplanes, the event created conflict between competing inventors. The same Glenn Curtiss who designed the motor for Thomas Baldwin’s California Arrow organized the meet in Los Angeles. After his early success as a managing member of the Aeronautical Experimentation Association, he incorporated the Curtiss Exhibition Company in 1910 and hired Jerome

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51 Ibid.
52 Los Angeles Daily Times, 11 January 1910, in Marrero, Lincoln Beachey, 43.
S. Fanciulli to manage it. At the time of the Los Angeles Air Meet, Curtiss was embroiled in litigation with the Wright brothers over their patent on heavier-than-air designs. Because of their patents, the Wrights viewed heavier-than-air technology as their own private industry. They feared exploitation of their heavier-than-air flying machines by Curtiss and other, smaller entrepreneurs. However, airplanes were causing great excitement across the country and the threat of legal action did little to impede engineers and pilots alike. “[D]espite the threat of the heavy hand of the law, there was an enthusiastic new generation in America which wanted, more than anything else in the world, to fly. And it was willing to pay a heavy price to do so.” The fact that Curtiss went ahead with the Los Angeles Air Meet despite an injunction against him demonstrates his determination to assert himself as a leading airplane manufacturer. The court battles only succeeded in polarizing the airplane industry. Starting in 1910, heavier-than-air technology was clearly split between two controlling interests: the Wrights and Curtiss.

Beacheay had to make a choice between the Wright and Curtiss flight schools. His old mentor, Roy Knabenshue, quit lighter-than-air flying in 1910 to manage the Wright Exhibition Company. This connection led Beacheay to initially approach the Wrights. Beacheay, however, could not come to terms with the Wrights so he decided to try his luck with Glenn Curtiss. Although Beacheay approached Curtiss second, the Curtiss Exhibition Company was by no means an inferior organization.

53 Maitland, Knights of the Air, 107.
54 Freudenthal, Flight Into History, 235.
55 Ibid., 234.
56 According to Maitland, the disagreement between the two parties had to do with Beacheay’s proposed salary. Maitland, Knights of the Air, 130.
By the end of 1909, Curtiss was a public figure ranking with the Wrights. He had flown from Albany to New York City, winning a $10,000 prize offered by the New York World; his trim pusher airplanes, with a ruggedly functional appearance, became as familiar to Americans as the distinctive Wright canard designs. Like the Wrights, Curtiss established an exhibition team to demonstrate the firm’s aircraft…

Beachey knew that to be a part of the Curtiss team was to be at the forefront of exhibition flying. He was thus determined to convince Glenn Curtiss of his merits.

Curtiss was only interested in hiring talented aviators to maximize public appeal for his product. “To pursue his goals with success, Curtiss assembled in one group the best pilots available. Impress upon them the need for the desired impression, he sent his men and airplanes off to barnstorm the circuits where there seemed the most likely prospects for airplane customers.”

Beachey was an inexperienced pilot who had to prove himself at the Curtiss flight school in Hammondsport, New York. His confidence and dedication to flying impressed Curtiss, despite the fact that Beachey wrecked two biplanes while learning how to fly. Keeping Beachey on the Curtiss payroll soon paid off. Within one year of joining the Curtiss Exhibition Company, Beachey made national headlines by flying over Niagara Falls and under the suspension bridge connecting the United States and Canada.

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58 Caidin, Barnstorming, 19.
59 Although Glenn Curtiss was ready to fire Beachey after the first accident, team manager Fanciulli convinced him otherwise. Because of Beachey’s earlier fame as a dirigible pilot, Fanciulli had faith that Beachey would be a stellar performer once he mastered the control of airplanes. Caidin, Barnstorming, 20; Maitland, Knights of the Air, 131;
June 27 and 28, 1911 he established himself as a leading American aviator and set a precedent for performing inventive aerial stunts that were previously thought impossible. As America’s most popular exhibition flyer, Beachey generated public enthusiasm for Curtiss’s airplanes. Beachey’s combination of daring and skill was the perfect complement to Curtiss’s business strategy. “Curtiss was acutely aware that to sell, he must convince a torpid public and the nation at large that his flying machines were the finest made and that they had an almost limitless variety of thrills to offer . . .”61

Exhibition Flying and the American Public
“The King of Aerial Exhibition”

As the name suggests, exhibition flying promoted flying through thrilling spectacle. Beachey’s success was a product of his showmanship and ingenuity in the performance of aerial stunts. K.C. Tessendorf chooses not to separate his praise for Beachey from the aviator’s proper name as he refers to him as “‘the incomparable Lincoln Beachey.’” More than any other heavier-than-air pilot of the pre-World War I exhibition era, he pushed the limits of airplane performance and demonstration. He was the first American to fly inverted, loop an airplane, and intentionally enter spins.

Beachey’s attributes were perfectly suited to the unique environment of American exhibition flying. Aviation in 1911 was very different from today. Airplanes were flimsy, pilots were inexperienced, and the public demanded aerial thrills. Exhibition flying was a melting pot for developing airplane technology, flying doctrine, and public interest. Stunt flying meant different things to different people. It was a spectator sport for the public, an advertising venue for airplane manufacturers, and a competitive game for pilots. The reason Beachey stands out from the rest is that his drive to be the best led him to embrace all these aspects of exhibition flying. He simultaneously fulfilled the demands of the public, airplane manufacturers, and his own personal ambitions. He was a showman, a test pilot, and an aviation romantic.

The immediate success of exhibition flying after the formation of the Wright and Curtiss exhibition teams in 1910 was proof that there was a commercial market for aviation. While airplanes were not yet a feasible method of mass transportation, they generated huge sums as spectator attractions.

61 Caidin, Barnstorming, 8-9.
At $5,000 to $7,500 per plane, a flying machine remained a gadget for the rich. The negligible payload continued to discourage commercial operations, which in any case would have foundered for lack of permanent landing fields, hangars, and maintenance facilities. The scarcity of alternate sources of revenue prompted the Wright brothers and Curtiss to organize their own exhibition companies and retain some of the fraternity of ‘birdmen’ to fly in them.\textsuperscript{63}

Curtiss and the Wrights realized that exhibition flying would give their names wide exposure and establish themselves as the leading aircraft manufacturers in the United States. To make their airplanes look the best necessitated having daring pilots to show them off. Beachey’s exciting stunts combined with his ability to evade the inherent dangers of stunt flying was an endorsement of the integrity of Curtiss airplanes. As compared to other fliers of the time, Bilstein asserts that, “Beachey performed with more consummate skill…and specialized in flying just close enough to things to cheat death by a whisker.”\textsuperscript{64}

There was no such thing as an experienced heavier-than-air pilot in 1911. Aviators had to develop their skills on the job. Beachey’s innate ability and his confidence in pursuing new aerial feats made him perfect for exhibition flying. The words of F.O. Farwell, an inventor of airplane engines, demonstrate how Curtiss and Beachey’s partnership was mutually beneficial: “There is no question but what the Curtiss biplane is the greatest manufactured today. It has speed and stability that other machines lack, and with such a machine Beachey was sure to become a wonder.\textsuperscript{65} The “wonder” of Beachey’s flying was soon nationally recognized. Flying Curtiss “pusher” biplanes, Beachey toured the country and amazed the masses.

\textsuperscript{63} Bilstein, \textit{Flight in America, 1900-1983}, 17.
\textsuperscript{64} Ibid., 20.
\textsuperscript{65} Mr. Farwell knew Beachey before the aviator joined the Curtiss Exhibition Company. Apparently, Beachey built his own monoplane but could not get it airborne because its engine was not powerful enough. Curtiss’ airplanes were thus the perfect complement to Beachey’s skill as an aviator. In Curtiss, Beachey
Between 1911 and 1915, Beachey dominated air exhibition in the United States by continually upping the ante on aerial stunt work. His Niagara Falls flight of June 27, 1911 defied the experts’ belief that the air currents created in the gorge would batter his biplane. According to Beachey, people bet money that he would fail. “When I flew over Niagara Falls and down the gorge they were betting two to one that I would not attempt the feat and five to one that I would never get out of the gorge alive.” 150,000 people held their breath as he passed safely underneath the steel bridge connecting the U.S. and Canada. The feat demonstrated his skillful piloting and testified to the strength of the Curtiss biplane. “The space through which he flew was 168 feet in height and barely 100 feet from side to side. The distance from the brink of the falls to the bridge in which he made the dip [was] about 400 yards.” Beachey did a repeat performance of the flight the next day in front of an equally amazed crowd.

The public noted that Beachey was not afraid to take risks in his flying. If the Niagara Falls flight was not proof enough of his determination, Beachey’s performance at the Chicago International Aviation Meet of late August 1911 cemented his identity as “the greatest exponent of the flying age.” The one-week-long event was one of the largest aviation meets held before World War I. It was attended by the world’s leading aviators. Here, they competed for thousands of dollars in speed, precision control, and altitude events. There was stiff competition, both from the pilots participating and the various airplanes that represented the state of the art in technology. Beachey was unsure

found a source of reliable airplanes and in Beachey, Curtiss had a skilled aviator.  *Dubuque (Iowa) Telegraph-Herald*, 17 September 1911.

66 Lincoln Beachey, “The Pacemaker for Death Quits!”

67 See Appendix B, Figure 1.


69 A local newspaper hailed Beachey with this description in anticipation of his appearance at an aviation meet in Dubuque, Iowa. *Dubuque (Iowa) Telegraph-Herald*, 17 September 1911.
that his Curtiss “pusher” airplane was robust enough to stand a chance in competition.

But Beachey was not one to concede defeat, so he made up for the performance deficiencies of his airplane with his flying skill. He broke the altitude record by flying his airplane upward until he was completely out of gasoline. While he was playing with fate as he glided back down to earth with a dead motor, he attained an altitude of 11,642 feet.\(^{70}\) That day he impressed 500,000 people with his ability.\(^{71}\) “Here, against the cream of the world’s aviators from France, England, and the United States, he demonstrated a mastery of control and daring that none could match.”\(^ {72}\)

The large public attendance at the Chicago International Aviation Meet demonstrates that, by 1911, there was great public interest in aviation. People from all around the Midwest attended the event and brought home word of Beachey. As heavier-than-air flying came into vogue, exhibition teams planned events throughout the country. “[S]pecially organized flying meets became major spectator events attracting thousands of people in a single day. Most of the crowd came to be convinced.”\(^ {73}\) In 1911 and 1912, Beachey performed in San Francisco, Boston, Los Angeles, Washington, D.C., Chicago, Niagara Falls, Elmira (New York), Hamilton (Ohio), Peoria (Illinois), Lawrence (Kansas), Milwaukee, Dubuque (Iowa), and towns in Florida, Georgia, Tennessee, and Pennsylvania.\(^ {74}\) Beachey toured the country during the peak of exhibition flying. In each

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\(^{71}\) More people attended the events on August 20 than any other day of the meet. Ticket revenues that day totaled $23,000 and Beachey performed for an estimated 500,000 people. Lebow, *Cal Rodgers and the Vin Fiz*, 62.


\(^{73}\) Bilstein, *Flight in America*, 17.

\(^{74}\) This list is not exhaustive. It is a synthesis of information from two sources: Marrero, *Lincoln Beachey*, 52; Weeks, “Lincoln Beachey’s Last Ride,” 106.
of these towns, Beachey performed in front of crowds of people who had never seen an airplane.

At this time, the novelty of aviation was its main selling point. As a result, aviation was relegated to a “show biz” form of existence. This was especially true in the Midwest, where people had no access to popular forms of entertainment such as vaudeville. Exhibition flying offered the average American citizen an opportunity to witness an element of popular culture. Prior to the Dubuque Aviation Meet of September 1911, the local newspaper quoted a carnival showman by the name of Rosenthal as saying:

“There is no doubt but aviation will draw more people to a town than any other branch of the show business (emphasis mine). At a number of fair dates I have played lately, they have had the aeroplane as the leading feature of the fair and have drawn better and large[r] crowds this year than ever before and the people go away satisfied if they have only witnessed one flight.”

Because the public came to aerial exhibitions to be entertained, the pilots had to be showmen. The act of flying in and of itself was exciting, but additional gimmicks were always a welcome part of aerial exhibition. Maitland describes Beachey’s ability to attract attention in flattering terms: “He had so many tricks in his flying bag, and played them with such expert finesse, that people flocked by the thousands to see him fly.”

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75 Bilstein points to musical anthems that emerged from exhibition aviation as a sign of stunt flying’s resonance with popular culture: “Many such early songs dealt with balloons and dirigibles, though airplanes made an increasingly strong appearance with tunes like ‘Come Josephine in My Flying Machine,’ a smash hit of 1910” (Bilstein, *Flight in America, 1900-1983*, 19).

76 *Dubuque (Iowa) Telegraph-Herald*, 17 September 1911.

77 Maitland, *Knights of the Air*, 131.
Beachey’s flying attire was indicative of his showmanship. He almost always donned a suit and tie. The only informal element of his dress while behind the controls was his cap, which he turned around backwards for flight.\textsuperscript{78} The airplanes he flew afforded no protection from the weather. Beachey sat out in front of the wing, with only the control wheel separating him from the oncoming air. Thus, his business-like attire was prominently displayed during every flight. While some argue that he purposely dressed formally to convey the normalcy of flight, it also gave him a dapper look, which surely appealed to his audience, especially the women.\textsuperscript{79}

Beachey’s showmanship reflects his dedication to exhibition flying. He approached his profession with extreme confidence. Aviation historians have misinterpreted his confident demeanor as a sign of disregard for the public.\textsuperscript{80} However, his performance style and the complimentary words of his close associate, Arthur Mix, tell a different story.\textsuperscript{81} Regardless of the true nature of his personality, Beachey evidenced a desire to please the crowds, even if it involved making a fool of himself. In January 1912, he flew at an air meet while dressed as a woman. The incident occurred at an air show in Los Angeles, where Beachey was supposed to perform with Blanche Stuart Scott, one of the female stunt pilots of the era. Because of the prevailing wind

\textsuperscript{78} See Appendix B, Figure 2.
\textsuperscript{79} As celebrity figures, exhibition pilots attracted the attention of many women. Exhibition pilot Slats Rodgers acknowledges his relationship with various women in somewhat lewd terms: “You didn’t have any trouble getting women in those days if you had a ship. They were out at the field waiting for you, and you could pretty much take your pick. I took my pick. They were part of the game” (Hart Stilwell and Slats Rodgers, \textit{Old Soggy No. 1: The Uninhibited Story of Slats Rodgers} [New York: Julian Messner, Inc., 1954; reprint, New York: Arno Press, Inc., 1972], 10). While Rodger’s probably exaggerated the truth, his statement is indicative of the fast lives these men led.
\textsuperscript{80} Maitland describes Beachey’s outward demeanor in negative terms: “His was not a pleasant personality. Difficult to get along with, grouchy, moody, and stubborn, he repelled rather than attracted people” (Maitland, \textit{Knights of the Air}, 129).
\textsuperscript{81} Mix offers a much kinder description of Beachey’s personality, although he does imply that pilots were naturally overconfident: “He was a quiet man and when not flying one would never know that he was an
conditions, the officials would not allow Scott to take off.\textsuperscript{82} Beachey decided to impersonate Scott by donning a wig and skirt. “Beachey, dressed as a woman, wheeled his biplane out in a thirty-five-mile wind, and in a flaxen wig and fluttering skirts, flew about the field.”\textsuperscript{83} He completely deceived the audience and only revealed his identity upon landing. Antics like this reveal that he had a playful disposition and strove to please the audience.

Beachey’s inventive stunts are the ultimate example of his creative talent in aerial exhibition. He devised many ways to keep the public interested in exhibition aviation. “BEACHEY” was written in bold letters on the top of the upper wing of his biplane. As the insignia could only be read when Beachey was upside down or in a vertical climb or dive, it gave the audience a greater appreciation of his maneuvers.\textsuperscript{84} The insignia was also a declaration of his superiority. Beachey wanted his audience to know who was behind the controls.

In 1914, Beachey partnered with racecar legend Barney Oldfield. Together, they staged numerous races that pitted automobile against airplane.\textsuperscript{85} As Oldfield sped around the track, Beachey would hover just above him, demonstrating control and speed.\textsuperscript{86} The races, however, were not an attempt to distinguish the dominant technology. Rather, the partnership of the respective leaders of air and ground exhibition simultaneously

\textsuperscript{82} Even though there were quite a few female stunt pilots, they apparently did not receive the same treatment as male aviators.
\textsuperscript{83} \textit{New York Times}, 28 January 1912.
\textsuperscript{84} Tessendorf, \textit{Barnstormers & Daredevils}, 8. See Appendix B, Figure 3.
\textsuperscript{85} See Appendix B, Figure 4.
\textsuperscript{86} On such race took place at Brighton Beach, New York on March 22, 1914. Oldfield drove a fiat while Beachey flew just overhead and won the race by fifty yards. The newspaper article describing the event carried the tag line, “Beachey and Oldfield Provide Thrillers in Monoplane and Auto” (\textit{The New York Times}, 23 March 1914).
highlighted both examples of modern technology.\textsuperscript{87} Beachey topped this act by flying through San Francisco’s Machinery Hall in the spring of 1914.\textsuperscript{88} In doing so, he became the first aviator to complete an entire flight within the confines of a building.

Beachey’s popularity led to an increase in his wealth. While some of the events he attended, such as the 1911 air meet in Chicago, lured aviators with prize money, many of the smaller locales hired exhibition companies to perform at municipal ceremonies. In the latter case, pilots were salaried by their respective companies. The Wrights paid their aviators a fixed rate of $20 per week in addition to $50 for each day they flew. Curtiss, on the other hand, promised his fliers 50 percent of the ticket revenue for each exhibition.\textsuperscript{89} In contrast to this typical pay scale, Beachey commanded over $1,000 per flight during the peak of his success.\textsuperscript{90} He made $5,000 for his 1911 Niagara Falls flight alone.\textsuperscript{91} Prior to his brief retirement in 1913, he stood to earn $100,000 flying in Europe.\textsuperscript{92} During the last days of his life in 1915, he performed at the San Francisco Panama-Pacific Exposition, grossing $1,500 per performance.\textsuperscript{93}

\textsuperscript{87} Gibbs-Smith describes how the cooperation between the automobile and airplane industries was mutually beneficial: “Aviation came to rival the automobile in sport, and the two were closely linked. Automobilism had increased by leaps and bounds during the early 1900s, and the new profession of aviation found a ready-made reservoir of man-power, engineering experience, and know-how, which came to be of benefit to both the road and the air” (C.H. Gibbs-Smith, \textit{Flight Through the Ages: A Complete, Illustrated Chronology from the Dreams of Early History to the Age of Space Exploration} [New York: Thomas Y. Crowell Company, Inc., 1974], 98).

\textsuperscript{88} Mix, “My 82,000 Miles with Lincoln Beachey,” 62; Weeks, “Lincoln Beachey’s Last Ride,” 107.

\textsuperscript{89} Two sources corroborate the Wrights’ pay scale, while Trimble also discusses Curtiss’s: Bilstein, \textit{Flight in America, 1900-1983}, 17; Trimble, \textit{High Frontier: A History of Aeronautics in Pennsylvania} (Pittsburgh: University of Pittsburgh Press), 73.

\textsuperscript{90} Bilstein, \textit{Flight in America, 1900-1983}, 20.

\textsuperscript{91} This figure is based on Beachey’s claim in Lincoln Beachey, “The Pacemaker for Death Quits!”

\textsuperscript{92} Ibid.

\textsuperscript{93} Bilstein, \textit{Flight in America}, 20; Maitland, \textit{Knights of the Air}, 135.
From 1911 to 1915, it was estimated that Beachey performed in front of between seventeen and twenty million people.\textsuperscript{94} This was at a time when the entire population of the United States was approximately 100,000,000.\textsuperscript{95} His huge public following indicates how popular exhibition flying was. The demand for exhibition aviation made the business very lucrative. While one can argue that the money encouraged pilots to take unnecessary risks, it is equally an affirmation of the public interest in the field.

The most convincing evidence of Beachey’s ability to raise popular support for aviation is his description of the effect that his flying had on people. In “The Genius of Aviation,” Beachey challenges the reader to admit that he/she has the same desire to fly as the thousands of people who have witnessed his performances:

As a matter of fact I know you are simply itching to go. I know this for the reason that in all my experience as a birdman, with all my tricks and daring performances, thousands of times thousands of people have urged me and begged me to take them along. Many times I have done so, on straightaway flights. They have been thrilled with the pleasure, as have I, and enchanted. And have wanted some more.\textsuperscript{96}

Beachey was “enchanted” with flight himself and translated his own passion into his performances. His statement illustrates a concerted effort to spread the joy of flying.

\textit{The Symbolic Appeal of Flight}

Exhibition flying was a romantic expression of modern technology. By captivating audiences with the beauty of flight, it emphasized the human motivation behind the scientific achievement. As Harrison attests in \textit{Mastering the Sky}, the wonder

\textsuperscript{94} Beachey’s mechanic Arthur Mix estimated that, in 1914 alone, Beachey performed in front of 17,000,000 people in 126 cities. In contrast, Beachey boasted that 20,000,000 people had seen him perform during his entire career. Mix, “My 82,000 Miles with Lincoln Beachey,” 62.
of flight is at the heart of humankind’s pursuit of wings. It emanates from a longing to be like the birds, free of the constraint of gravity. “The ancient myths and great religions reveal to us over and over again man’s dream to escape the bond’s of earth. . . .” The first investigations into the laws of nature that govern flight were a scientific response to its romantic appeal. Leonardo da Vinci experimented with ornithopters in the late 1400s because he was obsessed with birds. Ironically, his fervent desire to solve the mystery of their flight impeded his empiricism. “As a result of his emotional, rather than rational, approach to flying he did not on the whole subject it to the disciplined scrutiny he applied to other of his scientific activities.” Da Vinci’s difficulty in separating his emotional and scientific interests in flight highlights a duality in aviation articulated by Georges Besançon in 1902: “‘aeronautics confers beauty and grandeur, combining art and science . . .’” Stunt flying exemplified this duality by making performance art out of an invention of science. While the physics of flight was complex and only accessible to scientific minds, the magnificence of flight could be appreciated by anyone at an aerial exhibition.

Exhibition flying symbolized the human desire to fly. While it led to technological innovation, its primary purpose was to entertain the public with the wonder of flight. It did not matter that the early Curtiss and Wright designs had a maximum

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95 U.S. Census statistics indicate that the population was 92,228,496 in 1910 and 106,021,537 in 1920. The U.S. population was, thus, between these two figures during Beachey’s career. (http://www.census.gov/population/www/censusdata/hiscendata.html)  
97 Harrison speaks to this effect: “My idea is to try to give some general knowledge of the history and principles of human flight in one volume by concentrating on the ‘wonder’ of it, for surely the lifting and transporting through the air of enormous weights and numbers of people to distant places at previously unimaginable speeds and altitudes is one of the great miracles of our times” (James P. Harrison, Mastering the Sky: A History of Aviation from Ancient Times to the Present [New York: Sarpedon, 1996], ix).  
98 Ibid., 13.  
99 Gibbs-Smith, Aviation, 8.
capacity of two people and limited range and speed, because heavier-than-air flight alone was something to celebrate.\textsuperscript{101} People flocked to air meets in order to witness something that was, in their opinions, not far from a miracle. Gibbs-Smith attests to this emotional pull of human flight:

\begin{quote}
The idea of human flight has engaged the waking and sleeping thoughts of men from the time when they developed visual imagination and began to regard the birds with envy. With the envy came the ambition to emulate. For flying has never appeared to its devotees as a mere method of transportation, faster or more convenient than travel by land or sea; nor was it finally achieved by any pressure of economic need. Aviation has drawn its strength from an appeal to the emotions; an appeal to the longing for escape, or to the desire for exhilaration and power. Some have simply seen it as a symbol of aspiration.\textsuperscript{102}
\end{quote}

The nature of exhibition flying is a validation of Gibbs-Smith’s claim. It was flying for flying’s sake. Aeronautics came about as a means to fulfill peoples’ dream to fly like the birds. Since researchers’ fundamental motivation was to prove that humans could master flight, exhibition flying was the ideal way to publicly declare their success.

At a July 1914 performance in Dubuque, Iowa, Beachey ended the show by maneuvering from a three-thousand-foot dive into three consecutive loops. According to the local paper, the audience reacted with “speculation as to his (Beachey) internal emotions when the machine took its drop toward the earth, and excited declarations that nothing now remains to be accomplished in the conquest of the air.”\textsuperscript{103} The crowd’s interest in Beachey’s emotional state shows that they were curious about the act of flying and its effect on the psyche. Beachey was moving through the air in a manner that none

\textsuperscript{100} Georges Besançon was the editor of the aviation journal \textit{L’Aérophile}. He is quoted in Harrison, \textit{Mastering the Sky}, 4.
\textsuperscript{101} In 1911, at the dawn of the heavier-than-air exhibition era, the record for airplane speed was only 70 miles per hour. A good indicator of the limited range of early airplanes is Calbraith Rodgers’ transcontinental flight in the fall of 1911. In this historic flight – the first to connect the coasts of the United States – Rodgers flew a Wright biplane 4,231 miles in just over 1 1/2 months, averaging a speed of 51.59 miles per hour. Freudenthal, \textit{The Aviation Business}, 12; Lebow, \textit{Cal Rodgers and the Vin Fiz}, 1, 212.
\textsuperscript{102} Gibbs-Smith, \textit{Aviation}, 1.
of these people had ever witnessed. The precision with which he maneuvered heralded humankind’s control over the air.

The “conquest of the air” enacted a fundamental change in people’s relationship to the natural world. Throughout history, human civilizations have regarded the sky with reverence. It was indistinguishable from the heavens, a place inhabited by supernatural figures. As Harrison illustrates, religious doctrine and myth informed human understanding of what lay above the earth:

The great religions not unnaturally placed their divinities in the heavens, Christian angels, winged Greek gods, and Asian flying guardians linking man with the great beyond. And the myths spoke of heroes being carried into the sky by flying beast or bird, or like Peter Pan, they rose into the air by their own magical powers.104

For centuries flight was considered a supernatural phenomenon. Ancient myths reinforced the idea that humans did not belong in the sky. One such example is Ovid’s tale of Daedalus and Icarus in *The Metamorphosis*. King Minos imprisoned Daedalus and his son, Icarus, on Crete. In order to escape their captor they fabricated wings out of wax and feathers and flew to freedom. However, Icarus was tempted by the openness of the sky and flew too close to the sun. His wings melted and he fell to his death. In response, Daedalus “damned his art, his wretched cleverness,” sending the clear message that humans had no business journeying into the heavens.105

Starting in the eleventh century, humans began to attempt flight in the same vein as Daedalus and Icarus, usually with identical results. Around 1010, a Benedictine monk in Malmesbury, England began a trend of tower jumping in Europe and Turkey when he

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103 *Dubuque* (Iowa) *Telegraph-Herald*, 9 July 1914.
leaped from the roof of his abbey wearing artificial wings.\textsuperscript{106} While he only suffered broken legs, those that followed his lead were not so lucky. According to Harrison, “A list of fourteen tower jumpers, from about 1000 A.D. to the eve of proven balloon flight in 1783, cataloged four deaths, seven injuries, and three partial successes.”\textsuperscript{107} Without any knowledge of the air, these jumpers were testing fate more than a theory of science. However, their experimentation exhibited optimism about the possibility of human flight.

The advent of lighter-than-air balloons allowed the first, sustained human exploration of the sky.\textsuperscript{108} However, balloonists could only control the vertical path of their flights and were hesitant to ascend too high for fear of the upper atmosphere. In 1783, the Montgolfier brothers were sufficiently worried about the air at higher altitudes that they launched a balloon carrying a chicken, a duck, and sheep before they allowed humans to ascend in their contraption.\textsuperscript{109} Even though manned balloons proved that human flight was possible, they were at the mercy of the wind. Balloons allowed safe accommodation in the air but not the luxury of free reign.

The invention of the airplane changed peoples’ relationship to the sky by bringing it under human control. Airplanes could be flown directly into the wind by the force of their propeller. The lift generated by their wings countered the force of gravity, allowing them to achieve altitudes in excess of 10,000 feet. The elevator, ailerons, rudder, and

\textsuperscript{106} In 852, an Arab man named Armen Firman survived a similar attempt at flight in Cordoba, Spain. His flight and that of the monk of Malmesbury are the first examples of aerial experimentation in Europe. Gibbs-Smith, \textit{Aviation}, 4; Harrison, \textit{Mastering the Sky}, 19-20; Clive Hart, \textit{The Prehistory of Flight} (Berkeley: University of California Press, 1985), 197.
\textsuperscript{107} Harrison, \textit{Mastering the Sky}, 20.
\textsuperscript{108} In 1783, the Montgolfier brothers of Annonay, France designed the first hot-air balloon. On November 21, 1783 Pilâtre de Roziers and the Marquis d’Arlandes ascended in a Montgolfier balloon, becoming the first men to make a lighter-than-air flight. The flight lasted 20 to 25 minutes and covered a distance of 1 3/4 miles. Archibald Williams, \textit{Conquering the Air: The Romance of the Development and Use of Aircraft}, revised and enlarged (New York: Thomas Nelson and Sons, 1928), 2-7.
\textsuperscript{109} Ibid., 5.
wing-warping systems gave pilots command over the direction and angle of their flight. Thus, early airplane pilots could manipulate all aspects of their navigation through the air.\footnote{It should be noted that, despite all of these control mechanisms, early airplanes were very unstable. While they had all the basic components of a modern airplane, they required greater physical input on the part of the pilot. Bilstein’s description of the Curtiss biplane that Beachey flew demonstrates the complexities of airplane control: “Ailerons were controlled by the movement of the pilot’s body. A yoke fit over the shoulders and, in order to balance the plane, the pilot had to shift the torso left or right to move the aileron controls attached to the yoke. There were two foot pedals: one operated the throttle, the other controlled the front-wheel brake” (Bilstein, \textit{Flight in America, 1900-1983}, 21).}

Exhibition flying was the ultimate expression of the airplane’s domination of the air because it made the sky its stage. As Neil Williams attests, stunt aviators exploited the beauty of the sky to great effect:

At that time, the biplane reigned supreme, and unfortunate is the man who has not stopped to watch a tiny silver biplane high among the cumulus clouds, the sole performer on a stage of infinite breadth and indescribable grandeur.\footnote{Neil Williams, \textit{Aerobatics} (Shrewsbury, England: Airlife Publications, 1975, reprint 1976 & 1977), 5.}

Aviators were especially aware of the awe they inspired in the public because they too were enamored with flight. Exhibition pilots like Beachey were the public’s only link to the new, aerial frontier. Aside from being performers, they were emissaries of the sky who described their realm in romantic terms. In “The Genius of Aviation,” Beachey beseeches the reader to share in his appreciation of, what he terms, “ethereal space:”\footnote{The word “ethereal” is misspelled in the document. Beachey, “The Genius of Aviation,” 2.}

We will fly to a region where men who have courage will find an abundance of peace and good-will. We will fly through the clouds with their lining of gold and pure silver. We will fly to the skies where the birds through the ages have been welcomed and kissed by the glorious sunlight and where the moonbeams have caressed them and the cool winds and dew have rested and blessed them. It is there in the sky where men of all nations will some day learn the true meaning of brotherly love.\footnote{Beachey’s statement is an invitation for all people to come explore a region of the earth that had tantalized people for ages. In his description we see that, with the advent of the}
airplane, “courage” has replaced supernatural ability as the only prerequisite for becoming airborne. His idealistic sentiments also evoke a sense of American manifest destiny. The promise of “peace” and “good-will” make the sky out to be a region of opportunity. In this vision, the airplane symbolically replaces the covered wagon as a means for America to expand its influence and ideal of “brotherly love.” While Beachey calls upon all nations, his appeal was read by an American audience.

The American exhibition aviators were part of a tradition of independent, adventurous souls that had its roots in the frontier culture of the West. The opening of the aerial frontier, by gliders and then airplanes, occurred just as the Western frontier came to an end in the 1880s. While the development of heavier-than-air technology was not solely an American phenomenon, it found a ready group of aerial pioneers in the United States.

Frederick Jackson Turner posits that the constant presence of the Western frontier up to the late nineteenth century was fundamental to the development of the American social, political, and economic environment. Turner explains this in terms of the frontier’s influence on the unique characteristics of the American individual:

The result is that to the frontier the American intellect owes its striking characteristics. That coarseness and strength combined with acuteness and inquisitiveness; that practical, inventive turn of mind, quick to find expedients; that masterful grasp of material things, lacking in the artistic but powerful to effect great ends; that restless, nervous energy; that dominant individualism…these are traits of the frontier, or traits called out elsewhere because of the existence of the frontier.

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113 Ibid., 4.
114 In 1890, the Superintendent of the United States census proclaimed that the Western frontier had been settled: “‘Up to and including 1880 the country had a frontier of settlement but at present the unsettled area has been so broken into by isolated bodies of settlement that there can hardly be said to be a frontier line’” (Frederick Jackson Turner, The Frontier in American History [New York: Henry Holt and Company, 1920], 39).
115 Ibid., 37.
The sky was a symbolic extension of the Western frontier and had a similar influence on Americans. It was another place to be settled by inventive, practical-minded individuals. Exhibition pilots embodied these characteristics. They were nomadic, self-reliant people who lived a life of adventure. They only departed from Turner’s characterization in that their mastery of flying machines was also an artistic expression. In reminiscing about the sensation of flight, stunt pilot Slats Rodgers compares the experience of the exhibition pilot to that of the pioneer of the Western frontier: “I still feel just dandy up in the air if I’m in a ship that lets me do some feeling – not one of those big metal boxcars where you’re all locked in. I feel as free as the cowhand of the Old West felt when he was in the saddle, moving up the trail.”

The public’s admiration for exhibition aviators like Beachey was imbued with the historic symbolism of human flight. Exhibition flying elicited an emotional response that the scientific theories behind it could not. For the majority of the public, Beachey’s maneuvers seemed to defy gravity, common sense, and even God. As Marrero explains, throughout history, the marvel of flight is permeated by a continued concern that perhaps man does not belong in the domain of the gods.

For centuries, the saying ‘as difficult as flying’ was used to denote impossibilities, and implied some form of ultimate hubris – boldly going into God’s domain. . . . even a century after the first French balloonists had dared to rise heavenward, belief remained strong that the sky was not man’s domain.

The exhibition pilots were at the crux of this contention over whether humans belonged in the sky. While aerial stunts demonstrated humankind’s mastery of the air, they also

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116 Stilwell and Rodgers, *Old Soggy No. 1*, 11.
led audiences to view exhibition pilots as a special breed. As airplane accidents became an increasingly common sight at aerial exhibitions, people were loath to believe that everyone was cut out for flight. According to Dwiggins, “birdmen like Linc Beachey, Arch Hoxsey and Hubert Latham created the legend that it takes a superman to fly.”

While the “superman” status of stunt aviators was good for the entertainment value of exhibition flying, it was antithetical to the goals of the airplane manufacturers who employed them. Curtiss and the Wrights hoped to eventually push aviation into the mainstream of American society as a means of commerce. They did not want the daring stunts of their aviators to obscure the potential use of airplanes beyond exhibition flying.

Aviators like Beachey were compelled to contest the notion that they were different from earthbound people. While Beachey was genuinely interested in arousing public support for the practical application of airplanes, he was also careful to reinforce his renown as an “expert in the game of aviation.” While asserting that anyone could learn to fly with practice, he emphasized that his own natural attributes made him an ideal aviator:

Such form can be acquired only through a regular course of training and practice. His moral and physical habits must be free of all intemperance and abuse. The eyes of an aviator must be quick and clear, ditto his brain, and his nerves strong and steady. With just this sort of determination in mind it is possible for anyone, in time, to accomplish any and all of the so-called “fool-hardy” flights that I have accomplished. I am not running the risk you imagine. . . . I possess all the physical and mental requirements. I possess the necessary knowledge acquired through experience and study . . .

120 Trimble notes that the major aircraft manufacturers “recognized that increased sales could be generated by the appearance of their products in flight” (Trimble, *High Frontier*, 61). They did not want exhibition pilots to spread the notion that it took a unique sort of person to fly their products.
122 Ibid., 6-7.
Beachey dispels the myth surrounding human flight. In effect, we have Icarus telling us that he is not a fool; that if properly trained, one’s wings will not melt.

Exhibition pilots’ ultimate objective was to engender popular support for aviation by demonstrating the capabilities of the airplane to the American public. As legendary figures who demonstrated that human flight was no longer a dream, they played on people’s emotional reaction to the airplane. When aviation passed from myth to reality, it was the exhibition pilots who acted as intermediaries, shepherding the fledgling technology through its rambunctious infancy.

Beyond the Recklessness: Proving the Efficacy of Heavier-Than-Air Flight

Challenging the Criticism
Many sources treat the heavier-than-air exhibition era as a retroactive interlude in the evolution of a serious field of technology. Historians tend to discuss exhibition flying in relation to the public’s morbid desire to witness an accident rather than people’s curiosity in heavier-than-air flight. They argue that Beachey and the other aerial stunt artists gave flying an unsafe image. 

Bilstein, on the other hand, gives a more balanced summary of the effect of exhibition flying on the public, which lends credence to both sides of the debate: “People were willing to pay to observe the marvel of flight and to be on hand for the deliciously chilling prospect of an airplane smash-up.” While Bilstein is somewhat noncommittal in his critique of exhibition flying, it is important that he distinguishes the “marvel of flight” from the “chilling prospect” it created. While exhibition events featured dangerous stunts, the pilots were ambitious individuals interested in the progress of aviation. They delivered the spectacle of flight and, as Hallion attests, the “beneficial effect that this had on making Americans ‘air-minded’ cannot be overemphasized.”

Maitland’s delineation of three broad eras in aviation’s historical evolution provides a useful framework within which to examine the conflict between recklessness and utility in exhibition flying. According to Maitland, the three eras of aviation history (up to 1929) are: experimentation and research, beginning with man’s ancient dreams of

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124 Hallion acknowledges that public exhibitions allowed the “average citizen” to witness the airplane close up, but notes that the large number of deaths in early airplane accidents caused the image of the “‘unsafe airplane’” to become “‘firmly rooted in the public mind’” (Hallion, *Test Pilots*, 35). He goes on to say that the risky behavior of aviators like Beachey accentuated dangers that were already present in flying due to the instability of airplanes.


flight and culminating in the first practical flying machines of the early 1900s; the progress in aviation technology stimulated by World War I; and the refinement of airplane technology and its commercial use as a means of transport after World War I.\textsuperscript{127} Although his representation of aviation history is valid, it is defined only in terms of technological development. Maitland shows minimal interest in the social aspect of flying: the public’s responses to the airplane. Although he notes that Charles Lindbergh stimulated interest in transoceanic commercial aviation, he demeans the exhibition pilots’ contribution to aviation by treating them as a prewar anomaly. Maitland labels the prewar exhibition era a “hectic stage of feverish sensationalism” and an “orgy of aviation thrills.”\textsuperscript{128} He views it as a disorderly stage of development after the invention of the airplane, but prior to its fruition as an object of the military’s attention. “Recklessness held sway. Pilots took all sorts of chances with their machines. Death rode in the cockpit with them. Then came the war and the picture changes.”\textsuperscript{129} His summary analysis of exhibition flying is overshadowed by the importance of World War I. While the war was essential to aviation’s development, Maitland fails to recognize the exhibition era as a crucial link between the invention of the airplane and its first practical function as an instrument of war.

Maitland’s argument contains a conceptual leap from the Wrights’ invention to the military’s interest in aviation. The missing intermediate stage of development is the exhibition era. Maitland is correct that World War I advanced the state of technology and

\textsuperscript{127} Maitland, \textit{Knights of the Air}, 6-7.
\textsuperscript{128} Ibid., 8.
\textsuperscript{129} Ibid.
led to the development of the modern aviation industry; however, he ignores the fact that the fifteen years of aviation before the war was supported by the efforts of civilian inventors and their exhibition teams. That flying was dangerous during these intervening years does not discredit the historical relevance of the exhibition era. The Wrights realized the importance of exhibition flying. They understood that the public would only accept the airplane if they saw it in flight. Orville Wright acknowledged this, stating, “I think it was mainly due to the fact that human flight was generally looked upon as an impossibility, and that scarcely anyone believed in it until he actually saw it with his own eyes.”

Aviation technology advanced slowly during the exhibition era. While pilots tested and helped perfect the current state of the art in airplane design, the industry needed substantial funding before it could evolve. The government was only moderately interested in aviation. With war on the horizon, Germany, France, and Italy

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130 The impetus of war led Congress to increase its appropriations for military aviation from $1,800,000 in 1916 to $22,500,000 in 1917. The government’s demand for thousands of aircraft exceeded American manufacturer’s production capabilities. Simonson, “The Demand for Aircraft and the Aircraft Industry, 1907-1958,” 363. As Bilstein illustrates, the war contracts led to a “consolidation of most of the smaller companies, and the early plethora of airplane firms . . . slimmed down to seven major groups: the Aeromarine Plane and Motor Company, the Burgess Company, the Curtiss Aeroplane and Motor Corporation, the L.W.F. Engineering Company, the Standard Aircraft Corporation, the Sturtevant Aircraft Corporation, and Wright-Martin” (Bilstein, Flight in America, 1900-1983, 30). This fundamental change in the size and structure of the industry was primary in making aviation a pervasive part of American society. “From 1918 to 1929 American aviation progressed through the pioneering era, establishing the pattern of aviation’s impact on national security, commerce and industry, communication, travel, geography, and international relations. American, as well as global, society, experienced a dramatic transformation from a two-dimensional to a three-dimensional world” (Bilstein, Flight Patterns: Trends of Aeronautical Development in the United States, 1918-1929 (Athens: The University of Georgia Press, 1983), 181.
131 Bilstein, Flight in America, 15.
132 With a few exceptions, the prewar aviation industry did not develop beyond the biplane stage. While the exhibition pilots helped improve the stability and power of the biplane, its dual-wing design was fundamentally inefficient. As Ogburn demonstrates, it took government investment in the technology to get beyond the biplane: “One of the most important aviational developments of the war was the all-metal monoplane which solved some of the most troublesome aerodynamic problems of that time” (William Fielding Ogburn, The Social Effects of Aviation, with the assistance of Jean L. Adams and S.C. Gilfillan [Boston: Houghton Mifflin Company, 1946], 12).
invested in the technology, “But in the United States there was no imminent war and very little business pressure yet to make the government subsidize aviation.”\textsuperscript{133} The industry, consisting only of private entrepreneurs and pilots, was struggling.\textsuperscript{134} However, American aviators and inventors were determined people. They envisioned a bright future for aviation technology if only they could convince the government and the American people that it had practical uses. Until the government would support them, the manufacturers needed a way to generate capital and put their products on display. Exhibition flying emerged as the solution to their problems. While the press condemned stunt flying as dangerous, air meets invariably attracted huge crowds and brought in the funds needed to sustain airplane manufacturers.\textsuperscript{135}

The nation viewed exhibition flying as an entertaining sport. While it attracted millions of spectators between 1910 and 1915, the novelty of stunt flying could only sustain itself so long. The alarming number of aviator deaths led people to wonder if there was any value to these aeronautical activities.\textsuperscript{136} People watched aerial exhibitions with great skepticism. Although accidents appealed to their belief in the lunacy of human flight, successful aerial stunts left the crowds in awe of the scientific accomplishment. Nothing exemplifies this more than Curtiss pilot Beckwith Havens’ description of the public’s reaction to his flights:

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{133} Freudenthal, \textit{The Aviation Business}, 17.
\item \textsuperscript{134} Simonson states that, prior to the war, “Few airplanes were sold for either commercial or military purposes” (Simonson, “The Demand for Aircraft and the Aircraft Industry, 1907-1958,” 362). In the early years of the American aircraft manufacturing industry almost all of the airplanes produced were exported abroad. Even these exports only amounted to $100,000 in 1912.
\item \textsuperscript{135} Between September 17, 1909 and March 8, 1911, 35 fatal airplane accidents occurred in the United States. According to Whitehouse, “These fatalities were highly featured in the newspapers affording ammunition for the many critics who were loud in their denunciation of all forms of mechanical flight” (Whitehouse, \textit{The Early Birds}, 143).
\item \textsuperscript{136} “While no rational person after viewing an aerial demonstration could dispute the fact that heavier-than-air flight was a reality, many deplored the deaths and serious injuries that accompanied nearly all
\end{enumerate}
\end{footnotesize}
They thought you were a fake, you see. There wasn’t anybody there who believed [an airplane] would really fly. In fact, they’d give odds. But when you flew, oh my, they’d carry you off the field . . .137

Havens’ experience demonstrates the positive public reaction to the spectacle of heavier-than-air flight. In this light, the claim that exhibition flying created public anxiety over the safety of heavier-than-air flight seems erroneous. While stunt flying was inherently dangerous it was also an affirmation of the achievement of heavier-than-air flight.

Although it is paradoxical that a field marked by superfluous danger was the only means to garner support for the practical application of its technology, exhibition pilots mitigated the negative implications of their sport by advocating progress in aviation. They took it upon themselves to combat their negative image and promote the airplane as a safe and useful invention. Their livelihoods depended on the financial health of the manufacturers who employed them. While showmanship was their primary concern, the birdmen were cognizant of the broader interests of the aviation industry. For instance, Lincoln Beachey, known to the public as the “Pacemaker for Death,” became a champion of the efficacy of heavier-than-air flight during the latter half of his career. In “The Genius of Aviation” he predicted the future of aviation with the accuracy of an informed devotee:

The aeroplane, for reason of its simplicity in construction and operation, will be known as the ‘flyabout,’ and like the ‘runabout’ of motordom will become a popular means of conveyance with the masses. The aeroplane, also, is bound to prove of inestimable value as an agency in warfare, doing scout duty in signal service, and as a weapon of destruction in a variety of forms, for several reasons, one of which is the attainment and maintenance of tremendous speed.138

exhibitions” (Trimble, High Frontier, 74). Exhibition flying showed the airplane to the country, however, the tragedy of accidents had the potential to obscure the importance of the invention.
The accuracy of Beachey’s prediction was not a fluke. He and other exhibition pilots took an active role in seeing that aviation followed the course of development outlined in his statement.

The very existence of “The Genius of Aviation” brings credibility to the exhibition aviators’ purposefulness. In the treatise, Beachey claims that the United States government’s lackadaisical approach to aviation is primarily responsible for its lack of advancement. He calls upon all Americans to urge their congressmen to support the field.\textsuperscript{139} The fact that “The Genius of Aviation” sold for ten cents – not an insignificant sum in 1914 – indicates that people were receptive to his opinions. More importantly, the reading public was evidently not dissuaded by Beachey’s penchant for aerial recklessness as Beachey unabashedly uses his stunts to justify his argument for the efficacy of heavier-than-air flight. The title page of “The Genius of Aviation” shows the aviator, with his cap turned backward for flight, staring off into the distance with a confident smile. The caption below the photograph reads, “America’s startling, amazing – BEACHEY.”\textsuperscript{140} These superlatives suggest that, rather than creating public anxiety, the sensational appeal of exhibition flying engendered the support of the American public.

\textit{While the Government Slept}

Prewar developments in the field of aviation were displayed at air meets throughout the country. Even the limited military and Post Office involvement in aviation came by way of exhibition flying. On September 23, 1911, Earle Ovington

\textsuperscript{139} “Now is the time, if you are interested in the smallest degree, to sit down and write a letter to the congressman who represents you in Washington, D.C., urging him to engage himself in the study of the question of aviation” (Ibid., 7).
\textsuperscript{140} Ibid., title page. See Appendix B, Figure 5.
became America’s first airmail pilot by flying a bag of mail over a five-mile route.\footnote{F. Robert van der Linden, \textit{Airlines & Air Mail: The Post Office and the Birth of the Commercial Aviation Industry} (Lexington, KY: The University Press of Kentucky, 2002), 4-5.} This initial airmail flight was part of an international air meet being held on Long Island. The success of the mail drop led Postmaster General Frank H. Hitchcock to urge Congress to appropriate money for the development of airmail routes. Starting in late 1911, Hitchcock selected Curtiss aircraft and aviators, including Lincoln Beachey, to be “special mail carriers” for “transporting mail over difficult routes.”\footnote{Hitchcock selected specific cities in which to test the efficacy of airmail. Some of the notable cities included were Rochester, New York; Dubuque, Iowa; Fort Smith, Arkansas; Houston, Texas; and Atlanta, Georgia. \textit{New York Times}, 7 January 1912.} While essentially an experiment, Hitchcock’s decision to use Lincoln Beachey and other Curtiss aviators to inaugurate airmail service is indicative of the respect they commanded, as aviation professionals, beyond the realm of stunt flying.

The Curtiss Exhibition Company encouraged the Army and Navy’s interest in aviation by providing a test bed for early military experiments with heavier-than-air flying machines.\footnote{In addition, Curtiss offered to train naval and army aviators: “Curtiss invited the Army and Navy to send men to him for instruction – for which he never asked or received, he wrote, any remuneration” (Freudenthal, \textit{The Aviation Business}, 11). A majority of exhibition pilots were also instructors at the flights schools of their respective teams.} From the time of the Wright’s first flight, the military recognized that airplanes could be used for aerial surveillance of troop movements.\footnote{This is evident in the formation of the aeronautical division of the Army Signal Corps shortly after the Wright’s achievement in 1903. Ibid., 17.} Exhibition pilots, however, encouraged broader conceptions of the airplane’s applicability to war. “In 1910, Glenn Curtiss first experimented with projectiles dropped by an airplane, tossing dummy bombs toward the shape of a battleship outlined by buoys anchored in a lake.”\footnote{In addition, Curtiss offered to train naval and army aviators: “Curtiss invited the Army and Navy to send men to him for instruction – for which he never asked or received, he wrote, any remuneration” (Freudenthal, \textit{The Aviation Business}, 11). A majority of exhibition pilots were also instructors at the flights schools of their respective teams.} Mock battles became a part of aerial exhibitions, demonstrating that the airplane could be a potent weapon of war. At a 1911 air meet in Dubuque, Iowa, Beachey staged a “sham
battle” between his airplane and Company A of the Iowa National Guard. The “sham battle” was primarily for the public’s amusement but it was also an impressive endorsement of the utility of airplanes.

The government was nonetheless reluctant to increase its expenditures on military aviation. Between 1908 and 1913, The United States spent only $435,000 on aviation and had only 28 airplanes in military service. In contrast, Germany spent $28,000,000 on the purchase and maintenance of its 400 airplanes during the same period. The reluctance of Congress to appropriate funds to military aviation was indicative of their own agenda and not of the military’s stance on aviation. In 1913, the Army released an official statement urging support for military aviation: “Aviation, which may be considered a sport by the people of the country at large, is to the army a vital necessity.” While the statement seems to downplay the importance of aviation as a “sport,” it also suggests that stunt flying encouraged the United States Army to realize the practical implications of aviation.

Beachey made it his personal mission to raise awareness of what he termed, “The parsimonious policy pursued by [the] government in the matter of aviation.” In 1913, he met with Secretary of War Lindley Garrison to discuss “data” he had acquired while performing a loop maneuver at the Army aviation school on North Island in San Diego. Beachey’s dealings with the military assured him that the army and navy were dedicated to the progress of aviation technology, but were “powerless, absolutely, to develop the

145 Bilstein, Flight in America, 1900-1983, 32.
146 Dubuque (Iowa) Telegraph-Herald, 22 September 1911.
148 Ibid., 18.
science to a state of perfection without sufficient money to do so.” Technological advancement was not the only thing being hindered by the government’s passive policy. Beachey argued that the lack of funding was directly responsible for the deaths of several military aviators. He claimed that the First Aero Corps, stationed at North Island, was ill equipped and forced to “patch up” old machines for lack of funds with which to purchase new ones.

In “The Genius of Aviation,” Beachey ends his attack on the government by affirming that an aerial demonstration of his stunts would certainly convince Congress to change its policy:

I am convinced it is possible to demonstrate to members of Congress as individuals the great things of which the aeroplane is capable. If it were possible to corral ‘em – every mother’ son – on one of the aviation fields near Washington to witness an exhibition or two of the “loop maneuver,” “dropping from the clouds” and a few other perfectly simple stunts, I am sure they would have an entirely different opinion of the flying machine. The advancement in aviation then would go forward in leaps and bounds.

The fact that Beachey uses his stunts as justification for the utility of the airplane indicates that he considered his profession to be useful. He was convinced that stunt flying proved the value of heavier-than-air technology. Significantly, Beachey’s assertion implicates the government, rather than civilian interests, in the dormancy of aviation. While the stunt pilots touted the benefits of flight to Americans, the government was apathetic to their appeal. The absence of governmental regulation or financial support exacerbated the danger faced by stunt pilots.

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150 Ibid.

151 By February 1914, fourteen military aviators had died in airplane accidents. Commenting on the death of Lieutenant Henry B. Post in a faulty Army airplane, Beachey was quoted as saying, “The death of Lieut. Post only substantiates the charge I made against the policy of the United States Government last November. . . . At that time I blamed Congress for the deaths of the army and navy aviators” (New York Times, 10 February 1914).

Until World War I, American aviation was almost entirely a civilian practice of individual entrepreneurs and small exhibition teams. Simonson claims that in addition to the three industry leaders (Wright, Curtiss, and Martin), “In 1911, private individuals built more than 750 airplanes. From 1911 through 1913 no less than 139 companies were formed to manufacture others.”154 The research and development of aviation that occurred at Bell and Curtiss’s Aerial Experiment Association between 1907 and 1910 exemplifies the independent, entrepreneurial initiative that got American aviation on its feet.155 This civilian research would have been inconsequential without the exhibition aviators to test the designs. “Bell recognized that full-scale flight testing would have to complement the theoretical work on the ground . . . .”156 Although, the initial test flights were not public exhibitions, the fact that Curtiss left the AEA to start his own flight school and exhibition company illustrates the symbiotic relationship between the civilian airplane inventors and the early exhibition pilots.

Once the theory behind heavier-than-air flight had been established and the first airplanes built, it was up to the exhibition pilots to try out the designs in the air. The airplanes that Lincoln Beachey and his fellow Curtiss pilots flew in 1911 were still very new designs. In addition to advertising heavier-than-air flight to the public, the exhibition pilots were testing new technology. Freudenthal notes this twofold contribution:

The United States owes a large debt to the exhibition flyers who began in 1910 to bring flying to all the corners of the country; who slowly stretched the distance

153 Ibid., 3.
155 The AEA was one of the world’s first aeronautical research centers and contributed greatly to the development of heavier-than-air flight. Bilstein, Flight in America, 1900-1983, 16; Hallion, Test Pilots, 34.
156 Hallion, Test Pilots, 34.
records and the records for altitude; who applied the airplane to new uses; and who, in spite of the difficulties of patents and patent rights, built their own planes and started their own aviation schools.\textsuperscript{157}  

Beachey embodies this blend of showman and test pilot. While his stunts appealed to the public, they tested the developing scientific theory of aerodynamics. To say that the exhibitionist pilots detracted from progress in aviation is to overlook the contributions of a number of pilots who put their lives at risk to explore the viability of heavier-than-air technology.

Beachey may have been the master of airplane control but ironically he demonstrated little understanding of aerodynamics. His skill was innate and his flying style can only be described as by the “seat of the pants.”\textsuperscript{158} Speaking to this effect, Parrish asserts, “Beachey had little knowledge of or interest in the aerodynamic capabilities of his airplane but possessed an almost uncanny sense of timing and depth perception.”\textsuperscript{159} Although Curtiss was often worried that Beachey’s stunts would compromise the structural integrity of his airplanes, he was continually proven wrong by Beachey’s success.\textsuperscript{160} Beachey’s ignorance of aerodynamics combined with his adeptness at control made him something of a mad scientist. His daring behavior pushed the field of aviation forward by demonstrating the upper limits of airplane performance. When he became the first American to loop-the-loop in November of 1913, he was

\textsuperscript{157} Freudenthal, \textit{Flight into History}, 236.  
\textsuperscript{158} Flying by the “seat of the pants” is aviator’s jargon for relying on one’s kinesthetic sense to control the airplane. It was a flexible approach to flying that was ideally suited for dealing with the unreliability of early airplanes. Using the term to describe his own method of flying, stunt pilot Stats Rodgers attests to its usefulness in times of distress: “I was a seat-of-the-pants flier. I came down hundreds of times when that wasn’t what I had in mind” (Stillwell and Rodgers, \textit{Old Soggy No. 1}, 6-7).  
\textsuperscript{159} Parrish, “Beachey, Lincoln,” 2.  
\textsuperscript{160} Maitland, \textit{Knights of the Air}, 132.
seemingly indifferent to the physics of his maneuver. “When Beachey landed he was asked how he did it, and he could not tell. It was all an experiment, he said.”

Beachey’s ignorance of the physics of flight does not mean that he was a mindless guinea pig. To the contrary, he was well aware of the significance of his flights to the improvement of the science of aviation. Even though he was not a scientist himself, his experienced observations and daring stunts supplied researchers with useful, empirical evidence. “The Genius of Aviation” begins with a statement of his contributions to the field of aviation:

I have demonstrated the possibilities of aviation more than three thousand times. I was unable, however, to solve the genius of aviation until I ‘looped the loop,’ which feat I accomplished with my aeroplane, for the first time, November 24\textsuperscript{th}, 1913, over San Diego Bay, California . . .

There is an air of confidence in this statement that brings credibility to his words. Although the loop is an aerial stunt involving inverted flight and recovery from a steep dive, here it is discussed in very scientific terms. While Beachey’s stunts succeeded in thrilling crowds, here Beachey indicates that demonstrating the “possibilities of aviation” was a key motivation for his flying feats. The statement continues,

It was then that man’s courage, coupled with an invention of science, had finally solved the deep mystery which through the ages had surrounded the flight of the birds . . . The value of such knowledge to society now rests with men who possess money and brains.

These words evoke a sense of cooperation between the early aviators and inventors. While providing entertainment for the public, Beachey’s courage applied to Curtiss’s “invention of science” moved the field of aviation forward. Daring exhibition flyers like Beachey were the perfect complement to the scientific prowess of the airplane engineers.

\textsuperscript{161} \textit{New York Times}, 19 November, 1913.
\textsuperscript{162} Beachey, “The Genius of Aviation,” 2.
Conscious of the fact that the future of aviation was in their hands, exhibition pilots made the most out of their limited aeronautical knowledge and primitive flying machines. Aviators improved flying techniques and, concomitantly, enhanced the safety of flight in the process of devising stunts. Prior to becoming the first aviator to loop-the-loop, Frenchman Adolphe Pegoud stated his motivation for attempting the daring stunt: “If my demonstrations show – and I am certain they will – that the security in aeroplanes is a fact, I shall be satisfied. It will seem to me that I will have worked for the good of aviation and for national defense.” Pegoud evidences a conviction in the safety of flight. His method of demonstrating the “security of aeroplanes” was risky, but his intent was to promote the “good of aviation.”

Aviators developed a lot of aeronautical skills in times of crisis. Beachey invented his “Dip of Death” maneuver out of necessity when his engine unexpectedly died at a high altitude. As he began to drop, he realized that he could safely enter a steep descent and maintain control over the airplane all the way to a safe landing. When modified to thrill the masses, the “Dip of Death” became an even steeper descent designed to give the audience the impression of an inevitable crash, which Beachey would avert at the last minute. Beachey’s own justification for the maneuver indicates his purposefulness:

My defense of the “Dip of Death” is that I was forced to take it, as birdmen have since, and when I kept it up I was furthering the interests of science in that I was showing airmen that it was possible to cheat death when your motor stalled above.

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163 Ibid.
165 Beachey, “The Pacemaker for Death Quits!”
In addition to this contribution, Beachey discovered that inadvertent spins, which had killed many aviators, were the result of stalling the aircraft’s wings. ¹⁶⁶ This fundamental principle of aerodynamics remains one of the first lessons that student pilots are taught today.

**Competitive Impulses**

As exhibition flying spread across the nation, people joined the ranks of the stunt pilots. This, in turn, led to heightened competition between aviators. Although Maitland alludes to this competition as a contributing factor to the danger of stunt flying, it was equally an impetus for the improvement of flight techniques and aircraft design. ¹⁶⁷ While significant advances in airplane technology did not take place until World War I, the exhibition pilots helped refine the current state of the art and, concomitantly, made flight safer. Additionally, the competition led pilots to be more aware of their public image. This was particularly true for Beachey who, as the leader of the field, had to respond to allegations that the deaths of other aviators were directly attributable to the stunts he pioneered.

While Beachey wooed the crowds with increasingly hazardous stunts, he also encouraged his fellow aviators to do the same. In less than two years, nine of his

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¹⁶⁶ A stall is the result of disrupted airflow over the wing and should not be confused with a “stalled” or dead engine. Beachey “reasoned that one might recover from a spin providing there was sufficient altitude to center the directional controls and dive to regain speed permitting control of the airplane. It took considerable courage to enter an intentional spin in putting this theory to test. Beachey’s demonstration proved his theory correct, and his spin recovery technique did much to eliminate fatal accidents in those early days of flying” (Garber, [Washington, D.C.], to Lynn H. Black, Chicago, 12 May 1949).

¹⁶⁷ Maitland, *Knights of the Air*, 133-134.
colleagues died trying to “out-Beachey Beachey.” Aviators did not fully understand the limits of their airplanes and often lost their lives while attempting new stunts. Beachey was one of the few who ceaselessly pioneered maneuvers without getting hurt. He exerted great influence on his fellow pilots. While Beachey liked being at the top of his field, he did not want to be the “pacemaker for death.” The press harangued him for the deaths and criticized the practice of stunt flying. Appalled by the criticism, Beachey retired for a short period in the summer of 1913. While the deaths of so many aviators put exhibition flying in a bad light, Beachey’s retirement is indicative of his concern for the perpetuation of the field. His actions demonstrate a dedication to aviation’s well-being rather than to his personal fame.

Beachey was an arrogant aviator, confident in his skill. He was also an intelligent man who understood the potential utility of airplanes. As a result, he was torn between defending his personal glory and the interests of aviation at large. This internal conflict manifests itself in his retirement announcement, appropriately entitled, “The Pacemaker for Death Quits!” He opens the piece by clarifying the fact that he is retiring not out of cowardice but because of a concern for his fellow pilots:

Fear has driven me out of the skies for all time. Not fear of my own death or the dread of bodily injury for myself has made me give up an art which I dearly love, but the blame and remorse for the death of brothers aviators who went crashing into eternity trying to “out-Beachey Beachey.” I have quit as pacemaker for Death.

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169 “As a class, and with only few exceptions, they knew little or nothing about aerodynamics, stresses, and air pressures, with the result that they subjected their ships to all sorts of strains and never thought of the cost. For this lack of knowledge many of them paid dearly” (Maitland, Knights of the Air, 127).

170 Beachey, “The Pacemaker for Death Quits!”
The altruistic slant to his statement is as much an assertion of his dominance as it is of his compassion. He takes responsibility for setting the bar too high but concurrently defends his career. This is indicative of the competition in exhibition flying. Stunt pilots referred their field as the aviation *game* because they were constantly setting records for altitude, speed, and endurance in addition to stunts.\(^{171}\)

Beachey liked the competitive element of stunt flying, but he was frustrated by the deaths of so many of his fellow aviators because they supported the idea that aviation was unsafe. Beachey was convinced that flying was a safe practice and pointed to his own ability to avoid harm as proof. “Death has left me alone, has allowed me to do impossible things, because I was a good servant to him.”\(^{172}\) While it is hard to believe that Beachey thought he was insulated from death, he wanted to challenge the public’s morbid appreciation of aerial tragedies. The great showman showed a cynical side when he accused the public of wanting to witness his death:

> Why did I enlist as Death’s pacemaker? Well, listen. The people demand thrills in the first place. I was never egotistical enough to think that the crowds came to witness my skill in putting a biplane through all the trick-dog stunts. There was only one thing that drew them to my exhibitions – the desire to see “something happen” – meaning, of course, my death. They all predicted that I would be killed while flying, and none near wanted to miss being in at the death if they could help it.\(^{173}\)

Beachey’s accusations of the public show his disgust with the deleterious trend in exhibition aviation.\(^{174}\) As accidents occurred more frequently the public began to expect

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\(^{172}\) Beachey, “The Pacemaker for Death Quits!”
\(^{173}\) Ibid.
\(^{174}\) Although it proved to be a false premonition, many aviators were convinced that the Chicago Air Meet of 1911 would be the last of its kind because “no true impetus is given the science by such events which, despite all precautions to the contrary, soon become mere exhibitions of dare devilry” (*New York Times*, 21 August 1911).
disaster. This was not the desired effect that airplane manufacturers or aviators had in mind. Beachey’s declaration of his own immortality throughout “The Pacemaker for Death Quits!” is a challenge to the public. He wanted to prove to them that a human being really could master the art of flying without risk. However, wherever he succeeded, other pilots failed, perpetuating the unsavory image of flying.

While competition increased the danger of flying it also encouraged the development of flying techniques and airplane design. The public demanded new stunts and the exhibition teams responded by designing airplanes with increased performance. When Adolphe Pégoud performed the first aerial loop maneuver in September 1913, it not only brought Beachey out of retirement, it led to the creation of new airplanes capable of duplicating the stunt. “Beachey fairly exploded with renewed activity to regain his mythical crown. He immediately ordered a new heavy Curtiss, beefed up for looping.” Curtiss delivered on Beachey’s request with a reinforced version of his biplane and a 90 horsepower OX engine. In this airplane, Beachey became the first American to perform the loop maneuver on November 24, 1913 over San Diego. During the five weeks that

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175 By July 1, 1912, 158 people had died while flying airplanes in the United States and Europe. In the beginning of 1911 there were only 541 certified pilots worldwide. The fact of the matter was that due to the instability of flying machines, the lack of government regulation, and low skill level of pilots, flying was dangerous. Ogburn, The Social Effects of Aviation, 12.
176 Williams, a stunt pilot himself, gives an interesting depiction of the psyche of the early aviators. While the joy of flying is often described as emanating from the ultimate freedom it affords the pilot, the issue of control is another important consideration. It was one thing to be airborne and another thing entirely to be fully in control of your flight. “At this time, pilots began to realise that the control, strength and power of the aeroplane could be made to conform to their will to produce an intricate pattern in the sky, giving them a sense of freedom that no man before them had ever enjoyed. They were flying with the ease of birds and the sport of aerobatics had been born” (Williams, Aerobatics, 5). Beachey believed that he had achieved this level of control and was dismayed that the public chose to focus on aerial failures rather than successes.
177 It is interesting to note that, while secondary sources state that Beachey’s return to aviation was a direct result of Pégoud’s achievement, Beachey himself cited “the trend of the sport toward utility” as his motivation (New York Times, 8 October 1913). This highlights the tension between the stunt pilots’ reckless impulses and their desire to defend their field as useful.
followed this initial achievement, Beachey looped forty-three times. From that point on, it became his signature stunt.

Subsequent refinement of the maneuver led Beachey to seek out a more powerful engine. He traveled to France in the spring of 1914 and purchased an 80 horsepower “Gnome” that would operate in any position. At this time he also ended his employment with Curtiss and started his own company. He commissioned three men – Arthur Mix, Warren Eaton, and Al Hofer – to build a smaller, more efficient biplane. The aircraft was attached to the Gnome engine and affectionately dubbed “the little looper.” It boasted a cruise speed of 80 miles per hour and a climb rate in excess of 1,000 feet per minute, impressive performance characteristics for airplanes of the era. Thus, while attempting to revitalize his career and pioneer new stunts, Beachey improved upon airplane technology.

Beachey embodies the paradoxical combination of thrill-seeking and rationality that characterized stunt aviators. The pages of “The Genius of Aviation” are loaded with photographs of Beachey performing hair-raising aerial stunts, but the messages that surround them assure the reader that flying is a safe practice as long as it is done responsibly:

With the knowledge we now possess there remains no danger. We have solved the mystery which has surrounded the flight of the birds, have mastered the gravity of space, have acquired the genius of aviation. It requires only practice, patience and courage to master an aeroplane. And be careful—that’s all.

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Beachey’s behavior and, by extension, that of his fellow aviators, contradicts the terms of his advice. The publisher was concerned enough about the irony of the message to include two opposing images of Beachey – one that gives him a scholarly appearance and one that shows him eagerly awaiting a performance. Underneath these images is the caption: “Dr. Jekyll and Mr. Hyde’ Beachey, one the scientific, studious, careful Beachey, the other the nerve-tingling, spine-chilling, death-daring, sensational Beachey.”\textsuperscript{183} This characterization of Beachey’s dual personality reveals an important distinction. Exhibition pilots like Beachey may have enjoyed their notoriety for recklessness, but they wanted to be viewed as qualified aviation experts. They linked the American public to the aviation industry. In responding to the demands of both, they necessarily had to juggle aerial “daredevilry” with responsibility, entertainment with functionality.

In the competitive environment of exhibition flying, and without any government assistance, these aerial pioneers created a framework of viability for the future of American aviation. Aviators’ resources were limited – consisting of fragile airplanes and modest aeronautical knowledge – but they applied them as best they could. In particular, their ability to impress the public with the spectacle of flight fostered support for heavier-than-air technology. The danger of exhibition flying was an impediment to the pilots’ objectives. The pilots and inventors, however, remedied the problem by learning better techniques and improving upon the design of their airplanes. In doing so, they evidenced a unique combination of cooperation and ingenuity, which sustained American aviation before World War I.

\textsuperscript{183} Ibid., 7. See Appendix B, Figure 6.
Conclusion

Lincoln Beachey’s death prefigured the close of the American exhibition era of heavier-than-air flight. On March 14, 1915, Beachey was scheduled to fly as part of the Panama-Pacific International Exposition in San Francisco. His machine was a state of the art monoplane, one of the first of its kind. In front of 50,000 spectators, he entered a high-speed dive over the San Francisco Bay. At an altitude of 500 feet, the airplane came apart. The left and then right wings broke upwards and the airplane tumbled into the bay, nearly striking a docked ship.184 Beachey, trapped inside the cockpit, drowned to death. America’s flying legend was apparently mortal.

While Beachey’s death was not directly responsible for the end of the prewar aviation epoch, the loss of the nation’s greatest stunt pilot combined with the news of aerial battles in Europe effectively shifted the public’s attention away from exhibition flying. By 1915, “the first boom in air exhibition flying was fading. Daily, World War I in Europe presented truly death-defying air contests.”185 In war, the airplane found a function beyond entertainment.

The short duration of the exhibition era testifies to its function as a transitional stage in the development of aviation. Exhibition aviation was fundamentally an experiment. Stunt aviators like Beachey were pioneers of a technology that had outpaced society’s ability to apply it. Although their immediate purpose was entertainment, the ultimate goal was to prove the efficacy of the airplane. The fragility of the cloth wings that supported their airplanes is a metaphor for these aviators’ contribution to the

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185 Tessendorf, Barnstormers & Daredevils, 9.
development of aviation. Backed only by a few entrepreneurs and limited aeronautical knowledge, they *lifted* the field of aviation from obscurity to mass appeal.

As expressed by the sentiments of Lincoln Beachey, exhibition pilots believed in the value of aviation technology: “I am convinced the aeroplane is a safe and practical vehicle of transportation.” 186 The government and a majority of Americans, however, were unmoved. While some people still did not think that heavier-than-air flight was even possible, others were satisfied that it was a useless and dangerous practice. Scientific theory, as illustrated by the work of aeronautical engineers, proved otherwise but was too abstract to engage people’s interest. “For all the evidence that accumulated in published reports” Bilstein declares that, “most Americans had to see it to believe it.”187

Fortunately, flying was endowed with sex appeal. The engineers who pioneered the theory were themselves drawn to their scientific pursuit by a romantic interest in human flight. The desire to soar through the sky was a human ambition dating back to ancient times. The experiences of early aviators lived up to the dream. With the wind in their face and nothing to restrict their movement, these brave souls circled and dove with reckless abandon. The sky was their canvas and the airplane their brush. While satisfying their own passion for thrills, they traced beautiful figures in the sky, to the delight of observers below.

Exhibition flying was thus born out of pleasure and necessity. It was an emotional reaction to a scientific quest. It appealed to the emotions of pilot and audience alike. While stunt flying was a dangerous practice, the pilots were not stupid. Beachey

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exemplifies their rational-minded approach to stunt flying. He was equally motivated by the thrill of the game and a desire to advance aviation technology. His advocacy of aviation demonstrates how the exhibition era was wholly responsible for igniting the organized interest in aviation that eventually led to its regulation by the government and later domination by corporate enterprise. Through Beachey’s opinions and accomplishments we see that the interwoven themes of technology, spectacle, danger, and romance that characterized exhibition flying made it the exuberant, and essential, precursor to the practical, regulated reality of modern aviation.
Appendix A: Glossary of Technical Terms*

Aeroplane/Airplane. Both terms are used to describe heavier-than-air aircraft with (usually) fixed airfoils called wings. The aerodynamic reaction between the wing and the relative wind creates and upward force called lift, which opposes gravity and allows the airplane to become airborne. “Aeroplane” is the British spelling of “airplane,” but it was also used in the United States until 1911.

Aeronaut. Although the term implies a broad applicability to all aerial pursuits, it is typically applied to pilots of lighter-than-air dirigibles and balloons.

Ailerons. Control surfaces on the wings that roll (bank) the airplane about its longitudinal axis.

Airship. A powered, lighter-than-air aircraft.

Biplane. An airplane that has two parallel sets of wings, one above the other. The earliest heavier-than-air flying machines were biplanes.

Dirigible. A type of airship that incorporates a huge, (usually) football-shaped hydrogen balloon attached to wooden supports; the forerunner of the modern day blimp.

Elevator. A horizontal control surface that pitches the airplane about its lateral axis. It is used to control ascent and descent.

Glider. A lighter-than-air, fixed-wing aircraft without a propulsion mechanism.

Heavier-Than-Air Flying Machine. Aircraft that weigh more than the air they displace. They require a propulsion mechanism and they generate lift from their airfoils to stay aloft. Airplanes and helicopters are examples.

Lighter-Than-Air Flying Machine. Aircraft that weigh less than the air they displace. Balloons and dirigibles are examples.

Looping-the-loop. A stunt maneuver, involving an aerial somersault, in which the airplane traces a circular path.

Monoplane. An airplane with one set of wings; typical of present day airplane design.

Ornithopter. An aircraft with flapping wings. It was a failed design based on a misinterpretation of the flight of birds.

Pusher Propeller. A propeller that is behind the engine and (usually) the wings and faces towards the rear of the airplane.

* Gibbs-Smith’s glossary was a valuable complement to my own aeronautical knowledge and should be referenced for any terms not included here. Gibbs-Smith, Flight Through the Ages.
**Rudder.** A vertical control surface that moves the airplane about its vertical axis.

**Tractor Propeller.** A propeller that is located in front of the engine and (usually) the wings.

**Volplane.** An uninterrupted, sustained vertical dive from a high altitude in an airplane.

**Wing-Warping.** An alternative to ailerons; This system changes the curvature of the wings in order to create a rolling movement about the longitudinal axis.
Appendix B: Photographs

Figure 1: Lincoln Beachey flies under the steel bridge at Niagara Falls in a Curtiss biplane, June 1911.
(Facsimile of photograph located in Box 3, Folder 2 of the E.D. “HUD” Weeks Collection, Archives Division, National Air and Space Museum, Washington, D.C.)
Figure 2: Lincoln Beachy and his mechanics prepare for a flight. Beachy is seen here in formal attire behind the controls of a Curtiss biplane, ca. 1913.
(Facsimile of photograph located in the E.D. “HUD” Weeks Collection, Archives Division, National Air and Space Museum, Washington, D.C.)
Figure 3: Lincoln Beachey loops the loop over San Francisco in January 1914. His name is prominently displayed on the upper wing of his biplane.
(From p. 8 of “The Genius of Aviation,” located in the Lincoln Beachey Biographical File, Archives Division, National Air and Space Museum, Smithsonian Institution, Washington, D.C.)
Figure 4: Lincoln Beachey (in biplane) races Barney Oldfield (in automobile), ca. 1914. (Facsimile of photograph located in Box 3, Folder 1 of the E.D. “HUD” Weeks Collection, Archives Division, National Air and Space Museum, Washington, D.C.)
Figure 5: The title page of “The Genius of Aviation.”
(located in the Lincoln Beachey Biographical File, Archives Division, National Air and Space Museum, Smithsonian Institution, Washington, D.C.)
Figure 6: Two opposing images of Lincoln Beachey from “The Genius of Aviation.”
(From p. 7 of “The Genius of Aviation,” located in the Lincoln Beachey Biographical File,
Archives Division, National Air and Space Museum, Smithsonian Institution, Washington, D.C.)
Sources Consulted

The primary and secondary materials relating to Lincoln Beachey come from two locations at the Archives Division of the National Air and Space Museum, Smithsonian Institution, Washington, D.C.: the Lincoln Beachey Biographical File (file number CB-070700-01) and the E.D. “HUD” Weeks Collection (file numbers 1985-0004 and 1985-0006). Although some of the documents in these collections are original, many are facsimiles. I have done my best to give them detailed citations, but the provenance of some of the articles, letters, and photographs remains a mystery. The E.D. “HUD” Weeks Collection is one of the most comprehensive collections of materials on Lincoln Beachey in the Archives Division of the National Air and Space Museum, Smithsonian Institution. The Lincoln Beachey Biographical File is a somewhat random assortment of materials, including two primary sources purportedly written by Beachey.

Primary Sources

Printed/Published Materials:


Announcement of Lincoln Beachey’s posthumous induction into the Aviation Hall of Fame in 1966. It gives a brief biography of his life and a description of his contributions to aviation.


There is some doubt as to whether this document was written by Beachey or by one of his publicists. Regardless of its true source it gives a good illustration of pre-World War I aviation in the United States


A farewell to exhibition flying, supposedly written by Beachey before his temporary retirement in the summer of 1913.

A short piece written by Beachey’s mechanic and friend, Arthur Mix. Mix talks about traveling with the greatest aviator of the era and gives his opinion of Beachey as a person and pilot. He also discusses technical aspects of flying.


An address given by John Northrop at the Library of Congress on November 3, 1948. Northrop, one of the most influential airplane engineers between WWI and WWII, gives a technical analysis of the evolution of aviation technology from the Wright brothers to 1948 and discusses future innovation.


A compilation of works by early aviators, inventors, visionaries, and poets, from Ovid to the Wrights. Scott organizes the book thematically and chronologically, which makes it very accessible. Scott is interested in the evolution of flight as a whole. He invites the reader to witness the evolution of manned flight from the perspective of the people responsible for conceiving of and developing it. He is particularly interested in the aviation pioneers’ eloquent (and romantic) descriptions of flight.


T.P. Wright, Administrator of Civil Aeronautics, delivered this lecture in 1945 during the waning years of World War II. World War II demonstrated the power of aerospace technology to effect human lives and international politics because of the great destruction military aircraft could reap. Wright directs his lecture at the role that aviation fills in modern civilization, with emphasis on both its humane and destructive applications. Wright also discusses the problems that occur when scientific advances (in this case, aeronautics) outpace society’s ability to find productive uses for them.
Letters/Manuscripts:


A short biography of Lincoln Beachey written by Paul Edward Garber, the first curator of the National Air Museum.


Parrish apparently wrote this synopsis of Beachey’s career with the intention of getting it published. The date is unknown.

Newspapers:


Secondary Sources

Journal Articles:


Concerns the introduction of the long-range, Airbus A340-600 airliner in 2002.

Simonson gives a thorough, chronological analysis of the development of the American aircraft industry. Of specific interest is his discussion of the civilian industry prior to World War I and how the war stimulated the production of airplanes in the U.S.


Weeks was an amateur aviation historian with a specific interest in Lincoln Beachey. He uses many of the photographs in the Weeks Collection at the National Air and Space Museum archives to gloss Beachey’s career and his untimely death.

Wicks, Frank. “First Flights.” *Mechanical Engineering-CIME* 122:7 (July 2000). (Downloaded from InfoTrac OneFile, February 8, 2003)

Detailed account of the inventors of heavier-than-air flight technology.

Books:


A survey of the development of aviation in the United States during the first eighty years of the 20th century. Bilstein discusses the technical aspects of flying and the contributions of individual aviators and inventors. He also addresses the interplay between American culture and aviation, encompassing industry, politics, and society.


Focuses on the era following the war when American aviation progressed from a technological breakthrough to a field of economic and political importance. He synthesizes an economic analysis of this development with an appreciation of the symbolic aspects of the air age in twentieth-century American culture and society.

Discusses the development of commercial aviation in the United States.


Martin Caidin is widely accepted as a leader in the field of aviation history. He is both a novelist and a historian and approaches his work with a colorful subjective touch. He dedicates as entire chapter to Beachey. Caidin tends to exaggerate facts and he makes some unsubstantiated claims. However, he gives a good sense of the era. It is also rich with Caidin’s own appraisal of the beauty and wonder associated with early flight. His technical knowledge and familiarity with the barnstormers gives him an authoritative stance on the subject.


Although the focus of this book predates Beachey’s career, it provides excellent historical background on the technology from which heavier-than-air flight emerged.


A survey of the early days of flying and the transition from the exhibition era to barnstorming after WWI. It is full of personal tales of barnstormers and interesting anecdotal information. Though this book is aimed at the general public and is not a very academic text (it lacks a bibliography or any citations), Dwiggins knows the subject well. He also includes many interesting photographs from public and private collections.


Examines the growth of commercial aviation. It is a very interesting analysis of the government and private industry’s role in developing the field.

Comprehensive economic analysis of the relatively quick, but uneven, growth of the American aviation industry.


Excellent historical examination of the Wrights’ achievements. Also documents the careers of other aviation figures. She blends the economic, social, and political implications of early heavier-than-air flight superbly.


Covers a broad range of aviation history, from the visionaries prior to the development of heavier-than-air flight to the years of powered flight before WWI. This well-researched book looks at the motivations behind the development of aviation.


Great resource for examining the progression of aviation technology.


Although the specific focus of the book is the Guggenheim family’s support of early aviation in America, the general summary of aviation in the 1920s is informative.


Examines the role of aviators who tested scientific theory and aeronautical research by putting their lives on the line in experimental aircraft. This work spans from the prehistory of flight to the jet age.
Contributions by several authors about the Wrights and the early years of heavier-than-air flight.


An inspiring historical account that is situated around the theme of the “wonder” of flight. The work selectively focuses on certain achievements throughout the gamut of aviation history that illustrate the combination of science and romance in human flight.


Traces the evolution of human interest in aviation and the transition from dreams to theory and practice.


Explores the problematic issue of ownership of the air during the boom in air transport.


Engages the historical significance of aviation’s heroes. Keyhoe writes in the wake of a tour of the 48 states, which he made as an “aide” to Colonel Lindbergh. His objective is to give the reader a sense of what it is like to fly with Lindbergh and promote aviation to an expectant American public.


A biographical account of a famous exhibition aviator who participated in air meets and was the first man to fly an airplane across the United States.

An authoritative account of the development of heavier-than-air technology in the United States up to the late 1920s. Maitland examines the numerous aviation figures who advanced the field.


Marrero’s recent scholarship on Beachey is a very controversial contribution to aviation history. While it purports to be the first authoritative biography of Beachey, its historical accuracy is questionable. An aviation historian warned me that it would be more appropriate to classify Marrero’s book as historical fiction. This assessment is a bit of an exaggeration, although it is true that sections of Marrero’s account of Beachey cover aspects of his life that could not have been documented. While one should exercise caution when using this text, many elements of it are well researched and informative.


An interesting survey of a very scantily researched topic: American aviation prior to the 20th century. Milbank argues that the ingenuity of American individuals and their desire to conquer the sky (using balloons and gliders in the 19th century) is as old as the country itself and was motivated by human imagination and economic impulses.


Focuses on the effects of aviation technology on society and the interplay between economics, society, and technology.


A case study of one of aviation’s earliest and most interesting flying families. John Moisant was a gifted engineer, imaginative inventor, and early aviator. Though he lost his life flying, he and his kin were at the forefront of the emergent field and a lot can be gleaned from their story.

The story of barnstormer Slats Rodgers as told by Stillwell. Stillwell admits that he exercised some artistic license in writing the prose, but assures the reader that it is a very accurate tale of a daring aviator.


Tessendorf is very knowledgeable about the prewar exhibition pilots and the barnstormers of the 1920s.


A micro-history of early aviation in Pennsylvania that addresses both the personal stories of early aviators and the effects of aviation technology on the economy and society.


An account of the importance of the frontier to the American experience. He argues that the frontier is intricately tied to American culture, society, and politics.


Explores the important role of the air mail service in garnering government support and proving the viability of commercial aviation in the United States.


An interesting survey of the development of aviation, from ballooning in the 19th century to powered, heavier-than-air flight and its applications in WWI. This text appropriately gets its title, “Early Birds,” from the label attached to a group of early aviators who soloed in airplanes prior to Dec. 17, 1916 (13 years after the Wrights’ flight at Kitty Hawk).

A combined technological and romantic account of the origins of modern flight.


Mainly about the execution of aerial stunts, however, it also discusses the age-old appeal of flight.

Other:


A brochure of the Air and Space Museum’s collection. Interesting discussion of airplanes and other historical aviation artifacts.