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# Wings of Their Dreams: Purdue in Flight, Second Edition

John Norberg


Wings of Their Dreams

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*Second Edition*

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*To the Purdue people of yesterday and today who have dedicated their lives to flight and to the next generation of visionaries who will fashion tomorrow on the wings of their dreams.*

*"There shall be wings! If the accomplishment be not for me, 'tis for some other. The spirit cannot die; and man . . . shall have wings. . . ."*

—Leonardo da Vinci

# Contents

# Foreword

One of the questions people often ask me is why I think so many astronauts have come out of Purdue University. As I write this, the number of Boilermakers who have been selected to fly as astronauts with NASA is twenty-four, and we have one additional Federal Aviation Administration-designated commercial astronaut. I'm certain that number will increase in the future. No other public university is in Purdue's league.

There really isn't a simple answer to the question, but if you read this book, I think you'll recognize that Purdue's astronaut phenomenon is not a fluke. It's really just one of the results of Purdue having a unique combination of historic strengths. It begins with engineering. Purdue graduates engineers who understand both the theoretical and practical sides of their profession. They are problem solvers who know how to think fast when the chips are down, and that's something NASA values highly. Neil Armstrong demonstrated this quality in 1969 when he took control of the Apollo 11 lunar lander to avoid large rocks littering the intended landing site and manually landed on the lunar surface with only seconds of fuel remaining.

Another characteristic of Purdue that has led so many people into space is what I would call a questing spirit. This is dramatized most vividly in the stories of the early days of aviation that John Norberg recounts in *Wings of Their Dreams*. The men and women who took to the skies in the early twentieth century understood very well the risks they were taking. They had none of the technical support, pre-mission modeling, or redundant systems that NASA provides for those of us who fly into space.

When Purdue graduate James Clifford Turpin was flying for the Wright brothers, he was literally inventing maneuvers as he sat at the controls. There was no one to teach him because these things had never been done before.

When Amelia Earhart set out to circle the globe in a Purdue-sponsored Lockheed Electra, she wasn't only flying into unknown territory. She was also testing the limits of human endurance and the physical limits of the marvelous new machines that made flight the most exciting development of the twentieth century. Like Amelia, many other early aviators gave their lives in the course of learning how far, how fast, and how high they could go. Danger is built into the story of flight. Even though we have made air travel the safest form of transportation ever devised, there will always be men and women pushing back the frontiers of flight because they yearn to do something that no one else has done. No matter how many times I fly, I still feel the thrill of leaving the earth and the freedom of moving in three dimensions with ease. And I always remember that, even in the most routine flight, we are doing something not natural and that we are subject to the laws of nature and the possible consequences of not being careful. We were not born to fly, but that does not mean we were not meant to fly. We could not overcome the obstacles of weight and gravity solely with the strength of our bodies, but we did it with our intellect and through the courage and determination of the pioneers whose stories are told so well in this book. These qualities have manifested themselves in many ways at Purdue University. Every student there learns of the exploits of Neil Armstrong and Amelia Earhart and of the tragedy of Virgil "Gus" Grissom and Roger Chaffee, who died while preparing for a historic step in our country's space program.

Purdue's history is full of equally important or exciting events that are not as well known. President Edward Elliott recognized the vast economic and social impacts aviation would have and decided that it had a place in academia. Grove Webster daringly took Purdue's flight training program into the arena of commercial aviation. Boilermaker alumnus Iven Kincheloe became known as "The First Spaceman" and died doing what he loved, just as America reached the threshold of space. Forgotten by most people, he lives on as a legend among pilots.

These are the kinds of stories that emerge from *Wings of Their Dreams*. Purdue and its people were there at the dawn of the age of human flight. They helped steer the course through the transition from barnstorming to revolutions in military strategy and transportation. They led the leap to space travel that will take humankind beyond the bounds of our solar system.

We don't know where we will go from here, but we do know that we will continue to push back the frontiers of air and space travel. The journey that began at Kitty Hawk has just begun. The first century of flight is a prelude to progress that we can't yet imagine. I was fortunate to attend a university that had the vision, the courage, and the innate curiosity to place itself in the center of the story of the first one hundred years of flight. Purdue has not just gone along for the ride. It has been at the controls and helped keep the machine aloft. When the history of flight's second century is written, I think the story will be even more exciting, and I'm certain Purdue University and its graduates will have played major roles.

—Jerry L. Ross

# Acknowledgments

This book was authorized by then-Purdue University President Steven Beering in the late 1990s. His vision for the story of Purdue in flight is the genesis of this work. It also received the support of President Martin Jischke, who was in office when it was first published in 2003. Joseph L. Bennett, who served as vice president of Purdue University Relations and retired as University Relations vice president emeritus, was the guiding force of this project. Katherine Markee, former Purdue Special Collections Librarian, provided great help.

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Many thanks to Chris Brannan (designer), Katherine Purple, and Bryan Shaffer of Purdue University Press for their work in this second edition of *Wings of Their Dreams*. I have deleted a chapter from the first edition that was dated and added a chapter on Purdue graduate Sully Sullenberger, the "hero of the Hudson." The astronaut profiles have been updated. Sadly, four Purdue astronauts have passed away since the first edition was published in 2003. Two more Purdue graduates have joined the NASA astronaut ranks, and one graduate has become a commercial astronaut. In the first edition, because of time constraints, the chapter on Amelia Earhart was beautifully written by Jo Ellen Meyers Sharp. Since 2003 I have conducted research in the Purdue University Archives and Special Collections George Palmer Putnam Collection of Amelia Earhart Papers—the world's largest compilation of Earhart-related papers, memorabilia, and artifacts—and I wrote the chapter for this second edition.

Finally, thanks to my wife, Jeanne, and family for their patience and support.

—John Norberg, April 2019

# Introduction

When they talk about flight, the words you hear most often are "living a dream."

Whether they are jet pilots or astronauts or people who trailblazed aviation in wood and muslin biplanes more than one hundred years ago, flight means something more to these people than occupation, transportation, or even speed and power. They have a passion for being in the air, a love for the freedom that is theirs when they escape the confines of the earth and reach for the heights above. Rather than fighting nature, when they put their wings to the sky, they feel a part of it, at one with the wind.

At the dawn of the twentieth century, many people thought men and women were not meant to fly. They were wrong. Human flight occurs within and as part of the indisputable laws that govern our natural world.

In 1903, Wilbur and Orville Wright accomplished controlled, powered flight in a heavier-than-air machine at Kitty Hawk, North Carolina. The two men stopped to shake hands in the moment before their great success. They looked one another squarely in the eyes before Orville stepped onto their flying machine that windy morning of December 17. Biographers have quoted witnesses to the day as saying they looked like two men saying goodbye for the last time.

Confident in what they could do, perhaps they were saying goodbye—goodbye to an age. Perhaps they were wondering about the possibilities they were about to release into the twentieth century. Perhaps they realized their world, and all the world, would never be the same.

It only took less than sixty-six years to go from Kitty Hawk to the Moon. The history of aviation passed through the twentieth century like

a rocket, going faster and higher every second. It is an incredible history. And like all history, it is shaped by the incredible stories of men and women whose passion for flight dominated their lives.

Purdue University and its people are a part of this story, from the first days of flight, to its pioneering era, through war and peace, to the emergence of commercial transportation, to the Moon, to the space shuttles and space stations, to Mars. Someday they will be a part of everything that is yet to come.

This book tells the stories of some of these people. This is the story of Purdue's involvement in flight and the development of flight at the university as it was emerging throughout the nation and world. It is certainly not the complete history of flight at Purdue. That work would be many volumes. There is clearly much more to be written. There are many more Purdue people whose lives were filled with the evolution of flight than this book could possibly include. And while the focus of this work is on the people who fly, there is also a great and extensive research history involving Purdue and its people that stretches from the first days of flight to the space age. Purdue graduates by the thousands work in the aviation and space industry, for NASA and its many private contractors, and for the companies that are developing air transportation of the future. Theirs is another great story.

The story of flight and the story of Purdue are forever entwined. Both emerged from the revolution in thought and technology that leaped out of the late nineteenth century and shaped the years that followed. Flight and Purdue evolved together, and as the university and its people advanced aeronautics and astronautics, aeronautics and astronautics advanced the university's great international reputation.

Purdue graduate Richard Covey, who flew as a space shuttle pilot and commander, says the people of Purdue have an enormous and unique pride in the university's accomplishments with flight. Through support of Purdue, its alumni and friends feel a part of the story. Purdue celebrates the astronauts who emerged from the campus. Purdue, along with Massachusetts Institute of Technology (MIT), have graduated more astronauts than any nonmilitary academy. The first and last men to walk on the Moon are Purdue graduates—Neil Armstrong and Eugene Cernan. All

of Purdue's astronauts are frequent visitors on campus and, on occasion, come as a group. They enjoy meeting one another as much as everyone else enjoys meeting them.

Why did Purdue graduate so many people who would fly into space? There are five general reasons: Purdue offers outstanding educational opportunities with special strengths in engineering and technology, attracting top students; Purdue has one of the top ROTC programs in the nation, attracting people who want to take advantage of the military opportunities in flight; Purdue has its own airport, the first university-owned airport in the nation; Purdue had a master's degree program in cooperation with the U.S. Air Force Academy that brought seven young men to West Lafayette who would go on to fly in space; and finally, Purdue's reputation as a university that produces astronauts attracts new students interested in flight and space.

Purdue also has a leadership history of university presidents who have supported flight, from James Smart, who helped position the institution in engineering, to Edward Elliott, who believed land-grant universities should do for flight what they had done for agriculture, to Frederick Hovde, Arthur Hansen, Steven Beering, and Martin Jischke, who is an aeronautical and astronautical engineer, France Córdova, who is an astrophysicist and once worked for NASA, and Mitchell E. Daniels, Jr.

The Purdue University Barron Hilton Flight and Space Exploration Archives was established in 2011 with generous support provided by Barron Hilton and the Conrad N. Hilton Foundation, and now includes the papers of engineers, aviation professionals, scholars, and astronauts, including Purdue distinguished alumni such as Neil A. Armstrong and Eugene Cernan.

The story of Purdue in flight begins with the Wright brothers. This book tells the story of Cliff Turpin, who worked with the Wrights and thrilled hundreds of thousands of people across the nation with his demonstrations of flight. It is the story of pioneers such as Jimmie Johnson and Charles McAllister, who would be among the world's first test pilots and part of the country's first flight aerobatic teams. It is the story of Ralph Johnson, who was part of the birth of commercial aviation. It is the story of George Haskins and Grove Webster, who helped bring flight to Purdue. It is the story of Amelia Earhart, who flew out of

Purdue and into history. It is the story of test pilots George Welch and Iven Kincheloe, who went where no one had been before. It is the story of Malcolm Ross, who flew balloons up to the stratosphere. It is the story of astronauts who lived their dreams, including Neil Armstrong and Eugene Cernan, along with Virgil "Gus" Grissom and Roger Chaffee, who both died in the tragic Apollo 1 fire.

The history of flight is a step-by-step process with each person building on the accomplishments of others. When Neil Armstrong stepped on the Moon, it was not only his success, and it was not only the result of the thousands of people who worked on the Apollo program. It was a success shared by the research, experiments, expertise, and daring of everyone throughout time who advanced our knowledge of flight. In a larger sense, perhaps Armstrong's landing and first step on the Moon were the most shared accomplishments in human history. That was the day the world stood still to experience and marvel at a single event that inspired and uplifted the human spirit.

Visionary people in the late nineteenth century positioned Purdue to become not just a good university, but a great one, whose influence and reputation would reach around the world. These people did not know what technologies would emerge to dominate the world to come. They only knew Purdue should be a part of it.

So, too, Purdue is being positioned today to be a leader in the sciences, technologies, engineering, and arts that will dominate the next one hundred years. We cannot know what is to come, but we know that, because of the investments being made today, more generations of Purdue students will leave the university and help to shape the world of flight.

They will succeed as others have before them—on the wings of their dreams.


Wings of Their Dreams

**Buzz Aldrin**: Contact light! Okay, engine stop . . . descent engine command override off.

**Charlie Duke**: We copy you down, *Eagle*.

**Neil Armstrong**: Houston, Tranquility Base here. The *Eagle* has landed!

**Duke**: Roger, Tranquility. We copy you on the ground. You've got a bunch of guys about to turn blue. We're breathing again. Thanks a lot.

**Armstrong**: Thank you.

**Duke**: You're looking good here.

**Armstrong**: Okay, we're going to be busy for a minute.

**Duke**: There are lots of smiling faces in this room, and all over the world.

**Aldrin**: There are two of them up here.

**Mike Collins**: And don't forget the one in the command module.

**July 20, 1969**

*I can see as far as I do because*

*I stand on the shoulders of giants*

– Sir Issac Newton

# Chapter One

*Let us hope that the advent of a successful flying machine, now only dimly foreseen and nevertheless thought to be possible, will bring nothing but good into the world; that it shall abridge distance, make all parts of the globe accessible, bring men into closer relation with each other, advance civilization, and hasten the promised era in which there shall be nothing but peace and goodwill among all men.*

—Octave Chanute, *Progress in Flying Machines*, 1894

It was a fine, fresh day, the kind that arrives in Indiana near the end of spring—before summer's humidity slinks in, after winter's chill has been beaten back once and for all.

On June 10, 1908, 262 seniors at Purdue University, nearly all of them men, filed into a building named for a woman—Eliza Fowler Hall. It was commencement day.

The hall was practically new, having only been finished in the past five years, and it was a showcase of the campus. It featured a pipe organ with strong, full sounds that filled every inch of the more than 1,300-seat auditorium and spilled outdoors onto the sparse, green landscape of the young university.

On this commencement day, Eliza Fowler Hall was filled beyond capacity with graduates, administrators, faculty, and families all excited at

the prospects of a promising age, an exciting century that was only eight years old. All present wondered what possibilities the twentieth century would hold for these young men and the handful of women who made up the graduating class. What promise and potential was waiting to meet them? The future had never looked more exciting than that spring day in 1908. In fact, it was a time when barriers between the impossible and possible were being broken. Improbable dreams were coming true.

It was the age of inventions, of flourishing technology that seemed to know few limits, maybe none. Ideas were springing forth from the minds of research scientists and spare-timers tinkering in their workshops, people who explored possibilities with enthusiasm and wonder. Their discoveries and ideas were beginning to change the world.

The telephone, the light bulb, the wireless telegraph, the skyscraper, and the automobile had all recently come into commercial use, capturing the public eye and fancy. The travel time to distant shores had shortened, and it seemed to a public that was only forty-three years past the Civil War that the world was rapidly shrinking. It was an exciting time to be alive.

It was a time when some men and women were beginning to believe ingenuity and technology could accomplish any task, if people simply put their minds to it. It was an attitude that wouldn't diminish until after the sinking of the *Titanic* four years later, until the carnage of the Great War, whose shadow was not yet visible to the class of 1908.

The year 1908 marked the thirty-third commencement in the history of Purdue—"a notable event" the *Lafayette Daily Courier* reported in its evening edition. "The class that went forth from the halls of old Purdue was one of the most loyal and progressive in the history of the university," the newspaper reported.[1]

What the writer didn't understand that day—what no one who crowded into Eliza Fowler Hall could have comprehended—was that two members of this small class would soon play major roles in one of the most exciting stories of all time. From this class of 262 people, at this young Midwestern university in the heart of Indiana, emerged two men who would make their mark as engineers and adventurers and push the limits of a fledgling technology that would very soon change the world—flight!

These two men, along with a third from the class of 1907, mark the beginning of Purdue's involvement in the history of aviation—the story of incredible human accomplishment that took less than sixty-six years to go from Kitty Hawk to the Moon.

Nothing before in history had ever developed as rapidly as flight. Orville Wright would know Charles Lindbergh. Lindbergh would know Neil Armstrong. Armstrong would go on to personally inspire the men and women planning human exploration of Mars. Each step of the way people built on previous accomplishments, standing on the shoulders of those who came before them, building on dreams as old as time.

Purdue, its alumni, and its faculty would play a major role every step of the way in this remarkable record of flight. Purdue would have the first university airport and among the first programs in aeronautics and astronautics. Purdue would help finance the final flight by Amelia Earhart, who was a counselor for women at the university when the mission was conceived. A Purdue alumnus would help the Wright brothers. Purdue students would become among the nation's first test pilots and among the first members of flight demonstration teams. They would take balloons into the stratosphere, pilot the X-planes, and hold speed and altitude records from 1910 until the modern era. A Purdue alumnus would be one of the first two people to fly faster than the speed of sound.

Purdue astronauts would include Virgil "Gus" Grissom, one of the original astronauts of Mercury 7. They would include Neil Armstrong and Eugene Cernan, the first and last men on the Moon.

As the twenty-first century began, Purdue would have one of the top-ranked aeronautical and astronautical engineering programs in the world with a record in research that had helped to shape aviation and space. It would have one of the largest and best aviation technology programs and twenty-four alumni who had been selected as NASA astronauts and one commercial astronaut. By the twenty-first century, about 37 percent of all U.S.-manned space flights had launched with a Purdue alumnus onboard.

The story of Purdue and flight go hand in hand. Both were new at the start of the twentieth century, and by the start of the twenty-first, they had both impacted the world. Much of Purdue's great record of

accomplishment that places it on this international stage would emerge from its achievements in flight.

But the people attending the 1908 Purdue commencement had no idea about any of this. In their wildest dreams, they never imagined what was about to take place.

At the dawn of the twentieth century, many people in the United States and Europe were still struggling to accomplish a new form of flight that would launch the new age. Some of the best and brightest scientists of the day had tried and failed. Their dismal results were reported in newspapers. Eight years into the century, the public was just becoming aware that this new form of flight had actually been accomplished.

Oh, people had been flying in baskets strapped beneath balloons since the late eighteenth century. That was common knowledge to everyone. Dirigibles were well known. Brilliant engineers had been flying gliders with enormous success. The science of gliding was greatly advanced in the 1890s by work at Miller Beach in the Indiana Dunes where pilots hung on for dear life as odd-looking contraptions with multiple wings soared over sandy shores.

But this was different. What had been accomplished in the United States by Wilbur and Orville Wright in 1903, to little fanfare and public notice—and some misunderstanding—was powered, controlled, and sustained flight in a heavier-than-air machine. And if that terminology is cumbersome for people today, imagine the problem people had with it in the first decade of the twentieth century.

The fact that flight had been accomplished was not overnight, international news. It evolved slowly. In 1903, the *New York Times* story index carried nineteen entries for "aeronauts," most of them referencing balloonists and mentioning nothing about the Wright brothers. In 1904, there were twenty-five stories. In 1905, under the heading "aeronautics," which included ballooning and dirigibles, there were thirty-six stories. In 1906, the list grew to ninety-seven, including one story on January 7, page three, about "a machine invented by Orville and Wilbur Wright that flies without air balloon or gas bag." On March 18, 1906, the *Times* reported on page five that the "Aero Club of America had honored the Wright brothers for practical invention of a flying machine." There were 111 stories about

aeronautics in 1907, 270 in 1908. By 1909 the list of stories, in small type, fills more than five large pages in the *Times* index.

Major events connected to flight swirled around the Purdue graduation in June of 1908. That summer Orville Wright would write for the first time an article detailing the brothers' work and accomplishments in the respected magazine *Century*.

If not everyone in Purdue's Fowler Hall that June 1908 fully understood what was happening in this new science and technology, graduate James Clifford Turpin understood. And so did his classmate, Frederick L. Martin. They would become among the first Purdue graduates to tie the university's name and reputation permanently to flight.

Graduation day was a moment that actually linked eras, although no one yet knew it. Civil War veterans sat through that ceremony, fanning themselves in the growing heat of the crowded room. And somewhere in Eliza Fowler Hall that June day in 1908 sat people who sixty-one years later would watch on television as Neil Armstrong placed his boot on the surface of the Moon. Who could possibly have imagined that graduation day where the world was going—and so quickly?

The thoughts of Turpin and Martin were certainly in the sky that June day as Harvey Wiley, one of Purdue's first professors and a man who had gone on to become one of the nation's most distinguished researchers, rose to give his commencement speech from a flower-and-fern-filled stage.

Wiley had become chief of the U.S. Bureau of Chemistry and head of the Department of Pure Food in the U.S. Department of Agriculture. He had forever placed his seal on American history by being the driving force behind federal legislation that removed deadly preservatives and mislabeling from food. The same law took substances such as cocaine, morphine, and heroin off the shelves of corner drug stores. It was Wiley's determined and persistent research that resulted in the first U.S. Pure Food and Drug Act. It was a great honor for Purdue to have such an important and famous man speaking at its commencement.

Taking the podium at Purdue, Wiley gave a talk that was well received for its gentle humor and insightful advice. Work hard, Wiley told the assembled graduates. It is the only path to success.

"Every year the chances for great fortune, which formerly were abundant in this country, diminish," he said. "There is no more virgin soil, few undiscovered mines, almost no unexploited projects."[2] Almost no unexploited projects?

Turpin and Martin must have smiled at such a shortsighted statement from a far-sighted man. Flight—the powered, controlled, sustained, heavier-than-air machine variety—was still a mostly unexploited project five years after it had first been accomplished.

On the morning of December 17, 1903, Orville and Wilbur Wright wheeled their latest flyer out of its shed on the sandy shore of Kill Devil Hills, Kitty Hawk, North Carolina. The day was cold, clear, and windy. At 10:35 A.M. Orville started the engine, which was connected to eight-foot propellers by bicycle chains manufactured by the Diamond Chain Company in Indianapolis. The Wright brothers and an assistant had built the engine themselves in their Dayton, Ohio, workshop. Orville positioned himself, centered on the lower wing of the biplane, lying on his stomach. From that position he powered the fragile looking flyer with his left hand and hips. Approaching takeoff, the flying machine ran on a wooden rail into winds gusting up to twenty-seven miles per hour. The speed was slow enough that Wilbur ran alongside, keeping pace with the flyer until it rose into the air after a forty-foot run.[3]

Orville was in the air for only twelve seconds and traveled only 120 feet, but that was all it took for the Wright brothers to accomplish what no one had done before: powered, controlled, sustained flight in a heavier-than-air machine.

Both brothers took the controls that day, each dressed in their standard work gear: ties, coats, and starched white shirts. Wilbur followed Orville and flew for 195 feet. Orville tried again and flew 200 feet, staying in the air fifteen seconds. On the last flight of the day, they accomplished what they really considered success when Wilbur flew 852 feet and remained in the air for fifty-nine seconds. Some people would have rounded off those fifty-nine seconds and called it a perfect minute, but Wilbur and Orville Wright were all about exactness and precision. Science had brought them to this moment and led to their success. Fifty-nine seconds it would be.

A small group of people assembled to witness the great event. Orville had arranged for one of them to snap a photograph just as the Wright Flyer lifted off from the sandy dunes. The photo captured Wilbur standing to the side, his legs spread apart, and his arms at the ready as if he would try to catch the plane and throw it back up into the sky if it dared come back too soon. The photo captured Orville lying on the lower wing of the biplane, working the controls, desperately trying to stay aloft—no easy task for a man who was discovering the principles of flight every second he stayed in the air.

The photo is one of the most amazing ever taken. No one was standing on the beach to photograph Christopher Columbus as he waded to shore in the New World, but someone did snap a photo as the Wright brothers entered the new world in the sky. It was, perhaps, the first world-changing moment captured on film. From that moment on, every breakthrough in aviation and space would be captured on film.

The birth of aviation had been thousands of years in the making. 1700 B.C. Greek mythology told the story of Icarus flying on wings made of feathers and wax. He fell to his death when he flew too high, too close to the sun. The message for the ages to come was clear*:* Keep your feet on the ground. Don't reach too high.

But people who wanted the freedom of birds didn't listen. In A.D. 1010, an English monk named Eilmer of Malmesbury broke his legs when he tried to fly with wings attached to his body. Crippled, he remained convinced that flight was possible.[4] In 1300, Marco Polo told incredible stories of people tied to kites sailing in the air over China. Not all of those people went up voluntarily. Not all landings were smooth—or even successful.[5] In about 1500, Leonardo da Vinci used his study of science and knowledge of the laws of nature in plans to conquer the air.

Experiments in flight went on and on—and down and down. Suddenly, something incredible happened, the first breakthrough. In Paris, France, in November 1783, Pilatre de Rozier and the Marquis d'Arlandes made the first successful manned balloon ascent, traveling five miles and reaching a height of three thousand feet in a balloon that was the brainchild of Joseph and Etienne Montgolfier, brothers who had earlier noted that bits

of paper rise in the heat of open fires. Through careful experiments they discovered that bags filled with hot air from a fire would float upward. The brothers used this discovery to first launch an unmanned balloon, and then a basket of animals, before sending de Rozier and d'Arlandes into the sky above Paris,[6] and they thereby established a test flight protocol that would be repeated by NASA in the earliest days of the U.S. space program almost two centuries later.

Present to witness that first manned balloon flight was a scientist and diplomat from the New World—Benjamin Franklin. Franklin was appalled that people wondered out loud about the purpose of flight beneath a balloon. "What good is it?" he asked, and then he gave his own answer. "What good is a newborn baby."[7]

Balloon progress developed and advanced rapidly. Ten days after the first hot air balloon flight, Jacques Charles and Nobel Roberts lifted off from Paris and covered twenty-seven miles beneath a balloon filled with hydrogen.[8] In 1785, de Rozier used a hot air balloon and a gas-bag in an attempt to cross the English Channel. The balloon exploded, killing de Rozier.[9] Later in 1785, Jean-Pierre Blanchard completed a crossing of the English Channel, thereby continuing French domination of ballooning.

In 1793, Blanchard took his balloon to America and made the first successful flight in the New World before a group of dignitaries including George Washington, John Adams, Thomas Jefferson, James Madison, and James Monroe—the current and the next four presidents of the United States.[10] Flight had reached the New World in a big way.

Ballooning continued to be popular throughout the nineteenth century. It became a major spectator event, and by 1859, there were estimates that three thousand ascents had been accomplished, many of them at U.S. county fairs and urban celebrations.[11]

The year 1859 was an important one in the history of flight for Lafayette, Indiana, in Tippecanoe County, the home of Purdue. On August 17, 1859, Lafayette was the origination site of the nation's first airmail delivery. John Wise from Lancaster, Pennsylvania, piloted the balloon named *Jupiter* carrying 123 letters and 23 circulars. Wise was a noted balloonist who added to his prestige by using the title "professor."[12]

In July 1859, Wise had attempted the fist airmail delivery launching from St. Louis and heading toward New York City. He made it as far as Henderson, New York, before his balloon crashed in a storm and the mail was lost. The flight was officially classified unsuccessful because the mail did not reach its destination, but he had flown about eight hundred miles in a journey that took more than twenty hours. That was a balloon record for the day.

The attempt in Lafayette was originally scheduled for August 16. Some people estimated the crowd that gathered to watch that day at fifteen thousand. Others went as high as thirty thousand. The huge difference makes it impossible to even guess how many people might have actually been on hand. The important point is that it was probably the largest group of people that had ever gathered in Lafayette, leaving news reporters and authorities unable to come up with an accurate estimate.

Schools were let out so children could witness the historic event. The railroads, whose location in Lafayette had assured prosperity for the growing town, ran special excursions to bring in crowds from surrounding areas. It was a big day for hotels, so much so that "before 11:00 o'clock it seemed the rural areas had been depopulated," the *Lafayette Daily Courier* reported.[13]

The *Jupiter* balloon was filled at the gas works on the corner of Vine and what is now Fourth Street, and then it was moved, fully inflated with Wise in a basket beneath it, along what is now Fifth Street. At the head of the procession was a band followed by the Lafayette Guards who wore plumes in their hats. Band, guards, and balloon—it was quite an impressive procession and one that had never been seen before or has been seen since.

Near Fifth and Main, telegraph wires crossed the street. They had not been removed as planned, so Wise had to hop his balloon over them. The balloon was secured with ropes while it was raised above the wires. But one rope slipped from its securing and the balloon came dangerously close to crashing into the side of the tall Lahr Hotel. To save the balloon—and himself—Wise "determined to let her go," according to the *Courier*.

"She mounted the heavens . . . and in a few seconds had attained an altitude of several thousand feet, when Mr. Wise opened the valve and the balloon settled gracefully to earth, making a beautiful landing . . . opposite the home of Mr. Robert Jones, Esq." the newspaper reported.[14]

Once back to earth, the balloon was moved along South Street toward the Courthouse Square for a launch. Wise had lost some gas in the incident with the wire, so he tossed out more than two-thirds of the sand bags he had onboard for ballast. He then gave a speech to the gathered crowd and told them if the currents in the upper atmosphere were favorable, this would be an even more notable trip east to the seaboard than his earlier attempt from St. Louis. Wise seemed concerned about his potential to make it: "I will only say that this shall be as long a voyage eastward as a proper energy will enable me to make it," he said. "With that, I bid you all farewell."[15]

For a moment, everyone stood still while a photographer snapped his shot. The crowd roared. Wise waved. The balloon was released from its moorings.

Nothing happened.

The balloon, Wise, and the mail stayed right there on the ground. There was frantic activity as more ballast was removed.

Nothing.

Wise went nowhere as the impatient crowd waited. The *Courier* said, "It at once became evident that the balloon had been too much exhausted [getting over the telegraph wire] to overcome the stubborn gravity of the aeronaut's avoirdupois."[16] It was a nice, nineteenth-century newspaperman's way of saying that Wise was too big for what the balloon had left. So Wise's 120-pound son was recruited to make the ascent while his father cheered from the sidelines. It became a staged event to satisfy the large crowd, and the boy brought the balloon down after a short flight just to the outskirts of the city.[17]

There were other problems at the launch according to the *Courier*. It was a mid-August afternoon, which can be intensely hot in Indiana. The reporter from the *Courier* complained that with no public drinking fountains, many in the crowd were left to cool off in the town's saloons.

"The crowd—a colossal drunk," a newspaper subhead stated. "That the crowd . . . was the largest ever assembled at Lafayette on any occasion is generally conceded," the paper said. "In such a crowd and considering the extreme heat of the day, it is not astonishing that there was a vast amount of drunkenness. There were poor facilities for obtaining water and those who were compelled to enter the saloons to quench their thirst

generally took something stronger than Adam's ale. The result, to sum up, was a drunken attachment to almost every gas post and a lien upon half the buildings in the city. . . . Men who are compelled to enter saloons and other public places where liquor is sold for the purpose of obtaining a glass of water feel under obligations to patronize the bar as acknowledgment of the courtesy. They take a drink, which only serves to make room for another—another—and another."[18]

To prove its point, the newspaper also reported, "The Mayor's Office was crowded [the following morning] with whiskey-soaked and lager-inflated jailbirds . . . who fell into the hands of Marshal Evans."[19] All pleaded guilty and were fined five to ten dollars, depending on the circumstances.

The next day, with another large crowd on hand, Wise successfully launched his balloon at 2 P.M. in the afternoon. According to the *Courier*, "the beautiful air vessel moved off gracefully to the southeast, but after reaching an elevation of about two thousand feet, the local current changed to the west and, after remaining in full view for 50 minutes, suspended as it were almost over the city, the balloon was lost in the dim distance on the Southwest."[20]

Southwest, of course, was not the direction in which Wise wanted to travel to reach "the seaboard," as they called his eastern destination.

The *Courier* was less than confident about the potential for success. "The ascension from this city was grand and beautiful in the extreme, but in view of the fact that the local currents are adverse, we have little to hope from the experiment as a trans-continental voyage. It does not seem possible that Mr. Wise will be able to make any considerable progress toward the seaboard, and we shall not be surprised to hear of his descent this evening somewhere in southern Illinois or western Kentucky. The fact is that the aerial ship *Jupiter* is about as well adapted to the navigation of the upper current as Mr. Wise is adapted to preach the gospel."[21]

The grand trip to the seaboard was, in fact, terminated on a county road south of Crawfordsville at 7:08 P.M. that same evening. Total flight time was five hours and seven minutes. Wise had tried to reach the upper atmosphere currents he believed would take him east, but he failed. Understanding the value of publicity, he decided to come down on the public square at Crawfordsville, but the current carried him further south.

The *Courier* exposed the prejudices of the time in describing the attempts Wise made to land safely back on earth. "He threw out his rope to an Irishman, but the son of Erin had never before seen a balloon and, half-frightened out of his wits, refused to touch it," the newspaper reported. "Mr. Wise insisted, but Paddy refused to touch it, crossing himself . . . dodged behind a tree just in time to avoid a loaf of bread which the aeronaut had thrown at him. At half a mile further on, Mr. Wise observed some women in the road near a farmhouse. After a great deal of persuasion, [he] induced them to take hold of the rope and pull the balloon to the ground. . . . So endeth the transcontinental voyage. That this was only 'trans-county-nental' is no fault of the great aeronaut. His balloon was not suitable for a long voyage, nor was it possible to make one except under a combination of the most favorable circumstances."[22]

Wise was met and taken into Crawfordsville for the evening. The mail's trip to New York City was completed by the railroad, but Wise had successfully flown the initial leg, accomplishing the first airmail voyage.[23]

There was more to the flight than airmail. Wise was true to his title of "professor." He had joined with Lafayette's Dr. Charles Wetherill to conduct ozone experiments during the flight. Wetherill was involved in recruiting Wise to make the attempt from Lafayette in the first place. Wetherill, an accomplished chemist who, in just a few short years, would be named by President Abraham Lincoln as the first chemist in the U.S. Department of Agriculture, worked with Wise to create equipment that could monitor the ozone during the high airmail flight.

Wetherill had theories about the relationship between changes in upper atmosphere ozone and health. In 1854, he noted there had been a great deficiency of ozone and that year had been marked by a cholera epidemic.

On his *Jupiter* trip, Wise carried Wetherill's experiment. It consisted of chemically treated paper. Ozone, Wetherill said, would cause the paper to turn blue. Wetherill believe ozone was related to good health.[24]

The Wetherill family would eventually have an important impact on Purdue's standing as a science research center. Wetherill's son, Richard, was born in Lafayette in 1859—the year of the great airmail flight. Richard Wetherill attended Purdue and went on to become a physician

who studied in Berlin and Vienna in addition to the United States. He established a practice in Lafayette in 1886 and taught some courses at Purdue. His will provided funds for student scholarships at Purdue as well as for the Wetherill Building on the university campus, which helped perpetuate the momentum of scientific discovery in Lafayette and Purdue.

With the launch of *Jupiter* that August day in 1859, Lafayette was officially in the history books, connected to flight for the first time. And perhaps, even more importantly, the community was connected to the research possibilities of flight.

Wise also became the first person to see the Lafayette area from above. Here is his description as told by the *Courier*: "The view is among the most beautiful ever beheld. The Grand Prairie stretching away to the westward seemed like a mammoth pleasure garden, dotted here and there with pleasant summerhouses and with the woodland enclosing it like a hedge fence. Lafayette, Crawfordsville, Attica, and eight villages in full view, the river, the [Wabash and Erie] canal, and railroads altogether presented a panoramic picture of singular and impressive beauty."[25]

During the Civil War, both federal and confederate armies used balloons for military reconnaissance. Wise became a Union Army balloonist. In September 1879, at the age of seventy-one and considered the nation's top balloonist, he died in an accident over Lake Michigan.

In the postwar period, the age of ballooning began to wane. Balloons were much too subject to the "mercy of the winds."[26] Meanwhile, a new technology was developing that would change the world and have a particular impact on flight: the internal combustion engine.

In 1876, German Nicholas A. Otto demonstrated the first successful gas- (not gasoline) powered internal-combustion, four-cycle engine. It was the first practical alternative to the steam engine. In 1885, another German, Gottlieb Daimler, invented a gasoline-powered internal-combustion engine, and in less than a year, Karl Benz received the first patent for a gasoline-fueled car. The first motorcycle also appeared in 1885.

Turpin and Martin, along with most of the other graduates in the Purdue class of 1908, were born in 1886 just as this new age of engines,

cars, and motorcycles was emerging. Turpin and Martin came to Purdue to study mechanical engineering. They came to study engines.

Purdue, as a land-grant university launched in the tradition of educating the masses of people, held a philosophy that changed education in the United States forever, expanding it beyond the rich and elite and opening it to common people. In 1862, President Abraham Lincoln signed the Land-Grant College Act. It provided public land in the west that states could sell, using the proceeds to start colleges where people would be taught agriculture and the mechanical arts.

Purdue opened its doors to thirty-nine students in 1874, but the young institution would need a great deal of work to become a top university; developments took place rapidly. In 1879, a School of Mechanics was founded, and in 1882, a School of Mechanical Engineering appeared with a full curriculum in this up-and-coming discipline.

At that time, according to *One Hundred Years of Progress*, a brochure about the story of Purdue Mechanical Engineering, "Purdue was still engaged in a life and death struggle to justify its existence. Engineering education was only a generation removed from the blacksmith's shop and had yet to define its position in academia."[27] In fact, when Indiana Governor James "Blue Jeans" Williams spoke at the Purdue commencement in the spring of 1877, he started by saying, "Eddicate a boy and he won't work." It was an opinion that was widely shared.

The fact that Purdue took on this struggle to offer degrees in engineering is partially credited to early Purdue President Emerson White, a man who saw the need for training young men in engineering. He was also stern and had "little tolerance for campus frivolities such as fraternities, smoking, fashionable young ladies, or the new-fangled contraption known as the bicycle."[29]

In fact, it was Harvey Wiley, the nationally acclaimed, distinguished speaker at Purdue's 1908 commencement, who first ran afoul of the stern policies of White and the entire Purdue University Board of Trustees.

Wiley had started at Purdue in 1874 as one of six original faculty members. In 1880, Wiley peddled the first bicycle in Tippecanoe County. It was not a great occasion in the eyes of White and the board. To them, the

bicycle was bad enough, but to make matters worse, Wiley wore knickers while he peddled across the campus.

At a board meeting, one member of the board stated, "Imagine my feelings . . . on seeing one of our professors dressed up like a monkey and astride a cartwheel riding along our streets!"[30]

Upon hearing that, Wiley resigned. While his resignation was refused, he eventually left Purdue in 1883, moving to Washington, D.C. where people were more tolerant of bicycles and knee breeches. His return to Purdue for the 1908 commencement was his first visit since leaving.

In his absence, engineering at Purdue had progressed, and mechanical engineering had come into its own. According to Purdue's mechanical engineering history, "By the late 1880s the public had begun to accept the concept of formal engineering education. Indiana high schools restructured their programs to produce better-qualified applicants, and large numbers of them began seeking admission. In 1887 and 1888, the Schools of Civil and Electrical Engineering were created."[31]

Purdue's School of Mechanical Engineering quickly established itself as a worldwide center for research and learning in steam engines and transportation. So when the twentieth century arrived, the eventual evolution to a new manner of transportation—air travel—was a logical progression.

In 1891, the School of Mechanical Engineering acquired the Schenectady, an 85,000-pound steam engine locomotive. According to *One Hundred Years of Progress*, "The Schenectady brought the School of Mechanical Engineering and Purdue an instant international reputation for innovation and bravado. It . . . identified Purdue as an early leader in transportation research. . . . As early as 1893, Russian visitors to the World's Fair in Chicago made a point of stopping in Lafayette to see the Schenectady locomotive roaring away in place at eighty miles per hour, surrounded by students and faculty performing tests."[32]

At the turn of the century, Purdue was *the* place in the nation and the world for railroad locomotive testing. Railroad companies brought their best new equipment to West Lafayette for evaluation.

While railroads were dominating transportation and shaping history, more innovations were being studied at Purdue's School of Mechanical

Engineering. In 1892, Purdue acquired an Otto-Cycle gas engine—"the first in any engineering education laboratory in the United States." That engine launched the study of gas engineering at Purdue. "The installation of the Otto in Mechanics Hall preceded by at least a year the known manufacture of any American automobile. The Otto burned gas, not gasoline, and was used primarily by students making comparative studies of gas and steam engine efficiencies. During the first decade of the new century, many mechanical engineers believed gas and gas engines might prove to be the primary source of industrial power. Research of gasified coal aroused considerable interest as an alternative to steam-generated power. In 1906, a complete gas plant was functioning in Heavilon Hall"—the new state-of-the-art building where Mechanical Engineering was located. Even before that plant was put into operation, gasoline engines were beginning to redirect the thrust of research and teaching at Purdue.[33]

In 1905, an automotive testing plant was constructed in Heavilon Hall. Students and professors worked on a Lambert Runabout, a White Steamer, an Overland, a Ford, and a Cole.[34] By 1900, there were 599 students enrolled at Purdue. Eighty-four percent of them majored in engineering. The largest enrollment was in mechanical engineering with 202 students—almost 34 percent of the entire student body.[35]

Purdue, which was gaining an international reputation in the study of engines, power, and transportation, had a great deal to offer students such as Turpin and Martin. The developments in engines came along at the same time as rapid progress in flight and the two separate technologies were destined to merge. As engines became smaller, lighter, and more powerful, they became practical for powering flying machines.

After a decade of development, in 1900 German Ferdinand von Zeppelin combined a gas engine with balloon technology and came up with a powered airship called a dirigible, or zeppelin. Flight took a huge step forward. Meanwhile, other people were experimenting with gliders.

German Otto Lilienthal died in a glider accident in 1896, but his carefully researched, scientific work advanced the technology and he was widely studied by others. One of those who studied him was Octave Chanute. Born in Paris, Chanute came to the United States as a child. He

became a very successful engineer, designing the first railroad bridge over the Missouri River. He designed the Kansas City and Chicago stockyards.

In the mid-1890s, Chanute turned his attentions to gliders and began experiments at Miller Beach in the Indiana Dunes, not far from his Chicago home. In a very short time, steel mills would be built near Miller in a new town named Gary. Because of Chanute, northern Indiana was on the map as a center of progress in the quest for flight. As a widely respected engineer, Chanute wrote books and articles about his research in flight and became a popular lecturer.

In 1899 in Dayton, Ohio, the idea of powered flight struck the interest of Orville and Wilbur Wright. Their workshop was near the family home of James Clifford Turpin.

Within four years, the Wright brothers took what they could learn from Lilienthal and Chanute, added their own ideas including new controls and propeller design, combined it all with a gasoline engine, and accomplished flight.

The Wright family had close ties to Indiana. Orville and Wilbur Wright's father, Milton, was born in Rush County, Indiana, in 1829. At twelve years of age, Milton moved with his family to Fayette County, Indiana, where he grew up and became an ordained minister in the United Church of the Brethren.

Milton Wright married Susan Koerner in 1859—the year of Lafayette's airmail flight. And after several moves around this young state, they settled in a three-room house near Millville, Indiana, eight miles east of New Castle. It was here that Wilbur Wright was born a Hoosier in 1867. In 1871 the family settled in a new home in Dayton, Ohio, at 7 Hawthorn Street where Orville was born that August. The family continued to relocate until the two young men finally settled again in Dayton.[36]

After their mother died in 1889, Orville and Wilbur set out together searching for a calling in life, as well as a steady income. By 1892, they had found what they planned to make their life work: bicycles. The brothers began repairing, selling, and eventually building their own bicycles in a Dayton shop at 1127 West Third Street, not far from the Hawthorn Street home.

By the 1890s, bicycling had become a national passion, and the Wright brothers were doing quite well with their business. They began to work on flight during their spare time toward the end of the decade. The leap from bicycles to flight was not as great as it might seem.

Contrary to many others of the day, Wilbur Wright believed a major aspect of flight involved balancing a machine in the air. And that was not unlike the skill of balancing a bicycle on land. In fact, on several occasions—and at least once in court testimony—Wilbur Wright would use bicycling analogies to explain how the brothers developed their techniques of flight.

At one point in *The Bishop's Boys,* author Tom Crouch writes, "The development of a system to control an airplane in flight rested on . . . Wilbur's understanding of how a bicycle is turned to the left."[37]

Crouch, and many others who have studied the Wright brothers, says it was Wilbur who first became interested in flight. Later in his life, Wilbur noted that in 1896 he had read items in Dayton newspapers about glider experimentations. The idea was planted in his head, and like a seed, it took root and grew.

Crouch writes, "Millions of people around the globe were sufficiently fascinated by flight in nature to read an occasional book on the subject. [However] very few ever attempted to build their own wings. Wilbur's peculiarly receptive frame of mind had set the Wrights apart."[38]

In 1899, Wilbur Wright wrote a letter to the Smithsonian Institution asking for information about the study of flight. The letter still exists, and along with the Kitty Hawk photo, it is among the most historical documents associated with flight.

The reply from the Smithsonian included some pamphlets and articles and recommended books by, among others, Chanute and Samuel Pierpont Langley. Langley served as secretary of the Smithsonian Institution and was the man many thought would be the first to accomplish powered, controlled, sustained flight in a heavier-than-air machine—if anyone ever could.

Years later Wilbur explained his letter to the Smithsonian. "My brother and I became seriously interested in the problem of human flight in 1899. . . . We knew that men had . . . adopted human flight as the standard

Wright Cycle Company
1127 West Third Street
Dayton, Ohio
May 30, 1899

The Smithsonian Institution, Washington:

Dear Sirs: I have been interested in the problem of mechanical and human flight. . . . My observations . . . have . . . convinced me . . . that human flight is possible and practicable. It is only a question of knowledge and skill just as in all acrobatic feats. Birds are the most perfectly trained gymnasts in the world and are specially well fitted for their work, and it may be that man will never equal them, but no one who has watched a bird chasing an insect or another bird can doubt that feats are performed which require three or four times the effort required in ordinary flight. I believe that simple flight at least is possible to man and that the experiments and investigations of a large number of independent workers will result in the accumulation of information and knowledge and skill which will finally lead to accomplished flight.

. . . I am about to begin a systematic study of the subject in preparation for practical work to which I expect to devote what time I can spare from my regular business. I wish to obtain such papers as the Smithsonian Institution has published on this subject, and if possible a list of other works in print in the English language. I am an enthusiast, but not a crank in the sense that I have some pet theories as to the proper construction of a flying machine. I wish to avail myself of all that is already known and then if possible add my mite to help on the future workers who will attain final success. I do not know the terms on which you send out your publications, but if you will inform me of the cost I will remit the price.

Yours truly,
Wilbur Wright[39]

of impossibility. When a man said, 'It can't be done; a man might as well try to fly,' he was understood as expressing the final limit of impossibility. Our own growing belief that man might nevertheless learn to fly was based on the idea that while thousands of the most dissimilar body structures, such as insects, fish, reptiles, birds, and mammals, were flying every day at pleasure, it was reasonable to suppose that man might also fly. . . . We accordingly decided to write to the Smithsonian Institution and inquire for the best books relating to the subject."[40]

The brothers began working in their West Third Street shop in Dayton, carrying out test flights at Kitty Hawk, North Carolina, where winds were ideal for their research. While their first flights were accomplished in 1903, it would become 1909 before the Wrights were widely recognized.

The year 1908 would be a breakthrough year in flight. Just twenty-five days before the Purdue graduation, correspondents from the *New York Herald*, the *New York American,* the *London Daily Mail*, and *Collier's Weekly* had hidden themselves in pinewoods at Kitty Hawk, North Carolina to see for themselves if rumors about the Wright brothers were true. Their dispatches made headlines in major cities, but the general public remained skeptical, unconvinced, or simply unaware. In June 1908, when one of those "hidden" correspondents tried to sell his story to a major U.S. magazine, his work was returned with this comment from the editor: "While your manuscript has been read with much interest, it does not seem to qualify as either fact or fiction."[41]

In a book approved by Orville Wright, *The Wright Brothers: A Biography*, author Fred C. Kelly, who would later write a biography of Purdue benefactor David Ross, told of the public attitude in May of 1908. "After publication of many dispatches from these eyewitnesses at Kitty Hawk and front page headlines, it might have been expected that the fact of human flight would now be generally accepted. As [Byron] Newton had written to his paper, there was 'no longer any ground for questioning the performance of these men and their wonderful machine.' [Arthur] Ruhl in *Collier's* had told how the correspondents had informed the world that 'it was all right, the rumors true—that man could fly.' Yet even such reports by leading journalists still did not convince the general public. People

began to concede that perhaps there might be something in it, but many newspapers still did not publish the news."[42]

In June 1908, people remained unsure what to think of controlled, powered flight. But by July—appropriately on Independence Day—the influential magazine *Scientific American* offered a prize to anyone in the world who could fly one kilometer in a straight line. A dashing young man named Glenn Curtiss, whose spirit for technology and adventure would help define his age, would capture the prize. The recognition of flight was developing quickly.

In August 1908, Wilbur Wright literally wowed the skeptical people of France with spectacular flying demonstrations that made worldwide news. One month later, on September 17, 1908, accomplished flight recorded its first fatality. Army Lieutenant Thomas Selfridge died in the crash of a plane piloted by Orville Wright. Wright escaped with serious, but not fatal, injuries.

In the summer of 1908, right after the Purdue graduation, people in the United States and throughout the world began to understand that after thousands of years of inventing and experimenting and gazing into the endless, clear, blue sky, humankind had finally "slipped the surly bonds of Earth" to "touch the face of God."[43]

In his commencement speech on June 10, 1908, Harvey Wiley was brilliant and inspirational in his message to the young graduates—even if he did incorrectly believe that there were almost no unexploited projects left.

He said, "Three weeks ago I attended a conference to consider the best means of preserving our natural resources. We heard much spoken of preservation of forests, waterways, mines, and soil. But what are all these resources without that crowning resource of all—our people? And of our people, what part is more important than youth?

"No matter how successful you may be in your career, what wealth and honor you may acquire, you [graduates] are richer today than you will ever be in the future. Rockefeller and Carnegie would gladly exchange all their millions for the youth you possess.

"How are you going to use this great wealth for the benefit of the world. . . ?

"The young man who succeeds is . . . the one who never gives up. No matter how hard his fortunes may be, he still hopes, because he feels within himself that he is capable of doing something—and that he will do something."[44]

Frederick L. Martin would meet his destiny sixteen years after graduation.

The first person from the Purdue University class of 1908 to "do something" was James Clifford Turpin. He practically walked from that commencement into the sky, into the enthusiastic hearts of an American public who turned Turpin and other birdmen of the day into overnight, international heroes.

# Charles Walker

Flight emerged with the birdmen of the early twentieth century, and within two generations, a new term was being used for people who pushed the limits of the sky: *astronauts*.

Charles Walker was born into the space age, the era of rockets and astronauts, and he grew up to live his greatest dreams.

Among Walker's earliest memories are three television programs that brought the dream of space travel into the reality of American living rooms in the mid-1950s. The programs brought together two giants of the twentieth century—two men from two very different fields. Both were visionaries. And in the 1950s, they joined for a series of television programs about space that influenced a nation. Wernher von Braun was a German physicist responsible for managing many of the achievements of the U.S. space program in the 1950s–1970s, the Explorer satellites, Jupiter rockets, and the development of the Saturn rocket that launched men to the Moon. Walt Disney was a businessman and the owner of a movie and television studio who was just breaking into theme parks. Both were charming and charismatic, and they believed in the future and potential of a U.S.-manned space program.

Their first television space program aired on March 9, 1955. It was titled "Man in Space." Later in 1955 came "Man and the Moon," and finally "Mars and Beyond," which aired on December 4, 1957.

This is how Walker became interested in space as a boy growing up in Bedford, Indiana. "I remember seeing those programs and saying to myself, 'This space exploration has to be fun. I want to be a part of that,'" Walker says. "Our nation was beginning to seriously develop rockets. They were principally intercontinental ballistic missiles, but there was always the talk that these would also be used to send manned missions into space. You know, for a kid of seven years old, that was pretty exciting stuff. It caught my attention. Jet aviation records were being set at places like Edwards Air Force Base. This whole cultural focus on aviation and space in the 1950s really got me excited."

Bedford, in southern Indiana, is the largest town in Lawrence County. The second largest town is Mitchell, twelve miles to the south. And Mitchell, Indiana, by the late 1950s, had its own hometown space hero in native son Virgil "Gus" Grissom, a Purdue University graduate. Grissom had been selected as one of the original Mercury 7 astronauts. In July 1961, he became the second American to launch into space.

"Every fall Mitchell has its premier social event—the Persimmon Festival," Walker says. "And in 1960, Gus Grissom participated in that festival. In addition, NASA had shipped into town a full-size mock-up of the Mercury capsule. When I saw that, my eyes were just wide open, and I was saying, 'You know, this is cool.' The space program had come not quite to my hometown, but twelve miles away was close enough. And here was a guy who was going into space, and he came from just down the road!"

Walker watched on a black-and-white television set in a study hall at Bedford Junior High when Alan Shepard launched into space in May 1961. In high school he focused on science, math, and technology, where he had interests and strengths. The whole time he kept a close watch on NASA as it moved through the Mercury and then Gemini programs. When it came time to pick a university, Walker wanted to follow in Grissom's footsteps. He enrolled at Purdue University.

His parents, his friends, everyone who knew him through those days, uses the same word to describe Walker's attitude: *focused*.

"When I arrived at Purdue, I knew what I wanted to do," Walker says. "I remember one of the early interviews, and they said, 'Okay, freshman year you're going into general engineering.' I said, 'I don't want to go into general engineering. I want aero-astro engineering.'"

He got the opportunity to study aeronautical and astronautical engineering in his sophomore year after he completed the general introductory program all freshmen engineers take. During his years at Purdue, encounters with pioneering astronauts such as Neil Armstrong and Eugene Cernan, Purdue graduates themselves, only reinforced Walker's determination to be a part of the space program.

In the spring of 1971, Walker accomplished part of his dream. He graduated from Purdue with a degree in aeronautical and astronautical

engineering and went right to work—as a civil engineering technician, land acquisition specialist, and forest firefighter for the U.S. Forest Service.

"Well, I graduated right in the middle of the last big slump in aerospace employment," he says.

He had job offers to work as an engineer, but for Walker, it was going to be NASA or the aerospace industry. Nothing else in engineering would do.

He had worked summers with the U.S. Forest Service, and since he couldn't find a job in aerospace, he fell back on his old connections while he continued his job search. His dreams would have to wait—but not long.

He soon found employment as a design engineer with the Bendix Aerospace Company where he worked on aerodynamic analysis, missile subsystem design, and flight testing. He was also employed at the Crane Division, Naval Surface Warfare Center, in southern Indiana as project engineer with the Naval Sea Systems Command. He worked in computer-controlled manufacturing systems.

"All this time I was still looking for that space job," Walker says. "I paid my own way to travel to professional society meetings and build contacts. I wrote letters to industry contacts, and I was interviewed several times by several companies. I finally found the position I was looking for."

In 1977, he went to work with the McDonnell Douglas Astronautics Company as a test engineer on the aft propulsion subsystem for the space shuttle orbiters. This was four years before the first space shuttle flight in 1981. At McDonnell Douglas, Walker was interested in developing space-flight hardware with commercial applications.

"I really was focused on the commercial possibilities of exploiting the unique environments of space, particularly microgravity," he says. "McDonnell Douglas had just started a research and development program in that very vein. They said, 'Okay, we'll bring you on. Get going on it.'" Walker was involved in equipment design and development. Meanwhile, McDonnell Douglas was negotiating with NASA to test its equipment on space shuttle flights.

"I went to my management," Walker says. "I said, 'You know, if this stuff flies in space, I want to go with it.'"

He became the first industrial payload specialist to fly on a space shuttle in August of 1984. He flew on two other shuttle missions in April and November 1985.

As a payload specialist he was not a NASA astronaut, but rather he flew on the missions as a McDonnell Douglas employee. With the company paying NASA for the costs of his flights, he became the first paying—and working—passenger into space.

His flight in late 1985 was his last. Walker transitioned at McDonnell Douglas to design and business development for the conceptual next American space station. He was working for McDonnell Douglas Space Systems in Washington, D.C., when the company merged with the Boeing Company in 1997. In 2005 he retired from Boeing, but it wasn't really retirement. He started doing consultant work.

He consulted with Boeing on its Starliner space capsule, capable of taking a crew of seven into space. Its primary purpose would be to take crews to low earth orbit at the International Space Station.

Walker serves on an advisory council for the Commercial Spaceflight Federation and has been advising entrepreneurial space companies, including one planning to map, survey, and harvest water, minerals, and metals from asteroids.

He does public appearances, including twice each year at the Kennedy Space Center Visitor Complex, and he frequently returns for events at Purdue. Purdue President Mitchell E. Daniels, Jr. awarded him the prestigious Order of the Griffin.

After traveling above the world, Walker and his wife, Susan, have been doing a lot of travel on the ground, including trips to view lunar and solar eclipses. He also is writing a book about his space experiences and organizing his files for donation to the Barron Hilton Flight and Space Exploration Archives at Purdue. He also will donate some items to the Lawrence County Historical Society and Boeing.

Walker was unhappy when the Space Shuttle Program was canceled without a replacement ready to fly, so he is glad to see the United States getting ready to launch astronauts to the International Space Station again onboard American spacecraft.

As for himself, he's never forgotten the thrill of space flight.

"The memories are good and strong, and they're always with me," he says. "I do relish the recollections of the experiences. I'm often asked if I would go back and do it again. Yes, I would. But now I have some conditions I didn't have before. I made a promise to [my wife] after my third flight in 1985 that the next time I go to space she will have to have gone before me or she will be accompanying me. We'll see how that works out. The greatest adventure continues."

# About the Author

John Norberg is a writer, author, humorist, and a chronicler of the human condition. Retired as director of communications for development at Purdue University, he began his humor column in 1971 while working at Indiana's *Brazil Daily Times*. The column appeared in the *Lafayette Journal and Courier* from March 1973 to October 2014. He has received more than fifty state and national reporting awards. A nationally respected, award-winning speechwriter and public speaker, he also is the author of eight books, including *Ever True: 150 Years of Giant Leaps at Purdue University* and *Spacewalker: My Journey in Space and Faith as NASA's Record-Setting Frequent Flyer*, which details the story of astronaut
. Additionally, Norberg has written articles for various national publications, including the *Saturday Evening Post*, *USA Today*, the *Christian Science Monitor*, and *Time* magazine. He was most recently honored with the prestigious Purdue University Special Boilermaker Award and was inducted into the Indiana Journalism Hall of Fame for a lifetime of work.