

## A Long Road to Travel

Each day millions of Americans travel by automobiles, and buses to get to school or work or just simply to complete daily tasks. The transportation available in North America today—boats, trains, and trucks—allows people to eat food grown in faraway places and purchase clothes and other products made in other countries. Although many of these modes of transportation are easily accessible today, they took time to develop.

In the early 19th century, America was rapidly growing. Settlers were beginning to move farther west into areas that were newly discovered. As they did so, areas were cleared and roads developed so other travelers could follow. However, the routes were not able to compete with the heavy traffic they received. The absence of a good transportation system meant that products were not able to be shipped to these new frontiers at a reasonable cost. The future of America depended on connecting small settlements to centers of trade.

Thomas Jefferson, the third president of the United States, hoped to discover a waterway that crossed from the Atlantic Ocean to the Pacific Ocean. Jefferson requested that Meriwether Lewis and William Clark lead the search for this waterway. Their efforts were without success, and people continued to trade within a limited area.

Jefferson decided that a different transportation system was needed to connect communities. This system would include roads, rivers, and railroads. By the mid-1800s, dirt roads had been built in some parts of the United States, and steamboats had become more popular. Since waterways were used as a means of trading, many cities were built near rivers so the citizens could have access to the goods they needed.

In the 1820s, the railroad changed the way people and goods traveled. Railroads had an effect on where people chose to live. With the development of the railroad, towns could be built farther from a water source yet still around a main means of transportation.

By the 1860s, a transcontinental railroad had been built, connecting New York to California. The railroad now became the main way to transport goods. Farmers used the railroad to ship their crops. Trains had special containers that kept products cold. This allowed people in the United States to have access to a larger selection of produce. Trains also increased the distance that products could be shipped and decreased the amount of travel time.

By the early 1900s, cities in America had grown, and some Americans were driving cars. Travel across the United States was still difficult due to the quality of roads. During the early 1900s, automobiles were seen as a luxury rather than a necessity, but that soon changed. By the 1930s, many families owned an automobile. Cars created a need for roads to be built and traffic laws to be made. Businesses were also needed to sell and maintain these automobiles.

In the late 1940s, many families moved away from cities and into suburbs. Soon businesses were also moving to the outskirts of cities and into the suburbs. Citizens within these communities used cars, bicycles, motorcycles, and buses to get around.

The transportation system that had been built in the United States changed the way people lived. With the invention of the automobile, people were starting to travel for pleasure and were enjoying the new-found freedom to go where they liked.

## How Fast Is Too Fast?

Travel on roads has now come to be expected, and the creation of interstate highways has allowed people to travel from one coast to the other coast without much difficulty. However, it seems that people continue to want to reach their destinations faster. Air travel has met this need by offering a higher rate of speed.

### Traveling by Airspeed. Traveling

In 1903, the modern age of flight began when the Wright brothers' plane stayed in flight for 12 seconds. This flight marked an important turning point for people and products in the United States. This flight led to the creation of the first practical airplane and launched efforts to create better flying machines. As a result, people of the early 20th century witnessed a number of advancements in aircraft technology that have had a lasting effect on Americans.

The airplane proved to be an effective military tool during World War I, which lasted from 1914 to 1918. During this time, airplanes also showed promise to a larger population when the airmail service was implemented.

In 1925, the Air Mail Act encouraged the development of the airline industry. At this time the postmaster contracted private airlines to deliver mail. However, some people felt that in order for airlines to reach their full potential, federal action was needed to maintain standards. As a result, the Air Commerce Act was passed in 1926, giving power to the Secretary of Commerce to establish airways, certify aircrafts, license pilots, and issue and enforce air traffic laws. By the mid-1930s, ordinary citizens were traveling across America on commercial jets.

### Traveling to Space

Spaceflight had been imagined for years, as can be seen in science fiction novels. But it was not until the late 20th century that rockets powerful enough to overcome the force of gravity were developed, which opened space for exploration.

In 1961, Alan Shepard was the first American to fly in space. In 1962, John Glenn made a historic flight when he became the first American to orbit Earth. Finally, in 1969, Neil Armstrong became the first American to step on the moon. Satellites were eventually sent into space, helping scientists collect information about Earth's weather and climate and about other planets.

### Traveling Faster than the Speed of Sound

Although planes helped people reach destinations faster, some travelers were looking for an even faster way to travel distances across the ocean. In 1976, the supersonic passenger jet, the Concorde, began service. The service of the Concorde would continue until the fall of 2003. Supersonic jets were different than typical commercial jets because they were able to travel faster than the speed of sound, 760 miles per hour (mph) or Mach 1. Most military jets are considered supersonic. A trip from New York City to London, England, would take less than four hours on the Concorde. On a commercial flight, the same trip would take about twice as long.

Many passengers enjoyed reaching their destinations quickly, but the increasing costs of a flight on the Concorde caused a decrease in the number of passengers. Ultimately the decline in

passengers would lead the Concorde to the end of its existence. Other factors affected its service. Traveling faster than the speed of sound leads to a sonic boom. A sonic boom is a loud thunder-like sound that a person on the ground hears from a supersonic aircraft traveling overhead. Some people believed this boom created environmental concerns.

### **Traveling Beyond the Speed of Sound**

The U.S. Air Force is working on achieving hypersonic travel. Hypersonic is defined as a speed over five times faster than the speed of sound—Mach 5. A hypersonic flight will reach speeds between 3,800 mph and 4,000 mph, fast enough to travel across the United States in a matter of minutes.

These speeds have been reached before. Pete Knight, a U.S. Air Force test pilot, was selected for the X-15 research program. During this program, he flew a trio of X-15 rocket research crafts. In 1967, he set a speed record of 4,520 mph while flying the X-15.

NASA space shuttles also travel at hypersonic speeds when re-entering Earth's atmosphere. However, the U.S. Air Force wants to make hypersonic crafts more common than landing on the planet. Hypersonic flights may be a technology that could impact the U.S. Air Force greatly when responding quickly to information.

Although hypersonic flight may appear in science fiction books today, this invention is not likely to surface anytime in the near future. Just like any invention, it has many hurdles to overcome before becoming a reality.

## Fiction or Reality?

In the 1900s, people were amazed with the development of automobiles, trains, planes, and other forms of transportation that moved people from one place to another place quickly. The space program launched people farther than many had thought possible. The advances in technology over the last 50 years have made these things a reality, but there are writers who seemed to imagine some of these realities long before they occurred.

### What is science fiction?

Science fiction is a genre of stories that is usually about worlds different from the world people currently live in. These stories generally focus on imaginative situations and technologies that have not yet been developed. Many of the scientific and technological advances that were imagined in science fiction stories have eventually become a reality.

Many science fiction novels from the past foresaw the invention of computers. At the time, computers were seen as a way of solving complex problems. However, the authors of these novels did not realize how huge of an impact they would have on the daily lives of many people. The invention of the computer eventually led to cell phones, tablets, video conferencing, and other forms of technology that many people rely on every day. It may be surprising but some of the ideas for these technologies were imagined by authors of science fiction long before becoming available to most of us. These ideas showed readers how the world could be different. This knowledge helped scientists work toward inventions that might advance technology. Science fiction expands the human imagination and inspires scientists to incorporate some of their ideas.

### What forms of transportation were introduced in science fiction?

For much of human history, change happened slowly making it difficult to imagine a world different than the present one in which a person lives. In the early 1800s people mainly traveled by foot and horse. These forms of transportation did not allow people to travel great distances, leaving a large part of Earth unexplored. Thomas Jefferson's idea of connecting communities using a system of roads, rivers, and railroads led to the beginning of something new in America. From steamships, to railroads, to cars, and then to planes, each invention advanced technology and provided a way for people to reach their destinations more quickly, but where did these ideas come from?

Some of the transportation available today was once just part of an imaginary world. Simon Lake became interested in undersea travel and exploration after reading a science fiction book. With this interest, Lake worked toward creating a vessel that could safely travel under water. His dream became a reality in 1898, after his company built the first submarine that was able to operate successfully in the ocean—almost 30 years after reading the book that inspired his dream.

Robert Goddard was an American scientist who had become interested in spaceflight after reading the science fiction book *War of the Worlds*. Goddard would go on to design the first liquid-fueled rocket and successfully launch the rocket in 1926.

In the 1929 movie *Woman in the Moon*, the idea of space travel is shown in a realistic way. Although the characters use a cannon to launch the spacecraft to a moon, the movie shows a multistage rocket launch somewhat accurately.

In 1968, the movie *2001: A Space Odyssey* influenced many people to become interested in the possibilities of space travel. At the time, many Americans were interested in the race to the moon. The movie gave a realistic preview of what the future in space might look like. Today, crew members are aboard the International Space Station 365 days a year.

Jules Verne wrote about people traveling in space in his 1865 science fiction novel *From the Earth to the Moon*. Many of the ideas Verne mentioned in his book became a reality. In 1969, three astronauts went into space on Apollo 11 with the hopes of landing on the moon. Just as in Verne's book, the spacecraft was launched from a city in Florida. Verne also had introduced the concept of retro-rockets, which were designed to slow down the rocket. The Apollo 11 made use of similar rockets before landing on the moon.

With the technology that has become a reality it is hard to imagine what the future has in store, but it does give people something to ponder and dream about.

### What might the future have in store for us?

Teleportation has been another popular idea in some science fiction stories. Teleportation refers to the process of an object moving without traveling. During teleportation, the object does not walk, fly, or roll to a new place. It just appears in a new place. For example, in science fiction, a character on one planet may be suddenly beamed aboard a spacecraft of another planet using teleportation.

Although this may seem impossible, in 2014, a team of Dutch researchers reported in the journal *Science* that teleportation is now possible. Up to this point, teleportation was something that was only achieved in science fiction novels. The Dutch researchers were not referring to teleporting physical objects but rather information. These researchers had teleported data from one electron<sup>1</sup> to another electron about 10 feet away. Although the electrons were not physically connected, the second electron was able to copy the data from the first electron.

The Dutch demonstration is only a beginning. It may lead to secure transfers of digital data between computers. In theory, larger objects could be teleported, but the teleportation of physical objects remains unlikely in the near future.

Scientists believe that the speed of light limits the speed at which an object can travel. Yet the Dutch researchers showed that information can be teleported instantly. This finding implies that the speed of light may not be the limit to how fast items can travel.

As for the future, who knows what it holds. What is clear is that technology will continue to change transportation, and transportation will continue to change lives.

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<sup>1</sup>electron—a very small particle that is part of an atom

25. What is a synonym for the word settlements as used in the passage “A Long Road to Travel”?
- (A) towns
  - (B) coasts
  - (C) lakes
  - (D) roads

26. This question has two parts. Answer Part One and then answer Part Two.

**Part One**

What are two main ideas of “A Long Road to Travel”?

- A. People use automobiles to accomplish daily tasks. Many types of transportation are available for citizens to use.
- B. Thomas Jefferson influenced the types of transportation in the United States.  
Jefferson was eager to find a waterway that went from one coast another coast.
- C. It took many years for the United States to build a transportation system that connected communities. Transportation changed the way people lived.
- D. Cities were built near water sources for trading purposes. More people moved away from cities after the railroad was developed.

**Part Two**

How do the key details from the passage support your answer to Part One? Choose **one** answer.

- A. The key details provide an explanation of effects the railroad had on farmers trading their products.
- B. The key details describe the types of transportation available to citizens to get from one place to another place.
- C. The key details provide a thorough description of an act passed by a president to encourage exploring a new frontier.
- D. The key details describe the sequence of events that led to a modern transportation system that allowed people to move away from cities.

27. Which event from “How Fast Is Too Fast?” most likely had the **most** influence on the growth of the airline industry?

- (A) the success of the Wright brothers’ flight
- (B) the use of airplanes during World War I
- (C) the passage of the Air Commerce Act
- (D) the delivery of mail in the United States by air

28. This question has two parts. Answer Part One and then answer Part Two.

**Part One**

How does the author of “Fiction or Reality?” support the idea that scientists are influenced by science fiction?

- A. by explaining where data are gathered by scientists to support their scientific theories
- B. by providing a scientific explanation to events that happen in science fiction stories
- C. by analyzing scientific research to support the advances made in science during a specific time
- D. by describing inventions that were created from situations that happen in science fiction stories

**Part Two**

Which evidence from the passage supports your answer to Part One? Choose **one** answer.

- A. “With this interest, Lake worked toward creating a vessel that could safely travel under water.”
- B. “At the time, many Americans were interested in the race to the moon.”
- C. “Teleportation refers to the process of an object moving without traveling.”
- D. “This finding implies that the speed of light may not be the limit of how fast items can travel.”

29. How does the overall structure of “A Long Road Ahead” and “Fiction or Reality?” differ?

- (A) “A Long Road to Travel” uses chronological order to highlight the history of the American transportation system, while “Fiction or Reality?” defines a topic and gives specific examples of how the topic has affected science.
- (B) “A Long Road to Travel” uses comparison to describe the benefits of different types of transportation, while “Fiction or Reality?” uses chronology to identify the years that specific science fiction books were published.
- (C) “A Long Road to Travel” presents historical information about how a leader of a country developed a transportation system, while “Fiction or Reality?” uses opinions of experts about how a genre can influence the type of technology available for people to use.
- (D) “A Long Road to Travel” uses the order of importance to describe which type of transportation is used by most Americans, while “Fiction or Reality?” uses a question and answer format to explain predictions that have become a reality and why.

30. How are the point of views in the **three** passages similar?

- (A) The authors of the passages explain how secure information can be transferred from one source to another source.
- (B) The authors of the passages suggest that regulations should be created to limit the speed at which people can travel.
- (C) The authors of the passages discuss advances in science that happened over a number of years.
- (D) The authors of the passages explain the importance of research before making items available for regular use.

31. All **three** passages feature inventions that were the results of imagination. Write an essay analyzing how **each** passage shows how imagination inspired ideas for inventions. Use evidence from **each** passage to support your response.