THE USA

MEN AND MACHINES

VOCABULARY RANGE — 2400 WORDS

by

RACHAEL L. CHAPMAN

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Preface

This is the third book in a series of graded readers on the United States. Its modest title — *Men and Machines* — does not convey the full scope of what this book is about. For it is more than about men and the machines they invented. It is also about the great dreams and ideas these men had and how they brought these to fruition.

Here, beginning with the "whittling inventors" of early America and progressing into the 20th century, are traced the lives of outstanding men whose achievements in many fields profoundly affected the development of the United States as a nation and contributed greatly to the well-being of her people.

In planning this series on the United States Robert J. Dixson, the renowned author of many outstanding books in the field of English, had these goals:

To relate the development of reading skill to instruction and information on an important social study.

To provide interesting reading material so as to enhance pleasure in reading as skill in reading is being developed.

To accomplish these goals by means of a highly readable, carefully graded text, supported by challenging exercises for practice, comprehension, and review.

These goals are realized through the four books that make up this series:

The Land and the People deals with the geography of the United States, particularly as it relates to the territorial growth of the country from early times to the present.

Men and History tells the stories of certain famous Americans as revealed through the historical events that helped to make each one famous.

Men and Machines describes the achievements of those who contributed to the scientific, industrial, cultural, and social progress of the United States.

Customs and Institutions is a comprehensive view of the social institutions, customs, traditions, and "way of life" of the people of the United States.

An interesting and useful aspect of these books is that they need not be studied in sequence, even though the vocabulary is progressively graded. Each is a separate and distinct book and is independent of the others.

As to the vocabulary range of *Men and Machines:* apart from certain scientific and specialized words that relate to the context, the range is about 2400 words. The relationship of words in a special context to words in common use, including idioms, is clarified in the glossary that follows the text.

It has been a privilege to write this book under the inspiration of the ideals that Mr. Dixson expressed in the two earlier books. It is my hope that teachers, students and others will derive benefit and pleasure from reading and studying this book.

R. L. C.

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BENJAMIN FRANKLIN

(1706-1790)

Statesman, Philosopher, Scientist, Inventor

BACKGROUND

A conspicuous trait of the American people is their constant search for new ways of doing things and therefore their fondness for inventions and "gadgets."

Perhaps this trait had its beginnings in the life of the early colonists. Colonial Americans had very few luxuries. Very often, they lacked the tools with which to perform even the simplest tasks. It was necessity that drove them to inventing and making such homely things as wooden eggbeaters, buckets, handles for knives, bowls, and other household articles that men and boys could whittle at during the long winter evenings. In this way it developed that entirely new ideas were born and new inventions were discovered and developed.

Let us consider a few of these new ideas and inventions: It was during the colonial period that "Sleepy" Sam Winslow discovered that sea water, exposed to the sun in large vats, produced salt crystals. Salt, which had been scarce and costly, could now be obtained in plentiful enough supply to allow its use in preserving meat and fish. An important trade was born as a result. Salted codfish from New England was exchanged in the West Indies for sugar and molasses. And in turn, molasses made possible the New England trade in rum. Rum was manufactured in Newburyport, Massachusetts, from the molasses that came from the West Indies. Called **New England rum,** it was consumed in New England and also used as an article of trade.

Joseph Jenks of Rhode Island helped his neighbors cut trees into lumber more quickly by building a sawmill. He also invented a long-handled scythe to replace the small sickle, for harvesting. When a man worked from sunup to sundown his back got tired.

The Swiss and the Germans who had settled in Pennsylvania had an aptitude for precision craftsmanship. They developed the famed Pennsylvania long rifle. So accurate was this weapon that a skillful hunter could aim for the head of a turkey so as not to spoil any of the meat!

In the South, money and leisure were a little more plentiful and there was enough manpower. Tobacco, indigo, and later, cotton, were sold abroad.

From the different sections of the country a new nation was being born. This period produced many great men and one of the greatest of them was Benjamin Franklin. His lifetime covered almost a century. His many accomplishments and the great services he performed for his country led the French writer Balzac to say of Franklin that "he invented the United States."

THE MAN AND HIS WORK

Benjamin Franklin was born in Boston, in 1706. He was the son of a poor candle and soap maker. It has been said that he could read almost as soon as he could talk. Certainly his active mind began to work at an early age. After a short period of schooling, he taught himself mathematics, penmanship, and how to express himself in good English. Eager for knowledge, he read constantly. He studied French, Spanish, and Latin and mastered them well. To use his own modest words, he "had an acquaintance with them."

When Franklin was a young boy he wanted to go to sea. To prevent this, his father put him to work with another son, James, who was a printer and who ran a newspaper. Benjamin, as his brother's apprentice, could not resist trying his hand at writing. For a time, he wrote only humorous articles. It was when he branched out into political articles and one of them offended the General Assembly of Massachusetts, that he knew there would be unpleasantness with his brother.

To escape his brother's wrath, Benjamin, then seventeen, ran away and took ship for New York and Philadelphia. In time, Philadelphia became his home city.

Coming from the narrow and crooked streets of Boston – streets which were really cow paths–Franklin found the streets of Philadelphia wider and laid out in more orderly fashion. William Penn, the Quaker who founded Philadelphia, had seen some handsome brick buildings and residences built during his lifetime. Wharves lined the busy waterfront, for Philadelphia was an important seaport even during colonial times. And for several years it was also the national capital. Franklin's busy mind saw that Philadelphia needed better sanitation, police, and fire departments, and many other civic improvements. He gained these and many other important contributions to the development of his beloved city. Sometimes, people refer to Philadelphia as "The City That Franklin Built."

Although Franklin found work as a printer, he wanted a printing press of his own. But he was very young and he had no money. Printing presses were costly and they had to be imported from England. The Governor of Pennsylvania had encouraged Franklin to go to London to buy a press and it was Franklin's impression that the Governor would help him financially. When he arrived in London however, he realized that this was not so and he would have to do the best he could by himself. It did not take him long to learn that he could get along if he used his mind and exercised patience. In the meantime, he decided to absorb all he could of what he saw and heard in London.

Franklin stayed two years in England, working as a master printer and perfecting his knowledge of printing. At the same time, he studied the theories and works of Isaac Newton, particularly the laws of gravity and motion. He also examined Robert Hooke's inventions of nautical and weather instruments.

Shortly after his return to America, Franklin established himself as a printer and then acquired a newspaper. Between the years 1732 and 1758, while he was still in his 20's, Franklin began publishing his famous *Poor Richard's Almanac*. Almanacs were popular during Franklin's time. They were pamphlets issued periodically, on all sorts of subjects, particularly those that had a personal appeal. *Poor Richard's Almanac*, like many others, gave its readers something to read on a variety of subjects: the weather, the home, health, family, etc. Franklin's almanac was completely American. It was easy to read. It consisted of many wise and "homely" sayings which, though not new, appealed to everybody. In addition, Franklin added many of his own ideas on science, nature, and personal hygiene; on phenomena such as earthquakes and tidal waves; on crop planting and weather predictions. The jokes, games, recipes, and formulas were avidly read by young and old. Some of the ideas expressed in the almanac, such, for example, as those relating to hygiene and diet, were far in advance of his time.

Franklin had a fine physique. He was an excellent swimmer. He invented hand paddles and discovered that a swimmer could be pulled along by a kite. The water skiing and scuba diving practiced today would not have surprised him. While most of the people of his time lived on a diet of meat and potatoes, he became a vegetarian. He also believed in frequent baths – a shocking idea in those days. He advocated ventilation and open windows in a period when people nailed windows down in the fall and never opened them until the spring.

While his almanac was making him a comfortable fortune, Franklin continued to work on improving the city of Philadelphia. He started the first circulating library in America. He organized a literary group which shaped the political thinking

of the Revolutionary War. This group, called the *Junto*, later became the *American Philosophical Society*. Through this literary group he was able to work civic wonders. Franklin's street lamps, with ventilation to allow the smoke to escape, became so famous that they were copied in London. Some of these lamps may still be seen in Philadelphia today.

Through Franklin's efforts, Philadelphia was the first city to have a city-organized and city-paid police department. He founded a "bucket brigade" that led to a fire department. Fire losses were often disastrous to businesses before Franklin established the first fire insurance company. Philadelphians began to show enthusiasm for cleaner streets under his urging. Later, Franklin laid out plans for paving the streets of the city.

A self-educated man himself, Franklin next turned his attention to education. He founded an academy which later developed into the *University of Pennsylvania*. Once more years ahead of his time, he suggested vocational and agricultural training for academy students.

By the time this great man was helping to found the first hospital in the colonies, people were beginning to look to Franklin for advice on everything. "What does Franklin say about it?" was a familiar question. Had he done no more than his remarkable work to make Philadelphia the leading city of the colonies, he would have well deserved a place in history. But even greater triumph was to come with his discoveries in electricity.

Franklin's famous experiment with the kite and key during a thunderstorm proved to him that metal was a conductor of electricity. This led him to the invention of the lightning rod.

Franklin reasoned that a metal rod above a rooftop would attract lightning. If wire were used as a conductor, the electricity would be drawn from the rod along the wire and down into the ground, leaving the building unharmed. This form of protection against lightning immediately spread throughout the Colonies and Europe. It added greatly to Franklin's prestige.

He made other correct deductions about electricty, deductions on which later inventors like Thomas Edison and Lee De Forest, based some of their inventions. Then he moved to other fields: cooling by evaporation (the theory of air conditioning), and the discovery of vitamins from the sun's rays. Needing glasses for ordinary vision and stronger ones for reading, he invented the bifocal lens. Franklin foresaw many of the marvels that were to come in steam, balloons, unsinkable ships and other inventions. He often deplored that one lifetime was too short to do all the things he wanted to do. Even the days were too short for him, and he proposed what we now call daylight-saving time to allow more working hours.

Interwoven with Franklin's civic and scientific activities was his diplomatic service to the Colonies. Who but Franklin, the man who had taken time to learn languages, could represent the country in foreign affairs? His voice was heard in the English Parliament protesting the unjust tax laws. His wisdom and calmness engineered an alliance with France needed to carry on the Revolutionary War successfully. He helped to draft the Declaration of Independence and to steer a just peace when the war was over.

At eighty-one, Franklin sat in the Constitutional Convention and saw the Republic created. It was a fitting end to the life of this giant among men who had contributed so much to the political, social, and scientific development of early America. Three years later he died in Philadelphia.

Benjamin Franklin was a modest man. He called his inventions *contrivances* (gadgets). His scientific discoveries he called *philosophy*. His great civic works were *small matters*, in his opinion. It was in 1742 that he invented the Franklin stove which became so popular and is still used today. When questioned as to why he did not patent this invention, Franklin said: ". . . as we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any inventions of ours; and this we should do freely and generously. . . ."

However, realizing that times change and that the way people think changes too, Franklin approved of the provision in the new Constitution for a United States Patent Office and for laws protecting the rights of inventors.

Who could doubt that Benjamin Franklin was one of the greatest of Americans?

EXERCISES

I. Comprehension. In each of the following sentences choose the item – (a), (b), or (c) – which makes the sentence correct.

1. The accomplishments of the early Colonial Americans were mainly a result of
   (a) the colonists' imitation of the accomplishments of others.
   (b) the colonists' response to the needs of their daily lives.
   (c) the colonists' fondness for inventions.

2. Benjamin Franklin's father put Benjamin to work with another son, James, in order
   (a) to prevent Benjamin from going to sea.
   (b) to provide Benjamin with a good opportunity to publish articles in his brother's newspaper.
   (c) to keep Benjamin's active mind busy.

3. Franklin ran away because
   (a) he finally had the chance to go away on a ship.
   (b) he wrote political articles which offended some people and made his brother angry.
   (c) he wanted to learn more about printing than his brother could teach him.

4. Franklin made many important contributions to the development of
   (a) Boston.
   (b) New York.
   (c) Philadelphia.

5. Franklin spent two years in London
   (a) working and learning.

(b) waiting for the Governor of Pennsylvania to send him money.
(c) publishing an almanac.

6. In many of his ideas, such as those relating to health and hygiene, Franklin was
(a) behind the times.
(b) a child of the times.
(c) ahead of his time.

7. The *Junto,* a literary group which Franklin organized, shaped the political thinking of
(a) the Revolutionary War.
(b) the Civil War.
(c) the Spanish-American War.

8. As far as education is concerned, Franklin was
(a) a self-educated man.
(b) a graduate of the University of Pennsylvania.
(c) a student at Oxford in England.

9. Franklin's discovery that metal is a conductor of electricity led him to the invention of
(a) the bifocal lens.
(b) the lightning rod.
(c) unsinkable ships.

10. The attitude of the people toward Franklin was one of
(a) indifference.
(b) envy.
(c) respect.

II. Vocabulary: Adjectives and Nouns. Copy each of the following sentences, replacing the italicized word with a word of similar meaning from the list given. The words in the list occur in the story you have just read.

comfortable
conspicuous
homely
impression
physique

1. An *outstanding* trait of the American people is their constant search for new ways of doing things.

2. It was necessity that drove the American people to inventing and making such *ordinary* things as wooden eggbeaters, buckets, and handles for knives.

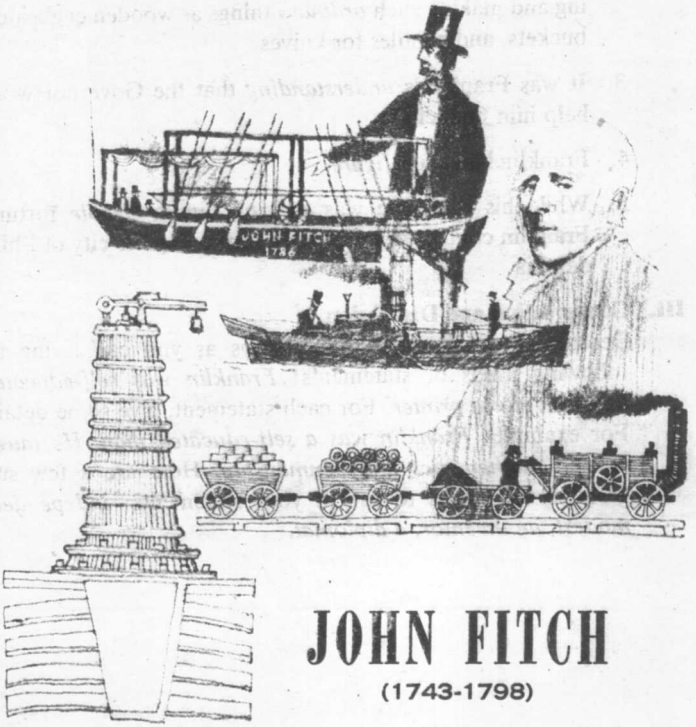
3. It was Franklin's *understanding* that the Governor would help him financially.

4. Franklin had a fine *figure*.

5. While his Almanac was making him a *sizable* fortune, Franklin continued to work on improving the city of Philadelphia.

III. Conversation and Discussion.

Describe Franklin in as many ways as you can, using the following kinds of statements: *Franklin was self-educated. Franklin was a printer.* For each statement, give some details. For example: *Franklin was a self-educated man. He taught himself mathematics and penmanship.* Here are a few suggestions for words to use in your statements: *independent, modest, an inventor, a diplomat.*



JOHN FITCH

(1743-1798)

COL. JOHN STEVENS

(1749-1838)

Pioneers in the Vaporous World of Steam

BACKGROUND—JOHN FITCH

No field of invention seems to have had a greater number of inventors and more obstacles to success than the field of steam. It is understandable, when we consider that the whole idea of steam was foreign to people who for centuries had used beasts of burden, water-power, or their two hands and a strong back to accomplish work.

Agriculture and fishing were the basic means of livelihood in Colonial America. These required a knowledge of the winds, weather, the sun, and the tides. Men, however, had learned to make these elements work for them.

"Steam! A scientific word babbled by people too lazy to work!" scoffed most people. It took many years and the lifetimes of many inventors before steam was accepted.

John Fitch, a pioneer in steam, belongs to that type of American called the "whittling boys." From this group came some of America's earliest inventors. They had very little formal schooling and no knowledge of mathematics. With a knife and a block of wood they fashioned things that expressed their ideas and dreams. Oftentimes the model they fashioned became a useful invention. "Whittling boys" were sometimes disappointments to their parents, who needed strong sons to work the farms. This was the case in the Fitch family.

John Fitch grew up in Connecticut under a stern father who underfed and overworked him. An undersized boy, John had no inclination toward agriculture, but he did show mechanical ability and he could "whittle." Disappointed, the elder Fitch denied the boy an education and early apprenticed him to a clockmaker. The clockmaker made the boy the object of his jokes, taught him nothing about clock-making, and put him to work.

THE MAN AND HIS WORK

By the time Fitch was beyond the apprentice age, he had neither occupation nor prospects. When rather young he had married a woman who nagged him. They had two children by the time Fitch was in his early twenties. Despairing of ever making enough to support his family, Fitch left home and became a wanderer.

For a time he made brass buttons from discarded kettles. When he had a supply, Fitch would walk around the countryside peddling buttons. During the period before the Revolutionary War, he acquired a little money with which he bought sixteen hundred acres of land in the Northwest Territory. It was while he was surveying this land that he saw the great need for steamboats on the western rivers. He thought also of steam carriages but as he trudged the poor roads of that time he gave up this idea as impractical.