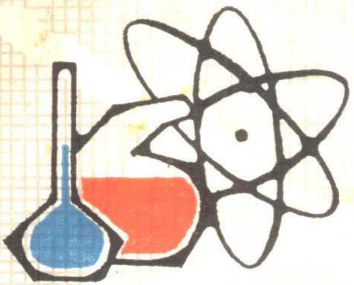

American Men of Science and Invention

美国科学家和发明家

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上海译文出版社出版

上海延安中路967号

新华书店上海发行所发行

上海市印刷三厂印刷

开本 787×1092 1/32 印张 7.75 字数 172,000

1980年8月第1版 1980年8月第1次印刷

印数：1—18,000

书号：9188·79　定价：0.63元

出 版 说 明

本书收美国重要科学家和发明家的传记故事十四篇，供中等英语程度的读者阅读。原著为美国情报服务中心所编，各篇篇末均有练习题，书末附练习答案和词汇表。现将科学技术文献出版社出版的中译文收在书内，并经注者对全书作了注释，作为附录，附在书末供读者参考。

Contents

Introduction

The subjects of these fourteen short biographies represent some of America's most remarkable men. The stories of their lives and work cover all the important periods in the history of the United States. Together, they provide a helpful view of the development of the American nation.

The vocabulary and structure have been controlled for the level of the intermediate learner of English. Those vocabulary items, for example, beyond the 3,000-word level (based on *The New Horizon Ladder Dictionary of the English Language*) have been placed in a glossary at the end. Exercises, both comprehensive and word-study types, are included at the end of each biography.

Benjamin Franklin

"As we enjoy great advantages from the inventions of others, we should be glad to serve others by any inventions of our own .... I have no private interest in the acceptance of my inventions by the world. I have never made, nor propose to make, the least profit by any of them."

Benjamin Franklin spoke these words in the year 1742. Today his philosophy of serving others through science and invention still influences the history of science in the United States.

Franklin's practical approach to science was shown by an early experiment in which he studied the heat of the sun. Using different colored pieces of cloth, he found that the darker the color of the material, the greater the amount of heat it would absorb. The lighter the color, the greater it would reflect heat. In reporting these findings more than two centuries ago, he said: "We learn from this that black clothes are not as fit to wear in a hot, sunny climate as white ones. Summer hats for men and women should be white to reduce the heat."

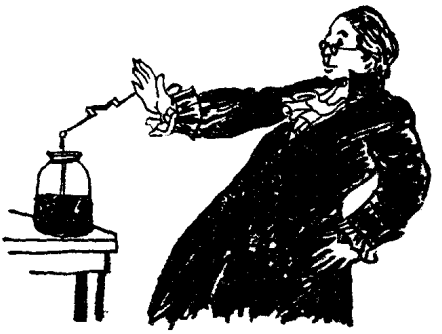
It took almost a century for this advice to be generally followed by millions of people around the world. But this was only one of Franklin's many contributions based

on his desire to make practical use of facts gathered from personal observation and experiment. This desire made him a better inventor than a scientist.

Franklin had many of the qualities of an inventor. They included great curiosity, broad interest, mechanical skills, the ability to continue with a task until completed, and a practical view of life. But, even more than these, he also had a sense of the valuable uses of science for the benefit of his fellow man.

At the age of twenty-one, for example, while living in Philadelphia, Franklin formed a club. It was a discussion group which met each week. At the meetings, each member presented a question of science, politics, literature, or philosophy which was discussed by the entire group. Franklin's social philosophy is clearly seen in the promise he required of each new member. He asked that they love their fellow man regardless of what religion or profession they followed; that they see that no person was harmed for holding any opinion; that they love truth for the sake of truth and try, without showing favor, to find truth and communicate it to others.

Thus, at twenty-one, Benjamin Franklin set out to broaden the frontiers of knowledge in the new land that was America. At the same time he also began the printing business which was to make his fortune. For the next twenty years, he prospered in Philadelphia. By the time he was forty-two years old, he was wealthy enough



to retire from business. He then turned his interest to public and private affairs. The record of his great role in public affairs, especially in the American Revolution, is the story of the period in which the United States was born.

Our interest here, however, is with Franklin's other story—that of a man of science. In spite of his desire to gain practical results from his many experiments, Franklin never argued openly with other scientists in defense of his own scientific opinions. When writing about his opinions, he said: "I leave them to take their chance in the world. If they are right, truth and experience will support them. If they are wrong, they ought to be proved wrong and set aside."

The generations which followed Franklin were the ones that mainly benefited from his scientific efforts. His experiments in the field of electricity, for instance—especially his adventure with the kite and lightning—were

perhaps his most famous. In them he sought to find the connection between the man-made electrical charge produced by rubbing silk with a cloth and the natural lightning that came with summer thunderstorms. By flying a kite during one such storm, Franklin was able to attract an electrical spark to a piece of metal tied to the kite's string. By comparing the characteristics of the natural spark with the man-made charge, Franklin was able to prove the similarity of electric matter and lightning.

As an experimenter and practical user of scientific facts, Franklin saw an immediate and important use for this discovery. Why could not homes, barns, and other buildings be protected against the fire and destruction caused by lightning? Why could not the lightning flash be controlled? Inspired by these ideas, in 1752 Franklin developed a practical lightning rod. It was an upright metal pole attached to the roof of a house by a material that would not conduct electricity. To the rod he fastened a wire which led to the ground. When lightning struck the house, it followed the best way, through the rod and wire, to reach the ground. The rest of the building was left unharmed. When news of Franklin's invention spread, people adopted it in large numbers.

In the years that followed, Franklin continued an active life. While adding to his record of scientific ex-

periments, he played a leading role in the conflicts of his time in defense of liberty and human rights. Then in 1776, when colonial America began its struggle for independence, Franklin went to France as the nation's first ambassador. In his nine years in France, he found time to establish close relations with European scientists. He even became interested in the early work of men trying to conquer the air and saw one of the first flights of a hydrogen balloon.

Franklin always had faith in the steady progress of science. His vision of things to come was never more clear than when he remarked, shortly before his death in 1790 at the age of eighty-four: "The rapid progress of science makes me regret sometimes that I was born too soon. It is impossible to imagine the height to which the power of man over matter may be carried in a thousand years. We may perhaps learn to overcome gravity and lift large objects for the sake of easy transport. Agriculture may reduce its labor and double its produce. And diseases may by sure means be prevented or cured—and our lives lengthened."

Exercises

A. *Decide which item best completes each unfinished sentence.*

1. Franklin's practical approach to science was shown by an early experiment in which he studied

(a) the design of ladies' hats.
(b) the structure of kites.
(c) the heat of the sun.

2. The discussion club which Franklin organized was interested in such topics as
   (a) music, travel, and sports.
   (b) Indians, land development, and frontier wars.
   (c) science, politics, literature, and philosophy.
3. Franklin made his fortune from
   (a) his printing business.
   (b) his inventions.
   (c) politics.
4. Franklin's experiment with the kite
   (a) was to study summer thunderstorms.
   (b) gave him the idea to fly in a balloon.
   (c) proved that lightning was electricity.
5. Franklin played a major role in
   (a) the American Civil War.
   (b) the American Revolution.
   (c) the French and Indian War.
6. Franklin was the United States'
   (a) first ambassador to France.
   (b) first book publisher.
   (c) first president.
7. From his studies of electricity, Franklin

(a) discovered that rubbing silk with a cloth made an electrical charge.

(b) invented the lightning rod.

(c) proved that lightning is impossible to control.

B. *Complete each sentence by selecting the item that is closest in meaning to the italicized word.*

Example: Franklin *regretted* being born too soon. He felt ___* that he would miss seeing the inventions of the future.

relieved	happy
*sorry	afraid
upset	convinced

1. Franklin's *advice* to people to wear white clothes in a hot, sunny climate was followed. This ____ helped people to be cooler.

demand	recommendation
invention	plan
idea	suggestion

2. He made practical use of facts gathered from *personal* observation and experiment. In fact, he did most of his research ____.

without money	quickly
secretly	at home
by himself	with friends

3. His inventions *influenced* science and ____ people's daily lives.

advanced	affected
helped	lengthened
complicated	freed

4. Franklin's *talenl* as an inventor was matched by his ____ as a statesman.

identity	work
position	ability
recognition	dedication

5. He always had *faith* in the steady progress of science. This ____ is characteristic of most American men of science.

sadness	stubbornness
dream	opinion
conclusion	belief

6. He played a leading *part* in the conflicts of his time, but his ____ in the publishing business is not well known.

effort	leadership
responsibility	experience
role	history

7. Franklin also *achieved* fame as an inventor and ____ a respected place in the history of American science.

lost	discovered
demanded	attained
sought	refused

8. His experiment with a kite successfully *attracted*

lightning. The results —— public attention to his research work.

drew	stirred up
ignored	encouraged
limited	rejected

Benjamin Banneker

In 1792 President George Washington and Secretary of State Thomas Jefferson were discouraged. They felt that the plans for a new capital of the country would never be completed. But a black surveyor helped to save the situation. Through his talents, the plans for the city of Washington, D. C., were finally finished. He was Benjamin Banneker—astronomer, mathematician, and surveyor.

Born on a Maryland farm in 1731, Banneker was the son of a slave father and a freewoman mother. Since his mother was free, Benjamin was also considered free. When he was twelve years old, he attended a school, open to "all" boys, run by a Quaker neighbor. Young Banneker was the only black student in the school. He showed particular interest and talent in mathematics and soon progressed beyond the ability of his teacher. As he grew older, his interest in mathematics deepened, and he often would invent and solve his own mathematical problems.

When he was twenty-one years old, Banneker received a pocketwatch as a gift. Soon he became thoroughly familiar with the way it worked. This interest led him

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to decide to build a clock. So he went to his old school teacher for advice and help. The teacher was not much help, but he did give Banneker some material to guide him: a picture of a clock from a magazine, a book on geometry, and Isaac Newton's *Principia* (laws of motion). Thus equipped, Banneker proceeded to draw plans for a clock, using a compass and a ruler to make measurements and the picture and the pocketwatch as models. For two years he spent his spare time working on the clock. He built it entirely of wood and carved each of the parts by hand. By 1753 it was completed, and it kept perfect time, striking every hour for more than forty years.

During the Revolutionary War Banneker grew wheat on his farm to help feed the American army. But whenever possible, he also continued his interest in science. A