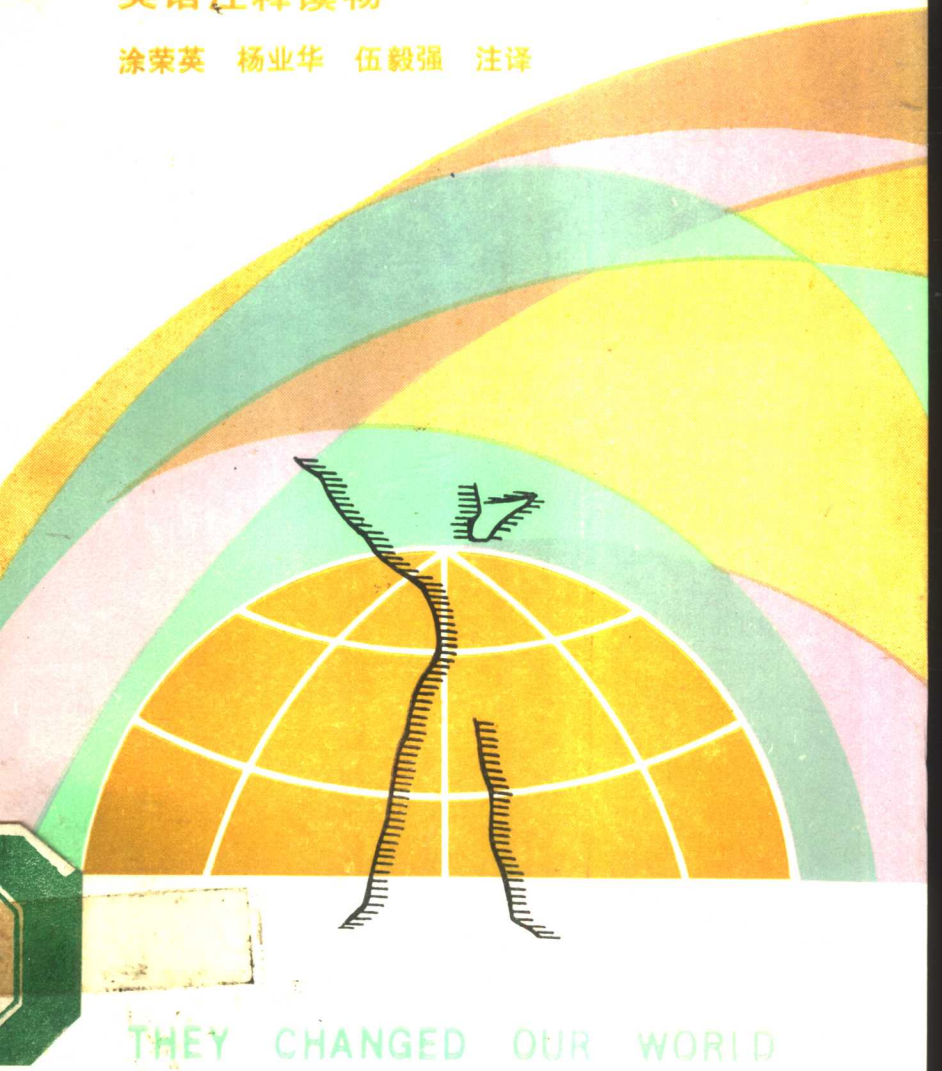
英语注释读物

涂荣英　杨业华　伍毅强　注译



THEY CHANGED OUR WORLD

他们改变了世界

英语注释读物

他们改变了世界

涂荣英　杨业华　伍毅强　注译

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内 容 提 要

本书为英语注释读物，由 15 篇独立的文章组成，均选自美国读者文摘出版公司 1982 年出版的“They Changed Our World”一书。文章以流畅精练的文笔叙述了一些杰出的科学家和艺术家的生平、以及几件重大科学事件的始末。每篇文章后均配有注释、练习及参考译文，并在书末给出了练习参考答案。

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前　言

本书中的15篇文章均选自美国读者文摘出版公司(Reader's Digest Press) 1982年出版的"They Changed Our World"一书。这些文章主要向读者介绍对世界文明进步作出巨大贡献的一些伟人的生平事迹。他们之中有天才科学家哥白尼、牛顿、爱因斯坦、贝尔；杰出的艺术大师毕加索、莫扎特、贝多芬、肖邦；开拓者哥伦布、福特等。此外还向读者叙述了一些重大科学事件的始末。

在这些文章中，作者不是平铺直叙、刻板地替科学家和艺术家们填履历，按时间顺序给某项发明作实验记录，而是选取一些有代表性的情节和一些精彩的特写镜头来描绘这些科学家、艺术家一生的轮廓和某项发明的艰苦过程及紧张场面。文章文字精练流畅，结构严谨，并且集知识性、趣味性于一体，是较理想的英语读物。

为便于阅读，我们为每篇文章配了注释、练习、参考译文以及练习参考答案。

本书由湖南大学涂荣英、中南工业大学杨业华、伍毅强三位同志翻译、注释和编写练习，最后由涂荣英同志审校。

译注者

1990年2月

目　录

一、Giants of the World of Science

Copernicus: The Man Who Moved the World

by Robert Strother

A courier sprang from his horse and hammered at the door[1] of the cathedral. He had raced across Germany to Poland to deliver a book which was destined to change[2] man's view of the universe and to herald the stormy dawn of modern science. And he was just in time. Only a few hours after the first copy of *concerning the Revolutions of the Heavenly Bodies*[3] was slipped under the hand of its semi-conscious author, Nicolaus Copernicus, he died of a brain hemorrhage.[4]

That book ignited a furious controversy between theology and science which was to rage for[5] more than 300 years. For Copernicus had challenged the Scriptures, the wisdom of antiquity and the common sense of mankind by proclaiming

that the earth was not the stationary center of the universe, with the sun, the planets and the stars revolving round it. The earth, he said, is an ordinary planet which revolves round the sun.

Eye-Opener.[6] His attack shattered the grip of ancient dogma which had stifled scientific thought; his thinking was a turning-point in man's intellectual history. It was an astonishing feat for a modest astronomer who had no telescope, a devout churchman who had chosen to live half of his 70 years in seclusion.

Nicolaus Copernicus was born 500 years ago on February 19, 1473, in the town of Torun in Polish Prussia. His ancestors came from the small town of Köppernig in Silesia,[7] hence, probably, the name Copernicus. When Nicolaus was ten his father, a prosperous merchant, died, and he became the ward of his uncle, Lucas Watzelrode, who was soon to become a bishop.

In 1491 his uncle sent Copernicus to study in Cracow,[8] the capital of Poland and a renowned center of learning. The hand-some 18-year-old lad, with his deep-set dark eyes and high cheekbones, was a conscientious student with a flair for[9] science. He studied astrology and mathematics as well as philosophy and through the influence of a young professor, Albert Brudzewski, he became interested in astronomy. It is possible that, even then, Copernicus seized upon[10] the " unthinkable thought" that the earth moved round the sun—the theory that was to dominate most

of his life.

In 1496 he set out for[11] Italy to study canon law at the University of Bologna. There he met Dominicus Maria di Novara, who was a professor of anatomy and former pupil of the famous mathematical genius Regiomontanus.

During long summer nights, while the two men plotted some of the lunar and planetary positions that Copernicus was to use in his great book many years later, they speculated excitedly on[12] the true nature of the universe. The planets were never quite where the traditional theory—that of the Greek, Claudius Ptolemy—predicted they would be, and Copernicus began to be convinced that there must be a basic error in the system itself.

Labor of Love. Copernicus grasped at Renaissance[13] Italy's inexhaustible opportunities to learn. He had no need to hurry home: his uncle had wangled his appointment as canon, or[14] member of the ruling council, of the diocesan cathedral at Frauenburg in northern Poland, a life sinecure with a good salary. So altogether Copernicus spent ten years studying in Italy. When he finally returned to Poland in 1506 to become secretary and physician to his uncle, he was a church lawyer, a mathematician and could speak five languages.

Bishop Watzelrode died in 1512, and Copernicus, at the age of 40, took up[15] his duties at last as one of the 16 canons of the Frauenburg chapter. Although he had not taken holy orders,[16] he never married. He was given a corner turret in the fortified wall surrounding the cathedral hill, and for the

remaining 30 years of his life he left the cathedral grounds only on matters of church business. He was canon, bailiff, judge and tax collector by day, a scientist by night.

Rough Tool-Kit. Copernicus had only a few crude observing instruments (the telescope was not invented until 65 years after he died) and these he probably made himself from designs in Ptolemy's ancient astronomical textbook, the *Almagest*.[17] His main instruments were a levelling device for determining star altitudes; a "Jacob's staff," merely a pole with a movable crossbar for rough sightings; and an instrument for measuring the meridian altitude of the sun.

The prevailing view of the cosmos, expounded by the great Aristotle, had been accepted in large part by the medieval church. In the center of everything was the earth. A series of crystal spheres was arranged round it like the layers of an onion; on successive transparent spheres were embedded the moon, Mercury, Venus, the sun, Mars, Jupiter and Saturn, in that order.[18] Beyond Saturn was the outer sphere of the fixed stars. The whole lot,[19] pushed by industrious angels, revolved round the world every day. Since they were divine, Aristotle decreed, they moved at uniform speed and in perfect circles.

But even without the angels, Aristotle's cosmology did not fit the observed facts. The planets, for example, seemed at times[20] to hesitate in their travel across the sky, stop altogether and reverse before resuming their usual course. When Ptolemy took up the problem in the second century

A.D.,[21] he ignored the spheres and opted for an elaborate system of circles, with the earth in the middle, big circles round it representing the main orbits of the planets, and smaller circles turning on them like the seats on some mad celestial Ferris wheel.[22]

Until Copernicus dedicated his life to the task,[23] nobody had seriously challenged the universally accepted Ptolemaic concept, but Copernicus rejected it on esthetic as well as scientific grounds: he did not believe that God would have created so clumsy a system.

He decided to begin by compiling, in complete mathematical detail, a catalogue of changes observed in the positions of the sun and planets. With this he hoped to prove that the suncentered theory reduced the complex and irregular planetary motions to[24] predictable order and provided new evidence for an understanding of the structure of the universe.

To demonstrate his new world view using the ancients' astronomical observations, and to produce new planetary tables based on it, proved extraordinarily difficult. Copernicus labored alone, except for an occasional talk with a fellow canon. He grew steadily more grumpy and withdrawn as he struggled through 15 long years, with inadequate mathematical techniques, to draw the right answers out of a mass of data. His use of old, and often faulty, observations did not help; and his computed planetary positions—especially those of Mars[25]—obstinately refused to

come out right.[26]

Blind Spot. We now know why. Although he stubbornly attacked the central–earth dogma, Copernicus could not shake himself free of the idea of perfect circles at uniform speed. As Johannes Kepler discovered almost a century later, the planets move not in circles, but in ellipses. For one moment,[27] as we know by his notes, Copernicus hovered on the brink of that discovery himself. He actually wrote down the idea of elliptical orbits, but he stared at the solution without recognition. He could not perfect his work, and his frustration grew.

However, he succeeded brilliantly in other areas, as in showing that the retrogressions of the planets are an optical illusion. "The haltings and backward and forward motions of the planets," he said, "are not theirs, but of the earth." The earth travels faster than the outer planets, and a planet being overtaken seems to move backwards. The diagrams he constructed to show the precise retrogressions of each planet were so clear that they are used in textbooks today.

Academic Grapevine. By 1530, word spread in the university world that *Concerning the Revolutions of the Heavenly Bodies*, a 400–page book of text, charts and diagrams, was finished.[28] Cardinal Nicholas von Schönberg,[29] trusted councillor of the Pope, wrote to Copernicus encouraging him to publish the work and asking for a copy. Copernicus refused. He realized the enormity of what he proposed—and was humble enough to know that he had not quite proved his momentous case. And he was fearful of criticism and deri-

sion. As he wrote later: "The contempt which I had to fearbecause of the novelty and apparent absurdity of my views very nearly induced me to abandon utterly the work I had done."

If it had not been for an unexpected visit in 1539 from Georg Joachim Rheticus, a brilliant young professor of mathematics from the University of Wittenberg, the book might never have been published. Rheticus had got leave of absence to visit[30] Copernicus and to investigate his theory. The energetic 25-year-old scholar had boundless faith in[31] Copernicus's heliocentric idea, and he quickly made himself his disciple, editor and promoter.

For two years he worked on the manuscript that had lain for years under lock and key in the canon's tower room. It was in sad shape, a hodgepodge of astronomical tables, diagrams and columns of figures scribbled on scraps of paper. Closely reasoned scientific arguments were larded with metaphysics; deep insights lay buried in trivia.

Although Copernicus continued to resist all urgings to publish the book, he finally agreed that Rheticus could issue a summary. Rheticus made a fast and skillful job of it, and three months later brought out *Narratio Prima*, or First Account.[32] It created an encouraging stir and Copernicus began to hope the complete book would not arouse the contempt he dreaded. He finally acceded to the young man's pleadings, and Rheticus traveled to Nuremberg to get the book printed.

But almost six months before the first copy was ready,

Copernicus suffered a stroke.[33] He clung to[34] life until the courier from Nuremberg arrived. Whether he recognized the crowning achievement of his life, no one could say for, on May 24, 1543, he died without speaking.

Six years after it was published, the Lutherans officially denounced Copernicus's book as contrary to the Old Testament.[35] But it was not until 1616, when Galileo's activities attracted attention to it, that the Catholic Church realized the farreaching threat to dogma posed by *The Revolutions:* if infinity stretched away for ever, where was the seat of Heaven?[36] If other planets were inhabited, how could their people be the sons of Adam? Did Christ die to redeem *their* sins,[37] too? The Copernican theory shook too many old beliefs in a time of mounting trouble.[38] The book was banned and remained on the Index of forbidden books until 1822.

Preparing the Way. Complete proof of the Copernican view had to await the work of three giants among his successors—Galileo, Kepler and Newton. They found the needed proofs, and in finding them created the methods for exploring nature which swept the world into the scientific revolution and on into the Space Age.

But it was the silent Canon of Frauenburg who opened the door to the new knowledge. The "new astronomer who wants to prove the earth moves" moved it himself. By his insight and daring in challenging the most venerable of false notions about the universe, he opened man's eyes to infinity.

Notes

1) …sprang from his horse and hammered at the door… = jumped suddenly from his horse and knocked heavily at the door….

2) be destined to + v.: 注定要…；肯定会…；将会…。

3) Concerning the Revolutions of the Heavenly Bodies:《天体运行论》。

4) brain hemorrhage: 脑溢血。

5) rage for: 流行；盛行；进行。

6) Eye-Opener: 指令人十分惊奇的新发现，在此表示别开眼界的理论。

7) Köppernig in Silesia: 在西里西亚（中欧东部一地区，在捷克北部及波兰西南部）的哥白尼（波兰语）（地名）。

8) Cracow（波兰语）= Krakow: 克拉科夫（地名）。

9) with a flair for…: 具有…天才。

10) seize upon (on) = snatch at: 抓住；占据…。

11) set out for = begin a journey; start: 启程，出发。

12) speculate on (upon) = meditate on: 思索；推测。

13) Renaissance: 文艺复兴时期；文艺复兴时期的。

14) or作同位语的引导词，意为：也就是，即是，换言之等，后连接一个短语作同位语。

15) take (took) up: 就任；接纳；接受；接任。

16) take holy orders: 就任圣职。

17) the Almagest:《天文学大成》(是公元2世纪古希腊天文学家托勒密写的天文学数学名著)。

18) 倒装句，主语（moon, Mercury,…and Saturn）在谓语动词"were embedded"后面。

19) The whole lot = The whole spheres.

20) at times = occasionally; now and then: 有时；时时；不时。

21) in the second century A.D.: 在公元2世纪。

22) Ferris wheel: 阜氏转轮（游艺场中供人乘坐可以飞快转动的玩具）。

23) dedicate…to = give up; devote (one's time, energy, etc.) to…: 奉献；把…贡献于…。

24) reduce…to: 把…简化为…；把…归纳成…。

25) especially those of Mars 是 positions 的同位语。those = positions。

26) come out right = be solved; be worked out as a result of calculations: (算术题) 被解出；(总数) 被算出。

27) for one moment是插入语，意为这儿插一句。

28) 句中主句的主语word = news; information (单数，不用定冠词) 消息；音讯；传说。that…was finished 是一个分隔的同位语从句，说明主句的主语 word. in the university world: 大学界。

29) Cardinal Nicholas von Schönberg: 红衣主教尼古拉·冯·舍恩伯格(男人名)。

30) had got leave of absence to visit…: 请假来拜访…。

31) had boundless faith in: 对…无限崇拜（敬仰)。

32) Narratio Prima: 拉丁语，意为"简要"。

33) stroke: 瘫痪；中风。

34) cling (clung) 后常接to或together = hold tightly; stick firmly: 抓紧，紧靠；坚守。

35) as contrary to the Old Testament: 与旧约圣经相违（即背叛旧约圣经的教义)。

36) Heaven = God: 上帝。

37) to redeem…sins: 把…从罪恶拯救出来。

38) in a time of mounting trouble: 在困难重重的年代里。mounting trou-

ble = increasing trouble.

Exercises (1)

(一) Comprehension

Choose the best answer.

1. Copernicus was
   a) the man who lighted the world.
   b) the author of the Theory of Relativity.
   c) the discover of the element, radium.
   d) the astronomer who moved the earth.
2. Copernicus's book, "Concerning the Revolutions of the Heavenly Bodies", ignited _____ between theology and science.
   a) a long discussion
   b) a furious struggle
   c) a violent prolonged argument
   d) a storm in a teacup
3. At that time people believed that the earth never moved, but Copernicus declared publicly _____.
   a) the earth was the stationary center of the universe, with the sun, the planets and the stars revolving round it
   b) the earth was moving round the sun and it was not the centre of the cosmos
   c) the earth was unusual planet which turns round the sun
   d) a series of crystal spheres, pushed by industrious angels, revolved round the world everyday