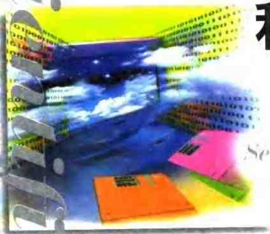

科技英语文选

Selected Readings in Scientific English

王颖 主编

山东大学出版社

Selected Readings in Scientific English

科技英语文选

主 编 王 颖
编 者 王 颖 董素华 宋 杰

山东大学出版社

图书在版编目(CIP)数据

科技英语文选/王颖主编．—济南：山东大学出版社，1999.8
ISBN 7-5607-2050-1

Ⅰ．科…　Ⅱ．王…　Ⅲ．科学技术-英语-语言读物
Ⅳ．H319.4

中国版本图书馆CIP数据核字(1999)第39109号

山东大学出版社出版发行
(山东省济南市山大南路27号　邮政编码：250100)
山东省新华书店经销
山东莒南印刷厂印刷
850×1168毫米　1/32　8.75印张　227千字
1999年8月第1版　1999年8月第1次印刷
印数：1—2 000册
定价：12.00元

序

学习英语者很少有能够用英语谈科技的，这并不是因为他们对科技全然无知，而是因为他们对科技英语知之甚少；即使接触过科技方面的材料，能转化为学习成果的也不多，因为许多现成的材料不一定适合用做教材。有鉴于此，王颖主编的《科技英语文选》就是很合时宜的了。

读书为学习之本。这个道理是显而易见的，学习外语也不例外。对学习英语者来说，阅读是获取语言知识、巩固语言知识和增强语感的最经常、最广阔也是最可靠的渠道。而且，人们注意到一个事实并作出相应的论断，即凡是英语水平和能力不高的学习者都有一个共同特点：读书少；凡是自觉英语水平和能力不高的学习者都会有一个共同感觉：读书少；反之，亦然。任何一位读者都可以自己为例，证明这个论断的正确性，并从而得出结论：多读书对学好英语、用好英语是至关重要的。

多读书，读什么？回答是：什么都读，有读无类；一切见之于英语文字的篇章，不拘种类，都应该读。为学习英语而阅读就该多而杂。但当务之急，似应在英语阅读方面跟上现代科技的飞速发展。这在我们的教与学中都是一个十分薄弱的环节。从生物钟到计算机到基因工程，我们也许能用汉语说个一二三；事实上，我们可以

像其他人一样，通过阅读汉语材料学到更多的有关知识。但是，我们是学英语的，是准备用英语工作的，我们能用英语说说这些属于现代科技中的常识性问题吗？以我自己为例，在读本书之前，我不能。

因此，我建议有心的读者不妨从学习王颖主编的《科技英语文选》开始，启动自己“用英语谈科技”的经历，这对达到“学好英语、用好英语”这个整体目标将是非常有益的。

李玉陈

1999年6月23日

于山东大学南苑

前　言

我们的大学生、研究生面对的将是一个国际化的信息时代，这要求他们具有较强的查、阅英语资料的能力。目前提倡的素质教育和高校教学改革，核心正是要求高校培养出综合型、复合型、实用型的人才，在此精神的指引下，高校教学的指导思想、课程相应的安排与设置、教材的编写与选用、教师的配备也正朝着这个中心努力。

《科技英语文选》正是在这一氛围中诞生的，它旨在介绍科技成就，普及科技知识，培养和提高学生们的英语阅读能力。全书选录22篇文章，内容涉及计算机、网络通信、医学、生物、环保等方面，所选文章全部选自原文材料，在编写过程中借助因特网和多媒体等手段，力求选材面广，内容新颖有趣，体裁多样，语言规范，知识性和趣味性并重，难易程度相当。

为了便于教与学，把内容相关的文章较集中地编排，这样便于教师选用。另外，每一篇文章后提供了单词表，生词分别用英语、汉语解释，但对于那些意思单纯，某一领域中的词条与术语，则直接给出汉语的意思，这样做更便于学生掌握和理解。注释主要是介绍作者的情况，同时对语言难点、难句作了解释；考虑到科技英语本身的特点和学生们对科技英语接触较少，注释部分是用英语、汉语

混合解释的。同时，每一课后面我们提出几个问题，供教师在课堂上引导学生讨论或学生课后思考，我们希望学生在英语阅读水平有所提高的同时，力争口头表达也上一个台阶。

本书可作英语专业科技英语课程的教材，也可作为大学高年级本科生和研究生的阅读教材，同时对提高 TOEFL 和 GRE 应试人员的阅读能力大有益处；由于提供了详尽的单词表和注解，本书也适合广大的英语爱好者自学。

我的研究生导师李玉陈教授在百忙中为本书作序，在此表示诚挚的谢意。我们希望本书的出版会受到广大师生和读者的欢迎，缺点和不足之处，恳请同行、读者批评和指教。

编 者

1999 年 6 月

Contents

Foreword(序) ······ (1)
Preface(前言) ······ (1)
Lesson One: Biological Clock ······ (1)
Lesson Two: Psychological Influences on the Childhood Diet ······ (11)
Lesson Three: The Carbon Equation ······ (23)
Lesson Four: Acid Rain Control: Success on the Cheap ······ (31)
Lesson Five: Living on the Edge ······ (45)
Lesson Six: Are We Selfish, Are We Nice, or Are We Nice Because We Are Selfish? ······ (56)
Lesson Seven: Fungus ······ (68)
Lesson Eight: Bacteria ······ (81)
Lesson Nine: Vitamins ······ (94)
Lesson Ten: Transmission Media ······ (110)
Lesson Eleven: Introduction to Communication Networks ······ (123)
Lesson Twelve: Electronic Mail ······ (136)

Lesson Thirteen: Electronic Cash ······················ (145)
Lesson Fourteen: Computer and Society ················ (157)
Lesson Fifteen: New Language Could Meld the Web into
a Seamless Database ···················· (170)
Lesson Sixteen: Common Rules for Animals and Plants
·· (181)
Lesson Seventeen: How Economists See the Environment
·· (189)
Lesson Eighteen: Environmental Pollution(Ⅰ) ········· (203)
Lesson Nineteen: Environmental Pollution(Ⅱ) ········· (218)
Lesson Twenty: Psychiatry ······························ (229)
Lesson Twenty-one: Genetic Engineering ··············· (242)
Lesson Twenty-two: No Need to Isolate Genetics ······ (260)

Lesson One

Biological Clock[1]

Karl C. Hammer

People who have to get up at a certain time in the morning often awaken just before the alarm goes off[2]. A biological clock seems to tick off the nighttime hours and "ring" an alarm in the brain to start the waking process.

With the possible exception of viruses and bacteria, every form of life seems to have an internal means of measuring time. These internal "clocks" do not require the intricate action of muscles or nervous systems since they are found in most one-celled plants and animals. They are probably "wound" by basic hiochemical events within the cells[3].

Why do living things need biological clocks? One reason is that such clocks regulate the sequence of tissue and organ formation during the development of many kinds of life. A plant that produced flowers before it grew roots would die. A newly born baby with teeth but no stomach would starve. Another reason is that biological clocks synchronize the natural rhythms——the times of activity and rest——of both diurnal (daytime) and nocturnal (nighttime) animals to ensure that peak activity[4] occurs when food or prey is available. Whether the biological clock within an organism is a single master rhythm[5] or a myriad of associated rhythms is not yet known.

Clocklike Rhythms in Nature

The rhythmic activity of most living things at certain times of the day and night offers strong support for the existence of biological clocks. When scientists first studied these rhythms, they dealt mainly with sleep movements, the rhythmic leaf movements of plants. Many plants go through[6] a rhythmic daily cycle—— their leaves are extended during the day and droop or are folded at night. When such plants were kept under laboratory conditions of constant darkness or low intensity light, the sleep movements continued for days. Under these conditions, however, the frequency, or time required to complete a cycle, of the rhythm was not exactly 24 hours. Afterward it was learned that the daily rhythms of many living things continued when they were subjected to similar laboratory conditions. For most organisms, the frequency of the persistent rhythm varied from 23 to 27 hours. Since these rhythms had a frequency not exactly 24 hours long, they were called circadian rhythms, from the Latin words *circa*, meaning "about," and *dies*, meaning "daily."

Circadian rhythms were known to naturalists centuries ago. The great 18th-century Swedish botanist Carolus Linnaeus grew a garden that told time. He planted flowers that opened or closed their blossoms an hour apart around the clock[7].

Mice have exhibited circadian rhythms under constant laboratory conditions. Normally, these nocturnal animals begin running on an exercise wheel in their cage at about dusk and then run intermittently throughout the night. During the day they sleep. When their cages are darkened and temperature is held constant, they maintain this circadian pattern in the laboratory, often week after week.

Colonies of the microscopic alga *Gonyaulax polyedra* illuminate ocean waves at certain times of the year. The algae are luminescent at night, especially if the water is agitated, and relatively nonluminescent during the day. Under constantly dark laboratory conditions, this circadian rhythm of luminescence and nonluminescence continues. It seems probable that almost all forms of life would display circadian patterns in the laboratory if similarly tested.

Characteristics of Circadian Rhythms

Certain similarities can he found in the circadian rhythms of most organisms. For one, frequencies are so precise that the start of each daily activity can often be predicted almost to the minute. In addition, circadian rhythms will entrain, or adjust to, an artificial light-dark cycle if the imposed cycle does not vary too much from a 24-hour length. If a test animal is exposed to 11 hours of light and 11 hours of dark in each cycle, its rhythm will entrain to the 22-hour cycle; if it is exposed to 13 hours of light and 13 hours of dark, its rhythm will adjust to the 26-hour cycle. In all the cases studied, however, the imposed cycle has never had a carry-over effect. It has been found that even though an organism has been subjected to artificial cycles for weeks, the regular circadian rhythm returns when the artificial one is removed.

A single exposure to light during an extended dark period may phase-shift any circadian rhythm. Because of the exposure, the rhythm may reach its peak at a different time of day. For example, a test mouse on a 26-hour cycle in a dark laboratory may begin running its exercise wheel at 10 PM on a specific evening. But if a light is turned on briefly afterward, the mouse may start running the wheel again at about 10 PM on the following night. This is a phase-shift of the circadian rhythm because ordinarily the running activity should begin at 11 PM the following night. However, the frequency of the rhythm does not change. A 26-hour cycle will remain a 26-hour cycle.

Circadian rhythm frequencies are not affected by temperature. This is true not only for warm-blooded animals but also for cold-blooded animals and plants, whose temperatures change with the surroundings. At cold and hot temperatures alike, circadian rhythms maintain the same frequency.

If circadian rhythms are the basis of biological clocks, they certainly have distinct advantages as timepieces. Through their entrainment feature, circadian clocks would adjust daily to the natural 24-hour cycle of Earth rotation, regardless of the rhythm's natural frequency. Through their phase-shift feature, the clocks in travelers who jet across many time zones[8] would adjust within days to new light-dark cycles. Since such clocks are temperature-compensated, they would not be affected by wide-ranging temperature changes.

Biological Clocks and the Seasons

Plants and animals in the temperate zones respond in various ways to the amount of daylight in 24-hour periods. This response to day length is called photo periodism. It controls many activities, among them the migration of birds, the hibernation of animals, and the flowering of plants. The ability to respond to day length is linked to an endogenous, or inner, light-sensitive circadian rhythm.

In the temperate zones, day lengths during the natural 24-hour cycle vary with the seasons. In winter and spring, the period of light lengthens; in summer and autumn, it shortens. Organisms in these zones undergo alternate 12-hour phases of light sensitivity. During one 12-hour phase, decreasing exposure to light induces a short-day reaction. For example, deciduous trees under the influence of the shorter days of autumn drop their leaves. During the other 12-hour phase, increasing exposure to light induces a long-day reaction. Deciduous trees grow leaves again during the lengthening days of spring. Although this description has heen greatly simplified, it indicates that through their sensitivity to changes in the duration of light, living things can measure day length to determine the season and the time spans within a season.

The relationship of this "time sense" to circadian rhythms is easily demonstrated. Florists, for example, often "trick" greenhouse plants into producing blossoms out of season by exposing them to unseasonal periods of artificial light[9].

Some scientists are not certain that the biological clock of any organism is completely endogenous. They think that even under the most constant laboratory conditions living things are aware of the

Earth's rotation and that this has an effect on the "balance wheel" of their clocks. However, many scientists believe that such geophysical factors are not essential to the functioning of biological clocks and that the clocks are probably endogenous.

Biological Clocks in Humans

Most, if not all, organisms have more than one circadian rhythm. Human circadian rhythms include the wake-sleep cycle, glandular secretion, the highs and lows in body temperature, and the excretion of urine. Many studies of persons who have lived for a time in Arctic regions, where there is continual daylight in summer, have confirmed the existence of these rhythms. Confirmation has also been provided by experimental studies, such as made of persons living in caves under artificial conditions.

Circadian rhythms are known to rephase when a person flies across many time zones in a day. On reaching their destinations, travelers are under new local times, and it takes a few days for their bodies to adjust to the new day-night patterns. This phenomenon is commonly called jet lag. Frequent shifts in circadian patterns, as when a person takes several transatlantic flights in a month, can lead to mental and physical fatigue. Studies of airline pilots and flight attendants who often travel across many time zones revealed that some of the subjects' body functions became irregular. Other studies have shown that the human hody can learn to function in cycles ranging from 18 to 28 hours. Any variance greater or less than this, however, usually causes the body to revert to a 24-hour cycle.

In outer space, daylight patterns are not consistent. Astronauts first encounter rapid changes in the day-night cycle while orbiting the Earth; farther out, there is constant blackness. To avoid disrupting their natural circadian rhythms, astronauts follow regimented cycles estahlished to simulate the 24-hour day. Scientists are conducting studies to research what effect future spaceflights will have on astronauts compelled to live for a long time under artificial conditions.

(From *Compton's Interactive Encyclopedia*)

New Words

intricate adj. containing many detailed parts and thus difficult to understand 错综复杂的

wind v. to make (some machine) go by turning some part of it 上紧…的发条

synchronize v. to cause to happen at the same speed 使同步;使在时间上一致

myriad n. a great and varied number 极大数量

droop v. to hang or bend downwards 低垂;下垂

subject v. to cause to be controlled or ruled 使受到…的控制;受支配于

persistent adj. continuing to exist, or appear for a long time 持续的

circadian adj. 生理节奏的

naturalist n. a student of natural history, esp. a field biologist 博物学家

blossom n. the flower of a seed plant 花

intermittent adj. happening then stopping, then happening again, with pauses in between, not continuous 时断时续的

intermittently adv. 时断时续地

colony n. a group of the same kind of animals or plants living in close association 群体；菌落

alga n. any of various chiefly aquatic, eukaryotic, photosynthetic organisms, ranging in size from single-celled forms to the giant kelp 海藻

luminescent adj. transmitting, producing or yielding light 发光的

agitate v. to move the surface of a liquid about 搅动(液体)

imposed adj. to be established or applied as compulsory 强加的

carry-over adj. 从前一阶段或先前的活动继续下去的，遗留下来的

timepiece n. 时计(指钟、表)

photo periodism 光周期现象；光周性

endogenous adj. caused by factors inside the organism or system 内生的

undergo v. to go through; experience 经历

alternate adj. happening or following in turns; succeeding each other continuously 交替的；轮流的 *e.g. alternate seasons of the year*

deciduous adj. shedding or losing foliage at the end of the growing season 每年落叶的

induce v. to cause or produce 引起；导致

span n. a length of time over which something continues or works well 一段时间

glandular secretion 腺分泌

confirm v. to support, make certain or give proof of 进一步证实

jet lag a temporary disruption of bodily rhythms caused by high-speed travel across several time zones typically in a jet aircraft 跨时区高速飞行后生理节奏的破坏(时差)