高等学校试用教材

4

ENGLISH

上海交通大学科技外语系
吴银庚(主编)　张彦斌(副主编)
吴信强　王士先　李汉卿　李荣辉

高等教育出版社

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本书系一套高等学校理工科通用的英语教材，共分四册(每册均配有教师参考书)，供学过英语并掌握700左右单词和基本语法的学生使用。本教材仍以阅读为教学目标，同时进行一些听、说、写的训练。全书采用单元的编写形式，每册各有12个单元。本书选材新颖，题材较广，以科普性文章为主，内容有趣，语言规范，易于上口。

本册增加了课文的难度和长度，注意选编了科学著作中的序言之类的文章，加强了对科技英语写作的指导和训练，增编了“英译汉翻译指导”。“结构学习”与“有指导的会话”不再专列项目，而代之以相应的练习。

本册是继前三册基础阶段之后的提高阶段教材，既与前三册衔接，又有一定的独立性，供学完基础阶段英语的理工科大学生和科技人员进一步提高英语阅读和写作能力之用。

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说　明

本书是高等学校理工科通用英语教材第四册，也是全套教材的最后一册。本册属提高阶段教材，教学目的侧重于进一步提高阅读理解能力与写作能力。因此，与前三册相比，增加了课文的难度和长度，较大幅度地充实了“有指导的写作”的内容，并增写了“英译汉翻译指导”。但是，结构学习和有指导的会话不再作为专门的项目列出。本册仍为12单元，每一单元包括课文、词汇学习、有指导的写作、听力训练和阅读材料等五个部分。英译汉翻译指导集中放在12单元之后，以便教学时灵活使用。

本册内容既考虑了与前三册基础阶段的衔接，又有一定的独立性，可供学完基础阶段英语的大学理工科学生和工程技术人员进一步提高阅读和写作能力之用。本书教学时数仍为80学时(其中翻译部分安排10学时，阶段复习取消)。

本书的主要内容如下：

1. 课文　以科技内容为主，题材广泛，有仿生学、同位素确定化石年代、航天飞机、人工智能、遥控技术、光纤通讯、科学教育等，文章大多选自英美科技书刊，如：*Popular Science*, *Science Digest*, *Endeavour*, *Encyclopaedia Britannica*，以及一些语言教科书，还注意选编了一些科技书籍的序言和综合性介绍的章节。每篇课文的长度约2,500—3,000印刷符号，生词量约30—40个。课文练习形式有所变化，主要侧重于阅读理解(如增加 anaphoric reference 代词指代关系）和综合使用语言的练习（如句子和短文的汉译英等)。由于本册书中不专门安排有指导的会话，在课文的第5个练习(Questions for Discussion) 中安排了一些内容可供讨论的问题，

目的是使学生能应用书中已学过的词汇和句型进行口头训练。

2. **词汇学习** 本册教材中重点选择了35个常用词（主要是动词）。每个词义后增加了英语解释，例句数量增多但不再附汉语译文。一些常用句型和搭配关系不再用方括号表示，而一律在例句中用斜体标出。练习量也有增加。

3. **有指导的写作** 第二、三册的写作主要是按照一些科技常用概念（如长、宽、高，可能性等）列出一些句子的表达方式。本册教材除了单句的写作外，主要介绍科技英语中的段落写作，如实验描述、操作说明书、书信写法、图表和曲线图的描述、摘要写作等。

4. **听力训练** 文章长度为700—800印刷符号，内容结合课文。新单词控制在5个左右。本册听力训练后配有两个练习。一是填写反映听力短文中主要内容的词或短语，另一是口头回答问题，要求学生把听和说的训练结合起来。

5. **阅读材料** 题材和内容尽量配合课文，阅读材料（A）和（B）的长度每篇约3,000印刷符号，单词和词组约20个。

本册共出现新单词1271个，要求记忆的631个；新词组177个，要求记忆的89个。

本册书后还附有：a）英国英语和美国英语常用词汇拼写对照表；b）常用词缀表（侧重于科技文章中出现较多、派生能力较强的词缀）；c）词组表；d）总词汇表；e）专有名词表。

本书的英译汉翻译指导部分由奚兆炎编写。

参加第四册教材审稿的人员有：大连海运学院刘鸿章（主审）、上海工业大学戴浩中、复旦大学郁明亮、西南交通大学王世馥、华中工学院张义斌和华南工学院郭杰克。

上海外国语学院英籍教授 Margaret Wang（王珍珠）和1980—1981年度在本校任教的英国专家 Frank Thorne, Christopher Pearson, David Chapman, Desmond Allison 对本册教材提出了许多宝贵意见。

本册在编写过程中得到许多兄弟院校的热情支持，收到了不少建议。对以上单位和人士的大力支持与帮助，我们表示衷心的感谢。

编　者

1981 年 6 月

Contents

Table of

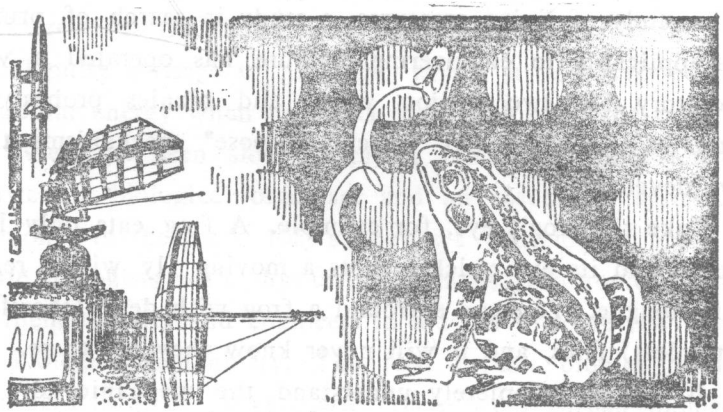
UNIT	PAGE	TEXT	WORD STUDY	GUIDED WRITING
1	1	The Science that Imitates Nature's Mechanisms	Supply Verbs ending in "-ion"	Experimental description I. Use of the Imperative Mood or the Passive II. Use of the Simple Present and Simple Past Tenses
2	25	A Century of the Electric Lamp	Bring Advantage—Disadvantage	Expanded definition I. Definition+Example II. Definition+ Use III. Definition+Main Parts
3	51	Chemistry as a Natural Science	Separate Body	Descriptions of How Things Work
4	76	Carbon 14—a New Time-Telling Tool	Rather Range Date	Actions in Sequence I. Preceding, Simultaneous and Following Events II. Sequences III. Cycle
5	103	Magnetism in the Health Science	Consider originate—origin—original	Operational Instructions

Units

LISTENING COMPREHENSION	READING MATERIAL
Imitation of Natural Mechanisms	(A) Eyes, Ears, Nose and Brain (B) What Is Bionics?
Edison as a Telegraph Operator	(A) Electricity and Electronics (B) The History of Metals
Control of Plant Growth with Chemicals	(A) Natural Science: A Body of Systematized Knowledge (B) From Ivory to Plastics
How Old Is Water?	(A) Finding the Age of Objects (B) Radiocarbon Clock Inaccurate
Faraday and His Generator	(A) Developing Maglev Trains (B) The Earth's Magnetic Field

LISTENING COMPREHENSION	READING MATERIAL
The Aging of Astronauts	(A) Tachyons. Faster Than Light... If They Exist (B) Clock Paradox
A Pickup Truck for the 'Eighties	(A) Students in Space? Maybe! (B) Chances of Making Contact
The Story of Samuel Morse's Invention	(A) Electrical and Electronic Engineering in the Future (B) Are Quarks Really the Ultimate End?
Machines — a Part of Ourselves	(A) The Machine Age (B) The Future of Robotics
Automatic Control of Trains	(A) Feedback—The Action Correcting System (B) Information Bank
The Visual Ear	(A) New Telephonic Tricks Are on the Way (B) Fiber Optics
College Students Today	(A) Science Education for a New Age (B) The Preface of *The Man-Made World*

UNIT 1



TEXT

The Science That Imitates Nature's Mechanisms

In the early 1960's an industrialist became very suspicious about American purposes and intentions in certain areas of scientific research. He learned by chance that the United States was signing contracts with many foreign scientists, calling for research into such matters as the function of the frog's eye and the learning abilities of some animals.

It seemed to the industrialist that such studies could not possibly have any practical value. He seriously believed that the United States was asking the foreign scientists to do meaningless work and waste their time.

Actually, the research the industrialist questioned involved a field of science so new at that time that most people had never heard of it. Named bionics in 1960, this science is the study of living creatures, a study in search of principles applicable to engineering. Nature has operated a vast laboratory for two billion years, and bionics probes the secrets of the wonderful "special-purpose" mechanisms that have developed.

Take the frog's eye, for example. A frog eats only live insects, and its eye quickly spots a moving fly within reach of its tongue. You can surround a frog with dead (therefore motionless) flies, and it will never know they are there.

If we can completely understand the mechanics of the frog's eye, we can develop a "map-reading eye" for missiles and a "pattern-recognition eye" for our air-defense system. This system is badly overworked. Its network of radar "eyes" supplies a great mass of unimportant details about meteorites, clouds, flights of birds and friendly planes, and it sometimes gets confused. Until we can build a mechanical frog's eye into this system, it will remain somewhat inefficient.

Theoretically at least we should be able to copy these mechanisms found in nature, for all biological organisms are in part actually electrical systems. The sense organs that "connect" all animals to the outside world are merely transducers — instruments like a microphone, TV camera, or phonograph pickup arm — which convert one form of energy into another. A microphone, for example, converts sound into electrical signals which are carried to a loudspeaker and

converted back into sound waves. Similarly, the nerve cells of a man's ear convert a cry for help into electrical pulses which are carried over his nervous system to the brain. The brain receives the signal, and then sends an answering electrical-pulse message to his legs, where it is converted into muscular energy when he starts running toward the cry.

We have been slow to profit from this close analogy between a biological organism and an electronic system. It was only in the early 1950's that we consciously began to unite biologists with physicists, chemists, electronic experts, mathematicians, and engineers in a team to solve the secrets of biological machinery. The first formal bionics meeting was held in 1960. A year later there were 20,000 biologists at work in research laboratories in the United States, more than double the number employed ten years earlier.

New Words

1.	imitate	['imiteit] *vt.*, *vi.*	模仿；仿造
2.	suspicious	[səs'piʃəs] *a.*	(表示，引起)怀疑的，可疑的
3.	intention	[in'tenʃən] *n.*	意图；动机
4.	unite	[ju(:)'nait] *vt.*, *vi.*	(使)联合，(使)连接；统一
5.	sign	[sain] *vt.*, *vi.*	签字(于)
		n.	记号，符号；手势
6.	contract	['kɔntrækt] *n.*	合同，契约
		[kən'trækt] *vt.*, *vi.*	(使)收缩
7.	function	['fʌŋkʃən] *n.*	作用；功能；函数
		vi.	起作用

8. frog	[frɔg] *n.*	蛙
9. bionics	[bai'ɔniks] *n.*	仿生学
10. billion	['biljən] *n.*	[美]十亿；[英]万亿
11. secret	['si:krit] *n.*	秘密
12. live	[laiv] *a.*	活的，有生命的；(参加)实况播送的
13. insect	['insekt] *n.*	昆虫
14. spot	[spɔt] *vt.*	发现，看出；弄上污点
15. fly	[flai] *n.*	(苍)蝇
16. tongue	[tʌŋ] *n.*	舌
17. dead	[ded] *a.*	死的，无生命的
18. defense [美]	[di'fens] *n.*	防卫，防御
defence [英]	[di'fens]	
air-defence		防空
19. meteorite	['mi:tjərait] *n.*	陨星(石)
20. confuse	[kən'fju:z] *vt.*	使混乱，使混淆
21. somewhat	['sʌm(h)wɔt] *ad.*	稍微，(多少)有点
22. copy	['kɔpi] *vt.*, *vi.*	模仿；复制；抄录
	n.	抄本；复制品；一份，一册，一本
23. organ	['ɔ:gən] *n.*	器官
24. merely	['miəli] *ad.*	仅仅，只
25. transducer	[trænz'dju:sə] *n.*	换能器；变换器；传感器
26. microphone	['maikrəfəun] *n.*	扩音器
27. pickup	['pikʌp] *n.*	拾音(器)
28. convert	[kən'və:t] *vt.*, *vi.*	转换，转变
29. loudspeaker	['laud'spi:kə] *n.*	扬声器
30. nerve	[nə:v] *n.*	神经
31. cry	[krai] *n.*	呼(喊)声
	vt., *vi.*	叫喊

32.	brain	[brein] *n.*	脑；头脑
33.	muscular	['mʌskjulə] *a.*	肌肉的
34.	profit	['prɔfit] *n.*	利益；益处
		vt., *vi.*	有利(于)；利用
35.	analogy	[ə'nælədʒi] *n.*	类推；类似；模拟
36.	consciously	['kɔnʃəsli] *ad.*	有意识地
37.	team	[ti:m] *n.*	组；队

Phrases and Expressions

1.	(be) suspicious about	对…感到可疑
2.	hear of	听到(人或事)；听说
3.	in search of	(为了)寻求，试图发现
4.	within the reach of	在…够得着的地方；为…力所能及的范围内
5.	in part	部分地，有几分
6.	convert ... into	把…转换为
7.	unite ... with	把…与…结合起来

Notes

1. This system is *badly* overworked.
这种系统的工作负担过于繁重。
badly 意为 very much 或 seriously。
2. We *have been slow to* profit from this close analogy between a biological organism and an electronic system.
生物有机体和电子系统极为相似，但是我们很晚才学会利用这一点。
be slow (+ to V) 意为 not be quick to learn 或 acting only after a time。

Exercise 1 Are these statements true or false according to the text?

1) At the beginning of the 1960s, an industrialist happened to find

out that America was interested in research into such matters as the function of the frog's eye.

2) The industrialist believed that research into the learning abilities of some animals was a meaningless job, so he asked the United States to give up such studies altogether.
3) Bionics, named in 1960, is a science which deals with the application of principles developed in laboratory experiments to engineering.
4) A frog's eye can easily see a moving insect within the area which its tongue is able to reach, but it will never notice dead bodies of insects lying nearby.
5) The network of radar "eyes" based on the mechanics of the frog's eye is badly overworked, because it supplies a great amount of unnecessary details of what it sees.
6) The radar system will not work properly until it is fitted with a "map-reading eye".
7) Since all biological organisms are more or less electrical systems, it is at least theoretically possible to replace all the man-made things with the mechanisms found in nature.
8) All animals are linked with the outside world through their sense organs, which can be regarded as transducers able to convert one form of energy into another.
9) The close relationship between a biological organism and an electronic system was discovered long ago, but so far man has not been able to make use of this analogy.
10) In the early fifties, the number of biologists at work in bionics research in the United States was believed to be much less than 10,000.

Exercise 2 What do the following pronouns in the text refer to? Choose the correct answer.