

孔庆炎 张 旭 童光燧 主编

新科技英语阅读教程

(上 册)

New EST Reading Courses
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大连理工大学出版社

NEW EST READING COURSE

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上册

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主编 孔庆炎 张旭 童光燧

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内容提要

本教材是根据国家教委颁发的《大学英语教学大纲》(理工科用)编写的,可作为《大纲》规定的专业阅读阶段的教材,也可供具有中等英语水平的广大科技人员进一步进修英语使用。

本教材的特点是:一、通过精选的范文归纳、介绍不同文体英语科技文的篇章结构特点,以便帮助读者更有效地阅读英文科技文献,迅速搜集所需科技信息。二、围绕当代若干重要科技领域(如计算机、无线电通讯、航空航天、交通、能源、环保等)选取阅读文章,介绍这些领域的科技新成果和发展动向,但不过深涉及具体专业内容,因此本教材可供理工科各专业的学生和科技人员使用。

新科技英语阅读教程

Xinkejiyingyu Yuedujiaocheng

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Preface (前言)

根据高等学校理工科本科《大学英语教学大纲》(以下简称《大纲》)的规定,高等学校理工科在本科生完成《大纲》所规定的大学英语基础阶段学习后,从第五学期到第七学期要开设必修的专业阅读课。考虑到高校理工科专业繁多,而且在第五学期大部分学生还没有完全接触到所学的专业课,学生从基础阶段立即转入阅读本专业的英语资料尚有一定困难,我们特编写了这本通用《新科技英语阅读教程》,供理工科各专业本科生在第五和第六两学期使用。

本教程在选材上着重考虑以下两点:一是所选英语材料所叙述的科技内容一般能为理工科三年级学生所理解,不过多过深地涉及具体专业知识,避免由于选材内容过专而影响阅读能力的培养;二是所选的语言材料均出自英文科技书刊,属科技文体,能体现英语科技文的篇章结构特点和词汇特点,以便学生在学完本教程之后能顺利阅读所学专业的英语资料。

本教程共九个单元,每单元分两大部分。第一部分 Discourse Features 简要介绍英语科技文的篇章结构特点。每个单元着重介绍某一方面的篇章结构特点,如前言、定义、分类与比较、结构与系统、过程等。介绍之后辅以范文(Samples)。范文选自多种英文科技书刊,尽量体现本单元所介绍的篇章结构部分的特点,以便于学生根据这些特点来更好地阅读,在阅读具体语言材料的基础上进一步加深理解和掌握这些特点。第二部分 Readings on Scientific Topics 主要选材于 Science Fact 一书。每个单元围绕一个专题介绍当代重要科技领域的新成果和发展动向。这一部分选材和第一部分所介绍的篇章结构特点无一定的对应关系。主要是为学生提供阅读素材。其目的是通过大量阅读提高学生阅读英语科技资料和获取信息的能力。

每篇范文和阅读选文后均列有生词和词组表,并附有少量的注释。由于使用本教程的学生已修过《大纲》规定的四级,生词表只收四级词表以外的词。凡属于《大纲》五、六级的词在该词条前均标有△符号,以示区别。所收入的词组系四级以外的或虽属四级但估计学生掌握尚不巩固的词组。为了便于学生阅读,在本教程各单元中重复出现的生词,每次重复出现时都做为生词重复收入。生词一般只注在本篇文章中所出现的词义。这样处理生词也有助于教师根据自己的教学对象和需要,自行安排各单元的教学顺序或有选择地使用各篇选文。

各单元第一部分的每篇范文和第二部分的每篇阅读选文之后均附有练习。第一部分每篇范文之后的第一项练习为阅读理解练习。然后是词汇练习。最后一项为篇章结构练习。在布置篇章结构练习时,教师可稍加指点,明确做该项练习的目的和方法。

第二部分每篇阅读选文后的练习为阅读理解练习，用以指导与检查学生的阅读。在第二部分的最后有词汇练习，对整个第二部分的词汇做一定的复习检查。

根据《大纲》的规定，专业阅读阶段的任务是：“指导学生阅读有关专业的英语书刊和文选，使其进一步提高阅读英语资料的能力，并能以英语为工具，获取专业所需要的信息。”根据这一要求，编者建议：在组织教学时，每一单元的第一部分为必学部分，因为这一部分介绍的是英语科技文的篇章结构特点，是英语科技文的共性部分。任何专业的学生都有必要了解和掌握这些特点。懂得这些特点有助于提高学生的阅读技能。至于各单元的第二部分，教师可根据所教学生的专业特点，有选择地加以使用。但使用总量不应少于三分之二，否则难以保证必要的阅读量。不管教师对本教材做何处理，在整个教学过程中，必须突出以阅读为中心，要引导学生从语篇水平上进行阅读理解，避免在句子上花过多的功夫，更不能搞逐词逐句的分析翻译。编者主张多读、快读（教材中有些阅读选文可用来在课上进行快速阅读训练）。通过大量阅读掌握阅读技巧，提高阅读能力。在阅读过程中，既要注意对内容的准确理解，又要注意阅读速度与阅读总量（《大纲》规定三个学期的总阅读量为 250 000 词左右）。正确处理两者之间的关系，是专业阅读阶段能否达到预期目的的关键之一。

由于编写时间和编者水平的限制，本教材定有不少不足之处。欢迎外语界的同行，尤其是使用本书的专业英语教师和学生提出批评和改进意见。

编者

一九九一年五月

CONTENTS (目 录)

Preface	(1)
---------------	-----

Unit One

Part One Discourse Features	(1)
-----------------------------------	-----

Preface	(1)
---------------	-----

Sample A Preface	(2)
------------------------	-----

Sample B Editor's Foreword	(5)
----------------------------------	-----

Sample C Preface	(13)
------------------------	------

Sample D Preface	(20)
------------------------	------

Part Two Readings on Scientific Topics	(26)
--	------

Electronics	(26)
-------------------	------

Passage A	(26)
-----------------	------

Passage B	(33)
-----------------	------

Passage C	(37)
-----------------	------

Passage D	(44)
-----------------	------

Unit Two

Part One Discourse Features	(53)
-----------------------------------	------

Definition	(53)
Sample A Analogy and Memory	(61)
Sample B The Heat Engine	(66)
Sample C Matter, Mass and Energy	(73)
Part Two Readings on Scientific Topics	(81)
Energy	(81)
Passage A	(81)
Passage B	(92)
Passage C	(99)
Passage D	(104)

Unit Three

Part One Discourse Features	(113)
Classification and Comparison	(113)
Sample A Surveying	(117)
Sample B Classification of Small Dams	(123)
Sample C Metals	(130)
Part Two Readings on Scientific Topics	(136)
Transport and Communication	(136)

Passage A	(136)
Passage B	(145)
Passage C	(153)

Unit Four

Part One Discourse Features	(164)
Structuer and System	(164)
Sample A And Now It is Pond Power	(166)
Sample B The Champion Scrubber—Polisher	(172)
Sample C Systems	(178)
Part Two Readings on Scientific Topics	(184)
The Living Sea	(184)
Passage A	(184)
Passage B	(193)
Passage C	(206)

Unit Five

Part One Discourse Features	(219)
Process	(219)
Sample A Pig—iron Production	(221)

Sample B	Machine Papermaking	(227)
Sample C	Whiskey Production	(234)
Part Two Readings on Scientific Topics		(240)
Industrial Civilization		(240)
Passage A		(240)
Passage B		(247)
Passage C		(253)
Glossary		(260)

Unit One

Part One Discourse Features

Preface (前言)

前言, 顾名思义, 是书刊中编著者的开场白, 对书的内容进行总体概括说明或介绍。前言有的写得很短, 只简单地对内容概括说明。大多数前言写得较长, 涉及的内容较多。读者通过前言能对全书有一总体了解。

英语前言的形式一般为 Preface 和 Introduction。如果是几位作者撰写的专题丛书, 则在 Preface 前通常有 Editor's Foreword (编者的话)。

就前言所述内容来说, 大体包括有:

1. 编写此书的目的、依据或意图。编著者通常先阐述涉及的学科或课题的情况 (如为适应其发展现状; 把比较好、比较新的见解和理论反映在著作中) 或者说明该学科或课题意义重大, 因而需要出版专著。

2. 编写对象: 说明本书是为学科行家、一般读者还是为学生编写的。因而其内容涉及面及深浅度不同。

3. 书中讨论的具体内容、章节的分布及各章节的内容与特点。

4. 与相关学科的关系: 该学科课题会与哪些学科有关联。

5. 该学科或课题的发展前景。

6. 该书的使用方法指导、编著者预期达到的目的与愿望。

7. 书中不足之处或读者按常理认为应包括而未写入的内容与原因, 使读者知道书中侧重的内容。

8. 大多数的编著者还在前言最后向对该书的出版给予支持或协作的人表示感谢。有的还专门列入 Acknowledgement (鸣谢) 一项, 以表示谢意。

有的著作中兼有 Preface 和 Introduction, 用具体事例或细节论述课题发展的过程与沿革。有的 Introduction 是对全书内容作摘要性介绍, 有的全书每一章前均列 Introduction。有些书一开头便是 Introduction (无 Preface), 提出该学科或课题中有关的最基本概念、定义及范畴。

并不是所有的前言都包含上述八项内容, 内容也不一定按上述顺序出现。

科技阅读的目的是获取信息，获得所需的参考资料。在知识爆炸的今天，信息来源极为广泛，读者需要查阅大量文字资料，但不可能成部头地阅读，只能通过前言综观全貌以确定其可利用（参考）的价值，因此具备阅读前言的能力十分重要。

前言说理性强，作者常对问题提出个人见解，论述用词严谨、科学精确。由于编著者的写作水平不同，读者对象不同，写作风格各异，反映这些内容的语言难度也较大，比一般科技内容的论述更难于理解。例如，大量使用各种类型的从句，特别是定语从句，以使论述严密准确。广泛使用 that, it, as 等有多种功能的小词。此外还可概括出以下几个特点：

1. 用短语代替从句：用名词短语来代替名词从句；用形容词短语代替定语从句；用分词独立短语代替状语从句。这样，用词较少，结构简练，表达严密，但却增加了理解的难度。如 Inclusion of a number of topics is planned 就比 We are planning to include a number of topics 更难理解，更不用说中间再加上定语、状语等修饰成分了。

2. 修饰成分多，频繁使用动词的各种非谓语形式。如在 It is our hope that after taking a course using this text, students will have sufficient understanding of system analysis and electronics design to be able to master more advanced material as needed. 这句话中有七处用了动词的非谓语形式。

3. 除用替代词 it, they 外，还经常使用词义相当的词来避免重复。如在同一篇前言中，“课程”一词先用了 subject，但在另处又用了 subject matter，又在另一处用了 course 或 material。

阅读前言时，抓住前言的结构特点，顺着作者可能收入前言的各个部分去理解，阅读就会变得轻松一些。但由于前言的文字比较严密艰深，故阅读时需更加细心。下面所选的几篇前言，简繁程度不同，但都涉及上面所概括的部分或几乎全部，阅读时应注意分析归纳。

Sample A

Preface

"Scientifically Speaking" is a short introduction to the English written and spoken by scientists and engineers. The book shows the specialized English of science and technology in use, and gives examples of many words which are frequently found in a number of scientific and technological fields.

After a general introduction on technical English, there are twelve chapters, each of which deals with a particular technological subject by means of written texts, diagrams and conversations. The most useful vocabulary items from the chapters are studied in detail. There is also a general vocabulary at the end of the book. A special appendix comments on some of the grammatical structures and sentence patterns commonly used by scientists and engineers which occur throughout the book.

The reader is not expected to be an expert in the subject dealt with in the book. He needs to have a knowledge of elementary science and mathematics, but the technical subject matter of the book is presented in a way that will be of interest to the specialist and non-specialist alike. Since the technical and semitechnical words which occur in the English texts are studied in detail or appear in the general vocabulary, the book can be used without the help of a technical dictionary.

Acknowledgements

The British Broadcasting Corporation¹ wishes to thank the following for generous assistance in the preparation of this book:

Plastic	The British Plastics Federation
Nuclear Power	The United Kingdom Atomic Energy Authority ¹² The Central Electricity Generating Board ¹³
Oil	Esso Petroleum Co. Ltd.
Civil Engineering	The Institution of Civil Engineers ¹⁴ Binnie & Partners, Consulting Engineers
Electronics	The Institute of Computer Science 'Electronics Weekly' ¹⁵
Shipbuilding	The Shipbuilding Industry Board The Shipbuilders and Repairers National Association The British Shipbuilding Research Association
Computers	Computer Enterprises Ltd. The Institute of Computer Science The General Electric and English Electric Companies Ltd.
Telecommunications	The Post Office Corporation

From *Scientifically Speaking*

New Words and Expressions

- Δ appendix [ə'pendiks] n. 附录
acknowledgement [ək'nɒlɪdʒmənt] n. 感谢, 答谢
federation [fedə'reɪʃn] n. 联合会
telecommunication [ˈtelɪkəmjuːni'keɪʃn] n. 电信 (学)
Δ consult [kən'sʌlt] v. 商量, 磋商; 查阅

*	*	*	*	*	*	*	*	*
vocabulary item	词条							
subject matter	学科内容, 题材							
be of interest to	对来说……饶有兴趣							

Notes

- ① The British Broadcasting Corporation
(BBC) 英国广播公司
- ② The United Kingdom Atomic Energy Authority
(UKAEA) 英国原子能管理局
- ③ The Central Electricity Generating Board
(CEGB) 中央电力局
- ④ The institution of Civil Engineers
(ICE) 土木工程师协会
- ⑤ Electronics Weekly 电子学周报

Exercises

Comprehension

1. 'Scientifically Speaking' mainly presents_____.
A. the spoken English used in science and technology
B. the written English used in Science and technology
C. the recent developments in some scientific and technological fields
D. both A and B
2. Paragraph 2 mainly tells us about_____.
A. the structure of the book
B. the purpose the author bears in mind in writing the book

- C. the way in which the book should be used
- D. the special characteristics of the book
- 3. Apart from the main body, the book contains_____supplementary parts.
A. 1 B. 2 C. 3 D. 4
- 4. The book is written for_____.
A. specialists only
B. non-specialists only
C. both specialists and non-specialists
D. those who are familiar with the subject matter discussed in this book
- 5. Why don't the users of this book need to consult a technical dictionary?
Because_____.
A. the readers of the book are supposed to have mastered some basic technical and semi-technical words
B. the technical and semi-technical words involved are discussed in detail in this book
C. this book contains a general vocabulary which includes the technical and semi-technical words concerned
D. both B and C

Sample B

Editor's Foreword

THE TEACHING OF GENERAL CHEMISTRY to beginning students becomes each day a more challenging and rewarding task as subject matter becomes more diverse and more complex and as the high school preparation of the student improves. These challenges have evoked a number of responses; this series of monographs for general chemistry is one such response. It is an experiment in the teaching of chemistry which recognizes a number of the problems that plague those who select textbooks and teach chemistry. First, it recognizes that no single book can physically encompass all the various aspects of chemistry that all instructors collectively deem important. Second, it recognizes that no single author is capable of writing authoritatively on all the topics that are included in everybody's list of what constitutes general chemistry. Finally, it recognizes the instructor's right to choose those topics that he considers to be important without having to apologize for having omitted large parts of an extensive textbook.

This volume, then, is one of approximately fifteen in the General Chemistry Monograph Series, each written by one or more highly qualified persons very familiar with the current status of the subject by virtue of research in it and also conversant with the problems associated with teaching the subject matter to beginning students¹. Each volume deals broadly with one of the subdivisions of general chemistry and constitutes a complete entity, far more comprehensive in its coverage than is permitted by the limitation of the standard one-volume text². Taken together, these volumes provide a range of topics from which the individual instructor can easily select those that will provide for his class an appropriate coverage of the material he considers most important.

Furthermore, inclusion of a number of topics that have only recently been considered for general chemistry courses, such as thermodynamics, molecular spectroscopy, and biochemistry, is planned, and these volumes will soon be available. In every instance a modern structural point of view has been adopted with the emphasis on general principles and unifying theory³.

These volumes will have other uses also: selected monographs can be used to enrich the more conventional course of study by providing readily available, inexpensive supplements to standard texts. They should also prove valuable to students in other areas of the physical and biological sciences needing supplementary information in any field of chemistry pertinent to their own special interests. Thus, students of biology will find the monographs on biochemistry, organic chemistry, and reaction kinetics particularly useful. Beginning students in physics and meteorology will find the monograph on thermodynamics rewarding. Teachers of elementary science will also find these volumes invaluable aids to bringing them up to date in the various branches of chemistry.

Each monograph has several features which make it especially useful as an aid to teaching. These include a large number of solved examples and problems for the student, a glossary of technical terms, and copious illustrations.

The authors of the several monographs deserve much credit for their enthusiasm which made this experiment possible. Professor Rolfe Herber of Rutgers University has been of invaluable assistance in the preparation of this series, having supplied editorial comment and numerous valuable suggestions on each volume. Thanks are also due to Professor M. Kasha of the Florida State University for many suggestions during the planning stages and for reading several of the manuscripts.

RUSSELL JOHNSON

Preface

COORDINATION CHEMISTRY is primarily concerned with metal complexes, but many of its concepts are applicable to chemistry in general. Beginning students, therefore, will profit from an appreciation and understanding of the basic principles of coordination chemistry, which may later be applied in more sophisticated fashion in advanced courses.

Although textbooks of general chemistry usually contain brief treatments of metal complexes and coordination chemistry, their limited space precludes the discussion of many of the important aspects of the subject. This being so, the present book was written to supplement the material now available on the subject to freshman chemistry students. The authors believe that the material presented will also be of value to students in junior-senior level courses in inorganic chemistry.

Modern theoretical concepts as applied to metal complexes are used. At first glance, such an approach may seem more difficult and confusing than a somewhat more traditional treatment. However, it is our experience that beginning students are able to grasp these concepts, thus making it easier for them to understand the material as presented in advanced courses. The valence bond theory is mentioned only briefly, whereas the crystal field and molecular orbital theories are discussed in considerable detail. These theories are used to explain the stability and liability of metal complexes. Current theories of reaction mechanisms are also included.

The authors would appreciate both suggestions for the improvement of the book and reports of student reaction toward it. We wish to thank Dr. S. A. Johnson, who read the entire manuscript and made many helpful suggestions. One of us (F. B.) wishes to thank Dr. V. Caglioti and the people in his Institute at the University of Rome, where part of the original writing of this book was done, for their generous help and hospitality.

FRED BASOLO
Evanston, Illinois

RONALD C. JOHNSON
Atlanta, Georgia

From *Coordination Chemistry*

New Words and Expressions

- challenging [ˈtʃælɪndʒɪŋ] a. 挑战的, 有吸引力的
rewarding [riˈwɔːdɪŋ] a. 有价值的
evoke [iˈvəʊk] v. 引起, 唤起
monograph [ˈmɒnəgrɑːf] n. 专题著作
plague [pleɪɡ] v. 使……烦恼
textbook [ˈtekstbʊk] n. 教科书
Δ physically [ˈfɪzɪkəli] ad. 实际上
encompass [ɪnˈkʌmpəs] v. 围绕, 包括 (含)
Δ deem [diːm] v. 认为, 相信
collectively [kəˈlektɪvli] ad. 集体地
authoritatively [ɔːˈθɒrɪtətɪvli] ad. 有权威地
Δ instructor [ɪnˈstrʌktə] n. 教员
then [ðen] ad. 而且, 另外
Δ status [ˈsteɪtəs] n. 情况, 状况, 地位
conversant (with) [kənˈvɜːsənt] a. 熟悉的, 精通的
subdivision [sʌbdɪˈvɪʒən] n. 再分, 细分
coverage [ˈkʌvərɪdʒ] n. 所包括的范围 (区域, 数量)
inclusion [ɪnˈkluːʒən] n. 包括, 包含
thermodynamics [θəˈmɔːdaɪˈnæmɪks] n. 热力学
Δ molecular [məʊˈlekjʊlə] a. 分子的
spectroscopy [spekˈtrɒskəpi] n. 分光学, 光谱学
biochemistry [baɪəʊˈkɛmɪstri] n. 生物化学
unify [ˈjunɪfaɪ] v. 使……统一 (一致)
Δ enrich [ɪnˈrɪtʃ] v. 使……丰富
pertinent (to) [ˈpɜːtɪnənt] a. 有关的, 相干的
Δ kinetics [kaɪˈnetɪks] n. 动力学
meteorology [miːtjəˈrɒlədʒi] n. 气象学
invaluable [ɪnˈvæljuəbl] a. 无价的, 宝贵的
copious [ˈkəʊpiəs] a. 丰富的
Δ credit [ˈkredɪt] n. 荣誉, 功劳
editorial [edɪˈtɔːriəl] a. 编辑的, 编者的
Δ manuscript [ˈmænjuskript] n. 手稿, 原稿