总主编：戴炜栋

新世纪研究生公共英语教材

READING C (TEACHER'S BOOK)

阅读 C 教师用书

第二版

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出 版 说 明

随着大学外语教学水平的不断提高，研究生外语学习的起点也逐年提升。研究生入学时，绝大多数已经具备了较为扎实的语言基础，基本上都通过了大学英语四级考试，不少还通过了六级考试。为了编写出适应新时代要求的研究生英语教材，外教社组织了清华大学、复旦大学、浙江大学、山东大学、中山大学、大连理工大学、南京航空航天大学等10余所重点大学，召开了教材编写委员会会议，作了广泛而深入的调研。在认真分析当时研究生英语教学状况的基础上，于2002年推出了《新世纪研究生公共英语教材》。

教材编写时曾考虑到以下几点：1. 练习设计和活动安排以学习者为中心，强调应用能力的培养。2. 针对研究生听说能力下降的情况，编写专门教材，重视口语和听力的培养。3. 课文题材、体裁多样，内容时代感强。4. 重视翻译和写作(尤其是论文写作)能力的培养。5. 在突出词法、句法的基础上，融入篇章知识的教学。

《新世纪研究生公共英语教材》由以下几个品种组成：

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《听说》下　学生用书、教师用书各一册

《口语口译》一册

教材推出后受到了使用学校的广泛欢迎。为了适应新时期社会对研究生人才培养的需要，满足新时期研究生英语教学的要求，在广泛听取使用高校意见的基础上，外教社组织原编者对这套教材进行了修订。修订在保持原教材编写结构的基础上，阅读材料更新了三分之一以上的篇目，进一步突出了选材的时代性。同时亦对部分练习进行了调整、单元后增加任务型的练习，使教材更符合培养学生的听、说、读、写、译等实用技能方面的要求。

由于研究生学生来源不一，该套教材在使用过程中可能存在这样或那样的缺点。我们衷心希望广大师生多和我们联系、沟通，提出宝贵的意见和建议，以便我们不断修订，不断提高、完善。

该套教材的录音材料由上海外语音像出版社出版。

上海外语教育出版社

修 订 说 明

本书是《新世纪研究生公共英语教材》阅读C(教师用书)的修订本,供教师备课时参考,亦可作为学习者的自学辅导用书。全书共有十五个单元,每单元内容由背景知识、课文导读、语言要点、练习答案、参考译文等五部分组成。

背景知识（Background Information）包括作者生平介绍、重要人物简介以及与主题相关的学科历史、文化、思想等。

课文导读（Introduction）主要是说明课文主旨或介绍写作特色。

语言要点（Language Points）包括课文难点注释、同义词或近义词区分、活用词汇和习语的释义与例证等。

练习答案（Key to Exercises）中关于课文问答题的答案仅供参考，学生课堂活动讨论时可使用自己的语言表述,不必拘泥于答案。

参考译文包括课文和补充阅读材料（A）的全文译文。为节省篇幅,课文练习中结构与用法（Structure and Usage）部分的英译汉译文不再另行编排。

考虑到阅读教程(学生用书)亦可作为西方文化课读本使用，因此，在修订时增加了更为详尽的相关背景知识介绍，以便使用者对各单元主题有更为全面的了解。教师在教学活动中可根据具体情况酌情选用这部分内容。

关于教学方法，根据编者多年的研究生英语教学实践，结合目前我国研究生培养的发展趋势,我们的体会是：研究生阶段的外语教学应以自主性、研究性学习为主,结合课堂讨论、演讲、辩论、撰写论文等形式,在短时间内高强度训练，以期突破语言学习中的“高原期”，迅速提高语言的应用能力。关于具体方法，我们提出两套教学方案（见 Suggested Teaching Plan 1、2），供使用本书的教师参考。

本书初版由浙江大学外国语学院柴小平主编。曾参加前期编写工作的人员有寮菲、吴越民、刘建刚、厉绍雄。参考译文由刘建刚、闫建华提供，主编审订。这次再版修订时,主编对全书内容，包括译文，的疏漏不当之处作了修改、更正、润色，但仍难免存在种种缺点与不足，敬请读者匡谬指正。

上海外语教育出版社的编辑同志为本书的出版精心编审,谨此致谢。

本书在编写过程中参阅了大量的书籍资料,包括多种版本的百科全书,由于条目众多、来源广泛，未能一一注明出处，谨在此对各位作者或出版商一并致谢。

编　者

2006年7月

CONTENTS

Suggested Teaching Plan (1)

(4 periods/week—17 weeks)

Teaching Goal

To develop student's reading skills, especially the skill of reading long and difficult essays, and simultaneously, to help them apply what they learn from reading to their own writing.

Learning Objectives

After studying each unit, students should be able to:

1. Understand the main ideas of the three articles
2. Comprehend the reading materials on a discourse level
3. Grasp the key language points and sentence structures in the text
4. Develop proficiency in translation and writing
5. Conduct a series of class activities centered on the theme of the unit

Before the Sessions:

Students' Task — Autonomous Study

(1) To write the responses to the key words

(2) To learn the new words and expressions in the text

(3) To preview the text to get the main idea

(4) To do the text comprehension exercise

In the First Session: (Two periods)

The teacher is

(1) to introduce some background information

(2) to give an introduction of the text to the students

(3) to discuss the text (the structure, the writing skill, and the main idea of the text will be the focus. Only a few words and sentences, which will be the obstacles for students' understanding of the text, will be explained in class.)

(4) to check on the comprehension exercise (multiple-choice questions)

(5) to organize class activities in small groups (4–5 in a group)

(Students may first do the questions on the text in pairs, and then proceed to the discussion topics in groups. One member will be chosen as the group leader. Students may take this role in turns.)

(6) to ask group leaders to report the results of their discussion to the class

(7) to assign students the homework

Between the Sessions:

Students' Task — Autonomous Study

(1) To review the text

(2) To do the exercises of Vocabulary, Structure and Usage, and Cloze

(3) To read the supplementary materials (use an English dictionary)

(4) To prepare the questions in supplementary readings (both A and B)

In the Second Session: (Two periods)

The teacher is

(1) to check on the exercises of Vocabulary, Structure and Usage, and Cloze

(2) to invite questions from students and explain them

(3) to conduct a group discussion on the questions in supplementary readings

(4) to ask students to answer these questions individually in class

(5) to assign students homework

After the Sessions:

Students' Task — Autonomous Study

(1) To do translation exercises

(2) To choose a topic in Writing Task and write a composition

Suggested Teaching Plan (2)

(4 periods/week—17 weeks)

Teaching Goal

To develop student's communicative skills, i.e. the skill to read long and difficult essays, the skill to understand and effectively express oneself and the skill to write academic papers.

Learning Objectives

After finishing this program, students should be able to:

1. Have a good knowledge of each thematic unit
2. Understand the main idea of each reading article
3. Grasp the key structures and usages in each text
4. Develop proficiency in translation and writing
5. Conduct a series of class activities centered on the theme of each unit

First Week

First session An Introduction to the Program and the Course-book

1. The teacher should specify the aims and requirements of this program and motivate students, ask them to prepare for all the tasks, i.e. interviews, class activities and writing term papers.
2. Students should be assigned the task for the next session.

Second session Office Hours (for teachers)/Autonomous Study (for students)

1. Office Hours is designated for teachers to arrange interviews with students individually. Each student may have 15–20 minutes, during which students may talk with the teacher about the problems and difficulties they come across in their English study. One round of interviews with each student may take several weeks, depending on the size of the class. Teachers may also give students some topics for the interview so that they may prepare in advance.
2. Except the students who arranged the interviews, all the others are to have autonomous study, which means that students may go to the library, language lab, computer center, etc. to study by themselves. Students are advised to get a copy of this Teacher's Book for reference so that

they can check over the answers to the exercises.

Second Week

First session Class Activities (Unit One)

Teachers should first ask students to form speaking pairs to do Q & A on the text, and then divide students into small groups and designate group leaders to lead the discussion. All the questions including those in supplementary readings should be discussed if time is available. During these activities the teacher should walk around the classroom to skillfully manipulate the discussion and be ready to answer any questions from students. Towards the end of the session, the teacher should ask the group leaders to give a summary report to the whole class about their discussions.

Second session Office Hours (for teachers)/Autonomous Study (for students)

Third Week

First session Class Activities (Unit Two)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Fourth Week

First session Class Activities (Unit Three)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Fifth Week

First session Class Activities (Unit Four)

Second session Oral Presentation (1)

Arrange for the students to make a 3-minute presentation on one of the discussion topics or questions for consideration in units 1–4. The teacher should make a general comment on students' performances. This task should be assigned in the previous session.

Sixth Week

First session Class Activities (Unit Five)

Second session Office Hours (for teachers)/Autonomous Study (for students)

In this round of interviews, students should talk with the teacher about the topics they have chosen for their term papers. The teacher should give students some guidance in selecting the topic, which should be related to one of the thematic units in the course-book.

Seventh Week

First session Class Activities (Unit Six)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Eighth Week

First session Class Activities (Unit Seven)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Ninth Week

First session Class Activities (Unit Eight)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Tenth Week

First session Class Activities (Unit Nine)

Second session Oral Presentation (2)

Arrange for the students to make a 3-minute presentation on one of the discussion topics or questions for consideration in units 5–9. The teacher should make a general comment on the students' performances. This task should be assigned in the previous session.

Eleventh Week

First session Class Activities (Unit Ten)

Second session Office Hours (for teachers)/Autonomous Study (for students)

In this round of interviews, students should report to the teacher about the progress of their research and writing.

Twelfth Week

First session Class Activities (Unit Eleven)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Thirteenth Week

First session Class Activities (Unit Twelve)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Fourteenth Week

First session Class Activities (Unit Thirteen)

Second session Office Hours (for teachers)/Autonomous Study (for students)

Fifteenth Week

First session Class Activities (Unit Fourteen)

(Deadline for submitting term papers)

Second session Oral Presentation (3)

Arrange for the students to make a 3-minute presentation on one of the discussion topics or questions for consideration in units 10–14. The teacher should make a general comment on the students' performances. This task should be assigned in the previous session.

Sixteenth Week

First session Class Activities (Unit Fifteen)

Second session Oral Presentation and Defence (1)

Each student is to be given 10 minutes for oral presentation and defense of his/her term paper. The teacher and attending students should ask the presenter a couple of questions about his/her paper.

Seventeenth Week

First session Oral Presentation and Defence (2)

Second session Oral Presentation and Defence (3)

UNIT ONE

Science vs. the Humanities

Background Information

Barzun, Jacques Martin (1907–1979)

Historian and educator. Born on November 30, 1907, in Creteil, France, Barzun grew up in an intellectual atmosphere. He was brought to the United States by his parents in 1919; they settled in New York City, and Barzun graduated from Columbia University in 1927 at the head of his class. He remained at Columbia as an instructor in history, took his Ph.D in 1932, and by 1945 was a full-time professor. He became a US citizen in 1933. Attracted to the artists and thinkers of the nineteenth-century romantic movement at an early age, Barzun presented them in his writings as the flowering of a centuries-old tradition of liberal education and free thought, contrasting their works sharply with the products of modern scientific mechanism and political absolutism. His studies, scholarly and literate in the highest sense, include *Of Human Freedom,* 1939; *Darwin, Marx, Wagner; Critique of a Heritage,* 1941; *Romanticism and the Modern Ego,* 1943; *Berlioz and the Romantic Century,* 1950; *Energies of Art,* 1956; *The House of Intellect,* 1959; and *Science: The Glorious Entertainment,* 1964. An ardent advocate of the liberal arts as opposed to vocational and overspecialized courses, he produced a number of widely read and often controversial works critical of the modern university, notably *Teacher in America*, 1945, and *The American University*, 1968. In 1955 Barzun became dean of the graduate faculties at Columbia and three years later was made dean of faculties and provost, which were posts he held until 1967. From 1960 to 1967 he was the Seth Low Professor of History and in 1967 became University Professor, Columbia's highest-ranking teaching position.

Science

(Latin *scientia*, from *scire*, to know) term used in its broadest meaning to denote systematized knowledge in any field, but applied usually to the organization of objectively verifiable sense experience. The pursuit of knowledge in this context is known as pure science, to distinguish it from applied science, which is the search for practical uses of scientific knowledge, and from technology, through which applications are realized.

Origins of Science

Efforts to systematize knowledge can be traced to prehistoric times, through the designs that

Paleolithic people painted on the walls of caves, through numerical records that were carved in bone or stone, and through artifacts surviving from Neolithic civilizations. The oldest written records of protoscientific investigations come from Mesopotamian cultures; lists of astronomical observations, chemical substances, and disease symptoms, as well as a variety of mathematical tables, were inscribed in cuneiform characters on clay tablets. Other tablets dating from about 2000 BC show that the Babylonians had knowledge of the Pythagorean theorem, solved quadratic equations, and developed a sexagesimal system of measurement (based on the number 60) from which modern time and angle units stem.

From almost the same period, papyri documents have been discovered in the Nile Valley, containing information on the treatment of wounds and diseases, on the distribution of bread and beer, and on finding the volume of a portion of a pyramid. Some of the present-day units of length can be traced to Egyptian prototypes, and the calendar in common use today is the indirect result of pre-Hellenic astronomical observations.

Rise of Scientific Theory

Scientific knowledge in Egypt and Mesopotamia was chiefly of a practical nature, with little rational organization. Among the first Greek scholars to seek the fundamental causes of natural phenomena was the philosopher Thales, in the 6th century BC, who introduced the concept that the earth was a flat disk floating on the universal element, water. The mathematician and philosopher Pythagoras, who followed him, established a movement in which mathematics became a discipline fundamental to all scientific investigation. The Pythagorean scholars postulated a spherical earth moving in a circular orbit about a central fire. At Athens, in the 4th century BC, Ionian natural philosophy and Pythagorean mathematical science combined to produce the syntheses of the philosophies of Plato and Aristotle. At the Academy of Plato, deductive reasoning and mathematical representation were emphasized; at the Lyceum of Aristotle, inductive reasoning and qualitative description were stressed. The interplay between these two approaches to science has led to most subsequent advances.

During the so-called Hellenistic Age following the death of Alexander the Great, the mathematician, astronomer, and geographer Eratosthenes made a remarkably accurate measurement of the earth. Also, the astronomer Aristarchus of Samos espoused a heliocentric (sun-centered) planetary system, although this concept did not gain acceptance in ancient times. The mathematician and inventor Archimedes laid the foundations of mechanics and hydrostatics; the philosopher and scientist Theophrastus became the founder of botany; the astronomer Hipparchus developed trigonometry; and the anatomists and physicians Herophilus and Erasistratus based anatomy and physiology on dissection.

Following the destruction of Carthage and Corinth by the Romans in 146 BC, scientific inquiry lost its impetus until a brief revival took place in the second century AD under the Roman emperor and philosopher Marcus Aurelius. At this time the geocentric (earth-centered) Ptolemaic system, advanced by the astronomer Ptolemy, and the medical works of the physician and philosopher Galen became standard scientific treatises for the ensuing age. A century later the new experimental science of alchemy arose, springing from the practice of metallurgy. By 300, however, alchemy had acquired an overlay of secrecy and symbolism that vitiated the advantages experimentation might have brought to science.

Medieval and Renaissance Science

During the Middle Ages, six leading culture groups were in existence: the Latin West, the Greek East, the Chinese, the East Indian, the Arabic, and the Mayan. The Latin group contributed little to science before the 13th century, the Greeks never rose above paraphrases of ancient learning, and the Mayans had no influence on the growth of science. In China, science enjoyed periods of progress, but no sustained drive existed. Chinese mathematics reached its zenith in the 13th century with the development of ways of solving algebraic equations by means of matrices, and with the use of the arithmetic triangle. More important, however, was the impact on Europe of several practical Chinese innovations. These include the processes for manufacturing paper and gunpowder, and the use of printing and the mariner's compass. In India, the chief contributions to science were the formulation of the so-called Hindu-Arabic numerals, which are in use today, and in the conversion of trigonometry to a quasi-modern form. These advances were transmitted first to the Arabs, who combined the best elements from Babylonian, Greek, Chinese, and Hindu sources. By the 9th century Baghdad, on the Tigris River, had become a center for the translation of scientific works, and in the 12th century this learning was transmitted to Europe through Spain, Sicily, and Byzantium.

Recovery of ancient scientific works at European universities led, in the 13th century, to controversy on scientific methods. The so-called realists espoused the Platonic approach, whereas the nominalists preferred the views of Aristotle (see Nominalism; Realism; Scholasticism). At the universities of Oxford and Paris, such discussions led to advances in optics and kinematics that paved the way for Galileo and the German astronomer Johannes Kepler.

The Black Death and the Hundred Years' War disrupted scientific progress for more than a century, but by the 16th century a revival was well under way. In 1543 the Polish astronomer Nicolaus Copernicus published *De Revolutionibus Orbium Coelestium* (On the Revolutions of the Heavenly Bodies), which revolutionized astronomy. Also published in 1543, *De Corpis Humani Fabrica* (On the Structure of the Human Body) by the Belgian anatomist Andreas Vesalius corrected and modernized the anatomical teachings of Galen and led to the discovery of the circulation of the blood. Two years later the *Ars Magna* (Great Art) of the Italian mathematician, physician, and astrologer Gerolamo Cardano (1501–76) initiated the modern period in algebra with the solution of cubic and quartic equations.

Modern Science

Essentially modern scientific methods and results appeared in the 17th century because of Galileo's successful combination of the functions of scholar and artisan. To the ancient methods of induction and deduction, Galileo added systematic verification through planned experiments, using newly discovered scientific instruments such as the telescope, the microscope, and the thermometer. Later in the century, experimentation was widened through the use of the barometer by the Italian mathematician and physicist Evangelista Torricelli; the pendulum clock by the Dutch mathematician, physicist, and astronomer Christiaan Huygens; and the exhaust pump by the English physicist and chemist Robert Boyle, and the German physicist Otto von Guericke.

The culmination of these efforts was the universal law of gravitation, published in 1687 by the English mathematician and physicist Isaac Newton in *Philosophiae Naturalis Principia Mathematica*. At the same time, the invention of the calculus by Newton and the German philosopher and mathematician Gottfried Wilhelm Leibniz laid the foundation of today's sophisticated level of science and mathematics.

The scientific discoveries of Newton and the philosophical system of the French mathematician and philosopher René Descartes provided the background for the materialistic science of the 18th century, in which life processes were explained on a physicochemical basis. Confidence in the scientific attitude carried over to the social sciences and inspired the so-called Age of Enlightenment, which culminated in the French Revolution of 1789. The French chemist Antoine Laurent Lavoisier published *Traité élémentaire de chimie* (Treatise on Chemical Elements, 1789), with which the revolution in quantitative chemistry opened.

Scientific developments during the 18th century paved the way for the following century of correlation, so called for its broad generalizations in science. These included the atomic theory of matter postulated by the British chemist and physicist John Dalton; the electromagnetic theories of Michael Faraday and James Clerk Maxwell, also of Great Britain; and the law of the conservation of energy, enunciated by the British physicist James Prescott Joule and others.

The most comprehensive of the biological theories was that of evolution, put forward by Charles Darwin in his *On the Origin of Species by Means of Natural Selection* (1859), which stirred as much controversy in society at large as the work of Copernicus. By the beginning of the 20th century, however, the fact, but not the mechanism, of evolution was generally accepted, with disagreement centering on the genetic processes through which it occurs.

But as biology became more firmly based, physics was shaken by the unexpected consequences of quantum theory and relativity. In 1927 the German physicist Werner Heisenberg formulated the so-called uncertainty principle, which held that limits existed on the extent to which, on the subatomic scale, coordinates of an individual event can be determined. In other words, the principle stated the impossibility of predicting, with precision, that a particle such as an electron would be in a certain place at a certain time, moving at a certain velocity. Quantum mechanics instead dealt with statistical inferences relating to large numbers of individual events.

Scientific Communication

Throughout history, scientific knowledge has been transmitted chiefly through written documents, some of which are more than 4000 years old. From ancient Greece, however, no substantial scientific work survives from the period before the geometrician Euclid's *Elements* (circa 300 BC). Of the treatises written by leading scientists after that time, only about half are extant. Some of these are in Greek, and others were preserved through translation by Arab scholars in the Middle Ages. Medieval schools and universities were largely responsible for preserving these works and for fostering scientific activity.

Since the Renaissance, however, this work has been shared by scientific societies; the oldest such society, which still survives, is the Accademia del Lincei (to which Galileo belonged), established in 1603 to promote the study of mathematical, physical, and natural sciences. Later in the century, governmental support of science led to the founding of the Royal Society of London (1662) and the Academie des Sciences de Paris (1666). These two organizations initiated publication of scientific journals, the former under the title *Philosophical Transactions* and the latter as *Memoires*.

During the 18th century academies of science were established by other leading nations. In the US, a club organized in 1727 by Benjamin Franklin became, in 1769, the American Philosophical Society for promoting useful knowledge. In 1780 the American Academy of Arts and Sciences was organized by John Adams, who became the second U.S. president in 1797. In 1831 the British Association for the Advancement of Science met for the first time, followed in 1848 by the American Association for the Advancement of Science, and in 1872 by the Association Francise pour l'Avancement des Sciences. These national organizations issue the journals *Nature*, *Science*, and *Compte-Rendus*, respectively. The number of scientific journals grew so rapidly during the early 20th century that *A World List of Scientific Periodicals Published in the Years 1900–1933* contained some 36,000 entries in 18 languages. A large number of these are issued by specialized societies devoted to individual sciences, and most of them are fewer than 100 years old.

Since late in the 19th century, communication among scientists has been facilitated by the establishment of international organizations, such as the International Bureau of Weights and Measures (1873) and the International Council of Research (1919). The latter is a scientific federation subdivided into international unions for each of the various sciences. The unions hold international congresses every few years, the transactions of which are usually published. In addition to national and international scientific organizations, numerous major industrial firms have research departments; some of them regularly publish accounts of the work done, or file reports with government patent offices, which in turn print abstracts in bulletins that are published periodically.

Fields of Science

Knowledge of nature originally was largely an undifferentiated observation and interrelation of experiences. The Pythagorean scholars distinguished only four sciences: arithmetic, geometry, music, and astronomy. By the time of Aristotle, however, other fields could also be recognized: mechanics, optics, physics, meteorology, zoology, and botany. Chemistry remained outside the mainstream of science until the time of Robert Boyle in the 17th century, and geology achieved the status of a science only in the 18th century. By that time the study of heat, magnetism, and electricity had become part of physics. During the 19th century scientists finally recognized that pure mathematics differs from the other sciences in that it is a logic of relations and does not depend for its structure on the laws of nature. Its applicability in the elaboration of scientific theories, however, has resulted in its continued classification among the sciences.