PROFESSIONAL ENGLISH OF GEOLOGY

地质专业英语

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Professional English of Geology

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内容简介

本书系根据国家教委颁布的“大学英语教学大纲”的教学要求，针对地质类各专业学生获得足够的地质专业英语词汇量，能顺利阅读并正确理解地质专业英文文献的需要而编写的。全书课文内容取材广泛，涉及当代地质学领域内各主要学科。书中紧密配合课文内容，收录和编写了有关地质类不同学科的500个标准化试题。书后附有练习答案及总词汇表。

本书可作为大学地质专业英语教材，也适于地质专业英语自学者阅读。

序

为尽快和更好地提高专业人员的外语水平，自50年代起即有专业外语教本和工具书出版。在地质专业领域内，情况也是如此。经过30余年使用经验的积累，专业外语教材曾几次修编，更趋完善；然而不同时期和不同编著者对书中的取材范围、内容安排和阅读对象的考虑等都不完全一致，因之使用的效果亦各异。切实地调查已有教材的使用情况，认真总结经验，注意专业和语言科学本身的特点及其发展趋势，是编著一本高水平的、有针对性的和使用效果较好的专业外语教材的必要基础条件。

陈建平同志最近完成的《地质专业英语》是总结了多年来若干同类教本的实践经验后，在陈建平、徐安顺合编的《地质类专业英语》（成都地质学院内部使用教材）的基础上修改、补充而编写成的。这本教材取材广泛，涉及当代地质学领域内各主要学科，一些文章还反映了现代地质学的新进展，不仅保证了学习者有足够的专业词汇量，也可使读者得到一些地质学新领域的专业英文信息。该书取材于国内外公开出版的书刊。从文字来讲做到了规范化，保证了质量。书中列出一定数量的练习题，与课文内容配合紧密，既有利于教，又有利于学。该书考虑了学习者的基础和水平，内容安排有针对性，循序渐进，富有启发性，阐述清楚，也便于自学。上述各点都是该书的特点。

这本教材是按照国家教委颁布的《大学英语教学大纲》的

要求编写的。使用该教材可以达到大纲规定的“能顺利阅读并正确理解有关专业的书籍和文章”的要求。它不仅可以作为大学专业英语教材，而且对专业英语自学者也是一本很好的读本。相信该书出版后，定可在我国地质教育中发挥应有效果。值此书付梓之际，写了几点认识为序，以示祝贺之忱。

刘宝珺

1991年10月5日

前　言

本教材是遵照“大学英语教学大纲”的教学要求，广泛听取地质类不同专业教师对该课程内容的各种建议和设想，并且在该课程的各位任课教师多次讨论研究的基础上编写而成的。编写教材的指导思想是提供与地质专业直接相关、切实有用、而且是基础英语教学中没有涉及的专业文献、基础地质词汇和地质专业英语标准试题。课文均取材于不同地质专业的各类英文文献；对原文的选材力求选用具有一定专业影响的经典著作或新近成果，在专业内容上具有一定深度和参考价值。与课文所对应的习题力求反映不同专业的基本词汇和术语，同时涉及不同地质专业的基础知识。

本教材共分五个单元。第一单元为基础地质部分（1—5课），课文涉及动力地质学、矿物学、岩石学、古生物学和构造地质学的内容。第二单元为地质专业部分（6—10课），课文涉及变质岩石学、地球化学、数学地质、遥感地质和天体地质学的内容。第三单元为矿产地质部分（11—15课），课文涉及经济地质学、岩浆矿床、热液矿床、机械沉积矿床和层控矿床的内容。第四单元为参考阅读部分（16—25课），主要包括地质图特性、地质年代、板块构造、沉积环境、石油地质、地球物理、水文地质、工程地质和环境地质等方面的内容。第五单元为综合试题（二份试卷），试题采用当前国内外流行的标准化题型。教材最后附有部分习题答案、词汇表和主要参考文献。

本教材是在陈建平、徐安顺合编的《地质类专业英语》（成都地质学院内部使用教材）的基础上经修改、补充和加工编写而成的。教材中编写和收录了不同地质专业的标准化试

题500题。试题难度深浅兼顾，侧重不同。第一单元至第三单元中，每课附有相应专业内容的20个标准化试题，分为二个练习大题：第一个练习大题中的10个小题以词汇练习为主；第二个练习大题中的10个小题以专业知识的检验和英语阅读为主。每课的练习中还包括相应专业内容的汉译英、英译汉练习。第四单元中每课附有相应专业内容的10个标准化试题，以专业知识的检验和英语阅读为主。第五单元中共有综合各专业的标准化试题100题，分为二个试卷。试卷难度与美国GRE专业试题的难度相当。在这500个标准化试题中，除200个系自行拟定编写的试题外，大多取材于陈源仁教授编的《普通地质学标准化试题集》(成都地质学院内部使用教材)，其余取材于美国GRE专业试题。

本教材适合于不同地质专业和与地学相关的专业的学生使用，也可供广大地质工作者自学，拓宽专业词汇面和提高阅读理解能力，对学习和工作都有一定的参考价值。在教学过程中，可根据不同专业的课程要求和学时安排，对教材的内容酌情选择、调整或补充。

在教材编写过程中，得到了成都地质学院教务处、地质系、三系和矿产系的大力支持。特别是陈源仁教授和汪云亮副教授对教材的编写、大纲的审定、内容的取材等方面给予了颇多赐教和帮助。教材脱稿后，经陈源仁教授审定；学部委员刘宝珺教授在百忙中抽出时间审阅了初稿，并为本书作序。在此一并表示衷心的感谢！

鉴于编者水平有限，加上时间仓促，教材中的错误和不妥之处在所难免，恳请各位多多指正。

编者

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UNIT ONE

Lesson One

The Scope of Geology

The world we live in present an endless variety of fascinating problems which excite our wonder and curiosity. The scientific worker attempts to formulate these problems in accurate terms and to solve them in the light of all the relevant facts that can be collected by observation and experiment. Such question as What? How? Where? and When? challenge him to find the clues that may suggest possible replies. Confronted by the many problems presented by, let us say, an active volcano, we may ask: What are the lavas made of? How does the volcano work and how is the heat generated? Where do the lavas and gases come from? When did the volcano first begin to erupt and when is it likely to erupt again?

Here and in all such queries, What? refers to the stuff things are made of, and an answer can be given in terms of chemical compounds and elements. The question How? refers to processes—the way things are made or happen or change. The ancients regarded natural processes as manifestations of power by irresponsible gods; today we think of them as manifestations of energy acting on or through matter. Volcanic eruptions and earthquakes no longer reflect the erratic behaviour of the gods of the underworld;

they arise from the action of the earth' s internal heat on and through the surrounding crust. The source of the energy lies in the material of the inner earth. In many directions, of course, our knowledge is still incomplete: only the first of the questions we have asked about volcanoes, for example, can as yet be satisfactorily answered. The point is not that we now pretend to understand everything, but that we have faith in the orderliness of natural processes. As a result of two or three centuries of scientific investigation we have come to believe that Nature is understandable in the sense that when we ask her questions by way of appropriate observations and experiment. She will answer truly and reward us with discoveries that endure.

Modern geology has for its aim the deciphering of the whole evolution of the earth from the time of the earliest records that can be recognized in the rocks to the present day. So ambitious a programme requires much subdivision of effort, and in practice it is convenient to divide the subject into a number of branches. The key words of the three main branches are the materials of the earth' s rocky framework (mineralogy and petrology); the geological processes or machinery of the earth, by means of which changes of all kinds are brought about (physical geology); and finally, the succession of these changes, or the history of the earth (historical geology).

Geology is by no means without practical importance in relation to the needs and industries of mankind . Thousands of geologists are actively engaged in locating and exploring the mineral resources of the earth. The whole world is being searched for coal and oil and for the ores of useful metals. Geologists are also directly concerned with the vital subject of water supply. Many en-

gineering projects, such as tunnels, canals, docks and reservoirs, call for geological advice in the selection of sites and materials. In these and in many other ways, geology is applied to the service of mankind.

Although geology has its own laboratory methods for studying minerals, rocks and fossils , it is essentially an open-air science. It attracts its followers to mountains and waterfalls, glaciers and volcanoes, beaches and coral reefs in search for information about the earth and her often puzzling behaviour. Wherever rocks are to be seen in cliffs and quarries, their arrangement and sequence can be observed and their story deciphered. With his hammer and maps the geologist in the field leads a healthy and exhilarating life. His powers of observation become sharpened, his love of Nature is deepened, and the thrill of discovery is always at hand.

Exercises

一、词汇练习

1. The general shape of the earth is that of a ____.
   A. circular B. square
   C. flattened sphere D. triangle
2. The solid part of the earth is called the ____.
   A. atmosphere B. lithosphere
   C. hydrosphere D. biosphere
3. ____ is a science of studying the earth.
   A. History of geology B. Astronomy
   C. Biology D. Geology
4. ____ is the theoretical foundation of prospecting mineral deposits.
   A. Economic geology B. Seismology
   C. Volcanology D. Meteoritics
5. Scientists believe the earth is made up of ____.
   A. crust B. mantle

C. core D. A, B and C

6. The thickness of crust is believed to be average ____.
   A. 60 kilometres B. 33 kilometres
   C. about 10 kilometres D. 70 kilometres
7. The granitic layer beneath the oceans seems to be ____.
   A. thicker than that beneath the land
   B. thin or missing
   C. as same as that beneath the land
   D. become other kind of rocks
8. Geological associates of coal seams are almost always ____.
   A. roche moutonnée B. beach cusp
   C. shales and sandstones D. graded surface
9. Lofty mountains are slowly worn away to ____.
   A. steep slope B. orogenic belt
   C. low rolling plains D. morass
10. Heat from the sun stirs to the atmosphere, generating ____.
   A. winds B. volcanoes
   C. water D. frost

二、汉译英

1. 研究地质作用可以帮助我们探明矿床的成因及其分布规律。
2. 宇宙地质学是随着宇航事业的发展而兴起的一门新学科。
3. 有证据表明外地核的密度约为地幔物质的两倍。
4. 当你研究地球时，你会注意到大多数大块陆地曾是连接的，或者几乎如此。
5. 以相对年代为基础的时间顺序已经被用来确定地质年代表。

三、英译汉

Geology deals with the origin, composition, structure and history of the earth. It has been divided into two major divisions: physical and historical geology. Physical geology treats the earth' s composition, its structure, the movements in and upon the earth' s crust and the geologic processes by which the earth' s surface is, or has been changed. Its more important specialized

branches include mineralogy, the study of minerals; petrology, the study of rocks; structural geology, the study of earth structures; geochemistry, the study of the chemistry of earth materials; geophysics, the study of the physical behavior of earth materials; and economic geology, the study of economic products of the earth' s crust and their commercial and industrial application. Historical geology deals with the origin and evolution of the earth. Its subdivisions include paleontology, stratigraphy and paleogeography.

Geology relies heavily on other basic sciences. Astronomy has provided information adout the earth' s origin and its place in the universe. Chemistry is used to analyze and study earth' s rocks and minerals, and the principles of physics are used to explain the physical forces that affect the earth and the reaction of the earth materials to these forces. Biology has provided a better understanding of prehistoric plants and animals and how they developed throughout geologic time.

四、将下表译成汉语（见下页表）

五、阅读理解

1. The crust of the continents and ocean basins:
   a. is characterized by about the same thickness and composition.
   b. may not be realistically compared.
   c. have a markedly different composition and thickness (oceanic crust being much thinner and more basic).
2. Oceanic crust and continental crust:
   a. have virtually identical physical properties.
   b. have significantly different physical properties.
   c. cannot be compared because of the inaccessibility of the ocean floor.
3. The heat present in the earth' s interior is:
   a. a remnant of that present at the time of its formation billions of years ago.
   b. transmitted by solar energy (the lunar input is very small).
   c. generated by radioactive decay.

Era (Erathem)	Period (System)		Epoch (Series)
Cenozoic Era (Cz)	Quaternary Period		Holocene Epoch Pleistocene Epoch
	Tertiary Period		Neogene Period { Pliocene Epoch, Miocene Epoch } Eogene (Paleogene) Period { Oligocene Epoch, Eocene Epoch, Paleocene Epoch }
Mesozoic Era (Mz)	Cretaceous Period Jurassic Period Triassic Period		
Palaeozoic Era (Pz)	Permian Period Carboniferous Period Devonian Period Silurian Period Ordovician Period Cambrian Period		
Proterozoic Era (Pt)	Upper Proterozoic Subera (Pt_3)	Sinian Period	
	Middle Proterozoic Subera (Pt_2)		
	Lower Proterozoic Subera (Pt_1)		
Archaeozoic Era (Ar)			

4. Differential vertical displacements of the earth' s st:
   a. are of the same amount at any one time on both land and sea.
   b. are related solely to seismic events.
   c. occur due to a variety of causes, and in differing amount at any one time.
5. The thermal gradient present in the earth' s crust and mantle is best explained as due to:
   a. gradual cooling from a primordial molten condition.
   b. the effects of Permian insolation.
   c. insolation prior to the development of protective cover of land plants.
   d. radiogenically generated energy.
6. Differences in gravity measured at the earth' s surface are best explained by:
   a. concluding that the value of gravity varies erratically on the earth' s surface.
   b. that rocks with differing mass are present near the earth' s surface.
   c. the different instruments used for making the measurement have not been properly calibrated.
7. The strength of rock buried in the earth' s crust:
   a. is unaffected by increase in temperature.
   b. is increased by raising the temperature.
   c. is decreased by raising the temperature.
8. The geothermal gradient is present because:
   a. heat is being continually supplied from radioactive decay and lost at the earth' s surface.
   b. surface rocks do not transmit heat as readily as those in the upper mantle or deeper crust.
   c. of the large amount of heat used during photosynthesis.
9. The mohorovicic discontinuity is commonly taken as the boundary be-

tween:

a. continents and ocean basins.

b. alpine chains and karst.

c. the crust and upper mantle.

10. Most magmas that come to the surface are thought to originate:

a. in mantle part of the earth' s interior.

b. in core part of the earth' s interior.

c. in lithosphere part of the earth.