

Readings in Mining English

矿业英语注释读物

井巷工程

沈季良 陈俊芳 编

煤炭工业出版社

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前 言

本书是井巷工程类英语注释读物，是专门为帮助具有一般英语基础的读者阅读专业英语书籍和有关技术资料而编写的。书中文章选自英美两国出版的专业著作和国际会议学术报告文件，都是介绍井巷工程方面的基本知识。全书约有二千余个专业词汇。各篇选文都附有词汇表、词组及汉语注释。汉语注释的重点是帮助读者分析和理解较复杂的语法和特殊句型。为了便于读者在自学时正确理解原文，书后附有译文。译文的文字尽量照顾了原文结构，以利对照，这对初学专业英语的读者是颇有裨益的。

本书可供煤炭、冶金、建材、化工等矿业工程技术人员和有关院校师生参考。

书中不妥之处，请读者批评指正。

编 者

1980年8月

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GEOLOGY

1. GEOLOGY AND GEOLOGIC TIME

The study of the Earth is called geology. This science attempts to explain the origin of the earth and its relation to the heavenly bodies; it attempts to explain the reason for the atmosphere, the waters which flow on or cover parts of the earth and the rocks and minerals which form the land surfaces; and it attempts to reconstruct the history of life, going back beyond the age of man and giving us the story of the animals that first roamed the earth and telling us how they lived.①

Historical geology is a review of the events that have occurred on the earth in past ages. It includes studies of the distribution of the land and sea areas at various times, the upbuilding and erosion of the continents and mountain ranges, the periods of special activity of subsurface pools of molten rock that resulted in igneous intrusions of the earth's crust or in volcanic activity, the deposition of material by the great erosive agencies, and the growth and extinction of the ever-changing plants and animals that played their appointed roles on earth's

stage and then disappeared forever.^②

One of the more interesting portions of historical geology is that dealing with geologic time.^③ The vast stretch of geologic time has been divided by geologists into divisions and subdivisions, each with certain identifying characteristics in the rocks, life or crustal movements.^④ Table 1 is a "Geologic Time Table". The relation between the time scale and the rock scale is as follows:

Time Scale	Rock Scale
Era	Group
Period	System
Epoch	Series
Age	Stage or Formation

TABLE 1 GEOLOGIC TIME TABLE

Era	Period		Epoch	Dates, Millions of Years in the past
Cenozoic Kz	Quaternary		Recent Qn	2-3
	Q		Pleistocene Qp	
	Tertiary R	Upper Tertiary N	Pliocene N ₁ Miocene N ₁	80
		Lower Tertiary E	Oligocene E ₃ Eocene E ₂ Paleocene E ₁	

TABLE 1 **GEOLOGIC TIME TABLE** (*Continued*)

Era		Period	Epoch	Dates, Millions of Years in the past
Mesozoic Mz		Cretaceous K	Upper Cretaceous K ₂ Lower Cretaceous K ₁	80
		Jurassic J	Upper Jurassic J ₃ Middle Jurassic J ₂ Lower Jurassic J ₁	140
		Triassic T	Upper Triassic T ₃ Middle Triassic T ₂ Lower Triassic T ₁	195
	Upper Paleozoic Pz ₂	Permian P	Upper Permian P ₂ Lower Permian P ₁	230
		Carboniferous C	Upper Carboniferous C ₃ Middle Carboniferous C ₂ Lower Carboniferous C ₁	270
		Devonian D	Upper Devonian D ₃ Middle Devonian D ₂ Lower Devonian D ₁	320
Paleozoic Pz	Lower Paleozoic Pz ₁	Silurian S	Upper Silurian S ₃ Middle Silurian S ₂ Lower Silurian S ₁	375
		Ordovician O	Upper Ordovician O ₃ Middle Ordovician O ₂ Lower Ordovician O ₁	440
		Cambrian Є	Upper Cambrian Є ₃ Middle Cambrian Є ₂ Lower Cambrian Є ₁	500
				600 ±

TABLE 1 GEOLOGIC TIME TABLE (Continued)

	Era	Period	Epoch	Dates, Millions of Years in the past
proterozoic Pt	Upper Protero- zoic Pt ₂	Sinian Z	Upper Sinian Z ₃ Middle Sinian Z ₂ Lower Sinian Z ₁	600 ±
	Lower Proterozoic Pt ₁			1700 ±
Archean Ar	Upper Archean Ar ₂			2050 ±
	Lower Archean Ar ₁			2400-2500
				2700
	Age of meteorites and the earth			4500 ±

NEW WORDS 词 汇

geology [dʒi'ɒlədʒi] *n.* 地质学

geologic [dʒiə'lɒdʒɪk] *a.* 地质的

geologic time [dʒiə'lɒdʒɪk taɪm]

n. 地质年代

attempt to [ə'tempt tə] *v.i.* 试图

heavenly bodies ['hevnli bɒdiz]

n. 天体

atmosphere ['ætmosfɪə] *n.* 大气

mineral ['mɪnərəl] *n.* 矿物

reconstruct ['ri:kənstrakt] *v.t.*

(1)描述, 设想 (2)重建, 使再现

roam [roum] *v.i.* 漫游, 游动

historical [his'tɒrɪkəl] *a.* 历史的

historical geology [his'tɒrɪkəl dʒi'ɒlədʒi] *n.* 地史学, 历史地质学

upbuild [ʌp'bɪld] *v.t.* 建立

erosion [ɪ'rouʒən] *n.* 侵蚀, 腐蚀

continent ['kɒntɪnənt] *n.* 大陆

mountain range ['maʊntɪn reɪndʒ]

n. 山脉

subsurface ['sʌbsə:fɪs] *a.* 地表的, 地下的

pool [pu:l] *n.* 坑潭
melt [melt], **melted** ['meltid],
molten ['moultən] *v. t. & v. i.*
 融化, 使融化
igneous ['ignies] *a.* 火成的
intrusion [in'tru:ʒən] *n.* 入侵
crust [krast] *n.* 地壳
volcanic [vɒl'kænik] *a.* 火山的
deposition [,depə'ziʃən] *n.* 沉
 积, 沉积物
erosive [i'rouʃiv] *a.* 侵蚀的, 腐
 蚀的
disappear [,disə'piə] *v. i.* 不见,
 消失
stretch [stretʃ] *n.* 伸长
subdivision ['sʌbdi'viʒən] *n.* 由
 再分分成的部分
crustal movement ['krastl
 'mu:vmənt] *n.* 地壳运动
time scale [taim skeil] *n.* 时代
 单位, 地质年代等级
rock scale [rɒk skeil] *n.* 岩层单
 位, 岩层等级
era ['iərə] *n.* 代
period ['piəriəd] *n.* 纪
epoch ['i:pɒk] *n.* 世
age [eidʒ] *n.* 期
group [gru:p] *n.* 界
system ['sistəm] *n.* 系
series ['siəri:z] (单复同) *n.* 统
stage [steidʒ] *n.* 阶
formation [fɔ:'meiʃən] *n.* 阶
Archean Era (Ar) [ɑ:'ki:ən 'iərə]
n. 太古代
Upper Archean Era (Ar₂) ['ʌpə
 ɑ:'ki:ən 'iərə] *n.* 晚太古代
Lower Archean Era (Ar₁) ['ləʊə
 ɑ:'ki:ən 'iərə] *n.* 早太古代

Proterozoic Era (Pt) [ˌprɒtərə-
 'zɔɪk 'iərə] *n.* 元古代
Upper Proterozoic Era (Pt₂)
 ['ʌpə prɒtərə'zɔɪk 'iərə] *n.*
 晚元古代
Lower Proterozoic Era (Pt₁)
 ['ləʊə prɒtərə'zɔɪk 'iərə] *n.*
 早元古代
Paleozoic Era (Pz) [ˌpæliə'zɔɪk
 'iərə] *n.* 古生代
Upper Paleozoic Era (Pz₂) ['ʌpə
 pæliə'zɔɪk 'iərə] *n.* 晚古生代
Lower Paleozoic Era (Pz₁)
 ['ləʊə pæliə'zɔɪk 'iərə] *n.* 早
 古生代
Mesozoic Era (Mz) [ˌmizə'zɔɪk
 'iərə] *n.* 中生代
Cenozoic Era (Kz) [ˌsi:nə'zɔɪk
 'iərə] *n.* 新生代
Sinian Period (Z) ['sinien 'piə-
 riəd] *n.* 震旦纪
Cambrian Period (C) [ˌkæmbriən
 'piəriəd] *n.* 寒武纪
Ordovician Period (O) [ˌɔ:də
 'viʃən 'piəriəd] *n.* 奥陶纪
Silurian Period (S) [sai'ljʊəriən
 'piəriəd] *n.* 志留纪
Devonian Period (D) [de'vounjən
 'piəriəd] *n.* 泥盆纪
Carboniferous Period (C) [ˌkɑ:
 bæ'nifərəs 'piəriəd] *n.* 石炭纪
Permian Period (P) [ˌpɜ:mian
 'piəriəd] *n.* 二叠纪
Triassic Period (T) [traɪ'æsɪk
 'piəriəd] *n.* 三叠纪
Jurassic Period (J) [dʒʊə'ræsɪk
 'piəriəd] *n.* 侏罗纪
Cretaceous Period (K) [kri'teɪʃəs

'piəriəd] *n.* 白垩纪
Tertiary Period (R) ['tə:ʃəri
 'piəriəd] *n.* 第三纪
Upper Tertiary Period (N) ['ʌpə
 'tə:ʃəri 'piəriəd] *n.* 晚第三纪
Lower Tertiary Period (E)
 ['louə 'tə:ʃəri 'piəriəd] *n.* 早
 第三纪
Quaternary Period (Q) ['kwɔ:
 tənəri 'piəriəd] *n.* 第四纪
Upper Sinian Epoch (Z₃) ['ʌpə
 'sinian 'i:pək] *n.* 晚震旦世
Middle Sinian Epoch (Z₂)
 ['midl 'sinian 'i:pək] *n.* 中震
 旦世
Lower Sinian Epoch (Z₁) ['louə
 'sinian 'i:pək] *n.* 早震旦世
Upper Cambrian Epoch (Є₃)
 ['ʌpə 'kæmbriən 'i:pək] *n.* 晚
 寒武世
Middle Cambrian Epoch (Є₂)
 ['midl 'kæmbriən 'i:pək] *n.*
 中寒武世
Lower Cambrian Epoch (Є₁)
 ['louə 'kæmbriən 'i:pək] *n.*
 早寒武世
Upper Ordovician Epoch (O₃)
 ['ʌpə ɔ:də'viʃən 'i:pək] *n.* 晚
 奥陶世
Middle Ordovician Epoch (O₂)
 ['midl ɔ:də'viʃən 'i:pək] *n.* 中
 奥陶世
Lower Ordovician Epoch (O₁)
 ['louə ɔ:də'viʃən 'i:pək] *n.* 早
 奥陶世
Upper Silurian Epoch (S₃) ['ʌpə
 sai'ljuəriən 'i:pək] *n.* 晚志留世
Middle Silurian Epoch (S₂)

['midl sai'ljuəriən 'i:pək] *n.*
 中志留世
Lower Silurian Epoch (S₁)
 ['louə sai'ljuəriən 'i:pək] *n.*
 早志留世
Upper Devonian Epoch (D₃)
 ['ʌpə de'vounjən 'i:pək] *n.*
 晚泥盆世
Middle Devonian Epoch (D₂)
 ['midl de'vounjən 'i:pək] *n.*
 中泥盆世
Lower Devonian Epoch (D₁)
 ['louə de'vounjən 'i:pək] *n.*
 早泥盆世
Upper Carboniferous Epoch (C₃)
 ['ʌpə ,kɑ:bə'nifərəs 'i:pək] *n.*
 晚石炭世
Middle Carboniferous Epoch
(C₂) ['midl ,kɑ:bə'nifərəs
 'i:pək] *n.* 中石炭世
Lower Carboniferous Epoch (C₁)
 ['louə ,kɑ:bə'nifərəs 'i:pək] *n.*
 早石炭世
Upper Permian Epoch (P₂) ['ʌpə
 'pæmian 'i:pək] *n.* 晚二叠世
Lower Permian Epoch (P₁)
 ['louə 'pæmian 'i:pək] *n.* 早
 二叠世
Upper Triassic Epoch (T₃) ['ʌpə
 trai'æsik 'i:pək] *n.* 晚三叠世
Middle Triassic Epoch (T₂)
 ['midl trai'æsik 'i:pək] *n.* 中
 三叠世
Lower Triassic Epoch (T₁)
 ['louə trai'æsik 'i:pək] *n.* 早三
 叠世
Upper Jurassic Epoch (J₃) ['ʌpə
 dʒuə'ræsik 'i:pək] *n.* 晚侏罗世

Middle Jurassic Epoch (J₂)

['midl dʒuə'ræsɪk 'i:pɒk] *n.*

中侏罗世

Lower Jurassic Epoch (J₁)

['ləʊə dʒuə'ræsɪk 'i:pɒk] *n.*

早侏罗世

Upper Cretaceous Epoch (K₂)

['ʌpə kri'teɪʃəs 'i:pɒk] *n.*

晚白垩世

Lower Cretaceous Epoch (K₁)

['ləʊə kri'teɪʃəs 'i:pɒk] *n.*

早白垩世

Oligocene Epoch (E₃) [ɔ'lig-

əʊsi:n 'i:pɒk] *n.* 渐新世

Eocene Epoch (E₂) ['i:əsi:n

'i:pɒk] *n.* 始新世

Paleocene Epoch (E₁) ['pæliəsi:n

'i:pɒk] *n.* 古新世

Pliocene Epoch (N₂) ['plaɪəsi:n

'i:pɒk] *n.* 上新世

Miocene Epoch (N₁) ['maɪəsi:n

'i:pɒk] *n.* 中新世

Recent Epoch (Qn) ['ri:snt

'i:pɒk] *n.* 全新世

Pleistocene Epoch (Qp) ['plais-

təʊsi:n 'i:pɒk] *n.* 更新世

PHRASES AND EXPRESSIONS 词 组

result in 结果, 导致

deal with 论述, 处理

play the role of 起, 作用

NOTES 课文注释

1. 本句为主从并列复合句。全句由三个并列分句组成, 其间由分号分开。This science attempts...bodies 为第一分句。it attempts to explain...the land surface, 为第二并列分句。the atmosphere, the waters, and the rocks and minerals 均为介词 for 的宾语。该介词短语中包含两个定语从句: which flow on or cover parts of the earth, 修饰 waters; which form the land surface 修饰 rocks and minerals. it attempts to reconstruct the ...lived 为第三分句。该分句包含三个作状语的分词短语, going back...man, giving us...earth, telling...lived. 第二个分词短语还包含一个定语从句 that first roamed the earth, 修饰 animals. 第三个分词短语中 how they lived 为宾语从句做 telling 的宾语。
2. It includes studies of 后跟五个并列宾语:
the distribution...times;
the upbuilding and erosion...ranges;
the periods...activity;
the deposition...agencies;
and the growth...forever.
其中有两个子句带有定语从句, 即: (1) that resulted in igneous intru-

sions of the earth's crust or in volcanic activity. 修饰 special activity of subsurface pools of molten rock; (2) that played their appointed roles on earth's stage and then disappeared forever. 修饰 plants and animals.

3. that 为代词做表语, 指代前面的 one 以避免重复, dealing with...time 为分词短语做后置定语。可译为“描述”, “处理”。
4. each with=each division (or subdivision) is with its ... movement. 在这里可视为独立结构。

2. ROCKS OF THE EARTH'S CRUST

The three great classes of rocks of the earth's crust are; Igneous, solidified from fusion; Sedimentary, deposited in water or air; Metamorphic, recrystallized or otherwise altered igneous and sedimentary rocks, such that their original character has been obscured. ① Igneous rocks are believed to have been the predecessors and source of all others. ②

The processes producing these three classes of rocks have been going on for millions of years. It is only natural to expect that all of the original igneous crust would have disappeared long ago; also, that sedimentary and metamorphic rocks would be found most abundantly, with igneous rocks interspersed throughout due to molten intrusions of recent ages. ③ Such is the case, regardless of what portion of the earth is inspected. ④ Following is a tabulation (Table 2) showing the various class of rocks

and the material from which they were formed; ⑤

TABLE 2

Sediments	Compacted Strata(Rock)	Metamorphic Rocks
Gravel	Conglomerate	Gneiss and various schists
Sand	Sandstone	Quartzite and various schists
Silt and Clay	Shale	Slate and various schists
Lime deposits	Limestone	Marble and various schists

Igneous Rocks	Metamorphic Rocks
Coarse-grained feldspars, such as granite, etc.	Gneiss
Fine-grained feldspars, such as felsite, tuffs, etc.	Slate and schists
Ferro-magnesian rocks, such as dolerite and basalt	Hornblende schists, various other schists, and serpentine

The sedimentary rocks associated with coal beds belong to one or more of the four classes of compacted strata given in Table 2. When certain sediments were deposited to form limestone or sandstone, we could hardly expect them to consist of pure lime deposits or pure sand. there would be some mixing of sediments. As a result, we find limestones containing small amounts of sand, and sandstones containing small amounts of lime carbonate, etc. A rock belonging to any one of the four main classes which, in addition, contains sand is classed