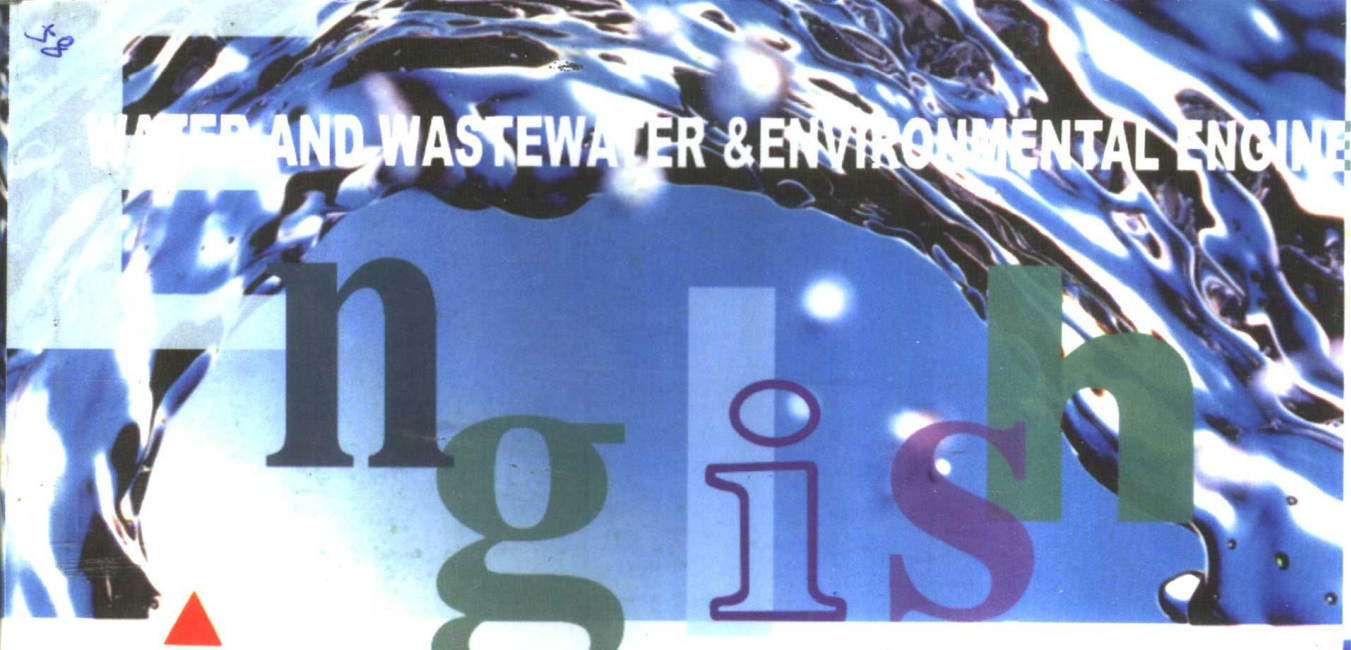

大学专业英语阅读教程

李 田 编著

给水排水与环境工程

同济大学出版社

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前　言

目前，通过大学基础英语的学习，许多学生尚不能顺利阅读、翻译专业文献资料，未能使英语成为实用工具。而随着我国对外开放的扩大与信息化社会的发展，对专业技术人员的外语水平提出了更高的要求。欲通过阅读顺利获得科技信息和专业知识，需要在基础英语学习的基础上，增加专业词汇，同时熟悉科技英语的特点。统计资料表明，在各专业的英语科技文献中，最常用的专业术语只有几百个，且专业词汇通常有着鲜明的构词规律。通过专业英语阅读课程有针对性地学习，可以在有限的时间内，增加学生专业英语的词汇量，提高其阅读技巧与实际应用英语的能力。本书就是为此目的而编写的专业英语教材。

本书分水资源与立法、给水工程、废水处理、环境工程与管理4个部分，共32个单元。在内容上有所侧重，以环境工程学科中的水处理为重点。每个单元除课文、词汇及注释外，还配有阅读材料与练习。书中内容选自近十年来出版的原版教科书、专著与科技资料。选材上注意专业领域的覆盖面与知识的新颖性，语言方面兼顾文字的规范性与风格的多样化，编排上顾及到难度上的循序渐进与语言课程的教学需要。其中，阅读材料的文字较为简单，内容为课文的补充或配合，有助于提高学生的阅读兴趣，巩固课堂教学的效果。阅读材料附有扼要注释。各单元的练习着重检查学生对课文的理解程度，同时强化对专业术语的记忆和掌握。为便于自学，书后附有练习参考答案。

本书适用于大学三年级及以上学生一学年的专业英语学习。除用作专业英语教材外，本书还适合有大学四级英语基础的专业技术人员自学英语及在读研究生作阅读材料使用。

由于编写时间紧迫，加之编者水平所限，书中难免出现疏漏与错误。敬请读者批评指正。

编　者

2000年10月

于同济大学环境科学与工程学院

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Water Resource and Legislation

Unit 1

The Hydrologic Cycle

The Hydrologic Cycle

The world's supply of fresh water is quite small compared to the enormous volumes of salt water in the oceans. Fortunately the freshwater supply is renewed by the hydrologic cycle, which is an immense solar distillation system. Water evaporated from the oceans is transported over the continents by moving air masses. When this moisture-bearing air is cooled to its dewpoint temperature, the vapor condenses into water droplets forming fog or cloud. The cooling occurs when the moist air is lifted to higher elevations. Since air pressure decreases with elevation, the air expands as it is lifted and cooled in accordance with the Ideal Gas Law:

$$\frac{PV}{T} = \text{const.}$$

Lifting occurs in three ways. Orographic lifting occurs when the air is forced up over the underlying terrane. Frontal lifting occurs when the air mass is pushed up by a cooler air mass. The boundary between the two air masses is called a frontal surface. Finally, the moist air may be heated from below as it passes over a warmer surface, causing convective lifting, which may result in a convective thunderstorm.

Often two or more of these mechanisms may take place together. About two-thirds of the precipitation that reaches the land surface is returned to the atmosphere by evaporation from water surfaces, soil, and vegetation and through plant transpiration.

The remaining third of the precipitation returns ultimately to the ocean through surface or underground channels. *The large percentage of precipitation that is evaporated has often led to the belief that increasing this evaporation by construction of reservoirs or planting of trees will increase the moisture available in the atmosphere for precipitation.*[1] Actually only a small portion of the moisture (usually much less than 10 percent) that passes over any given point on the earth's surface is precipitated. Hence, moisture evaporated from the land surfaces is a minor part of the total atmospheric moisture.

The hydrologic cycle is depicted diagrammatically in Fig. 1 - 1. *No simple figure can do justice to the complexities of the cycle as it occurs in nature.*[2] *The science of hydrology is devoted to a study of the rate of exchange of water between phases of the cycle and in particular to the variations in this rate with time and place.*[3] This information provides the data necessary for the hydraulic design of physical works to control and utilize natural water.

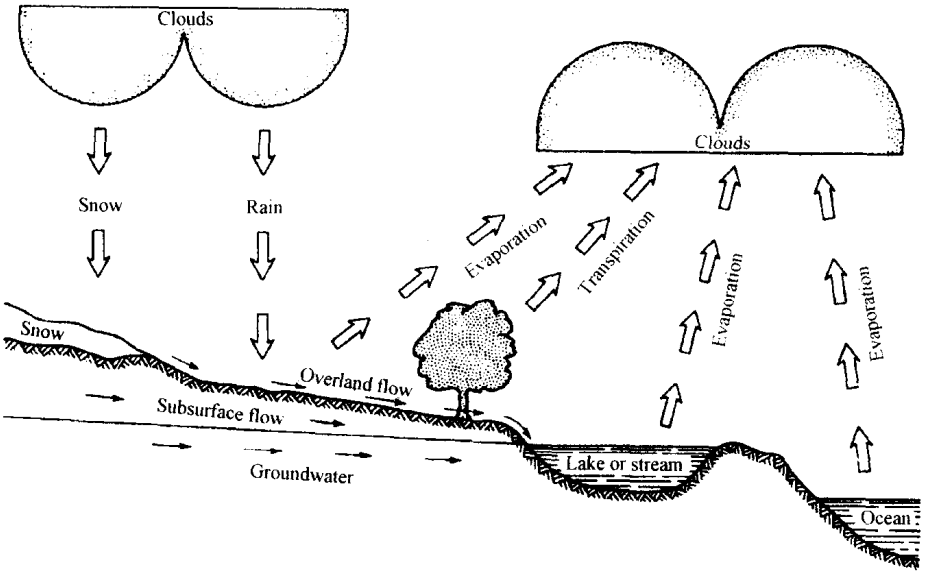

Fig. 1 - 1 Schematic diagram of the hydrologic cycle

Types of Precipitation

Precipitation includes all water that falls from the atmosphere to the earth's surface. Precipitation occurs in a variety of forms that are of interest to the meteorologist, but the hydrologist is interested in distinguishing only between liquid precipitation (rainfall) and frozen precipitation (snow, hail, sleet, and freezing rain). Rainfall runs off to the streams soon after it reaches the ground and is the cause of most floods. Frozen precipitation may remain where it falls for a long time before it melts. Melting snow is rarely the cause of major floods although, in combination with rainfall it may contribute to major floods such as that on the upper Mississippi River in 1969. Mountain snowpacks

are often important sources of water for irrigation and other purposes. The snowfields serve as vast reservoirs that store water precipitation until spring thaws release it near the time it is required for irrigation.

(Ray K. Linsley et al. Water-Resources Engineering. 4th ed. New York: McGraw-Hill Inc., 1992)

New Words and Expressions

hydrology [hai'drɔlədʒi]	*n.*	水文学，水文地理学
hydrologic [haidrə'lɔdʒik]	*adj.*	水文的，水文学的
(= hydrological)		
hydrologic cycle		水文循环，水循环
freshwater ['freʃˌwɔ:tə]	*adj.*	淡水的，河水的
fresh water		淡水，湖水
precipitate [pri'sipiteit]	*v.*	落下，沉降
evaporate [i'væpəreit]	*v.*	(使)蒸发；消失
dewpoint ['dju:pɔint]	*n.*	结露点
droplet ['drɔplit]	*n.*	小滴
Ideal Gas Law		理想气体定律
orographic [ˌɔrəu'græfik]	*adj.*	山岳的，山形的
terrane [te'rein]	*n.*	岩层
convective [kən'vektiv]	*adj.*	传送性的，对流的
schematic [ski'mætik]	*adj.*	示意性的
diagram ['daiəgræm]	*n.*	图表，图解
hydraulic [hai'drɔ:lik]	*adj.*	水力的，水力学的
precipitation [prisipi'teiʃən]	*n.*	降水，降水量；沉淀
transpiration [ˌtrænspi'reiʃən]	*n.*	蒸发(物)；生物蒸腾作用
depict [di'pikt]	*vt.*	描述，描写
diagrammatically [ˌdaiəgrə'mætikəli]	*adv.*	用图解法(地)
physical works		实际构筑物
meteorologist [mi:tjə'rɔlədʒist]	*n.*	气象学者
hudrologist [hai'drɔlədʒist]	*n.*	水文学者
hail [heil]	*n.*	冰雹
	vi.	下雹
sleet [sli:t]	*n.*	冰雪，雨夹雪
	vi.	下雨夹雪，下冻雨
snowpack ['snəupæk]	*n.*	积雪场
thaw [θɔ:]	*n. v.*	解冻

Notes

[1] The large percentage of precipitation that is evaporated has often led to the belief that increasing this evaporation by construction of reservoirs or planting of trees will increase the moisture available in the atmosphere for precipitation. 相当大百分比的降水被蒸发,常导致一些人相信,通过建造水库、栽种树木以增加蒸发量,将会增加大气中形成降水的湿气。has often led to 是主句谓语, that increasing …是同位语从句,作 belief 的同位语。

[2] No simple figure can do justice to the complexities of the cycle as it occurs in nature. 没有一个简单的示意图能适当地描述自然界中实际发生的这种循环的复杂性。do justice to,适当处理。

[3] The science of hydrology is devoted to a study of the rate of exchange of water between phases of the cycle and in particular to the variations in this rate with time and place. 水文学正是致力于研究该循环的各阶段之间水的交换速率,特别是这种速率随时间和地点的变化。

Exercise

Are these statements true (T) or false (F) according to the text?

1) Freshwater resource is reproducible in some sense, for there exist solar distillation, huge ocean surface and air masses moving. ( )
2) Once air moisture is cooled to its dewpoint temperature, some kinds of precipitation form. ( )
3) If moist air mass is heated by warmer air beneath, the air mass lifts and gets cool, then a convective thunderstorm might result. ( )
4) Ocean surface evaporation, air masses moving, precipitation on land area and runoff back to ocean consist of the hydrologic cycle. ( )
5) If only we construct more reserviors and plant plenty of trees and grass to increase evaporation, local rainfall will increase markedly. ( )
6) In the sense of water resource utilization and flood control, frozen precipitation is probably preferred to liquid precipitation. ( )
7) Hydrology is mainly a pure science which can help us deeply understand the interesting mechanism of water cycle in the planet. ( )
8) Mountain snowpacks are natural reserviors for irrigation and other purposes. ( )

Reading Material A

Water Resources and Hydrology

Water is one of our most natural resources. Without it, there would be no life on earth. The lifestyle we have become accustomed to[1] depend heavily upon having plenty of cheap, clean water available as well as an inexpensive, safe way to dispose of it after use.[2]

The supply of water available for our use is limited by nature. Although there is plenty of water on earth, it is not always in the right place, at the right time and in the increasing evidence that chemical wastes improperly discarded yesterday are showing up in our water supplies today.

Today, we faces record consumption, uncertain supplies, and growing demands for protection from flooding and pollution. The health and economic effects of a shortage of clean water are matters of great concern.

Hydrology has evolved as a science in response to the need to understand the complex water system of the earth and help solve water problems. Hydrologists play a vital role in finding solutions to water problems, and interesting and challenging careers are available to those who choose to study hydrology.

(From website of U. S. Geological Survey: http://www.usgs.gov/)

Notes

discard　　*v*.　　丢弃,放弃

[1] lifestyle we have become accustomed to　我们早已习惯的生活方式

[2] an inexpensive, safe way to dispose of it after use　廉价、安全的废水处置方法。it 指 water。

Reading Material B

Environmental Engineering as a Profession

The purpose of colleges and universities is to allow students to mature intellectually and socially and to prepare themselves for careers that will earn them a livelihood[1]. One of the main considerations used by students, especially in engineering, in selecting a profession is that the skills learned be marketable. There are, however, two other factors that should go into the equation by which career decisions are calculated.

First, the vocation should ideally be an avocation as well.[2] It should be a job that is "fun", a job that is approached with enthusiasm even after many years in the profession. The people who are doing exactly what they would like to do, people who made a fortunate career decision, are surprisingly rare. Most engineers in fact get bored with their work, search around for other jobs, and often leave the profession altogether. In the selection of a career, therefore, the enjoyment factor is immensely important.

Second, it is necessary to be proud of what one has accomplished. Building a bridge to allow access to a previously isolated community may be a positive and personally satisfying undertaking. On the other hand, building a dam on a river that wipes out a wild whitewater stream and that creates a useless, highly eutrophied body of water cannot be a source of pride, regardless of what the boss says, or what political favors and deals are involved.[3] In other cases, the social benefits from one's job are even more clearly lacking. Consider, for example, the people involved in the production of cigarette commercials. After completing a professional career on Madison Avenue, is it possible to note with pride that one wrote the world's best cigarette advertisement?

Environmental engineers are employed in all industries and by virtually all agencies of federal, state, and local government that deal with public works projects, roads, water and air quality, and management of natural resources. Much of the research for government policy is done under contract by consulting firms, who also hire many engineers. Environmental assessment also requires engineering input.

Environmental engineering has a proud history, and a bright future. It is a career that may be profitable, challenging, enjoyable, and satisfying, and perhaps most importantly, environmental engineers are committed to high standards of interpersonal and environmental ethics.[4] Environmental engineers try to be part of the solution, while

recognizing that all people are part of the problem.

(P. Aarne Vesilind et al. Environmental Engineering. 2nd ed. Boston: Butterworth Publishers, 1988)

Notes

environmenta	*adj*.	环境的,周围的
marketable	*adj*.	适于销售的
access	*n*.	接近;访问;入门
isolated	*adj*.	隔离的,孤立的
Madison avenue		(纽约)麦迪逊大街

[1] 大学和学院的目的是使得学生在智力与社交方面成熟,能为自己开创一个有良好生活条件的职业生涯。to allow … and to prepare …是两个不定式结构,并列作表语。themselves 指 the students themselves。

[2] 首先,职业应同时为一项理想的业余爱好。

[3] 做主语的动名词短语中有两个 that 引导的定语从句,句中 that 指 a dam。regardless of, 不管……的,不顾……的。eutrophied 为形容词,意为富营养作用的。该句强调工程设施应注重生态效果。

[4] 环境工程师献身于崇高的人际关系及环境道德。commit to: 托付于,献身于。

Unit 2

The World Fresh Water Resource

Fresh water is a fundamental resource, integral to all environmental and societal processes. Water is a critical component of ecological cycles. Aquatic ecosystems harbor diverse species and offer many valuable services. Human beings require water to run industries, to provide energy, and to grow food. In order to mobilize water for human needs, we build huge reservoirs to store water for dry periods and to hold back flood waters; we build aqueducts to transport water thousands of kilometers from water-rich to water-poor regions; we burn oil to generate electricity to desalinate salt water in arid regions; and we dream of towing icebergs from the polar regions and of reversing the flow of massive rivers.

Harsh realities intrude on these dreams. As we approach the 21st century we must now acknowledge that many of our efforts to harness water have been inadequate or misdirected. We remain ignorant of the functioning of basic hydrologic processes. Rivers, lakes, and ground water aquifers are increasingly contaminated with biological and chemical wastes. Vast numbers of people lack clean drinking water and rudimentary sanitation services. Millions of people die every year from water-related diseases such as malaria, typhoid, and cholera. Massive water developments have destroyed many of the world's most productive wetlands and other aquatic habitats. The economic and hydrologic resources for major new irrigation projects cannot be found. And expected changes in global climatic conditions will alter future water supply, demand, and quality.

Hindu and Buddhist traditions[1] place mythical Mount Meru — the dwelling place of the gods — at the center of the universe. Here originate the rivers of the earth, including the *Indus*,[2] the *Ganges*,[3] and the *Brahmaputra*.[4] *In early Christian tradition, the waters of the earth originate in the fountains of the Garden of Eden, which divide into the world's great streams: the Nile, the Tigris, the Euphrates, the Indus, and the Ganges*.[5] These myths arise in part from the sacred role of water in sustaining life, and in part from our early ignorance of the functioning of the global water cycle.

By the end of the 20th century, our understanding of the stocks, flows, and condition of global water resources is still distressingly imperfect. *The International Hydrological Decade, coordinated by the United Nations Educational, Scientific, and Cultural*