给排水科学与工程专业英语

ENGLISH FOR WATER SCIENCE AND ENGINEERING

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内 容 提 要

本书系统地介绍了给水工程、排水工程、建筑给水排水工程、暖通工程和科技英语写作等方面的专业英语知识。全书共15个单元，每个单元包括课文、词汇、翻译技巧和阅读材料。书后附录还提供了课文的参考译文和专业术语。本书本着先进、实用的选材原则和简明、系统的组织原则，充分吸收当前新技术和新成果，力求为给排水科学与工程专业学生提供一个提高专业英语水平和专业素养的平台。

本书可供高等院校给排水科学与工程、建筑环境与设备工程及环保工程等相关专业的学生使用，也可作为工程技术人员的参考资料。

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序

多年前本人在大学教过给排水科学与工程专业英语，那时我就感受到，学生理解和运用一门语言需要不同层次的能力，再结合专业知识进行表达，则有更大的困难。从学科来看，一方面，近年来给排水科学与工程专业理论技术与工程实践发展较快，知识更新频繁；另一方面，基于上述语言学习的固有屏障，加之专业英语课时受限制，一本好的教材在很大程度上可以解决教师授人以渔的问题，解决学生温故（语言）知新（知识）的需要，因此在教和学过程中的重要性是不言而喻的。

窃以为，专业英语教学不仅要让学生学会翻译，了解“信、达、雅”的必要，而且更是一个阶梯，可在提高读者阅读理解能力的基础上，扩大他们的获知面，真正把英语作为通向科技创新与实践纵深的工具，为学生的知识、能力、素质协调发展创造更好条件。

本书在内容安排设置上，涵盖了给排水科学与工程专业所涉及的大部分知识内容，覆盖面较宽，有助于学生巩固所学；在编排上，设有课文、单词、翻译技巧、习题和阅读材料，还设有专章介绍英文科技论文写作，有助于引导学生学会英文科技语言的规范表达；在选材上，课文语言选裁独有特色，能加深学生对学科前沿的了解。相信这样一部在内

容、体系、方法上都有突破的教材，可为造就新世纪给排水科学与工程、环境工程专业科研和工程素质全面的人才发挥重要的作用。

是为序。

2013 年 5 月
于重庆大学

前言

为适应社会发展的实际需要，培养较强的专业英语阅读能力和一定的听、说、写、译能力，编写了本教材《给排水科学与工程专业英语》，可供给水排水工程、建筑环境与设备工程及环保工程等相关专业的学生和工程技术人员使用。

全书共 15 章，内容包括给水工程：给水水源、给水水质及给水净化；排水工程：污水收集、污水处理、污泥处理与处置；建筑给水排水工程：建筑给水、建筑消防、建筑排水及建筑热水供应；暖通工程：供热工程、通风工程；科技英语写作：中文论文的英文摘要写作要求与方法等。

本教材的特点是：第一，突出学习性。本书为每章节编写了词汇、翻译技巧和扩展阅读三个部分，最后一个章节还编写了有关中文论文英文摘要写作要求与方法，方便教材使用者从词汇、翻译、阅读和写作方面自行学习和提高。第二，注重实用性。本书通过精选的各章节，力求使教材使用者在较短的时间内掌握给水排水工程专业的核心词汇、习惯表达方法和写作方法等，可为使用者熟练运用专业英语学习国外先进的工程知识提供支撑。第三，兼顾全面性。本书涵盖内容广泛，可供给水排水工程相关专业有英语提高要求的学生和工程技术人员使用。

本教材由石河子大学刘生宝、张伟主编，由李俊峰、吴心蓉主审。

参编人员均为石河子大学教师，编写分工为：第 1 章、第 5 章、翻译技巧及附录Ⅰ后 7 章由刘生宝编写；第 15 章和阅读材料由张伟编写；第 2 章及附录Ⅱ由孙志华编写；第 3 章、第 6 章及附录Ⅰ中第 3 章、第

6章由王春霞编写；第4章及附录Ⅰ中第1章、第2章、第4章、第5章、第7章由刘芬编写。第7章、第14章由杨广编写；第8章、第9章由蓝明菊编写；第10章、第11章由王健康编写；第12章、第13章由江煜编写。

本书编写中吸收了国内给水排水工程、市政工程、建筑环境与设备工程、建筑类、土木建筑类等的系列英语和水利专业英语教材的内容，以及其他参考资料的内容，书末参考文献已列出。编写过程中还得到了重庆大学高旭教授、吴心蓉博士及日本静冈大学李俊峰博士的审阅和指导。在此，编者谨向上述所引参考资料的作者和专家们，表示衷心的感谢。

由于编者水平所限，错漏和不当之处在所难免，恳请广大读者指正。

编者

2012年

于石河子大学

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Lesson 1　Sources of Water for Domestic Use

There are three possible sources of water for our daily use. One is rain water collected from roofs of buildings or special water sheds and stored in cisterns or ponds. Another is natural surface water, in streams and lakes. The third and most important in rural areas is ground water stored in the earth's crust.

Rain water

In regions where there is a fair amount of rainfall, rain water is often collected from buildings roofs or from outdoor water sheds, and stored in cisterns or ponds. In some rural sections of the country cistern water is used for all domestic and farm purposes, including drinking. This is particularly true where ground water is difficult to obtain or, if obtainable, is for any reason unsatisfactory. When cistern water is used for drinking the cistern should be filled only with clean rain water and should be well protected from contamination. To be absolutely safe for drinking, cistern water should be boiled, chlorinated, or otherwise sterilized.

Cistern water is soft water; therefore, in regions where ground water is especially hard, cisterns are frequently used as a source of soft water for the hot-water supply in homes.

Farm ponds are an increasingly important source of water for livestock, irrigation, spraying, and fire fighting. When correctly constructed and properly managed they also provide an important source of food fish. They are useful for recreation such as fishing, swimming, boating, and skating.

Natural surface waters

Natural surface waters from streams, lakes, and ponds are used extensively for irrigation, for industrial purposes, and for city water supplies. They are also used to

some extent for domestic purposes in rural areas. When used for city water supplies or domestic purpose, surface waters usually must be treated by filtration and chlorination to make them suitable for human consumption. Water so treated is said to be potable, i.e., suitable for drinking.

Ground water

The principal source of water for domestic uses in rural areas is ground water from springs and wells. Some cities also use ground water from wells. In some regions irrigation water is pumped from wells.

The character of ground water from springs and wells depends upon the nature and condition of the soil and rock through which it passes. If it contacts very little soluble material, it will be soft water, and because of the filtering action of the soil it may be cleaner and purer than rain water.

That portion of the total rainfall which soaks into the earth's crust (approximately one-third) percolates downward into the porous spaces in the soil and rock where it remains, or from which it finds its way out to the surface in some way. The exact behavior at any particular location depends upon the amount of rainfall and the character of the earth's crust through which it percolates.

1.1 Vocabulary

crust [krʌst]	*n.*外壳；地壳
rainfall ['reinfɔ:l]	*n.*降雨；下雨；降雨量
water sheds	*ph.*水域
cistern ['sistən]	*n.*储水器；水槽；水池
contamination [kən,tæmi'neiʃən]	*n.*致污物；污染物
chlorinated ['klɔ:rineitid]	*adj.*加氯消过毒的
sterilize ['sterilaiz]	*vt.*使无菌；消毒
irrigation [,iri'geiʃən]	*n.*灌溉
fire fighting	*ph.*消防;消防工作

filtration [fil'treiʃən]	*n.*过滤;滤清
well [wel]	*n.*水井
soak [səuk]	*vt.*使湿透；浸泡；浸渍
percolate ['pə:kə,leit]	*vt.*使渗出;使浸透
porous ['pɔ:rəs]	*adj.*多孔的；渗水的

1.2 Translation Skill Ⅰ

词义选择

英语词汇也具有一词多义、一词多类的特点。正确选择一个词的意义是翻译中首要解决的问题。选择词义一般从三个方面着手：①根据词类确定词义；②根据上下文选择词义；③根据词的搭配习惯确定词义。

Example 1. The service offered did not appear to be as good as people could get from a private well or cistern.

【译】所提供的服务似乎还不如人们用自家的水井或水池方便。

Example 2. in 1950, there were over 17,000 urban water systems in the US.

【译】1950 年，美国城市供水系统已超过 17,000 个。

Example 3. scientific knowledge established for certain that waterborne germs caused typhoid and cholera.

【译】科学知识确凿地证实了水生细菌可导致伤寒和霍乱。

Exercises

1. In some rural sections of the country cistern water is used for all domestic and farm purposes, including drinking.

2. Therefore, in regions where ground water is especially hard, cisterns are frequently used as a source of soft water for the hot-water supply in homes.

3. The exact behavior at any particular location depends upon the amount of rainfall and the character of the earth's crust through which it percolates.

1.3 Reading Material

Surface Water and Ground Water

Water is continually moving around, through, and above the Earth. It moves as water vapor, liquid water, and ice. It is constantly changing its form. Water on Earth is known by different terms, depending on where it is and where it came from.

The movement of water is referred to as the global water cycle (hydrologic cycle). Precipitation, evaporation/transpiration, and runoff (surface runoff and subsurface infiltration) are the primary phases in the hydrologic cycle. The global water budget is based on the recycling (movement, storage, and transfer) of the Earth's water supply.

Surface water

The volume of the Earth's water supply is about 326 million cubic miles. Each cubic mile is greater than 1 trillion gallons. Although water is abundant on a global scale, more than 99% is unavailable for our use. A mere 0.3% is usable by humans, with an even smaller amount accessible.

Surface water is a term used to describe water in a watercourse, lake or wetland, and any includes water flowing over or lying on land after having precipitated naturally, or after having risen to the surface naturally from underground. Surface water supplies, primarily river runoff, are about 300 cubic miles. That means we have about 1/10,000th of 1% to use. Conservation is important!

Surface runoff plays an important role in the recycling process. Not only does it replenish lakes, streams, and groundwater; it also creates the landscape by eroding topography and transporting the material elsewhere. A stream typically transports three types of sediment—dissolved load, suspended load, and bed load. Chemical weathering of rocks produces ions in solution (examples Ca^{2+}, Mg^{2+}, and HCO_3^-). Hence, a dissolved loads. High concentrations of Ca^{2+} and Mg^{2+} are also known by another name —hard water. Some of you may be very familiar with hard water. Suspended sediment makes water look cloudy or opaque. The greater the suspended load, the muddier the

water. Bed load settles on the bottom of the channel. Bed load sediment moves by bouncing or rolling along the bottom. The distance that bed load travels depends on the velocity of the water.

Underground water

Of all the earth's water ,97% is found in the oceans, 2% in glaciers and only 1% on land .of this 1% almost all (97%) is found beneath the surface and called sub-surface or underground water. most of this water eventually finds its way back to the sea either by underground movement or by rising into surface streams and lakes.

Many theories have been presented to explain the large volume of water underneath the earth's surface. Vitruvius was the first to recognize that precipitation provided the main source of sub-surface water, although his explanations of the mechanics involved were not very scientific. His theory, now firmly established, is the infiltration theory, and states that underground water is the result of water seeping downwards from the surface, either directly from precipitation or indirectly from streams and lakes. A very small proportion of the total volume of sub-surface water is derived from other sources.

During precipitation water infiltrates into the ground, under the influence of gravity, this water travels downwards through the minute pore spaces between the soil particles until it reaches a lawyer of impervious bedrock, through which it cannot penetrate .the excess moisture draining downwards then fills up all the pore spaces between the soil particles ,displacing the soil air. During times of excessive rainfall such saturated soil may be found throughout the soil profile, while during periods of drought it may be non-existent. Normally the upper limit of saturated soil, termed the water table, is a meter or so below the surface, the height depending on soil characteristics and rainfall supply.

Surface water /groundwater interaction

Surface streams have an effect on the groundwater table. Influent streams recharge groundwater supplies. Influent streams, located above the groundwater table, flow in direct response to precipitation. Water percolates down through the vadose zone to the water table, forming a recharge mound (Fig. 1).

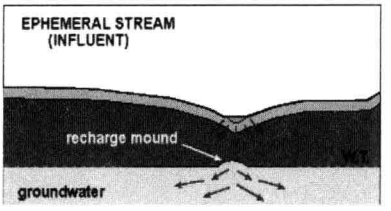

Fig. 1 Recharge mound

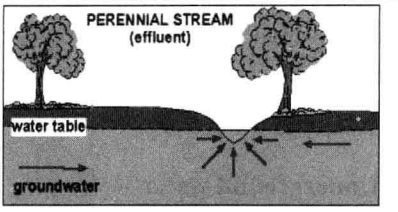

Fig. 2 Groundwater seeping

Effluent streams are discharge zones for groundwater. Effluent streams are generally perennial. Groundwater seeps into stream channels (Fig.2), maintaining water flow during dry seasons.

Lesson 2 Water Quality

What is in the water?

Is it safe to drinking? Can fish and other aquatic life thrive in streams and lakes that are affected by human activities? What is the water quality? To answer these questions, it is helpful to understand what "water quality" means, how it is determined, and the natural processes and human activities that affect water quality.

What do we mean by "water quality"?

Water quality can be thought of as a measure of the suitability of water for a particular use based on selected physical, chemical, and biological characteristics. To determine water quality, scientists first measure and analyze characteristics of the water such as temperature, dissolved mineral content, and number of bacteria. Selected characteristics are then compared to numeric standards and guidelines to decide if the water is suitable for a particular use.

How is water quality measured?

Some aspects of water quality can be determined right in the stream or at the well. These include temperature, acidity (pH), dissolved oxygen, and electrical conductance (an indirect indicator of dissolved minerals in the water). Analyses of individual chemicals generally are done at a laboratory.

Why do we have water-quality standards and guidelines?

Standards and guidelines are established to protect water for designated uses such as drinking, recreation, agricultural irrigation, or protection and maintenance of aquatic life. Standards for drinking water quality ensure that public drinking water supplies are as safe as possible. The U.S. Environmental Protection Agency (USEPA) and the States