

科技英语系列读物 EST Reading Series

第四级 第一分册

GRADE IV BOOK

Man and Atom

〔人类与原子〕



上海外语教育出版社

科技英语系列读物

第4级 第1分册

Man and Atom

人 类 与 原 子

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编写说明

为了开创公共外语教学的新局面，使理工科学生更快更好地掌握外语，机械工业部部属各院校，在机械工业部教育局的直接领导下，根据近年来教学的初步经验总结，经过调查研究，决定编写一套供全日制理工科大学及业余高等学校基础英语阶段使用的课外阅读教材。全书按照词汇量、语言结构和文体的难易分为四级，每级三个分册，共十二分册，分级编排，循序渐进。

本读物每册包括课文、注释、练习三部分：课文选自国外科普读物，选材原则强调思想性、科学性、知识性和趣味性；注释旨在帮助读者理解课文，掌握新的语言现象；练习力求多样化，以巩固课文所学的语言材料，提高英语实践的能力。此外，每册之后附有词汇表，便于读者自学查阅。

本读物以培养学生阅读能力为主要目标。各分册根据选材内容，各有其书名；级与级之间，分册与分册之间，相互连贯呼应，成为一个系列，所以定名为《科技英语系列读物》。

本读物由机械工业部部属院校英语学科协作组统筹安排，组织部属院校分工负责选注，由马泰来、卢思源、李国瑞、柯秉衡、谢卓杰、戴炜华、戴鸣钟等同志（以姓氏笔划为序）组成的审编小组负责审

订，陈开明同志担任审编小组秘书。总审为戴鸣钟教授。由于编写时间匆促并受选材来源和编写水平的限制，全书未尽完善，希广大外语教学工作者和读者予以指正。

编者

1983年7月

本分册在编写过程中，曾蒙英籍专家 Earl N. Kragt 和 Hazel Kragt 提供宝贵意见，特此致谢。

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1. Controlling the Hydrosphere

The hydrosphere is that thin layer of water that rings the continents with seas and at the same time permeates their rocks with groundwater. Abundant fresh water is usually synonymous with abundant food. That pound of beef in the supermarket requires 4000 gallons of potable water in its production; a ton of alfalfa takes 200,000 gallons. In addition to food production there is a host of industrial and domestic uses for water. There is plenty of water in the world—fifty times as much fresh water as we now need—but most of it is either in the wrong place at the wrong time or it is brackish or polluted. Result: deserts, floods, brackish marshes, dead lakes, and sewage-laden^① streams; all of which do agriculture little good. And, of course, the great salt oceans are scarcely tapped at all by farmers.

Man has always tried to manipulate that small fraction of fresh water that falls from the

① sewage-laden: 充满污物的。

skies. Roughly one-thousandth of one percent (0.00001) of the Earth's water exists as water vapor at any instant. This atmospheric reservoir discharges via rainstorms and fills up again through transpiration and evaporation about thirty times a year. Yet, it is this tiny fraction of our watery inheritance^② that sustains the great bulk of our agriculture.

Down the ages,^③ men have used dances, sacrifices, cannons, and silver iodide crystals to try to control rainfall—mostly to make it rain in drought-plagued regions;^④ rarely has man wanted to stop precipitation altogether. The results are controversial. The seeding of clouds^⑤ with silver iodide apparently has some positive effect under special conditions and over restricted geographical areas. Atomic technology has never played an intentional role in rainmaking, although past above-ground nuclear weapons tests have been blamed for heavy regional rainfalls in the United States. Presumably, the large quantities of dust injected into the stratosphere by the blasts could have seeded some of this rainfall. The atom's main role will be in helping scientists understand the

② watery inheritance: 天赋水(指雨水). ③ down the ages: 自古以来; 长久以来. ④ drought-plagued regions: 遭受干旱的地区. ⑤ seeding of clouds: 人工造云降雨. ⑥ hydrological cycle: 水(分)循环.

hydrological cycle^⑦ through the use of radioactive tracers.

Tracing Water. Tritium, the superheavy radioactive isotope of hydrogen (atomic mass of 3), is one of the most important tracers in hydrology because its chemical properties are essentially identical to those of the stable hydrogen in ordinary water molecules. The natural tritium found in rainwater is created by cosmic-ray interaction with the Earth's atmosphere. But man has been a more prolific tritium manufacturer than nature since 1952, when thermonuclear weapons tests began. By tracing the massive artificial injection of tritium into the hydrosphere from weapons explosions, unique data have been obtained on groundwater recharge rates, aquifer flow velocities, and aquifer storage capacities. By learning the details of how fresh water flows through streams and rock strata, engineers can plan water conservation and distribution programs better.

Other radioisotopes, such as iodine-131 and bromine-82, have also been useful in aquifer and groundwater studies. Tracers also measure river flow velocity, dam leakage, pollution sources, and river recharging of groundwater stores. Deep groundwater is usually pristine pure, even

⑦ "fossil" water: 古地下水。

though many reservoirs of such “fossil” water^⑧, such as that under the Sahara Desert, are tens of thousands of years old. These old water strata are dated by carbon-14 like other relics of prehistoric time. Groundwater reservoirs are immense—possibly thousands of times the volume of surface water; it is essential to understand this largely untapped source of fresh water, and the atom is an important tool in this endeavor.

Grand Plans. The sixteenth-century English poet John Heywood once wrote, “Much water goeth by the mill that the miller knoweth not of,”^⑨ Mankind’s mill is planet-sized,^⑩ and planet-sized plans to control it are in order.^⑪ Even though far less than one percent of the globe’s water runs toward the seas, immense engineering works are needed to “tame” this flow. Already, hundreds of thousands of dams, large and small, intercept the world’s rivers. Great dams are a symbol — even a passion — of the American West. Despite the best efforts of the dam builders, though, some areas are still too dry (southwestern United States) and some have more than their share of fresh water (eastern United States).

⑧ “Much water goeth... knoweth not of,”: “许多水从磨坊旁边流过，而磨坊主却还不知道”。意为人们没有充分利用水。
goeth [古] = goes, knoweth [古] = knows. ⑨ planet-sized: 星球规模的；世界规模的。 ⑩ in order: 合适的。

When regional efforts prove inadequate, continental plans are born. We speak now not of the TVA (Tennessee Valley Authority)^⑪ or the Mekong Delta,^⑫ but of even larger projects such as NAWAPA (North American Water and Power Alliance).^⑬ The engineering firm of J. M. Parsons proposed NAWAPA in 1964. It embraces Canada, the United States, and Mexico. The basic plan is to collect surplus water from high precipitation areas of the northwestern part of the continent and subsequently redistribute it to water-scarce areas in all three countries. Hydroelectric power (70,000 to 150,000 megawatts) could be generated as the water worked its way^⑭ seaward.

The largest reservoir in the NAWAPA system would be the Rocky Mountain Trench,^⑮ an artificial body of water sixteen times the size of Lake Mead.^⑯ Six huge pumping stations (possibly nuclear-powered) would pump the water stored in the Trench over the mountains into the

⑪ Tennessee Valley Authority (TVA): (美国)田纳西流域管理局。 ⑫ Mekong Delta ['meikɒŋdelta]: 湄公河三角洲。

⑬ North American Water and Power Alliance (NAWAPA): 北美洲水电联合工程。 ⑭ work one's way: 流向。 ⑯

Rocky Mountain Trench: 落矶山渠。落矶山为北美洲西部一山脉。设计中的落山矶渠在美国。 ⑰ Lake Mead: 米德湖 (在

美国内华达州与亚利桑那州之间, 面积约为250平方英里),

American Southwest and Colorado Basin,^{①⑦} and into Mexico. Another major NAWAPA feature would be the Alberta—Great Lakes Canal,^{①⑧} a waterway seventy-three feet wide and thirty feet deep linking the West (possibly even the Pacific Coast) with the Atlantic via a connection with the St. Lawrence Seaway^{①⑨}.

NAWAPA is year-2000 size;^{②①} a big investment of technology to guarantee a water supply for the continent, and the most effective distribution of runoff among Canada, the United States, and Mexico. NAWAPA displays the boldness and imagination also needed to solve our colossal environmental problems. Many western states back NAWAPA, although Canada is still reluctant. Being a \$200 billion project, it is hard to sell^{②②} when many other planetary ills^{②③} call for money. There are also unresolved problems and undesirable side effects such as the inundation of valuable mining and recreational areas, to say nothing of^{②④} flooding some towns and roads.

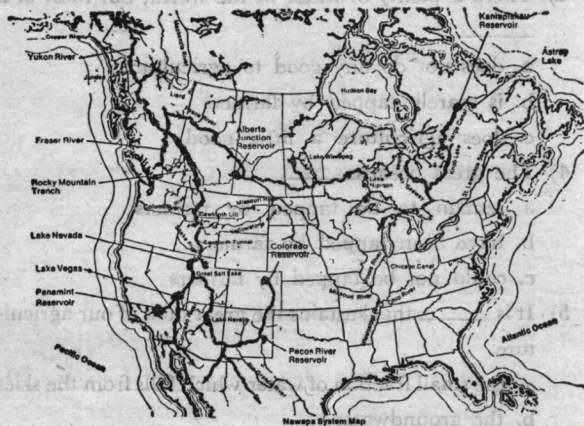
①⑦ Colorado Basin [ˌkɒləˈrɑːdəʊ]: 科罗拉多盆地(美国).

①⑧ Alberta-Great Lakes Canal: 阿尔伯塔-五大湖运河 (Alberta 为加拿大西部一省, Great Lakes 指北美洲五大湖). ①⑨ St.

Lawrence Seaway [seɪntˈlɒrənsˈsiːweɪ]: 圣劳伦斯航道(美国).

②① year-2000 size: 到公元2000年的规模. ②② to sell: 被广泛接受. ②③ planetary ills: 地球上的灾祸, ②④ to say nothing of: 更不必说,

Another large-scale plan to control surface water is the Amazon Great Lakes plan proposed by Hudson Institute.^{②④} In this concept, a series of low dams would create seven large lakes, opening up more completely the Amazon Basin^{②⑤} (the largest in the world) to boat traffic. More electricity would again go hand in hand^{②⑥} with improved transportation. Hundreds of thousands of square miles of fertile soil would be made arable below the dams.



• Map of the NAWAPA system concept. (Ralph M. Parsons Company)

②④ Hudson Institute: 哈得孙研究所(哈得孙河在美国东北部, 该河及其研究所皆以1609年抵达该河的英国航海家 Henry Hudson 命名)。

②⑤ Amazon Basin: 亚马孙河盆地(亚马孙河在南美洲, 是世界上流域最广、流量最大的河流, 也是世界第二长河)。

②⑥ hand in hand: 一起。

Exercises

I. Choose the best answer according to the reading and fill in the blank.

- 1) The hydrosphere is _____.
 - a. the thin layer of seawater
 - b. the thin layer of groundwater
 - c. the thin layer of both seawater and groundwater
- 2) Abundant fresh water _____.
 - a. has nothing to do with abundant food
 - b. usually means abundant food
 - c. has relation to abundant food
- 3) There is plenty of water in the world, but most of it _____.
 - a. does not do any good to agriculture
 - b. is scarcely tapped by farmers
 - c. does agriculture a little good
- 4) The great oceans _____.
 - a. remain to be tapped by farmers
 - b. have been tapped by farmers
 - c. could not be tapped by farmers
- 5) It is _____ that sustains the great bulk of our agriculture.
 - a. the small fraction of water which falls from the skies
 - b. the groundwater
 - c. the water from the river
- 6) Dances, sacrifices and cannons have _____.
 - a. some effect on controlling rainfall
 - b. some effect on stopping precipitation
 - c. no effect on controlling rainfall and stopping precipitation

7) _____ is an important tool in groundwater studies.

a. The superheavy radioactive isotope of hydrogen

b. Iodine-131

c. The atom

8) In order to _____, hundreds of thousands of dams have been built in the world.

a. tame the river's flow

b. keep the world's rivers from running toward the seas

c. intercept water

9) _____, one of the largest projects in the world, was proposed in 1964.

a. Mekong Delta Project

b. TVA

c. NAWAPA

10) The major NAWAPA features would be _____.

a. the Alberta Canal

b. the Alberta—Great Lakes Canal

c. the Rocky Mountain Trench and the Alberta—Great Lakes Canal

II. Supply the missing words in the following sentences.

1) Although "fossil" water is tens of thousands of years old, it is usually _____.

2) The dates of old water strata can be determined by _____.

3) Already, a lot of dams, large and small, have been built in the United States, some areas in _____ have more fresh water but some in _____ are still water-scarce regions.

4) _____ plans were proposed when local efforts proved insufficient.

- 5) The Rocky Mountain Trench has _____ huge pumping stations which are _____.
- 6) The Alberta-Great Lakes Canal is a waterway _____ the Pacific Coast with the Atlantic through a connection with the St. Lawrence Seaway.
- 7) NAWAPA is the most effective _____ of runoff among the three countries.
- 8) Planet-sized projects display the _____ and _____ of engineers.
- 9) There are also many problems, such as the inundation of some towns, roads and _____ valuable mining areas, to _____ in the NAWAPA plan.
- 10) The Amazon Great Lakes plan is another _____ project to control the globe's water.

2. How Nuclear Power and Explosion Fit In^①

Nuclear power is cheapest when the power plants are biggest. Nuclear power should be considered whenever large amounts of water must be transported against the force of gravity. In the NAWAPA scheme, for example, it may be more economical to employ nuclearpowered pumps to lift water over the Rockies^② than to transmit hydroelectric power back to the Rocky Mountain Trench from dam sites far downstream. Another interesting possibility is the use of power plant waste heat—otherwise called a thermal pollutant^③—to keep NAWAPA waterways ice-free and open to navigation^④ in the winter. For example, an ice-free Alberta—Great Lakes Canal would greatly reduce transportation costs in the northern portion of North America. However, the problem of disposing of waste heat in the summertime must be solved.

① fit in (with): 配合; (对...)适合。 ② the Rockies: 落矶山脉(北美洲)。 ③ otherwise called a thermal pollutant: 又称为热污染物。 ④ open to navigation: 通航的。