高级科技英语阅读教程

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An Advanced Course in Scientific English Reading

高级科技英语阅读教程

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【内容简介】本书选编了近年来国外出版的科技书刊及国际学术讨论会论文集不同学科英语论文，其内容涉及了工业、农业、林业、生物学、生态学、生物工程、高新技术、信息科学、计算机技术、经贸、管理科学、物理学、化学、医学、地质、海洋、大气科学等等，以便提高研究生、本科高年级学生、青年教师及科研人员阅读科技英语论文的水平。因此，本书能为适应各类英语考试打下一个良好的基础，确是一本良好的阅读教材。

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前　言

《*An Advanced Course in Scientific English Reading*》是为高等院校研究生、本科高年级学生、青年教师及科研人员而设计的，经过多年的试用和修改后完成的一部高级阅读教程。为了培养学生使用英语参加学术讨论和撰写读书报告的能力，我们以基础科学为重点，注意了多学科性，在力求突出语言共核的前题下编著了本教程。课文全部选自近年国外出版的科技书刊和国际学术会议论文集，只在少数地方作了必要的删节，具有较强的可读性。

全书由29个单元组成。每个单元后都配有一定的练习，分为理解、讨论与评论、阅读理解三部分。在编写过程中，我们得到西安理工大学、西北轻工业学院、西北农业大学等单位的大力支持。在此表示衷心的感谢。

由于编者水平有限，缺点和错误在所难免，希望使用本书的同志们提出批评意见，以便再版时修正。

编　者

1999年7月于西安

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Unit 1

An American Renassance in the Next Century

In this article, forecaster Marvin Cetron, author of numerous books about the future, prepared a new report listing 74 trends and forecasts affecting the United States.

Based on these trends, he anticipates a "renassance " for Ameraca in the years ahead. Though he reviews himself as a realist, Cetron says that his findings make him very optimistic about the future . This article shows trends that, together, provide a comprehensive overview of changes that will shape America as the nation approaches the start of the twenty – first century. Much of the report is startling or controversial, but all of it is based on the kind of research and analysis that have made Cetron a valued consultant to American presidents of both parties, from John F. Kennedy through Bill Clinton.

General Long – Term Trends in Society

Trend 1

Economic prosperity—affluence, low interest rates, low inflation rate—will continue through the foreseeable future.

There may be minor recessions during the 1990s, but they will only be perturbations. Our long – range forecast for the economy is

good. Through the year 2000, the U.S. economy should be the best in the world. Per capita personal income increased 1.5% annually between 1980 and 1991. It will average 1.8% annually through the turn of the century. Part of society affluence (riches) rests on the ovreuse of credit cards. Extension of excessive credit could result in government – imposed limitation especially on credit rates.

The intolerably high interest rates of the 1970s have led the Federal Reserve Board (FRB) to "manage" interest rates since 1981. As a result, interest rates are now the lowest in 20 years. They will remain low through the 1990s.

FRB monetary policies instituted by chairman Paul Volker and continued by his successor, Alan Greenspan, will keep interest and inflation rates in check. Housing starts will continue to grow, and building construction will increase.

As the dollar declines against other currencies, American exports will grow rapidly . This finally begin to correct the U.S. balance – of – trade deficit.

Trend 2

The growth of the information industries is creating an extremely knowledge – dependent society.

The computer industry will continue to offer vast opportuities for creative enterpreneurs. Though hardware remains promising, software developers will reap the greatest rewards.

Expert systems will issue reports and recommend actions based on date fathered (created) electronically, without human intervention.

Investment in expert systems and related technologies grew from $ 35 million in 1986 to $ 900 million in 1991. The pace will accelerate throughout the 1990s.

Industries that will benefit from systems include insurance, investments and banking, manufacturing and process control, equipment diagnosis, and quality control.

Trend 3

The very poor and very wealthy will decline in American society.

The very rich will still own a disproportionately large fraction of the national wealth; yet they will make up a smaller percentage of the population. The percentage of households with annual incomes over $ 75,000 (in dollars) grew from 5.6% in 1970 to 9.7% in 1990; those with incomes under $ 10,000 declined from 15.6% in 1970 to 14.9% in 1990. Both these trends will continue. Statistics overestate the number of very poor in the United States, because they omit income – equivalents such as food stamps (food ticket), housing allowances, and free medical care. When these are included, the poverty rate falls sharply. Official figures show that 10.5% have incomes under $ 10,000 per year, but the effective percentage is closer to 6% – 7%.

Higher taxes for people whose income is over $ 180,000 per family will tend to slow the growth of the very wealthy in U.S. society. Most importantly, small businesses structured as proprietorships or partnerships or as Subchapter S corporations will be taxed at the same rate as individuals. This will reduce job growth among small

businesses. To offset that, and restore job growth, the tax on capital gain will eventually be reduced.

The social security system will be reformed. Those reforms will include means testing and taxation of benefit.

Trend 4

Rural land is being colonised by suburbs and cities.

Land in farms has decreased steadily since 1959. The rate of decline was 1% per year from 1975 to 1985 and slowed to 0.5% per year between 1985 and 1991.

Suburbs are developing more rapidly than cities, largely because land there is cheaper and road systems provide easy access. Three – fourths of the U.S. population live in cities and their suburbs, while only one – fourth live in rural areas.

Suberbia is being urbanised, as satellite cities grow outside the major metropolitan areas. Construction of office parks, shopping centers, and entertainment districts is creating suburban 'downtown'.

And population is expanding from the suburbs into outlying towns and rural areas.

'Superburbs' will increasingly connect cities, especially in the next decade is expected to occur.

Trend 5

The middle – class society will prevail. The middle 60% of families have received 52% – 54% of income since 1950. This proportion will grow slightly in the next five years.

Trend 6

Growing acceptance of cultural diversity will promote the growth

of a truely integrated national society.

Our beliefs and values are shaped by what we see and hear. Throughout the United States , people see the same movies and TV programmes.

Schools across the country teach essentially the same things.

New modes of transportation, better roads (especially the interstate - highway system) and accommodations, more leisure time, and greater affluence will allow more frequent travel. (Common - carrier passenger miles grew by 4% per year from 1982 to 1985 and by 3.7% from 1985 to 1990.) This will produce a greater sharing of ideas, information, and concerns (interesting matters). Intermarriages continue to mix cultures geographically, ethnically, nationally), socially, and economically.

Information technologies are promoting long - distance communication as people hook up with the same commercial databases and computer networks. Two - way cable television will accelerate this process.

Regional differences, attitudes, incomes, and lifestyles are blurring (making indistinct) as people move from one region to another.

Minorities will exert more influence over the national agebda as the population of African Americans. Latinos and Asian Americans increases from 17% in 1990 to 33% by 2000.

Trend 7

The permanent military establishment will continue to shrink.

More and better trained reserves and National Guard units will reduce the need for professional troops.

Smart weapons will tend to reduce military personnel requirements. Orders form new and replacement weapons are being cut back.

By 2000, young men and women will probably spend two years in compulsory (obligatory) national service. They will have three options, military service, VISTA – type (Volunteers in Service to America) work with poor and disabled; or duty with the Peace Corps.

Trend 8

Americans will grow increasingly mobile in key areas, personal life, location, and occupations.

About 17% of the population move each year.

Modular housing made largely of plastic, will allow people to move more frequently and easily. They will simply pack up their houses and ship them in the new locale(the scene of a film shot). Job mobility—changing locations or firms, but doing the same work—will increase.

People soon will expect to change jobs four to five times during their lifetimes.

Dual – career families, with partners sometimes working in different cities , require greater personal mobility.

Global satellite communication will be available by next century. A person equipped with a mini – transceiver(micro – device used as both a transmitter and a receiver in radio communication) will be able to speak to anyone, send a fax, or even tie into computer, anywhere in the world, 24 hourse a day.

The new information based on model for the organization—a nonhierarchical (non - social stratum), organic system able to respond quickly to environmental changes—fosters greater occupational flexibilty and autonomy (independence).

Trend 9

International affairs and national security are becoming major factors within U.S. society.

More international travel for business and pleasure brings greater exposure to other societies—and to foreign political turmoil.

International student - exchange programmes are proliferating (sharply increasing).

Observation/verification activity between the East and the West has grown since the end of the Cold War.

East - West television and radio satellite hookups (internet broadcast) will increase.

Regional political and economic arrangements such as the European Union, the Organisation of American States, and the North American Free Trade Agreement will play a larger role in the world political and economic affairs.

The international treaty signed at Rio in 1992 was a global scale. The West and the United States are pumping large amounts of money into the former East - Bloc(Group) countries to aid their economies in the transition.

Technological Trends

Trend 10

Technology will increasingly dominate both the economy and

society. Personal robots will appear to the home by next century. Robots will also work at mundane(ordinary) commercial and service jobs, environmentally dangerous jobs, and assembly and repair of space station components in orbit.

Computers will become part of our environment, rather than just tools we use for specific tasks. Portable computers will give us wireless access to networked data wherever we go.

Wireless hookups will simplify relocation of personnel, minimise delays in accomplishing new installations, and let terminals travel with the user instead of forcing the user to seek out a terminal.

By 2001, artificial intelligence and virtual(imaginative) reality will help most companies and government agencies to assimilate data and solve problems beyond the range of today computers. Artificial Intelligence uses include robotics, machine vision, voice recognition, speech synthesis , electronic data processing, health and human services, administration , and airline pilot assistance.

By 2001, expert systems will permeate manufacturing, energy processing, automotive diagnostics, medicine, insurance underwriting, and law enforcement.

Superconductors operating at room temperature will be in commercial use by 2001. Products will include surpercomputers the size of three – pound coffee cans, electric motors 75% smaller and lighter than those of today, practical hydrogen fusion power plants, electrical storage facilities with no heat loss, analysers that can chart the interaction of brain cells, and 200 – mph maglev trains that float on magnetic cushions.

Trend 11

Technological advances in transportation will dispel the spectre (future trouble) of national gridlock(block) in the air and on land. Rails are the way out, but trains are not. Late in this decade, high speed trains will begin to replace the spokes of the airline industry existing bub – and – spoke system for journeys of 100 to 150 miles. Planes will carry 1,000 passengers. New York, Tokyo, and Frankfurt will become common transfer points for passengers of high – speed supersonic planes.

The average life of a car in the United States will be 22 years in the year 2000, (For a Volvo, it is already 19 years). Advances in automobile technology will give us the smart car, equipped with sensors, antilock brakes, computer – orchestrated (controlled) fuel systems, continuously variable transmission, active suspension, and many other innovations.

The government will lag in adopting new highway technology. A white House initiative , 'Car Wars,' in 2000, will usher in systems that allow traffic lights and the roadbed itself to interact with cars. Airline crashes will decline, and will involve fewer fatalities, by 2000 , thanks to the use of satellites for both navigation and communication in transoceanic flights, safer seat design and fire – resistant fuels.

Trend 12

The U.S economy is growing integrated.

New industrial standards – for building materials, fasteners (a contrivance for fixing things firmly together), even factory machinery

– allow both civilian and government buyers to order from any supplier, rather than only from those with whom they have established relationships. The acceptance of global standards is one of the most important industrial trends now operating.

To aid "just – in – time" purchasing, many suppliers are giving customers direct, on – line access to their computerised ordering and inventory systems. The order may go directly from the customer to the shop floor, and even into the supplier's automated production equipment. Many manufacturers will no longer deal with suppliers who cannot provide this access.

Computer networks and cable TV home – shopping channels are bringing retailers and manufacturers closer to distant customers, who have been out of reach until now.

Trend 13

The U.S. economy is becoming integrated with international economy. Imports continue to increase, international capital markets are merging, and buying patterns around the world coalesce (joint). All these factors promote the interdependence of business and government decisions worldwide.

Nationalistic self – interest will continue to yield to international trade cooperation. Both developing and developed countries will fucus less on dominating economic competitors and, instead, will put efforts into liberalising trade cooperation.

Trend 14

The international economy will gain importance throughout the 1990s. Consumers around the world are demanding higher quality in

products and services.

Tariffs and other trade barriers are falling.

Privatisation is a growing trend, with governments around the world selling off public services. In the United States, this could mean an end to the U.S. Postal Service's monopoly on regular mail service. Globally, this means a transition from governmental to private ownership of airlines, railroads, water, and electricity.

Trend 15

Research and development (R&D) will play a growing role in the economy. R&D outlays as a percentage of GNP (Gross National Production) rose steadly in the decade after 1978, then stablized in 1988. The increase in R&D outlays will likely resume as the effects of the recent recession are left behind.

R&D outlays are growing most rapidly in the electronics, aerospace, pharmaceuticals, and chemical industries.

Trend 16

Technology is turning over faster every year.

The design and marketing cycle – idea, invention, innovation, imitation – is shrinking steadily. Successful products must be marketed quickly, before the competition can copy them.

Computer – aided design in the automobile and other industries shortens the delay between idea and finished design.

All the technological knowledge we work with today will represent only 1% of the knowledge that will be available in the year 2050.

Trend 17