Chapter 9

写作参考：科技，生活，时代

Writing Reference: Science, Technology, Life

Saving My Revised GRE Issue

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【什么是科学】To understand what science is, just look around you. What do you see? Perhaps, your hand on the mouse, a computer screen, papers, ballpoint pens, the family cat, the sun shining through the window… Science is, in one sense, our knowledge of all that — all the stuff that is in the universe: from the tiniest subatomic particles in a single atom of the metal in your computer's circuits, to the nuclear reactions that formed the immense ball of gas that is our sun, to the complex chemical interactions and electrical fluctuations within your own body that allow you to read and understand these words.

【科学是了解世界的过程】But just as importantly, science is also a reliable process by which we learn about all that stuff in the universe. However, science is different from many other ways of learning because of the way it is done. Science relies on testing ideas with evidence gathered from the natural world. This website will help you learn more about science as a process of learning about the natural world and access the parts of science that affect your life.

【科学既是知识又是过程】Science is both a body of knowledge and a process. In school, science may sometimes seem like a collection of isolated and static facts listed in a textbook, but that's only a small part of the story. Just as importantly, science is also a process of discovery that allows us to link isolated facts into coherent and comprehensive understandings of the natural world.

【科学与发现】Science is exciting. Science is a way of discovering what's in the universe and how those things work today, how they worked in the past, and how they are likely to work in the future. Scientists are motivated by the thrill of seeing or figuring out something that no one has before.

【科学与实际用途】Science is useful. The knowledge generated by science is powerful and reliable. It can be used to develop new technologies, treat diseases, and deal with many other sorts of problems.

【科学不断进步】Science is ongoing. Science is continually refining and expanding our knowledge of the universe, and as it does, it leads to new questions for future investigation. Science will never be "finished."

【科学不断质疑】The knowledge that is built by science is always open to question and revision. No scientific idea is ever once-and-for-all "proved." Why not? Well, science is constantly seeking new evidence, which could reveal problems with our current understandings. Ideas that we fully accept today may be rejected or modified in light of new evidence discovered tomorrow.

【科学值得信赖】Despite the fact that they are subject to change, scientific ideas are reliable. The ideas that have gained scientific acceptance have done so because they are supported by many lines of evidence. These scientific explanations continually generate expectations that hold true, allowing us to figure out how entities in the natural world are likely to behave and how we can harness that understanding to solve problems.

【科学满足人们好奇心】Science helps satisfy the natural curiosity with which we are all born: why is the sky blue, how did the leopard get its spots, what is a solar eclipse? With science, we can answer such questions without resorting to magical explanations. And science can lead to technological advances, as well as helping us learn about enormously important and useful topics, such as our health, the environment, and natural hazards.

【科学是整个人类合作的结晶】Science is a global human endeavor. People all over the world participate in the process of science. Without science, the modern world would not be modern at all, and we still have much to learn. Millions of scientists all over the world are working to solve different parts of the puzzle of how the universe works, peering into its nooks and crannies, deploying their microscopes, telescopes, and other tools to unravel its secrets.

【科学为什么重要】The importance of science includes:

- Science is important because the act of doing science is a creative process. All creative processes are important, be they art, music, storytelling or anything else. After love, creativity is the most important human quality. Not only is science creative, it enables creation;
- Science is important because it provides us with mysteries to wonder about and beauty to wonder at;
- Science is important because it is part of the honorable quest that is the search for truth and knowledge;
- Science is important because it reveals our ignorance and humbles us, even the most intelligent and the most powerful;
- Science is important because when adults do science we recreate within ourselves the sense of awe and mystery we had when we were children;
- Science is important because it encourages us to question authority and provides a means for doing so;
- Science is important because it requires free exchange of ideas and information - it is incompatible with tyranny and so reduces tyranny;
- Science is important because it grounds us in reality - it can challenge us and force us to change our minds;
- Science is important because it helps us understand our place in the world, but more importantly it helps us actualize that place, both as human beings and as individuals.

【科学的特点】The word "science" probably brings to mind

many different pictures: a fat textbook, white lab coats and microscopes, an astronomer peering through a telescope, a naturalist in the rainforest, Einstein's equations scribbled on a chalkboard, the launch of the space shuttle, bubbling beakers… All of those images reflect some aspect of science, but none of them provides a full picture because science has so many facets:

- Scientists are everywhere, unraveling the secrets of the universe;
- Science focuses exclusively on the natural world, and does not deal with supernatural explanations;
- Science is a way of learning about what is in the natural world, how the natural world works, and how the natural world got to be the way it is. It is not simply a collection of facts; rather it is a path to understanding;
- Scientists work in many different ways, but all science relies on testing ideas by figuring out what expectations are generated by an idea and making observations to find out whether those expectations hold true;
- Accepted scientific ideas are reliable because they have been subjected to rigorous testing, but as new evidence is acquired and new perspectives emerge these ideas can be revised;
- Science is a community endeavor. It relies on a system of checks and balances, which helps ensure that science moves in the direction of greater accuracy and understanding. This system is facilitated by diversity within the scientific community, which offers a broad range of perspectives on scientific ideas.

【科学与你】To many, science may seem like an arcane, ivory-towered institution — but that impression is based on a misunderstanding of science. In fact:

- Science affects your life everyday in all sorts of different ways;
- Science can be fun and is accessible to everyone;
- You can apply an understanding of how science works to your everyday life;
- Anyone can become a scientist — of the amateur or professional variety.

Quotations on Science

Bad times have a scientific value. These are occasions a good learner would not miss.
Ralph Waldo Emerson (1803-1882, an American lecturer, philosopher, essayist, and poet)

Men love to wonder, and that is the seed of science.
Ralph Waldo Emerson

Science does not know its debt to imagination.
Ralph Waldo Emerson

Each problem that I solved became a rule, which served afterwards to solve other problems.
Rene Descartes (1596-1650, a natural philosopher and dubbed the "Father of Modern Philosophy")

Every great advance in science has issued from a new audacity of imagination.
John Dewey (1859-1952, an American philosopher, psychologist and educationist)

Facts are the air of scientists. Without them you can never fly.
Linus Pauling (1901-1994, an American chemist, peace activist, author and educator)

Give me a lever long enough and a fulcrum on which to place it, and I shall move the world.
Archimedes (287?-212BC, a Greek mathematician, engineer, and physicist and discovered the principle of buoyancy)

Only two things are infinite, the universe and human stupidity, and I'm not sure about the former.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

Science without religion is lame, religion without science is blind.
Albert Einstein

Our scientific power has outrun our spiritual power. We have guided missiles and misguided men.
Martin Luther King, Jr. (1929-1968, an American clergyman, activist, and prominent leader in the African American civil rights movement)

Science investigates religion interprets. Science gives man knowledge which is power religion gives man wisdom which is control.
Martin Luther King, Jr.

Science is the last step in man's mental development and it may be regarded as the highest and most characteristic attainment of human culture.
Ernst Cassirer (1874-1945, a German philosopher)

The belief that science developed solely out of a pursuit of knowledge for its own sake is at best only a half truth, and at worst, mere self-flattery or self-deception on the part of the scientists.
Lewis Mumford (1895-1990, an American historian, philosopher of technology and science, and influential literary critic)

Science is the great antidote to the poison of enthusiasm and superstition.
Adam Smith (1723-1790, was a Scottish social philosopher and a pioneer of political economy, whose *Wealth of Nations* (1776) laid the foundations of classical free-market economic theory.)

Science never solves a problem without creating ten more.
George Bernard Shaw (1856-1950, an Irish playwright and a co-founder of the London School of Economics)

Darwin has interested us in the history of nature's technology.
Karl Marx (1818-1883, a German philosopher, political economist, historian, political theorist, sociologist, and revolutionary socialist, who developed the socio-political theory of Marxism)

Observations always involve theory.
Edwin Hubble (1889-1953, an American astronomer who profoundly changed understanding of the universe by confirming the existence of galaxies other than our own, the Milky Way)

I am compelled to fear that science will be used to promote the power of dominant groups rather than to make men happy.
Bertrand Russell (1872-1970, a British philosopher, logician, mathematician, historian, and social critic)

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现代科学起源

Origins of Modern Science[1]

Relevant GRE Issue
相关题库题目 【新 33 题】【新 87 题】【新 109 题】

See Also
相关写作参考 【Ref-067 技术进步】【Ref-073 科学局限性】【Ref-065 有关科学】【Ref-071 科学与质疑】

The origins of modern science lie in a period of rapid scientific development that occurred in Europe between the year 1500 AD and 1750 AD.

【哥白尼革命】Copernican revolution

In these earlier periods the dominant world-view was Aristotelianism, named after the ancient Greek philosopher Aristotle (384-322 BC), who put forward detailed theories in physics, biology, astronomy, and cosmology. Geocentric astronomy lay at the heart of the Aristotelian world-view, and had gone largely unchallenged for 1800 years. The first crucial step in the development of the modern scientific world-view was the Copernican revolution. In 1542 the Polish astronomer Nicolas Copernicus (1473-1543) published a book attacking the geocentric model of the universe, which placed the stationary earth at the centre of the universe with the planets and the sun in orbit around it. Copernicus' theory initially met with much resistance. But

within 100 years Copernicanism had become established scientific orthodoxy.

【伽利略】Galileo Galilei

Copernicus' innovation did not merely lead to a better astronomy. Indirectly, it led to the development of modern physics, through the work of Johannes Kepler (1571-1630) and Galileo Galilei (1564-1642). Kepler discovered that the planets do not move in circular orbits around the sun, as Copernicus thought, but rather in ellipses. Galileo's most enduring contribution, however, lay not in astronomy but in mechanics, where he refuted the Aristotelian theory that heavier bodies fall faster than lighter ones. In place of this theory, Galileo made the counter-intuitive suggestion that all freely bodies will fall towards the earth at the same rate, irrespective of their weight. Galileo is generally regarded as the first truly modern physicist. He was the first to show that the language of mathematics could be used to describe the behavior of actual objects in the material world, such as falling bodies, projectiles, etc. To us this seems obvious - today's scientific theories are routinely formulated in mathematical language, not only in the physical sciences but also in biology and economics. But in Galileo's day it was not obvious: mathematics was widely regarded as dealing with purely abstract entities, and hence inapplicable to physical reality. Another innovative aspect of Galileo's work was his emphasis on the importance of testing hypotheses experimentally. To the modern scientists, this may again seem obvious. But at the time that Galileo was working, experimentation was not generally regarded as a reliable means of gaining knowledge.

【笛卡尔】Rene Descartes

The period following Galileo's death saw the scientific revolution rapidly gain in momentum. The French philosopher, mathematician, and scientist Rene Descartes (1596-1650) developed a radical new "mechanical philosophy," according to which the physical world consists simply of inert particles of matter interacting and colliding with one another. The laws governing the motion of these particles or "corpuscles" held the key to understanding the structure of the Copernican universe, Descartes believed. The mechanical philosophy promised to explain all observable phenomena in terms of the motion of these inert, insensible corpuscles, and quickly became the dominant scientific vision of the second half of the 17th century; To some extent it is still with us today; Its widespread acceptance marked the final downfall of the Aristotelian world-view.

【牛顿】Isaac Newton

The scientific revolution culminated in the work of Isaac Newton (1643-1727), whose achievements stand unparalleled in the history of science. Newton agreed with the mechanical philosophers that the universe consists simply of particles in motion, but sought to improve on Descartes' laws of motion and rules of collision. The result was Newton's three laws of motion and his famous principle of universal gravitation. Newtonian physics provided the framework for science for the next 200 years or so. Scientific confidence grew rapidly in this period, due largely to the success of Newton's theory, which was widely believed to have revealed the true workings of nature, and to be capable of explaining everything, in principle at least. The 18th and 19th centuries both saw notable scientific advances, particularly in the study of chemistry, optics, energy, thermodynamics, and electromagnetism. But for the most part, these developments were regarded as falling within a broadly Newtonian conception of the universe. Scientists accepted Newton's conception as essentially correct; all that remained to be done was to fill in the details.

【相对论和量子力学】Relativity theory and quantum mechanics

The Newtonian picture was shattered in the early years of the 20th century, thanks to two revolutionary new developments in physics: relativity theory and quantum mechanics. Relativity theory, discovered by Einstein (1879-1955), showed that Newtonian mechanics does not give the right results when applied to very massive objects, or objects moving at very high velocities. Quantum mechanics, conversely, shows that the Newtonian theory does not work when applied on a very small scale. Both relativity theory and quantum mechanics, especially the latter, are very strange and radical theories, making claims about the nature of reality that many people find hard to accept or even understand. Their emergence caused considerable conceptual upheaval in physics, which continues to this day.

【达尔文】Charles Darwin

In biology, the event that stands out is Charles Darwin's discovery of the theory of evolution by natural selection, published in *The Origin of Species* in 1859. Until then it was

widely believed that the different species had been separately created by God. But Darwin (1809-1882) argued that contemporary species have actually evolved from ancestral ones, through a process know as natural selection.

【发现 DNA】**Watson and Crick discovered the structure of DNA**

The 20th century witnessed another revolution in biology - the emergence of molecular biology. In 1953 James Watson (1928-) and Francis Crick (1916-2004) discovered the structure of DNA, the hereditary material that makes up the genes in the cells of living creatures. Watson and Crick's discovery explained how genetic information can be copied form one cell to another, and thus passed down from parent to offspring.

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技术进步

Selected Technological Advances

Relevant GRE Issue
相关题库题目

【新 33 题】【新 109 题】

See Also
相关写作参考

【Ref-066 现代科学起源】【Ref-078 科学研究】【Ref-069 科学与社会】【Ref-073 科学局限性】【Ref-065 有关科学】【Ref-071 科学与质疑】

【欧洲的印刷术】**The Printing Press**

During the fifteenth century, individuals began to print documents using moveable metal type. Of particular importance was Johannes Gutenberg's[2] establishment of a large printing shop, which was able to produce book-length texts. This shop incorporated the use of a printing press to produce regular and even text. One initial result of new printing methods was increased pressures on the paper industry, which resulted in driving reforms in the industry's structure. More significantly, increased access to printed texts created the opportunity for broad-based literacy. While the Catholic Church initially considered requiring licenses for printing presses, in the end they resisted this strategy and presses spread quickly through Europe.

An implication of the printing press for governance was the increased importance of authorship. Consistency across copies of a text made it possible to cite the particular edition and give reference to the author. The ability to easily copy a text created important concerns for appropriate citation, and this eventually led to the establishment of copyright laws. Innovations in manufacturing and engineering during the industrial revolution led to additional print-related changes, such as the ability to produce newspapers and books for a mass audience.

【工业革命】**The Industrial Revolution**

The Industrial Revolution is a broad term that encompasses a range of social, economic, and technological changes occurring in Great Britain during the eighteenth and nineteenth centuries and then spreading to continental Europe and North America. The major drivers of initial stages in this period are the introduction of steam power and automated machinery in manufacturing. The first true commercial steam engine was developed by Thomas Newcomen in 1712. Important for the ultimate success of steam engines is that there was a specific industrial role for which they were properly suited at the time of their emergence. In the British coalfields there was a need to keep the mines empty of water, and Newcomen's steam

engine was highly appropriate for achieving this goal. Steam power subsequently became the main source of power for industries during this period, thus contributing to the major shifts in industrial production of the time.

The late nineteenth century is considered the "Second Industrial Revolution," and this period was characterized by the ability to mass-produce steel cheaply, particularly for the needs of the railroads, in addition to more automation in other industries. This effort was facilitated by the availability of steam engines and contributed to major changes in transportation in Great Britain and many other countries. The Industrial Revolution is seen by many as having driven a major shift in social organization. The emergence of more automated technologies was seen by some as a threat to the jobs of skilled workers. The Luddite movement[3] in Great Britain destroyed many wool and cotton mills in the early 1800s until being suppressed by the national government. Analysts such as E. P. Thompson and Karl Polanyi argue that the introduction of new pricing mechanisms and free market policies during this period was the real threat to workers. Thompson posits that the actual source of the Luddites' antagonism was a shift from prices determined by custom to a fluctuation of prices based on free market principles. Polanyi had previously argued that economic reforms in Great Britain created a situation in which individual laborers were unprotected from the forces of the market. As a result, the government was forced to enact additional reforms to support the general welfare.

【核技术】Nuclear Technology

The twentieth-century discoveries in atomic physics led to potentially unmatched changes in the character of warfare. While advances in nuclear fission and fusion were the important scientific foundations of nuclear weapons, the success of these weapons depended on major technological advances involving the building of large nuclear reactors and developing technology to protect humans during the handling of radioactive materials. Further advances in the technology of bombs in the postwar period contributed to continued build up and proliferation of weapons.

The use of nuclear weapons to date has been limited to attacks during World War II. However, the long-term implication of access to these weapons has been significant in terms of global governance. In the postwar period of global dominance by the United States and the Soviet Union, the development of more advanced nuclear weapons was a key factor in national defense strategies. After the Soviet Union achieved effective nuclear parity with the United States, the countries entered a situation of mutual assured destruction (MAD). MAD entailed that the full-scale use of nuclear weapons by one side would result in a similar response by the defender, thereby resulting in the destruction of both countries. Thus, an ongoing strategy of deterrence resulted in which it was perceived as necessary to maintain a large deployment of weapons in order to create the threat of retaliation for the enemy. In the post-Soviet period, a major concern of governments has been the proliferation of nuclear weapons to more countries in addition to the potential for nonstate actors to access weapons. Although the Cold War provided an inherently threatening environment, the logic of deterrence created what seemed to many to be a generally stable situation. More recently, without a clear strategic logic to guide government action under the threat of continued proliferation, national governments are faced with what may be a much less predictable nuclear situation.

The dominance of nuclear weapons also had important effects on a broader aspect of society. The growth of weapon-related industries played an important economic role in each country, while the fact of potential nuclear war also influenced the character of society in both countries for multiple generations. References to nuclear war entered into popular art and literature in addition to regular attention in the news media. Thus, the development of a new military technology by the government contributed not only to a new era of military strategy, but also to changes in economic structures and the character of society.

【生物技术】Biotechnology

Biotechnology refers to the application of discoveries made in the biological sciences to other fields. Biotechnological advances have played an important role in many areas, particularly medicine and agriculture, with genetic engineering playing a key role. In medicine, genetic engineering led to the production of human interferon, human growth hormone, and human insulin, as well as new techniques for use in diagnosis and oncology. The most controversial uses of biotechnology have been in the cloning of organisms, particularly large mammals such as sheep, and the genetic engineering of plants and animals.

Genetic engineering of plants has played an important, and again controversial, part in the agricultural sector. Because

the long-term health effects of eating genetically modified foods and growing genetically modified crops are still undetermined, many people, particularly in Europe, have resisted the use of these products. At the same time, genetically modified crops have played an important role in increasing agricultural productivity in many other parts of the world and are often seen as more environmentally friendly than traditional crops.

【信息与通讯技术】Information and Communication Technology

Information and communication technology (ICT) refers to all of the technologies used to process and share information. ICTs became important tools in government, business, and people's personal lives as computers became smaller and less expensive, thereby making it easier for individuals to purchase personal computers for their homes and for businesses to purchase computers for their staff. The development of the Internet in the late twentieth century created the technological means to link computers and share information between them. In the 1990s, the widespread access to the Internet increased opportunities for individuals and groups to communicate with each other through their computers or other digital communication devices.

The potential for information and communication technologies is seen as incredibly broad because of the potential for their use across all industries, in the public sector, and by individuals. At the same time, access to these technologies is still limited for the majority of the world's population. Efforts to provide access are a key part of the agenda of most multilateral development organizations, such as the World Bank and the United Nations Development Program, in addition to many smaller nongovernmental organizations.

【纳米技术】Nanotechnology

Nanotechnology is a general term used to refer to technological research and developments on the nanometer scale, with one nanometer equal to one millionth of a millimeter. An important aspect of nanotechnology is the belief that as tools get smaller, the physical forces acting on them will produce differing effects than what we currently observe. It is expected that gravity would play a lesser role in the interaction of nanotools and that surface tension and van der Waals forces would play greater roles.

The development of nanotechnology is still in its early stages at the beginning of the twenty-first century. Analysts expect that nanotechnology could be used in a wide range of fields and industries, from computers to ceramics, as applications are developed. One difficulty for progress is that researchers are still developing techniques for incorporating atoms and molecules into particular devices for specific purposes. Advances in chemistry and biology are seen as providing potential techniques for achieving these goals. Also important to consider are the potential detrimental effects of new technologies. Science fiction–style perspectives highlight the risks of nanorobots that could replicate and destroy the Earth's ecosystem through a process of global ecophagy. Less extreme threats come from the potential problems of human interaction with products such as nanodust, which could be dangerous if inhaled or ingested. As with all technologies, the potential side effects of use must be considered as a part of the development process in order to avoid such counterproductive outcomes.

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科学的自由
Freedom of Science

Relevant GRE Issue 【新 131 题】【新 59 题】【新 36 题】【新 72 题】

相关题库题目

See Also 相关写作参考 【Ref-086 科学宣言】【Ref-080 科学研究与伦理】【Ref-083 科学研究与公众利益】【Ref-065 有关科学】【Ref-071 科学与质疑】

The pursuit of knowledge has throughout human history been closely linked to a need for courage and integrity, notably, the courage to carry new ideas across ideological boundaries and the integrity to resist temptations to gain fame by unsound methods. A possibly less powerful but no less faithful companion has been the desire to pursue knowledge not only for its own sake, but also in the aim of producing a better world and of improving the living conditions of those who inhabit it. The quest for intellectual freedom and the sense of social responsibility in using this freedom can be regarded as two sides of the same coin, in analogy to the notions of rights and duties.

【历史上限制科学发展】Historically, the liberty to think freely has been a hard fought-for goal. Casting a glance back in history, one can distinguish various origins of limits to academic freedom, notably: orthodox religions; political ideologies; state interests, and free-market ideologies aimed at short-term profit. There are also limits generated internally, e.g., issues of academic respectability, fashion in topics considered worthy of research, the influence of dominant personalities, or the role of authority within science. These origins are of course not exhaustive, and we should note that although they are distinguishable they often stand closely related. Elements in them overlap and can be found in the same historical periods and contexts.

【宗教思想与科学自由】The orthodox religious institutions are classical foes of enlightened thought. Religion and science form an ill matched couple, to the extent that whilst one is based on faith in independence of reason, the other has logical thought as its essential hallmark. The personal faith of the individual professional is a private concern; however, when religion is institutionalized and combined with economic and political power, a threat against the latter is not unlikely to emerge. For example, during the reign of Christianity in Europe most philosophically critical or scientifically advanced views were regarded as 'heretic' and severely punished, often by death. Pioneer minds like Copernicus, Galileo and Spinoza ran no negligible risk in propounding their theories about the 'true' nature of the Universe.

【政治形态与科学自由】Political ideologies have also raised barriers for scientific pursuits. The 20th century was a period of strong political visions on which political ideologies were construed that came to rule countries on every continent. Some of these political ideologies impose more or less strict limits on the scientific knowledge that is considered acceptable or desirable to pursue. Furthermore, rules are sometimes imposed that restrict scientists' free circulation, as well as that of scientific material and data. Numerous standards in our list express allegiance to distinct political ideologies, for example, by recommending that the individual scientists, or other people in positions of responsibility, be faithful to, or serve the purposes of democracy, communism, socialism, or of other ideologies, such as pacifism, or patriotism. Hence there are many politically imposed ideological limitations on scientific pursuits that they could not consistently accept. We shall return to this issue in greater detail below, in the discussion of the concrete ways in which scientific activities have been limited.

【国家利益与科学自由】State interests have limited the freedom of science under a number of different aspects, e.g., in terms of industrial, national and military development. Science has been used to strengthen territories (principalities, kingdoms, and, in modern history, States), and research was often directed to satisfy the political interests of the territory, e.g., the State. Research that developed the State's military and economic power has been liberally funded in many countries and a nationalist support of industry developed during the 19th and 20th centuries when science became increasingly dependent on the States' national interests. This interest was largely of a military nature. A quick look at the leading technological branches today (such as computer technology, biotechnology, optics, aviation industry, the development of micro-chips or the production of new materials) reveals that research in central parts of these areas began with military purposes but later (in part) developed into civilian production.

One reason why countries focus their attention increasingly

on the use of science is that competition between countries and their industries increasingly occurs on the economic front. To the extent that countries depend on their industries for employment, taxation-income and military defense, it is not uncommon for their governments to try and influence research institutions and universities to adapt their research to the industrial needs of the country and its major companies. It is presumably natural that governments encourage research in fields that particularly interest them. Scientists may have the right to investigate anything within their means, but that does not mean that they also have the right to the means to investigate anything they choose. However, the described dependence has occasionally led countries to try and prevent the circulation of scientists, knowledge, or scientific material for reasons of national security. This has obviously restricted the freedom of the individual scientists, e.g., in terms of the freedom of scientific publication, or circulation. The Cold War serves to illustrate this.

【全球化与科学自由】The present globalization process has considerably weakened the political and economic power of the National State. The economy of industrial countries is increasingly based on the production of knowledge rather than physical products. Today, large parts of that knowledge are produced within the private sectors. In the interest of more or less unlimited profit, the exploitation of knowledge is increasingly being privatized, notably through patent laws. Funds are being directed towards areas of research that are expected to yield maximal profit, rather than directing it toward areas that would, for instance, be in the maximal interest of society.

The problem is also that the globally dominant politico-economic systems are strongly directed towards short-term profit in order to satisfy the stock-markets demands, which means that scientists funded by profit-oriented agencies come under an obligation to produce rapid and regular results. Since an increasing portion of research funds come from this type of source, more and more scientists find themselves under that strain.

As the world-wide demand for research grows whilst the available funds are tightened, competition amongst scientists increases and new alliances are formed. The laws of the marketplace seem sometimes to overshadow the more traditional values and norms of the scientific enterprise. So, through its influence upon the direction of science towards profit-producing research (often within a short-term perspective), the unlimited profit-orientation of the so-called 'freemarket ideology' poses threats both to scientific freedom, and to scientific responsibility.

【科学发展喜忧参半】Scientific development is a mixed blessing. On the one hand, scientific and technological advances have resulted in great benefits for humankind. On the other hand, these benefits are distributed on our globe with profound inequality; scientific advances have contributed to social imbalance or exclusion. Furthermore, scientific progress has made it possible to manufacture sophisticated weapons of mass destruction and has also led to environmental degradation and technological disasters. Consequently, scientific freedom is also a mixed blessing: the development of science must be controlled and directed.

【科学是否该与世隔绝】Whether or not that traditional 'ivory tower' was really as isolated from society as the image suggests, science and technology have today become such integral parts of society that scientists can no longer isolate themselves from societal concerns. Even scientists conducting the most fundamental research need to be aware that their work can ultimately have a great impact on society. Construction of the atomic bomb and the development of recombinant DNA – events that grew out of basic research on the nucleus of the atom and investigations of certain bacterial enzymes, respectively – are two examples of how seemingly arcane areas of science can have tremendous societal consequences.

【限制科学研究范围】The interest in science's ethical and societal dimensions increased dramatically after the Second World War, the horrors of which, it was felt, should not be repeated. Numerous ethical standards for science were formulated, and ethics committees were established in many countries to give advice on science policy. More specifically, the WCS (World Conference on Science) Declaration calls for directing the funds for science to ensure, on a global front:

- A reduction of the resources allocated to the development of new weapons;
- The (partial) conversion of military production and research facilities to civilian use;
- Sustainable human development including poverty alleviation;
- Improved human health and social care;

■ Respect of the human rights.

Scientific research should thus accept as an important part of its external responsibility to use its funds (its economic as well as its human capital) in the aim of safeguarding fundamental human interests, such as peace, sustainable development, social equity, and respect of human rights. All of these recommendations find broad support amongst the standards in our list.

Reference
069

科技与社会

Science, Technology and Society

Relevant GRE Issue
相关题库题目

【新 59 题】【新 132 题】

See Also
相关写作参考

【Ref-074 知识局限性】【Ref-073 科学局限性】【Ref-067 技术进步】, 现代科技起源【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-092 能源安全】【Ref-089 全球变暖】【Ref-111 人工智能】【Ref-095 转基因食品】【Ref-091 物种灭绝】【Ref-102 保护臭氧层】【Ref-097 核武器】【Ref-093 克隆】【Ref-094 干细胞研究】【Ref-065 有关科学】

【科技与社会】Science and technology have had a major impact on society, and their impact is growing. By drastically changing our means of communication, the way we work, our housing, clothes, and food, our methods of transportation, and, indeed, even the length and quality of life itself, science has generated changes in the moral values and basic philosophies of mankind. Beginning with the plow, science has changed how we live and what we believe. By making life easier, science has given man the chance to pursue societal concerns such as ethics, aesthetics, education, and justice; to create cultures; and to improve human conditions. But it has also placed us in the unique position of being able to destroy ourselves.

【科学研究的重要作用】As the industrial societies of an earlier era evolve into today's high-tech 'knowledge societies', science and technology are regarded as primary drivers of innovation, social welfare, increased productivity and wealth creation. This presents an enormous challenge to poorer countries who, now more than ever before, need to establish and maintain their own scientific capacities if they are to be competitive in the global knowledge economy. Scientific research and exchange have a central role to play in fostering improved communication and shared orientations to problem-solving across political and cultural boundaries.

【推动社会变革】Members of our society take instant messaging and television, as well as schools and hospitals for granted. Few notes how society changes as a society gains new technology. Societies with complex technology such as cars and cell phones support hundreds of millions of people in far more affluent ways of life.

【社会资助科学研究】Science and technology are among the most positive forces for change at humankind's disposal. Rising public investments in scientific research, science education, technological innovation and the public communication of science demonstrate that many governments recognize the importance of science and technology for socio-economic development.

【科技推动社会发展】Inventing or adopting new technology sends ripples of change throughout a society. When our ancestors first discovered how to use wind to move a boat using a sail, they created a device that would take them to

new lands, greatly expand their economy, and increase their military power. The more technology a society has, the faster it changes. Technologically simple societies change very slowly. People in developed countries live a life totally different from their grandparents or great-grandparents. Modern, high-technology societies change so fast that people usually experience major social change during a single lifetime. Imagine how surprised your great-grand mother would be to hear about instant messaging, computer matchmaking and phone sex, artificial hearts and test tubes babies, space shuttles and smart bombs.

【科技与民众】Science affects people in several ways, both directly and indirectly. Some examples of the influence of science are these: the profound changes in worldview that have accompanied major scientific revolutions; the effect of movements like behaviorism and sociobiology on humanity's self-image; and the indirect effects of science resulting from the technologies enabled by scientific discoveries.

【科学提高公众福利】Scientific achievements serve to enhance the public's welfare. Advances in the medical treatment have facilitated to enhance our physical well-being, comfort and lengthen life span. Automobiles have enabled people to travel from place to place. Telephones and mobile phones help people to communicate with each other more efficiently. Thanks to the Internet and computers, people get access to information from every corner of the world. Advances in physics and engineering make buildings, bridges, and other architectures much safer.

【科技与现代生活】Technology give people power over their environment that change take place faster than ever before. Automobiles allowed people to move quickly almost anywhere, and electricity powered homes of full of modern "conveniences" such as refrigerators, washing machines, air conditioners, and electronic entertainment centers. Electronic communication, beginning with the telegraph and the telephone and followed by radio and television, gave people the ability to reach others instantly, all over the world.

【科技让幻想变成现实】As technology advances, much of science fiction becomes science fact. Robots – once found only in comic books and movies – now inhabit the real, everyday world. Star Wars featured a bad guy who was part man, part machine. Pure fantasy, right? Not anymore. In real time, people could have robotic arms or legs. In real life, an invisibility cloak could soon emerge from the "magic" of science. The world is just a click away. Thanks to the Internet and computers, people get access to information from every corner of the world. When writer Jules Verne[4] (1828-1905, French author, the father of science fiction) published an adventure novel about a trip to the moon, his readers thought the story was pure fantasy. That was in 1865, at a time people only dreamed about space travel. But, on July 20, 1969, American astronauts Neil Armstrong (1930-) and Buzz Aldrin (1930-) did walk on the moon. What was once wild fantasy had become reality.

【科学是把双刃剑】Technology has improved our standard of living in many ways. Notwithstanding, no one can deny that technology is a two-edged weapon sword, which can be applied equally for good or evil. Technology has caused the environmental consequences such as, global warming, nuclear waste, extinction of species, and holes in the ozone. People have seen the destructive sides of the technology – the development of submarines, machine guns, battleships and chemical weapons. During the cold war, people were threatened by the nuclear weapons and feared that the world being destroyed by nuclear weapons. At that time, United States and Soviet Union had produced and deployed sufficient number of nuclear weapons to destroy the world many times over. No picture is more whimsical than this, on one hand surgeons use science to carry out operation to restore one's body, on the other hand, gunners using science to shatter human's bodies. Human's ability to control the natural environment increased dramatically with the Industrial Revolution. Muscle power gave way to engines that burn fossil fuels: coal at first and then oil. Such machinery affects the environment in two ways: we consume more natural resources, and we release more pollutants into the atmosphere.

Reference
070

科技乌托邦

Techno-utopianism

Relevant GRE Issue
相关题库题目

【新 33 题】【新 66 题】【新 87 题】【新 109 题】

See Also
相关写作参考

【Ref-074 知识局限性】【Ref-073 科学局限性】【Ref-072 科技双刃剑】【Ref-145 信仰与质疑】【Ref-065 有关科学】【Ref-071 科学与质疑】

【科学技术是一种强大的信仰】Science and technology have taken on the dimensions of a belief system in recent times, and increasingly they set the agenda for how our culture is developing. Most of us have bought into their mystique and can hardly conceive of a society in which science does not play a leading role, providing the basis for our control over the natural world and with that the key to further improvements in the quality of life. Science has an immense authority in our society, and can commandeer vast resources, both public and private, for its operations. In serving the demands of the market on the one hand, and the seemingly insatiable appetite of national governments for ever-more sophisticated military hardware on the other, scientific research does very well for itself and is likely to continue to do so.

【什么是科技乌托邦】Techno-utopianism refers to any ideology based on the belief that advanced science and technology will eventually bring about a utopia or, more precisely, a techno-utopia, a future society with ideal living conditions for all its citizens.

【科学乌托邦的四个原则】Bernard Gendron, a professor of philosophy at the University of Wisconsin-Milwaukee, defines the four principles of modern technological utopians as follows:

- We are presently undergoing a (postindustrial) revolution in technology;
- In the postindustrial age, technological growth will be sustained (at least);
- In the postindustrial age, technological growth will lead to the end of economic scarcity;
- The elimination of economic scarcity will lead to the elimination of every major social evil.

【科学至上主义】The term scientism can be used as a neutral term to describe the view that natural science has authority over all other interpretations of life, such as philosophical, religious, mythical, spiritual, or humanistic explanations, and over other fields of inquiry, such as the social sciences.

Reviewing the references to scientism in the works of contemporary scholars, Gregory R. Peterson detects two main broad themes:

- It is used to criticize a totalizing view of science as if it were capable of describing all reality and knowledge, or as if it were the only true way to acquire knowledge about reality and the nature of things;
- It is used to denote a border-crossing violation in which the theories and methods of one (scientific) discipline are inappropriately applied to another (scientific or non-scientific) discipline and its domain. Examples of this second usage is to label as scientism the attempts to claim science as the only or primary source of human values (a traditional domain of ethics), or as the source of meaning and purpose (a traditional domain of religion and related worldviews).

【世界不再人性】The alliance between the multinationals and the scientific community is creating an ‘inhuman’ society, in which system efficiency is prized above all other

considerations. As a case in point, the degree to which Western society is dependent on computer systems is a warning of how we might become subservient to our technology, and to those who own it. The move towards an inhuman society could be at least as insidious a development as fundamentalism has proved to be, since it is no less concerned with enforcing its will on humankind at large: dissent is not approved of in either case.

【科技带来风险】Various recent scandals in areas such as GM (Genetically Modified) crops and genetic engineering indicate the dangers that an aggressive techno-science poses, especially when it manages to work through governmental bureaucracies.

Reference
071

科技与质疑

Science and Inquiry

Relevant GRE Issue
相关题库题目

【新 18 题】【新 42 题】【新 87 题】

See Also
相关写作参考

【Ref-050 学习与提问】【Ref-060 构成主义教育】【Ref-002 批判性思维】【Ref-145 信仰与质疑】【Ref-146 质疑与生活】【Ref-070 科技乌托邦】【Ref-065 有关科学】

【科学不断变革】Science is an area that regularly undermines itself, as theories are repeatedly overturned and particular paradigms are consigned to oblivion – as has so often been the case in physics of late, with Einstein eclipsing Newton, then quantum physics Einstein, and M-theory latterly edging into the sequence with its alarming claims that the speed of light may not be constant throughout the universe.

【科学在质疑中进步】Historically, the idea of science was based on the notion that it was important to ask questions about, and consequently think about, the world in a new way—a way that emphasized a carefully controlled empirical study of the world. The idea of science is based on the notion that, instead of thinking about what the world must be like, given our basic assumptions and preconceptions about it, we should discover, through empirical thinking and inquiry, what it is actually like. We must assume that the fundamental ideas through which we think traditionally about the world may be incorrect or misleading. We must be willing to question our seemingly self-evident beliefs about the world and entertain the assumption that they might be false. The idea of empirical thinking and carefully controlled experimentation was taken to be the key to gaining sound professional knowledge of the world.

【科学挑战经院哲学】This ideal of science emerged as a critical response to previous human inquiry in which the reasoning of important thinkers appeared to be inappropriately influenced by beliefs of a highly egocentric and sociocentric nature. Among those great thinkers were Plato,[5] Aristotle,[6] Augustine,[7] and Aquinas,[8] whose qualities of reflection and reasoning were taken at one time to be self-evident guarantors of professional knowledge. Their views of the physical and natural world were rarely questioned. With the emergence of science, however, such wide-ranging thinkers were increasingly recognized to be biased by questionable assumptions at the root of their thought. Most obviously, it appeared that pre-scientific thinkers often uncritically assumed metaphysical or religious concepts at the foundations of their thought about the world. What is more, the traditional questions asked seemed rarely to focus on testable characteristics in the world.

【文艺复兴：科学与实验】In the "new" view, which emerged during the Renaissance (1400–1650), one became a scientist when one committed oneself to modes of inquiry based on controlled experimentation. The fields of physical and natural sciences, then, separated themselves from the field of philosophy and became fields of their own. Many of the early scientists set up their own laboratories for this purpose. This commitment, it was assumed, would maximize discovery of the actual laws and principles that operating in the physical and natural worlds and minimize the influence of human preconceptions about the world. There can be no doubt that this notion of science represented a real advance in the pursuit of professional knowledge about the physical and natural worlds.

【伽利略：科学质疑的典范】In the history of culture, Galileo stands as a symbol of the battle against authority for freedom of inquiry. He put his questions to nature instead of to the ancients and drew conclusions fearlessly. He has been the first to turn a telescope to the sky and had seen there evidence and collected enough data to defeat cause a downfall of Aristotle's theory. In astronomy, he used the telescope in observation and the discovery of sunspots, lunar mountains and valleys, the four largest satellites of Jupiter, and etc. Galileo's most valuable scientific contribution was his founding of physics on precise measurements rather than on metaphysical principles and formal logic. He was the man who climbed the Leaning Tower of Pisa and dropped various weights from the top, and who rolled balls down the inclined planes, and then generalized the results of his many experiments into the famous law of free fall. Galileo discovered that all objects fall toward the earth with the same acceleration, regardless of their weight, size, or shape, when gravity is the only force acting on them. He refused to obey orders from Rome church to cease discussions of his theories and was sentenced to life imprisonment. Galileo died in 1642, while under house arrest imposed upon him by the Roman Catholic Church. In 1992, the Church acknowledged that its condemnation of Galileo was a mistake.

Reference
072

科技双刃剑

Science and Technology: a Two-edged Weapon

Relevant GRE Issue
相关题库题目

【新 31 题】【新 33 题】【新 36 题】【新 59 题】【新 63 题】【新 67 题】【新 72 题】【新 109 题】

See Also
相关写作参考

【Ref-069 科技与社会】【Ref-093 克隆】【Ref-099 水污染】【Ref-097 核武器】【Ref-089 全球变暖】【Ref-094 干细胞研究】【Ref-095 转基因食品】【Ref-102 保护臭氧层】【Ref-065 有关科学】

【科学是一把双刃剑】Armed with industrial technology, we are able to bend nature to our will, tunneling through mountains, damming rivers, irrigating deserts, and drilling for oil in the arctic wilderness and on the ocean floor. The human species has prospered. But these advances have come at a high price. Never before in history have human beings placed much demands on the planet. From the start, people recognized the material benefits of industrial technology. But only a century later did they begin to see the long-term effects on the natural environment.

The increasing dependence on fossil fuel based technologies is changing the planet's climate, with very serious implications for future generations. The application and further development of research with the aim of constructing new and more deadly weapons is still being pursued in several countries. New cooperative understandings between science and society are needed to counter-act these developments and ensure the transition

towards more sustainable ways of living. Technology also creates new problems that our ancestors hardly could imagine. Technology gives us more personal freedom, but often we lack the sense of community that was part of preindustrial life. Further, although technology can be used for good, the most powerful nations in the world today have stockpiles of nuclear weapons that could send the world back to the Stone Age.

【消耗越多，污染越多】Humans' ability to control the natural environment increased dramatically with the Industrial Revolution. Muscle power gave way to engines that burn fossil fuels: coal at first and then oil. Such machinery affects the environment in two ways:

- We consume more natural resources;
- We release more pollutants into the atmosphere.

【科学技术的困惑】More complex technology has made life better by raising productivity, reducing infectious disease, and relieving boredom. But technology provides no quick fix for social problems. Poverty, for example, remains a reality for millions of people worldwide. Not all of the impacts of science and technology, however, are equally beneficial, nor are they universally seen to be so. Fears have grown in recent years about the capacity of science and technology to intervene adversely in various dimensions of human life – including its origins, its ending, and its physical and social environments.

【破坏人类生存环境】Advancing technology has also threatened the physical environment. Technology increases our appetite for Earth's resources. Technological advances have improved life and brought the world's people closer. But establishing peace, ensuring justice, and protecting the environment are problems that technology alone cannot solve.

【实例：生活垃圾】Higher living standards in turn increase the problem of solid waste and pollution. Many products have throwaway packaging. Fast food is served with cardboard or plastic containers. Manufactures market soft drinks, beer, and fruit juices in aluminum cans, glass jars, and plastic containers, which not only consume finite resources but also generate mountains of solid waste. Then there are countless items designed to be disposable: pens, razors, batteries, even cameras. Other products, from light bulbs to automobiles, are designed to have a limited useful life and then become unwanted junk. One way to address the problem of solid waste is through recycling, reusing resources we would otherwise discard.

【饮水还安全吗？】Consider a simple feature of daily life: drinking water from the tap. With the increase of pollution, the poisoning of ground water, the indirect and long-term negative consequences of even small amounts of any number of undesirable chemicals, how are we to judge whether or not our drinking water is safe?

【通信技术引发矛盾】New technology has always sparked controversy. A century ago, the introduction of automobiles and telephones allowed more rapid transportation and more efficient communication. But at the same time, such technology weakened traditional attachments to hometowns and even to families.

【喜忧参半的信息时代】Consider the quiet revolution that is taking place in global communications. From fax machines to E-Mail, from complex electronic marketing systems to systems that track us and penetrate our private lives, we are not only providing positive opportunities for people to be more efficient with their time, but also systems that render us vulnerable and wield power over us. On the one hand, we have networks where goods, services, and ideas are freely exchanged with individuals the world over, and on the other hand, we face worldwide surveillance systems that render privacy an illusion.

【实例：电脑技术】Today people might well wonder whether computer technology will do the same thing, giving us access to people around the world but shielding us from the community right outside our doors; providing more information than ever before but in the process threatening personal privacy.

【实例：网络技术】The internet and world wide web have not only brought much of the world closer together but have introduced new vulnerabilities. The role of the media, including their use of new information and communication technologies, is pervasive but their impact on social values and cohesion remain poorly understood. More generally, the speed with which scientific ideas are communicated around the world and are incorporated into technology has increased.

【科技不确定性增加】The consequences of many technological developments accordingly seem less predictable than ever before. The political context for doing science also changed radically at the turn of the 21st

century, with the end of the Cold War, the intensification of global commerce and communications, and the rise of new transnational threats and conflicts and international terrorism.

【科技公正性受到质疑】Closer relations between science and industry, often actively encouraged by governments, have called into question the presumed impartiality of science and the openness of scientific communication. New concerns have also been raised about the ethics of research and the accountability of science to its sponsoring governments and publics, especially as more research is conducted across national political boundaries.

Quotations on Environment

Thank God men cannot fly, and lay waste the sky as well as the earth.
Henry David Thoreau (1817-1862, an American author, poet, and best known for his book *Walden*, a reflection upon simple living in natural surroundings, and his essay, *Civil Disobedience*, an argument for individual resistance to civil government in moral opposition to an unjust state)

Every creature is better alive than dead, men and moose and pine trees, and he who understands it aright will rather preserve its life than destroy it.
Henry David Thoreau

A virgin forest is where the hand of man has never set foot.
(Author Unknown)

We cannot command Nature except by obeying her.
Francis Bacon (1561-1626, father of the scientific method and influential through his works, especially as philosophical advocate and practitioner of the scientific method and pioneer in the scientific revolution)

You forget that the fruits belong to all and that the land belongs to no one.
Jean-Jacques Rousseau (1712-1778, a major Genevan philosopher whose political philosophy heavily influenced the French Revolution)

We shall require a substantially new manner of thinking if mankind is to survive.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

A human being is part of the whole, called by us "Universe," a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest - a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole [of] nature in its beauty.
Albert Einstein

Reference
073

科学局限性
Science and Its Limits

Relevant GRE Issue
相关题库题目
【新 33 题】【新 109 题】

See Also
相关写作参考
【Ref-074 知识局限性】【Ref-069 科技与社会】【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-145 信仰与质疑】

【科学的强大力量】Science is powerful. It has generated the knowledge that allows us to call a friend halfway around the world with a cell phone, vaccinate a baby against polio, build a skyscraper, and drive a car. And science helps us answer important questions like which areas might be hit by a tsunami after an earthquake, how did the hole in the ozone layer form, how can we protect our crops from pests, and who were our evolutionary ancestors? With such breadth, the reach of science might seem to be endless, but it is not. Science has definite limits.

【科学局限性】The limits of science have always been the source of bitter disappointment when people expected something from science that it was not able to provide. Take the following examples: a man without faith seeking to find in science a substitute for his faith on which to build his life; a man unsatisfied by philosophy seeking an all-embracing universal truth in science; a spiritually shallow person growing aware of his own futility in the course of engaging in the endless reflections imposed by science. In every one of these cases, science begins as an object of blind idolatry and ends up as an object of hatred and contempt. Disenchantment inevitably follows upon these and similar misconceptions. One question remains: What value can science possibly have when its limitations have become so painfully clear?

【科学不涉及道德判断】Science doesn't make moral judgments. When is euthanasia the right thing to do? What universal rights should humans have? Should other animals have rights? Questions like these are important, but scientific research will not answer them. Science can help us learn about terminal illnesses and the history of human and animal rights — and that knowledge can inform our opinions and decisions. But ultimately, individual people must make moral judgments. Science helps us describe how the world is, but it cannot make any judgments about whether that state of affairs is right, wrong, good, or bad.

【科学不涉及审美】Science doesn't make aesthetic judgments. Science can reveal the frequency of a G-flat and how our eyes relay information about color to our brains, but science cannot tell us whether a Beethoven symphony is beautiful or dreadful. Individuals make those decisions for themselves based on their own aesthetic criteria.

【科学不能提供生活目标】Scientific knowledge cannot provide life with goals, values or direction. The very clarity of science points to a source other than science for human life as a whole. Science, moreover, is unable to tell us its essential meaning. Its existence is due to motives whose truth and cogency are themselves beyond scientific demonstration.

【科学应用喜忧参半】Science doesn't tell you how to use scientific knowledge. Although scientists often care deeply about how their discoveries are used, science itself doesn't indicate what should be done with scientific knowledge. Science, for example, can tell you how to recombine DNA in new ways, but it doesn't specify whether you should use that knowledge to correct a genetic disease, develop a bruise-resistant apple, or construct a new bacterium. For almost any important scientific advance, one can imagine both positive and negative ways that knowledge could be used. Again, science helps us describe how the world is, and then we have to decide how to use that knowledge.

【科学不研究超自然现象】Science doesn't draw conclusions about supernatural explanations. Do gods exist? Do supernatural entities intervene in human affairs? These questions may be important, but science won't help you answer them. Questions that deal with supernatural explanations are, by definition, beyond the realm of nature — and hence, also beyond the realm of what can be studied by science. For many, such questions are matters of personal faith and spirituality.

【科学公理变成教条】Axioms of exact science turn into dogmas. The main limitations of science are a result of the things science takes from granted - i.e. of the axioms it uses as the basis for any further research. When you use an axiom, then you start on the wrong foot. You cannot prove axioms and if you base everything on them, then you guarantee that your whole theory cannot be ultimately be proved.

【自然法则并非普遍】All natural laws are universal and apply to everything and everyone. This has never been proven yet. It is just a thing scientists believe that is true. This axiom is also what causes problems in the explanation of the basis of our human nature: "free will". If we are to accept the existence of universal physical laws then no free will can exist. But most of us think otherwise. Most of us feel that we "decide" what to do. Science simply cannot explain that.

【并非所有的事物都可以测量】All things are measurable. This is based on a highly materialistic view of the world and

has nothing to do with reality. Things like moral, emotions, aesthetics and love cannot be measured, even though they are very important for human life. Science fields like physics, mathematics and chemistry simply cannot deal with these things.

【科学基于人类感官】Science is based on our senses. The limitations of them may pose significant limitations to how we understand the world, that we may never be aware of. Since we do not know if our senses work "correctly" (mainly because we do not have a benchmark as to what is the "correct" way for senses to be receiving signals from the world), we will never know how "close" we are to "Reality".

【科学使用逻辑】Science uses Logic as a tool to reach to conclusions. However even Aristotle, the founder of Logic, did not know how logic could be useful: as a tool to reach the truth or as merely a tool to analyze language and its structure? Many modern philosophers, like Wittgenstein, think that human language has many limitations and that due to these limitations, one must be careful as to talk only for things he/she can talk. The faith in the whole structure of science is based on the faith that logic works. If the latter collapses, then science is without any justification at all.

【不能盲目信仰科学】Despite the above, fields of exact science are indeed the best tools we have to understand the physical world. Scientists today have created really good models of nature that predict and can help us live better lives, work more productively, understand Universe in much more detail than ever before. We must use exact science carefully and always have in mind its limitations. Humans are more than electrons and protons and this calls for the simultaneous use of other ways of thinking - not only observation and induction. There are other ways that also help in searching for the truth. Believing in one thing only can be really dangerous. Believing that only the 'scientific' way of thinking exists can eliminate humanism, morality, and altruism from the world. Many human values are not understandable by science.

Moral judgments, aesthetic judgments, decisions about applications of science, and conclusions about the supernatural are outside the realm of science, but that doesn't mean that these realms are unimportant. In fact, domains such as ethics, aesthetics, and religion fundamentally influence human societies and how those societies interact with science. Neither are such domains unscholarly. In fact, topics like aesthetics, morality, and theology are actively studied by philosophers, historians, and other scholars. However, questions that arise within these domains generally cannot be resolved by science.

Reference
074

知识局限性
Knowledge and Its Limits

Relevant GRE Issue
相关题库题目

【新 33 题】【新 109 题】

See Also
相关写作参考

【Ref-073 科学局限性】【Ref-069 科技与社会】【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】

【知识与变革】We live in a world that changes by the minute. Change often advances people's intellect. For change to be effective, people must change. However, even the most intelligent individuals can become handicapped without gaining up-to-date knowledge. Knowledge has been the staple source of competitive

advantage for individuals for hundreds of years. For example, the idea of passing knowledge to an apprentice from a master was used extensively during medieval times. Passing the “family recipe” that makes a certain product unique from one generation to another also attests to the notion of knowledge transfer and knowledge sharing. The key to change and growth is awareness, sharing ideas, and coming up with new and innovative ways of staying ahead of the competition of knowledge. It involves learning, innovating, and adopting behavior designed to improve quality and performance.

【知识的局限】During the past four decades, many of us have come to terms with an increasing realization that there may be a limit to what we as a species can plan or accomplish. For technological optimists these limits are ever-receding, perhaps even nonexistent, as science-based technologies allow progressive increases in productivity and efficiency that allow the billion and a half people living in industrialized and industrializing nations today to achieve a standard of living that was unimaginable at the beginning of the 20th century. For the pessimists, there is global climate change, the ozone hole, air and water pollution, overpopulation, natural and human-caused environmental disasters, widespread hunger and poverty, rampant extinction of species, exhaustion of natural resources, and destruction of ecosystems. In the face of these conflicting perceptions, it makes no sense to try to use external limits as a foundation for inquiry and action on the future of humans and the planet. It is time to look elsewhere.

【个体利益局限性】Individual limits. We all operate out of self-interest, which is entirely rational. Community spirit and altruism may be motivating factors, but given that we cannot know the effects of our individual actions on the larger systems in which we are enmeshed, the only reasonable alternative is for each of us to pursue our conception, however imperfect, of our own interests. Yet as social systems grow more and more complex and as they impinge more and more on natural systems, our individual vision inevitably captures less and less of the big picture. Our only option is to accept the limits of individual rationality and to take them into account in formulating public policy and collective action.

【合作精神局限性】Cooperation limits. During the course of our development, humanity’s special capabilities in areas such as tool-making, language, self-awareness, and abstract thought have rendered us extraordinarily fit to engage in the competitive business of individual and species survival. We compete among ourselves at every organizational level and with other species in virtually every ecological niche. Cooperation, therefore, most often occurs at one level (a tribe or a nation, for example) in order to compete at a higher level (a war between tribes or nations). But at the highest levels—the behavior of an entire species competing with or dominating billions of other species—we have run out of reasons to cooperate or structures to foster effective cooperation.

【持续发展局限性】Planning limits. We are unable to integrate the long-term consequences of our competition-based society into our planning processes. Our competitive nature values the individual over the group, but the aggregation of individual actions constantly surprises us. Despite our best intentions, our actions are consistent with a global economy predicated on the expectation of continued growth and development derived from ever-increasing resource exploitation. Thus, for example, we all climb into our cars in the morning thinking only that this is the most convenient way to get to work. We are not deliberately choosing to waste time in traffic jams, exacerbate the trade deficit, and pump greenhouse gases into the atmosphere. We find it extraordinarily difficult to anticipate or accurately account for the costs and risks incurred over the long term by such group behavior. Indeed, those costs and risks vary wildly from individual to individual and from group to group. At every level of the political system, the individual perspective outweighed the collective, with the result that adequate protection for the whole community lost out. Because of these complexities, efforts to advance the long-term interests of the whole by controlling the short-term behavior of the individual are doomed to failure, which is one of the lessons of the global collapse of communism.

【科学技术局限性】Technological limits. Indeed, technology, harnessed to the marketplace, has allowed industrialized societies to achieve amazingly high standards of living. In doing so, however, we have put our future into the hands of the lowest bidder. Cheap oil and coal, for example, ensure our continued dependence on the internal combustion engine and the coal-burning power plant. The problem we face is not a shortage of polluting hydrocarbon fuels, but an excess. History shows that we will develop increasingly efficient energy technologies but that gains in efficiency will be more than offset by the increased consumption that accompanies economic growth. The increased efficiency

and cleanliness of today's cars when compared with those built in 1980 are an example. Technology has allowed us to pollute less per mile of driving, but pollution has declined little because we drive so many more miles. Too often we choose technologies that save us from today's predicament but add to the problems of tomorrow.

【知识本身的局限】Knowledge limits. There is absolutely no a priori reason to expect that what we can know is what we most need to know. Science uses disciplinary organization to recognize and focus on questions that can be answered. Disciplines, in turn, are separated by methodology, terminology, sociology, and disparate bodies of fact that resist synthesis. Although disciplinary specialization has been the key to scientific success, such specialization simultaneously takes us away from any knowledge of the whole. Today the whole encompasses six billion people with the collective capability of altering the biogeochemical cycles on which we depend for our survival. Can science generate the knowledge necessary to govern the world that science has made? Do we even know what such knowledge might be? Producing 70,000 synthetic chemicals is easy compared to the challenge of understanding and dealing with their effects.

Despite the billions we have spent studying our interference with the planet's biogeochemical cycles, we really do not have a clue about what the long-term result will be. And we have even less knowledge about how to organize and govern ourselves to confront this challenge. The intrinsic difficulties of creating a transdisciplinary synthesis are compounded dramatically by a dangerous scientific and technological illiteracy among senior policymakers and elected officials. An ironic effect of technology-created wealth is the growth of an affluent class that prizes individualism over civic engagement and that feels insulated from the need to understand and confront complex technology related social issues.

【哲学思考局限性】Philosophical limits. The scientific and philosophical intellectuals of "the academy" remain focused on the relatively simple question of understanding nature. The much more complicated and challenging—and meaningful—quest is to understand nature with a purpose, with an objective, with an end. What is the purpose of our effort to understand nature: to learn how to live in harmony with nature or to exploit it more efficiently? For thousands of years, philosophical inquiry has been guided by such fundamental questions as "Why are we here?" and "How should we behave?" Such questions were difficult enough to confront meaningfully when our communities were small, our mobility limited, and our impact restricted. In today's hyperkinetic world, how can we possibly hope to find meaning? The literal answers provided by science amount to mockery: We are here because an expanding cloud of gas some 15 billion years ago eventually led to the accretion of planets, the formation of primordial nucleotides and amino acids, the evolution of complex organisms, the growth of complex social structures in primates, and the dramatic expansion of cognitive and analytical capabilities made possible by the rapid evolution of neocortical brain structures. Such explanation is entirely insufficient to promote the commonality of purpose necessary for planetary stewardship. We lack a unified or unifiable metaphysical basis for action, just when we need it most.

Quotations on Knowledge (Part 1)

Imagination is more important than knowledge.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

The true sign of intelligence is not knowledge but imagination.
Albert Einstein

The only source of knowledge is experience.
Albert Einstein

Information is not knowledge.
Albert Einstein

I was bold in the pursuit of knowledge, never fearing to follow truth and reason to whatever results they led, and bearding every authority which stood in their way.
Thomas Jefferson (1743-1826, the third President of the United States (1801–1809) and the principal author of the Declaration of Independence (1776))

The doorstep to the temple of wisdom is a knowledge of our own ignorance.
Benjamin Franklin (1705-1790, one of the Founding Fathers of the United States)

Science investigates religion interprets. Science gives man knowledge which is power religion gives man wisdom which is control.
Martin Luther King, Jr. (1929-1968, an American clergyman, activist, and prominent leader in the African American civil rights

movement)

Ignorance is the curse of God; knowledge is the wing wherewith we fly to heaven.
William Shakespeare (1564-1616 widely regarded as the greatest writer in the English language and the world's pre-eminent dramatist)

I think this is the most extraordinary collection of talent, of human knowledge, that has ever been gathered at the White House - with the possible exception of when Thomas Jefferson dined alone. John F. Kennedy (1917-1963, often referred to by his initials JFK, the 35th President of the United States)

The goal of education is the advancement of knowledge and the dissemination of truth.
John F. Kennedy

The greater our knowledge increases the more our ignorance unfolds.
John F. Kennedy

All men by nature desire knowledge.
Aristotle (384-322BC, a Greek philosopher, a pupil of Plato, and the tutor of Alexander the Great, who profoundly influenced Western thought)

True knowledge exists in knowing that you know nothing.
Socrates (469-399BC, a Greek philosopher whose theories of virtue and justice have survived through the writings of Plato, his most important pupil)

Our treasure lies in the beehive of our knowledge. We are perpetually on the way thither, being by nature winged insects and honey gatherers of the mind.
Friedrich Nietzsche (1844-1900, German philosopher whose written works include *Ubermensch* and *Thus Spake Zarathustra*)

It is not when truth is dirty, but when it is shallow, that the lover of knowledge is reluctant to step into its waters.
Friedrich Nietzsche

Knowledge which is acquired under compulsion obtains no hold on the mind.
Plato (427-347BC, a Greek philosopher, whose written works includes *The Republic* and founded the Academy)

Human behavior flows from three main sources: desire, emotion, and knowledge.
Plato

Opinion is the medium between knowledge and ignorance.
Plato

Knowledge is true opinion.
Plato

Knowledge without justice ought to be called cunning rather than wisdom.
Plato

True friendship can afford true knowledge. It does not depend on darkness and ignorance.
Henry David Thoreau (1817-1862, an American author, poet, and best known for his book *Walden*, a reflection upon simple living in natural surroundings, and his essay, *Civil Disobedience*, an argument for individual resistance to civil government in moral opposition to an unjust state)

Reference
075

科学发现
Scientific Discovery

Relevant GRE Issue
相关题库题目
【新 56 题】【新 143 题】【新 9 题】【新 27 题】

See Also
【Ref-077 偶然发明】【Ref-科学发现与运气】【Ref-067 技术进步】【Ref-066

How does a scientist go about making a discovery? Many thoughtful people, scientists and science critics alike, would now agree that science is too wide-ranging, multifaceted, and far too interesting for any single answer to suffice.

【伦琴发现 X 光：“运气”+“系统实验”】Working late in his laboratory one evening on November 8, 1895, a competent (but not very famous) scientist named Wilhelm Roentgen[9] made a sensational and accidental discovery, while investigating emissions from a Crookes tube (a glass vacuum tube with electrodes at either end). The emissions Roentgen was looking for are called cathode rays, composed of high-speed electrons that come off the negative electrode when voltage is applied to the electrodes of a Crookes tube. Cathode rays cause the vacuum tube to glow when the vacuum is strong enough and enough voltage is applied; it was this glow Roentgen was watching when he made his discovery. Cathode rays are weak—they cannot pass through glass (scientists use aluminum windows in a vacuum tube when they want to study cathode rays outside the tube) or an ordinary piece of cardboard—but they do excite barium platinocyanide[10] molecules and cause surfaces painted with barium platinocyanide to glow.

Roentgen was using a Crookes tube without an aluminum window and he had surrounded the tube in black cardboard to better see the tube glow. Therefore, when he noticed a glow coming from a screen painted with barium platinocyanide that was some distance away, he knew cathode rays could not be the cause, because cathode rays could not have gone through either the glass of the tube or the cardboard. Roentgen did more tests to verify that the Crookes tube was the source of the emissions that made the screen glow. He inferred that these emissions were present in all experiments like his, but that he was the first to notice them because no one else had set up conditions like his experiment: a nearby barium platinocyanide-painted screen and an arrangement that suppressed the known emissions.

Roentgen found a photographic plate in a drawer of a desk in the same room as the Crookes tube and noticed it had been exposed. When he developed it and found an image of a key that had been on the desk top, he realized the X rays had passed easily through the wood of the desk, but to a lesser degree through the metal of the key. Using a barium platinocyanide-treated screen and a Crookes tube, Roentgen produced an image of a lead disk—and the bones of his fingers holding the disk.

His experiments revealed the existence of a new kind of ray that had exotic and interesting properties. Because these mysterious rays were then unknown, Roentgen called them x-rays (x standing for the unknown). After he reported his new discovery, Roentgen immediately became a highly celebrated figure and won the first Nobel Prize in physics just a few years later.

His experiments showed that X rays pass through different materials to different degrees. Release of his findings caused worldwide excitement and speculation about X rays, also called Roentgen rays. Medical applications in diagnosis began immediately. The hazard of burns from prolonged exposure soon became evident; the risk of cancer was realized later. X rays came to be used in medical treatment, dental examinations, industrial inspections of metal work, and many other areas.

Roentgen’s discovery of x-rays was a marvelous combination of luck and skill. Discovering something you aren’t looking for, a process often referred to as serendipity, is not uncommon in the sciences. But as Pasteur[11]’s famous maxim says, “chance favors only the prepared mind.” Roentgen’s mind was extremely well prepared to make this discovery, both by his skill in experimental techniques and by his thorough knowledge of the previous work that Roentgen had in mind built on the work of many other nineteenth-century scientists (Thomson, Crookes, Lenard, and others). Also, Roentgen’s painstaking detailed investigation of the x-rays, following his initial lucky break, was crucial to the discovery process.

【发现苯环结构：“扎实的知识”+“想象力”】Benzene is a volatile liquid that can be obtained from coal tar. Benzene is sometimes used as an industrial solvent, but the major importance of benzene is its role as the structural basis for many dyes, drugs, and other important chemicals. The structure of the benzene molecule is of the utmost importance to the theory of organic chemistry. The first to formulate the resonating ring structure described above

was the German chemist Friedrich August Kekulé von Stradonitz[12] (August Kekulé), in 1865.

By 1865, Kekulé had worked out the structures of many compounds, but the structure of benzene had proven to be intractable. Michael Faraday had already determined the atomic composition of benzene in 1825. Benzene consists simply of six carbon atoms and six hydrogen atoms. But forming these six C and six H atoms into a structure that makes sense had defied the efforts of organic chemists.

Kekulé had pondered these problems for a long time. He combed his knowledge of organic chemistry in general, reviewed everything that was known about the reactions of benzene with other chemicals, and expended great effort in order to devise a suitable structure that made sense. Then, Kekulé hit upon the answer in a flash of inspiration. As Kekulé recounts the episode:

> *I turned my chair to the fire and dozed. Again the atoms were gamboling before my eyes… My mental eye, rendered more acute by repeated visions of this kind, could now distinguish larger structures of manifold conformation: long rows sometimes more closely fitted together all twining and twisting in snakelike motion. But look! What was that? One of the snakes had seized hold of its own tail, and the form whirled mockingly before my eyes. As if by a flash of lightning I awoke; and this time also I spent the rest of the night in working out the consequences of the hypothesis.*

It's crucial to immerse oneself completely in the details of the problem before the flash of inspiration can come. An unusual aspect of Kekulé's experience is the highly visual character of his insight. His earlier development of the structural theory of organic chemistry had also been informed by such visions of dancing atoms, so this seems to have been a general part of his thinking process. Kekulé's early training had been in architecture, and it's possible that this training influenced his rather visual approach to chemistry and his tendency to think in terms of the spatial "architecture" of molecules.

【发现水痘疫苗："系统观察"+"合理假设与实验验证"】
Smallpox in the 18th century was a worldwide scourge, highly contagious and often fatal. There was no treatment available. Among the victims who did not die, many were left horribly disfigured, blinded, or insane. The only preventative measure known was inoculation, the practice of purposely infecting people with material from active smallpox pustules. This action might produce a less severe case of the illness, which then protects the person against contracting it again. But, the procedure often could go awry and produce a severe case, even death. Worse yet, even when the procedure worked well, the inoculated person might give the disease to others.

Edward Jenner,[13] an excellent scientist that he was, realized that he needed to start making careful observations, including keeping good notes and records, if he wished to untangle the situation. Jenner became a keen observer of nature at an early age. After nine years as a surgeon's apprentice, he went to London to study anatomy and surgery under the prominent surgeon John Hunter, then returned to Berkeley to start a country practice that lasted the rest of his life. His move back to the countryside, however, gave Jenner the opportunity to follow up on an idea he had gotten when he was still a young apprentice. While treating a milkmaid for a minor ailment known as cowpox. The milkmaid told him that she was lucky to have the cowpox, because now she would never contract smallpox.

He made a scientific study of the cowpox, which no one had ever done before. A more precise description of the symptoms and course of the disease was needed, both in cows and in humans. For several years, Jenner carefully observed all the cases which occurred in the dairies, and he interviewed people who had gotten cowpox in the past. Making careful notes on these case histories, he began to achieve a more thorough understanding of the cowpox. At the same time, Jenner began to make a systematic study of the cases in which cowpox had apparently conferred immunity to smallpox. After five years of patient work, Jenner was able to distill a hypothesis from his observations. He hypothesized that the virulence of the matter in the pustules, which transmits the disease, should also likewise gain and decline in strength; and cowpox only protects against smallpox when the matter in the pustules is at its strongest.

In May of 1796, Jenner extracted some material from a pustule on the hands of a milkmaid named Sarah Nelmes. He used the material to purposely infect a young boy named James Phipps. After the cowpox had run its course in young Phipps, Jenner inoculated him with live smallpox matter the following July. Tensely, day after day, Jenner and the Phipps family looked for any sign of a smallpox infection

beginning. But even several days after the expected time of onset, the boy had absolutely no smallpox symptoms!

Reference
076

科学发现与运气

Discovery and Serendipity

Relevant GRE Issue
相关题库题目

【新 9 题】【新 27 题】【新 56 题】【新 143 题】

See Also
相关写作参考

【Ref-077 偶然发明】【Ref-075 科学发现】【Ref-067 技术进步】

【科学发现与运气】Stories of scientific discovery abound with lucky coincidences. It's true that serendipity and good fortune are often cited as key factors in making scientific innovations. But look closer. Even when scientists feel that they just got lucky — like Newton being hit on the head with his proverbial apple — the steps leading to a new finding or idea often tell a different story. It takes more than being in the right place, at the right time, to make a serendipitous discovery. Here are a few important attributes of scientists who turned a lucky break into a breakthrough: It's not a myth that scientists spend a lot of time studying. It takes a well-prepared mind to recognize a breakthrough. Many "serendipitous" discoveries take place only because the discoverer happened to have specialized background knowledge.

【实例：腔棘鱼的发现】For example, a second population of living coelacanths[14] (a rare type of fish that closely resembles fossils from 400 Million years ago) was discovered in 1997 when a chance sighting happened to be made by a student of marine biology. The graduate student, Mark Erdmann, was wandering through an Indonesian fish market with his wife, Arnaz Mehta Erdmann, on their honeymoon, when she pointed out a strange-looking fish. He immediately recognized it as a coelacanth — and as a potentially important scientific discovery. Erdmann did "get lucky" but he was certainly helped along by his wife's discerning eye and his training in marine biology.

【科学发现需要探索精神】Surprising or anomalous results sometimes stimulate new discoveries, but it takes a scientific perspective to look beyond an anomaly and see it as something worth following up.

【实例：X 射线】Wilhelm Roentgen's 1895 discovery of the X-ray started with a serendipitous observation, but explaining it required careful study. Working by himself in the lab, Roentgen was trying to make electrons pass through air, when he noticed that with a high charge, his vacuum tube caused a screen all the way across his lab to light up. He wasn't the first to see these strange effects — at least two other researchers had noticed them earlier, but they had not investigated them further. Roentgen, however, thought that these effects were worth studying. He carefully documented many different aspects of the new rays, and then published his work to encourage ongoing research. Roentgen's initial observation was certainly serendipitous, but it was his subsequent investigation of the anomaly that turned it into a groundbreaking discovery.

【科学发现需要创造性思维】Sometimes, serendipity doesn't come from being the first to see something, but from being the first to see it in a new way.

【实例：微波炉】While working for the Raytheon company, Percy Spencer noticed that microwaves from the radar set he was working on had melted the candy bar in his pocket. He wasn't the first person to notice that microwaves generate heat, but he was the first person to think of using this heat to cook food. He received a patent for his idea in 1950, and Raytheon developed the idea for commercial and industrial use. In a sign of things to come, popcorn was

the first thing Spencer and his colleagues cooked with microwaves — it appears in the illustration from his patent! Spencer's creative thinking turned a routine observation into a technological breakthrough.

【恰当的工具】New technologies often allow us to study things in ways that weren't possible in the past. The first researchers to take advantage of a new technology often get "lucky" in making exciting new discoveries.

【实例：捕捉来自外太空的电波】One such discovery took place in the 1960s when a sensitive antenna, developed to communicate with satellites, became available for research use. Arno Penzias and Robert Wilson decided to use the antenna as a radio telescope to study low levels of radio waves in outer space. They knew that many celestial bodies — from stars to galaxies — emit radiation that corresponds to their temperatures, but decided to try and see whether any waves emanated from places where there were no stars. Penzias and Wilson didn't expect to find much, but to their surprise, the telescope picked up radio waves in large amounts! These waves corresponded to temperatures indicating that space was about four degrees higher than previously thought. Theoretical physicists later recognized this as leftover warmth from the Big Bang itself — a discovery that can certainly be attributed to Penzias and Wilson, but also to the new technology they had at their disposal.

【时势造英雄】Important discoveries are often made simultaneously by different people, suggesting that the field is ripe for a new idea. Perhaps the pieces of a new theory are available in different scientific publications, just waiting for someone to put them together. Or perhaps new observations seem to independently point toward a unifying principle.

【实例：进化论】The theory of evolution by natural selection may have been one of these ideas. Although Charles Darwin's notes on evolution extend back to the late 1830s, Alfred Russell Wallace developed some of the same key ideas independently. Both drew on relatively recent advances in geology and economics, applying ideas from other fields to develop a new theory of their own. In the end, they agreed to share credit for the idea and jointly presented papers on evolution to London's Royal Society. Darwin and Wallace were certainly great thinkers of their own accord, but good timing may have contributed to their conceptual breakthrough as well.

Reference
077

偶然发明

Selected Accidental Discoveries

Relevant GRE Issue
相关题库题目

【新 56 题】【新 143 题】【新 9 题】【新 27 题】

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【Ref-科学发现与运气】【Ref-075 科学发现】【Ref-067 技术进步】【Ref-154 创意】【Ref-153 创造力】

The serendipity effect is the ability to make unexpected discoveries by accident. To demonstrate the importance of serendipity, the following puts together several examples of unintentional discoveries that too often we find ourselves taking for granted.

【贴纸】Post-It Note

The invention of the humble Post-It Note was an accidental collaboration between second-rate science and a frustrated church-goer. In 1970, Spencer Silver, a researcher for the large American corporation 3M, had been trying to formulate a strong adhesive, but ended up only managing to create a very weak glue that could be removed almost effortlessly. He promoted his invention within 3M, but nobody took any notice.

4 years later, Arthur Fry, a 3M colleague and member of his church choir, was irritated by the fact that the slips of paper he placed in his hymnal to mark the pages would usually fall out when the book was opened. One service, he recalled the work of Spencer Silver, leading to an epiphany – the church being a good a place as any to have one, I suppose – and later applied some of Silver's weak yet non-damaging adhesive to his bookmarks. He found that the little sticky markers worked perfectly, and sold the idea to 3M. Trial marketing began in 1977, and today you'd find it hard to imagine life without them.

【糖精】Saccharin

Saccharin was discovered because chemist Constantin Fahlberg didn't wash his hands after a day at the office. The year was 1879 and Fahlberg was trying to come up with new and interesting uses for coal tar. After a productive day at the office, he went home and something strange happened. He noticed the rolls he was eating tasted particularly sweet. He asked his wife if she had done anything interesting to the rolls, but she hadn't. They tasted normal to her. Fahlberg realized the taste must have been coming from his hands - which he hadn't washed. The next day he went back to the lab and started tasting his work until he found the sweet spot.

【现代指纹识别】Modern Fingerprinting

Although the science of fingerprinting began with the work of Francis Galton in the nineteenth century, detectives still had trouble locating the tell-tale marks. Then, in 1982, some researchers at the US Army Criminal Investigation Laboratory in Japan cracked a fish tank. When they patched it together with superglue (cyanoacrylate), they noticed the fingerprints on the glass standing out in proud relief. The fumes from the glue had condensed on oils in the prints, rendering them highly visible. Cyanoacrylate is now an important weapon in the forensic scientist's armory.

【尼龙搭扣】VELCRO

Velcro was actually invented in 1948 by a Swiss engineer who had just been walking his dog. When George de Mestral got home, he noticed that both he and his pet were covered in burrs.[15] Suddenly an idea struck him. Ignoring the dog, he plucked one of the offending items from his cloth jacket and raced to his microscope. Under magnification, the secret of the burr was revealed. It was covered with hooked strands, and these, he realized, would inevitably cling to the coat of a beast that rubbed up against it. Mistral knew at once that the burr principle could be used to develop a revolutionary fastening device, but it took him several years to perfect his invention. In 1951, Mistral applied for a Swiss patent for an early version of his fastening system.

【青霉素】Penicillin

Everybody knows the story – or at least, should – the brilliant yet notoriously absent-minded biologist Sir Alexander Fleming was researching a strain of bacteria called staphylococci. Upon returning from holiday one time in 1928, he noticed that one of the glass culture dishes he had accidentally left out had become contaminated with a fungus, and so threw it away. It wasn't until later that he noticed that the staphylococcus bacteria seemed unable to grow in the area surrounding the fungal mould. Fleming didn't even hold out much hope for his discovery: it wasn't given much attention when he published his findings the following year, it was difficult to cultivate, and it was slow-acting – it wasn't until 1945 after further research by several other scientists that penicillin was able to be produced on an industrial scale, changing the way doctors treated bacterial infections forever.

【微波炉】Microwave Oven

In 1945 Percy Lebaron Spencer, an American engineer and inventor, was busy working on manufacturing magnetrons, the devices used to produce the microwave radio signals that were integral to early radar use. Radar was an incredibly important innovation during the time of war, but microwave cooking was a purely accidental discovery. While standing by a functioning magnetron, Spencer noticed that the chocolate bar in his pocket had melted. His keen mind soon figured out that it was the microwaves that had caused it, and later experimented with popcorn kernels and eventually, an egg, which (as we all could have told him from mischievous childhood 'experiments'), exploded. The

first microwave oven weighed about 750lbs and was about the size of a fridge.

Reference
078

科学研究
Scientific Research

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 15 题】【新 135 题】【新 136 题】【新 98 题】

See Also
相关写作参考

【Ref-079 科学研究与资助】【Ref-085 科学研究与不确定性】【Ref-080 科学研究与伦理】【Ref-083 科学研究与公众利益】【Ref-082 科学研究与利益矛盾】【Ref-084 科学研究与商业利益】

【什么是科学研究】Research is a logical and systematic search for new and useful information on a particular topic. It is an investigation of finding solutions to scientific and social problems through objective and systematic analysis. It is a search for knowledge, that is, a discovery of hidden truths. Here knowledge means information about matters. The information might be collected from different sources like experience, human beings, books, journals, nature, etc. A research can lead to new contributions to the existing knowledge. Only through research is it possible to make progress in a field. Research is done with the help of study, experiment, observation, analysis, comparison and reasoning.

【科学研究的目的】The prime objectives of research are:

- To discover new facts;
- To verify and test important facts;
- To analyze an event or process or phenomenon to identify the cause and effect relationship;
- To develop new scientific tools, concepts and theories to solve and understand scientific and nonscientific problems;
- To find solutions to scientific, nonscientific and social problems; and
- To overcome or solve the problems occurring in our every day life.

【从事科学研究的动机】No person would like to do research unless there are some motivating factors. Some of the motivations are the following:

- To get a research degree (Doctor of Philosophy (Ph.D.)) along with its benefits like better employment, promotion, increment in salary, etc.;
- To get a research degree and then to get a teaching position in a college or university or become a scientist in a research institution;
- To get a research position in countries like U.S.A., Canada, Germany, England, Japan, Australia, etc. and settle there;
- To solve the unsolved and challenging problems;
- To get joy of doing some creative work;
- To acquire respectability;
- To get recognition;
- Curiosity to find out the unknown facts of an event;
- Curiosity to find new things; and
- To serve the society by solving social problems.

【科学研究的重要性】Research is important both in scientific and nonscientific fields. In our life new problems, events, phenomena and processes occur every day. Practically implementable solutions and suggestions are required for tackling new problems that arise. Scientists have to undertake research on them and find their causes, solutions, explanations and applications. Precisely, research assists us to understand nature and natural phenomena. Some important avenues for research are:

- A research problem refers to a difficulty which a researcher or a scientific community or an industry or a government organization or a society experiences. It may be a theoretical or a practical situation. It calls for a thorough understanding and possible solution;
- Research on existing theories and concepts help us identify the range and applications of them;
- It is the fountain of knowledge and provides guidelines for solving problems;
- Research provides basis for many government policies. For example, research on the needs and desires of the people and on the availability of revenues to meet the needs helps a government to prepare a budget;
- It is important in industry and business for higher gain and productivity and to improve the quality of products;
- Mathematical and logical research on business and industry optimizes the problems in them;
- It leads to the identification and characterization of new materials, new living things, new stars, etc.;
- Only through research can inventions be made; for example, new and novel phenomena and processes such as superconductivity and cloning have been discovered only through research;
- Social research helps find answers to social problems. They explain social phenomena and seek solution to social problems; and
- Research leads to a new style of life and makes it delightful and glorious.

【科学研究方法】Research methods are the various procedures, schemes, algorithms, etc. used in research. All the methods used by a researcher during a research study are termed as research methods. They are essentially planned, scientific and value-neutral. They include theoretical procedures, experimental studies, numerical schemes, statistical approaches, etc. Research methods help us collect samples, data and find a solution to a problem. Particularly, scientific research methods call for explanations based on collected facts, measurements and observations and not on reasoning alone. They accept only those explanations which can be verified by experiments.

【基础理论研究】Basic research is an investigation on basic principles and reasons for occurrence of a particular event or process or phenomenon. It is also called theoretical research. Study or investigation of some natural phenomenon or relating to pure science is termed as basic research. Basic researches some times may not lead to immediate use or application.

It is not concerned with solving any practical problems of immediate interest. But it is original or basic in character. It provides a systematic and deep insight into a problem and facilitates extraction of scientific and logical explanation and conclusion on it. It helps build new frontiers of knowledge. The outcomes of basic research form the basis for many applied research. Researchers working on applied research have to make use of the outcomes of basic research and explore the utility of them.

【应用性科学研究】In an applied research one solves certain problems employing well known and accepted theories and principles. Most of the experimental research, case studies and interdisciplinary research are essentially applied research. Applied research is helpful for basic research. A research, the outcome of which has immediate application is also termed as applied research. Such a research is of practical use to current activity. For example, research on social problems has immediate use. Applied research is concerned with actual life research such as research on increasing efficiency of a machine, increasing gain factor of production of a material, pollution control, preparing vaccination for a disease, etc. Obviously, they have immediate potential applications.

【应用研究与基础研究区别】Differences between basic and applied researches are listed in the following table:

Basic research	Applied research

Seeks generalization	Studies individual or specific cases without the objective to generalize
Aims at basic processes	Aims at any variable which makes the desired difference
Attempts to explain why things happen	Tries to say how things can be changed
Tries to get all the facts	Tries to correct the facts which are problematic
Reports in technical language of the topic	Reports in common language

【科学研究的几个步骤】Whenever a scientific problem is to be solved there are several important steps to follow. The problem must be stated clearly, including any simplifying assumptions. Then develop a mathematical statement of the problem. This process may involve use of one or more mathematical procedures. Frequently, more advanced text books or review articles will be needed to learn about the techniques and procedures. Next, the results have to be interpreted to arrive at a decision. This will require experience and an understanding of the situation in which the problem is embedded. A general set of sequential components of research is the following:

- Selection of a research topic;
- Definition of a research problem;
- Literature survey and reference collection;
- Assessment of current status of the topic chosen;
- Formulation of hypotheses;
- Research design;
- Actual investigation;
- Data analysis;
- Interpretation of result;
- Report.

Quotations on Technology

It has become appallingly obvious that our technology has exceeded our humanity.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

I am sorry to say that there is too much point to the wisecrack that life is extinct on other planets because their scientists were more advanced than ours.
John F. Kennedy (1917-1963, often referred to by his initials JFK, the 35th President of the United States)

Never trust anything that can think for itself if you can't see where it keeps its brain.
J.K. Rowling (1965-, a British author best known as the creator of the *Harry Potter* fantasy series)

The production of too many useful things results in too many useless people.
Karl Marx (1818-1883, a German philosopher, political economist, historian, political theorist, sociologist, and revolutionary socialist, who developed the socio-political theory of Marxism)

It is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being.
John Stuart Mill (1806-1873, a British philosopher and an influential contributor to social theory, political theory, and political economy)

Civilization advances by extending the number of important operations which we can perform without thinking of them.
Alfred North Whitehead (1861-1947, an English mathematician who became a philosopher)

Civilization advances by extending the number of important operations which we can perform without thinking of them.
Alfred North Whitehead

Lo! Men have become the tools of their tools.
Henry David Thoreau (1817-1862, an American author, poet, and best known for his book *Walden*, a reflection upon simple living in natural surroundings, and his essay, *Civil Disobedience*, an argument for individual resistance to civil government in moral opposition to an unjust state)

Men have become the tools of their tools.
Henry David Thoreau

The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.

Reference
079

科学研究与资助
Scientific Research and Funding

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 15 题】【新 135 题】【新 136 题】【新 98 题】

See Also
相关写作参考

【Ref-078 科学研究】【Ref-085 科学研究与不确定性】【Ref-080 科学研究与伦理】【Ref-083 科学研究与公众利益】【Ref-082 科学研究与利益矛盾】【Ref-084 科学研究与商业利益】

Science, Technology and Innovation are important pillars of any modern society and economy. Their importance is even growing the more diversified and complex a society and economy is. As a society, we reap the rewards from this science in the form of technological innovations and advanced knowledge, but we also help pay for it. You indirectly support science everyday through taxes you pay, products and services you purchase from companies, and donations you make to charities.

【科研资助来源】Most scientific research is funded by government grants, companies doing research and development, and non-profit foundations. Public policies, especially public funding, play a decisive role in this domain, since without this intervention significant parts of science, particularly basic science would not be funded by private means. This is because basic research is a high-risk, high-uncertainty and, quite often, a high-cost endeavor.

【历史上的科研资助】Funding for science has changed with the times. Historically, science has been largely supported through private patronage (the backing of a prominent person or family), church sponsorship, or simply paying for the research yourself. Galileo's work in the 16th and 17th centuries, for example, was supported mainly by wealthy individuals, including the Pope. Darwin's Beagle voyage in the 19th century was, on the other hand, funded by the British government — the vessel was testing clocks and drawing maps for the navy — and his family's private assets financed the rest of his scientific work.

【培根的《新大西岛》】The prophet of public funding for science was Francis Bacon. In his fictional work *New Atlantis*[16] written in 1624, Bacon envisioned a utopian society that supported systematic scientific research to unlock the secrets of nature and systematic applications of this knowledge to produce practical benefits. Although Bacon's work may have influenced the founding of the Royal Society, the King only gave his good name to the endeavor; he did not give any money. Bacon was far ahead of his time.

【二战：政府重视资助科研】The pressing needs of World War II required quick results in areas such as the development of radar, antibiotics, and the atom bomb. Given the emergency situation, money was no object. Government officials recognized the valuable contributions of science during the war, and Franklin Roosevelt[17] asked the head of the scientific war effort, Vannevar Bush,[18] to write a report on the role of government in postwar science. This influential report, entitled *Endless Horizons*, recommended large scale funding of scientific research by the government and led to the creation of the National Science Foundation.[19]

Since that time, the federal government has dominated the funding of science. I'm not as familiar with the particular

historical circumstances in the other industrialized countries of the world, but all of them have devoted significant amounts of money to the support of science in the postwar period. While the motivation of a scientist is often simply curiosity and a desire to understand nature, the motivation of society to fund science (through its government) is generally more practical. Of course many citizens are fascinated by the new results of scientific research, but I doubt that this alone would justify the amount of tax money spent on research and development. Economic prosperity, military security, and better health are more often cited as reasons for societal support of science.

【冷战：政府大力支持科研】In the decades following World War II, the arms race and the space program rivalry resulting from the Cold War served to stimulate governmental funding of science. The booming economic climate of this period also stimulated the growth of scientific funding (leading to rapid scientific progress). The more stagnant economic times that followed caused a slowdown of this growth and a renewed debate over the justification for science funding. Several large multibillion dollar scientific projects were all started around the same time, unfortunately on the verge of a recession.

【科研与商业】The success of Japan in fostering the commercial development of technologies had encouraged a new element in the debate over public funding of science in the United States. There seemed to be some impediment to the use of basic scientific research results in commercial applications. The Japanese government took a more active role in promoting such technology transfer, and voices were raised in favor of adopting a similar policy in the United States. Similarly, a shift in emphasis away from basic scientific research in favor of applied science and engineering was advocated. Meanwhile, the amount of basic research done in the major industrial laboratories steadily decreased.

【资助与科研结果偏见】In a perfect world, money wouldn't matter — all scientific studies (regardless of funding source) would be completely objective. But of course, in the real world, funding may introduce biases — for example, when the backer has a stake in the study's outcome. A pharmaceutical company paying for a study of a new depression medication, for example, might influence the study's design or interpretation in ways that subtly favor the drug that they'd like to market. Drug research sponsored by the pharmaceutical industry is more likely to end up favoring the drug under consideration than studies sponsored by government grants or charitable organizations. Similarly, nutrition research sponsored by the food industry is more likely to end up favoring the food under consideration than independently funded research. Companies and special interest groups provide invaluable funding for scientific research and also manipulate research outcomes. Ultimately, misleading results will be corrected as science proceeds; however, this process takes time. Meanwhile, it pays to scrutinize studies funded by industry or special interest groups with extra care.

Reference
080

科学研究与伦理
Scientific Research and Ethics

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 59 题】【新 53 题】

See Also
相关写作参考

【Ref-086 科学宣言】【Ref-081 科学家与社会责任】【Ref-078 科学研究】【Ref-083 科学研究与公众利益】【Ref-082 科学研究与利益矛盾】【Ref-084 科学研究与商业利益】

【科研道德的重要性】Research ethics is important not only because it helps students, the public, and experimental subjects avoid research-related harm, but also because it provides a framework for examining the ends and goals that research serves. Because taxpayers ultimately fund much university-based scientific work (especially at public institutions), academic researchers have a special duty to ensure that their work serves socially desirable ends and goals, such as democratic freedom, societal welfare, equity, and growth in knowledge.

【科学研究的道德准则】In 1982 the Swedish Council for Research in the Humanities and Social Sciences published four research ethics principles:

- Experimental subjects ought to give free informed consent to the research.
- They have the right to decide the conditions under which they will participate.
- No unauthorized persons will have access to research data.
- The data cannot be used outside the research project for commercial or nonscientific purposes.

【两个基本问题】Despite such widespread and recent progress in research ethics, however, there are at least two fundamental problems. Most countries do not have government-mandated regulation of research; even where such regulation exists, often it covers only drug experimentation. A second difficulty is that even if a nation has research ethics committees, many times they are associated only with a particular institution and typically they cover only cases involving human and animal subjects of medical or scientific experimentation.

【科学研究与民众意见】Because scientific and technological research involves potential risks as well as benefits, people should have the right to exercise free informed consent regarding such research and technical activities. After all, consent (either implicit or explicit) is a precondition of most just laws and policies and indeed a general precondition of governmental power over citizens. One may thus argue that researchers have the duty to secure public consent to the imposition of research-related risks, just as doctors must obtain patients' consent before performing risky medical procedures. According to most authorities, "free informed consent" includes four analytical components: disclosure, understanding, voluntariness, and competence. These components require that the researcher provide full information about possible research hazards; that the subject understand and assent to the research; and that the subject be emotionally, mentally, and physically competent to give consent.

【忽视学生的需求】For scientists engaged in university-based research, students may be some of the second or third parties to whom researchers owe duties. For one thing, university scientists face a conflict of commitment between teaching and research that may cause them to shortchange their students because of the time scientific investigations require. Ignoring student needs is particularly likely in universities that base salary increments primarily on research productivity.

A scientist's over-commitment to scholarly activity may harm graduate research assistants if the researcher spends inadequate time helping them with their own work or channels graduate research and course content along lines profitable to the professor rather than along avenues basic or useful to the student. When scientists derive profit from outside consulting or grants, or when they begin their own companies, they are especially likely either to ignore student needs or to direct their own teaching, student research, and subject interests along the lines of their own profits. In such a situation, a researcher may use graduate students to further outside economic commitments.

Moreover, because university scientists typically wield power over students' grades and recommendations, their emphasis on their own research and profits creates a situation of student dependency from which it is difficult to escape. In joint projects among professors and students or in graduate-student research, professors may also cause harm by failing to give students' research adequate recognition or by stealing student work and publishing it as their own.

【科学研究背后的利益集体】Profits and financial investments interfere with research not only in cases where outside interests "buy" researchers, but also in situations where scientists are not as objective as possible because of their personal investments of time and money in a particular area of research. Michael Gold's *Conspiracy of Cells* tells the story of how researchers ignored warnings

that a particular cell line was contaminated and would give erroneous results if used in culture experiments. Researchers who had spent money, time, and careers on this contaminated line ignored the warnings published in both Nature and Science.

If such examples are typical, then some researchers may be selling their integrity in much the same way as the medieval Church sold pardons and indulgences. If university scientists move from being public servants to entrepreneurs, then they may lose some of their accountability to the public. They may help to blur the lines between disinterested scholarship and personal profit.49 Nobel Laureate and MIT faculty member David Baltimore owns more than one million dollars in shares in a biotechnology company designed to commercialize his inventions. Other university scientists have similar conflicts of interest, such as owning shares of more than $10 million each, because of businesses supported by their research.

【科学研究与环境】Researches are concerned with maximizing short-term gain, also may direct and pay researchers for work on processes and products that bring profit despite their environmental unsustainability. Research ethics is important not merely to help prevent harm to the public, to research subjects, and to democratic institutions, but also to help protect the environment. Practicing questionable research ethics can threaten the environment in at least three ways:

- Choosing research (or agreeing to do paid research) on unsustainable products and processes may indirectly harm the environment and decrease the probability that sustainable products and processes will be available. (Sustainable products and processes satisfy economic needs without jeopardizing the prospects of future generations.)
- Certain types of research may be direct causes of environmental pollution and degradation, as in the case of space exploration and experimentation littering low-earth orbits (120250 nautical miles above the earth) with numerous projectiles from previous launches and spacecraft.
- Some research methods, especially in economics, indirectly cause environmentally suspect decision-making.

Reference
081

科学家与社会责任

Scientists and Social Responsibility

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 53 题】

See Also
相关写作参考

【Ref-086 科学宣言】【Ref-080 科学研究与伦理】【Ref-083 科学研究与公众利益】

【社会在不断变革】The 20th century that is now coming to an end, has been a unique century in that it witnessed more significant changes than any previous century: changes for better, changes for worse; changes that brought enormous benefits to human beings, changes that threatened the very existence of the human species. The world today is completely different from that of a hundred years ago.

【科学技术推动社会变革】Many factors have contributed to these changes, but by far the most important factor, the dominant factor, was the progress in science and technology. It is scientists who are mainly responsible for both the immense blessings received and the grave dangers confronting us now.

【科学曾经只属于象牙塔】There was a time when science was considered to be completely divorced from ordinary life. Scientists built an “ivory tower” in which they sheltered pretending that their work had nothing to do with human welfare. The aim of scientific research — they asserted — was to understand the laws of nature, and since these are immutable and unaffected by human reactions and emotions, these reactions and emotions have no place in the study of nature.

【科学家肩负社会责任】Even when scientific research went beyond the passive study of natural phenomena, many scientists continued the pretence of living in the ivory tower. They tried to evade their responsibilities to society by hiding behind such precepts as: “science should be undertaken for its own sake”; “science has nothing to do with politics”; “science cannot be blamed for its misapplication”; and “scientists are just technical workers”. All this was a fallacy and an illusion even in the past, and is certainly not true today. Many scientists still stand by these maxims, advocating a laissez faire policy on science. But a growing number of them are abandoning it in the face of reality, in view of the changing nature of science, its scale, its tools, its image; above all, its impact on national and international affairs.

【科学界不再是“世外桃源”】Science has lost its innocence. It plays a dominant role in almost every walk of life, especially so in matters of world security. Nowadays, scientific research has a direct impact on political relations between nations, and vice versa, political events directly affect the ways scientific research is done. This was first clearly demonstrated during the Second World War, in the development of nuclear weapons. The atom bomb dropped on Hiroshima, in August 1945, heralded a new age, the nuclear age. The use of the atom bombs on Hiroshima and Nagasaki brought the Second World War to a dramatic end, but it was also the start of a ferocious nuclear arms race, mainly maintained by scientists from both sides of the iron curtain. Within a few decades both superpowers accumulated more than 100,000 nuclear weapons, which — if used — could have brought the human species to an end. On several occasions, notably during the Cuban Missile Crisis,[20] of October 1952, we came very close to the actual use of the weapons, with catastrophic consequences.

【科研活动与公众】The standards of science extend beyond responsibilities that are internal to the scientific community. Researchers also have a responsibility to reflect on how their work and the knowledge they are generating might be used in the broader society. Researchers assume different roles in public discussions of the potential uses of new knowledge. They often provide expert opinion or advice to government agencies, educational institutions, private companies, or other organizations. They can contribute to broad-based assessments of the benefits or risks of new knowledge and new technologies. They frequently educate students, policymakers, or members of the public about scientific or policy issues. They can lobby their elected representatives or participate in political rallies or protests. In some of these capacities, researchers serve as experts, and their input deserves special consideration in the policy-making process. In other capacities, they are acting as citizens with a standing equal to that of others in the public arena. Researchers have a professional obligation to perform research and present the results of that research as objectively and as accurately as possible. When they become advocates on an issue, they may be perceived by their colleagues and by members of the public as biased. But researchers also have the right to express their convictions and work for social change, and these activities need not undercut a rigorous commitment to objectivity in research.

【科研工作者的道德操守】The values on which science is based—including honesty, fairness, collegiality, and openness—serve as guides to action in everyday life as well as in research. These values have helped produce a scientific enterprise of unparalleled usefulness, productivity, and creativity. So long as these values are honored, science—and the society it serves—will prosper.

【为什么科学家肩负社会责任】Every citizen must be accountable for her or his deeds; this applies particularly to scientists. The reasons include:

- First there is the argument of moral responsibility. If you create something you should be concerned with its consequences. This should apply as much to making scientific discoveries as to having children.
- Scientists will understand the technical problems better than the average politician or citizen and knowledge brings responsibility.
- Scientists can provide technical advice and assistance to solve the incidental problems that may emerge.

- Scientists can warn of future dangers that may arise from current discoveries.
- Scientists form an international fraternity that transcends natural boundaries so they are well placed to take a global view in the interest of mankind.
- It is necessary to prevent a public backlash against science. Self-interest requires that scientists must be fully involved in public debate and must not be seen as "enemies of the people"

【科研规范】Scientists have at least five general rules of thumb to guide them in avoiding certain research:

- Scientists ought not to do research that causes unjustified risks to people.
- Scientists ought not to do research that violates norms of free informed consent.
- Scientists ought not to do research that unjustly converts public resources to private profits.
- Scientists ought not to do research that seriously jeopardizes environmental welfare.
- Scientists ought not to do biased research.

【规范科学家科研活动】But what exactly does one have to do to behave scientifically? Here is a scientist's code of conduct:

- Pay attention to what other people have already done. Scientific knowledge is built cumulatively. If you want to discover exciting new things, you need to know what people have already discovered before you. This means that scientists study their fields extensively to understand the current state of knowledge.
- Expose your ideas to testing. Strive to describe and perform the tests that might suggest you are wrong and/or allow others to do so. This may seem like shooting yourself in the foot but is critical to the progress of science. Science aims to accurately understand the world, and if ideas are protected from testing, it's impossible to figure out if they are accurate or inaccurate!
- Assimilate the evidence. Evidence is the ultimate arbiter of scientific ideas. Scientists are not free to ignore evidence. When faced with evidence contradicting his or her idea, a scientist may suspend judgment on that idea pending more tests, may revise or reject the idea, or may consider alternate ways to explain the evidence, but ultimately, scientific ideas are sustained by evidence and cannot be propped up if the evidence tears them down.
- Openly communicate ideas and tests to others. Communication is important for many reasons. If a scientist keeps knowledge to her- or himself, others cannot build upon those ideas, double-check the work, or devise new ways to test the ideas.
- Play fair: Act with scientific integrity. Hiding evidence, selectively reporting evidence, and faking data directly thwart science's main goal — to construct accurate knowledge about the natural world. Hence, maintaining high standards of honesty, integrity, and objectivity is critical to science.

【不应给公众造成风险】Scientists ought not to do research that causes unjustified risks to people. For example, during the Nixon era, government researchers accumulated private information about people whose only "crimes" were opposition to Nixon-administration programs and policies. Although the products of politically motivated research typically are used only against a minority of people, they pose severe risks to civil liberties, free speech, and equal treatment.

【不应亵渎公众知情权】Scientists ought not to do research that violates informed consent. The most egregious examples of coercive research include Nazi experimentation on inmates of prison camps, Japanese experimentation on prisoners of war, and U.S. experimentation on criminals. All such research has violated basic human rights to life, to equal treatment, and to fairness. Nazi scientists and doctors shot inmates to study wounds; starved prisoners to study nutrition; placed humans at 70,000 feet, unprotected, to see what would happen; surgically grafted people to each other; and burned Polish nuns with exposure to radiation.

Japanese experimenters engaged in similar activities during the war, except that many of their deeds did not become public. The U.S. government protected Japanese scientists in exchange for learning the results of their research. The experiments and the U.S. protection remained secret until 1981. Such experimentation is not only heinously harmful and unnecessary, but its

coerciveness makes it ethically unjustifiable. Because experimentation on prisoners is conducted in an atmosphere in which valid consent is unlikely, many experts have condemned such research.

Nonhuman animals also are especially vulnerable as research subjects, and many spokespersons for animal rights have described cruel, unnecessary, and unethical treatment of animals used in experiments.

【不应将公共资源据为己有】Scientists ought not to convert public resources to private profits.

Scientific research can harm not merely members of the public or research subjects but also society as a whole. Failure to pay attention to research ethics especially to the societal goals that scientific research, especially in public universities, ought to serve could damage not only the democratic freedom of society but also its educational missions. In universities dominated by industrial support, for example, the curriculum may be more narrowly focused, more devoted to applied research, and less supportive of "unproductive" scholarly activities.

The rise of militaristic nationalism, fueled by the dominance of narrow technical and professional training, eroded ethical values and liberal university education and lay the foundation for Hitler. Given such a restrictive conception of the university and scholarship, it was no accident that in 1937 the Prussian Academy of Sciences condemned Einstein because he criticized the violations of civil liberties in the Nazi regime. Once an Einstein, or any other disinterested researcher, is condemned for speaking about the public interest, then the narrowing of the ivory tower can strangle democracy as well. For a taxpayer-supported university to allow unregulated industry or private individuals to reap what the taxpayer has sown, especially in a scientific situation involving secrecy, may encourage taxation without full representation of the people.

The celebrated case of George and Gladys Dick, the two University of Chicago scientists who discovered how to mass produce an antitoxin used in immunization against scarlet fever, illustrates the dubiousness of private interests' controlling discoveries, including patents and intellectual property rights, made in part through public funding. These two researchers were nominated for the Nobel Prize in medicine in 1925 but did not receive it. Despite the importance of their discoveries, the Nobel Committee apparently did not agree with their patenting, therefore exercising control over, a substance having significant public health consequences.

【不应威胁人类生存环境】Scientists ought not to seriously jeopardize environmental welfare. Scientific research dominated by monopolistic control or conflicts of interest can threaten not only public but environmental welfare. As chapter one and the fourth general rule (against performing certain types of research) suggest, numerous examples exist of ethically questionable research that leads to environmentally unsustainable development. For instance, research on how to mine fossil aquifers, underground aquifers that hold water hundreds of thousands of years old, is questionable because the aquifers receive little replenishment from rainfall today. Depending on these aquifers is like depending on an oil well that will eventually run dry. Groundwater depletion is sure to cause serious environmental and economic depletion in the future, as in Saudi Arabia where 75 percent of water needs are met by fossil groundwater. Researchers who encourage such practices may bear some of the responsibility for subsequent environmental problems.

Researchers' and policymakers' employment of the gross national product (GNP) also may contribute to environmental degradation. According to this internationally accepted system of economic accounting, a researcher subtracts depreciation of a plant and its equipment from its overall output of goods and services, but the GNP takes no account of the depreciation of "natural capital" such as the loss of topsoil or the destruction of forests. Hence the GNP-based accounting system used throughout the world may overestimate economic progress and underestimate the economic costs of environmental degradation, thereby helping to generate environmentally destructive economic policies.

One of the most visible examples of such environmental deficits is deforestation. If tropical forests are clear cut or burned, the land rapidly loses its fertility because most nutrients are stored in vegetation. After several years of farming, the land becomes waste, even though the economic system takes no account of the consequent costs associated with tropical deforestation. Thus, to the degree that a scientific method generates conclusions that lead to such faulty policy consequences, scientists ought to question whether they should engage in the research.

【科研活动不应存在偏见】Scientists ought not to do biased research. Even though diseases have different frequencies,

symptoms, or complications in the two sexes, researchers typically ignore gender differences in forming their hypotheses. Race and gender bias has led to almost unbelievable studies, the most amazing of which was a project studying the impact of obesity on breast and uterine cancer conducted only on men. Other federal researchers have studied aging for 20 years and included only male research subjects, even though two-thirds of those defined as elderly are women. The two main alleged justifications for white-male-only studies are that including women would "complicate" some research because of hormone changes in the menstrual cycle or could damage children conceived while their mothers were research subjects.

【应该评估科研造成的结果】Research scientists ought to evaluate consequences. Because some harm is often unavoidable, however, dangerous consequences of research usually require assessment in the light of relevant duties and the benefits associated with the research. Also, although scientific research may threaten public welfare, as in the case of testing commercial nuclear reactors or attempting to measure alleged race- or sex-related differences in intelligence, not doing certain research also poses public risk. Not doing research into energy technologies, for example, might result in higher utility costs and greater burdens on the poor, both indirectly causing greater fatalities among people whose incomes are most sensitive to the price of energy. In other words, the economic costs of regulating research induce mortality risks, and sometimes these risks may exceed those caused by the failure to regulate.

Correctly answering questions regarding research ethics thus requires a balancing of the benefits and harms likely to arise both from research and from the failure to do the research. It also presupposes a balancing between the rights of scientists to pursue their work wherever it may lead using whatever methods seem most likely to lead to success and the rights of society to regulate research whenever it affects public welfare.50 In later chapters we give some examples of how to balance these conflicting, research-related rights and duties and how to balance research-related harms and benefits.

Reference
082

科学研究与利益矛盾

Scientific Research and Conflicting Interests

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 15 题】【新 135 题】【新 136 题】【新 98 题】

See Also
相关写作参考

【Ref-079 科学研究与资助】【Ref-083 科学研究与公众利益】【Ref-084 科学研究与商业利益】

【什么是“利益冲突”】Researchers have many interests, including personal, intellectual, financial, and professional interests. These interests often exist in tension; sometimes they clash. The term “conflict of interest” refers to situations where researchers have interests that could interfere with their professional judgment. Managing these situations is critical to maintaining the integrity of researchers and science as a whole.

【科学家的科研动力】One motivation of scientists, of course, is simply curiosity and a desire to find out more about how nature works. But scientists are also motivated by a desire for rewards, as most people are. A difference between science and many other professions is that money is only secondarily important as a reward; the main desideratum of scientists is more often recognition and fame.

【利益冲突的来源】Conflicting interests arise in many ways. A researcher who wants to start a company to commercialize research results generated in the laboratory might feel pressure to compromise the progress of students by having them work on company-related projects that are less related to their academic interests. A researcher might need to decide whether to publish a series of narrowly focused papers that would build the researcher's record of publication but not help the field progress as quickly as would a single paper containing the researcher's main conclusions. Or a researcher might have to decide whether to accept a grant to do routine work that will help the researcher financially but may not help the researcher's career or the careers of the students in the research group.

【科学研究与经济利益】Conflicts of interest involving financial gain receive particular scrutiny in science. Researchers generally are entitled to benefit financially from their work—for example, by receiving royalties on inventions or bonuses from their employers. But in some cases the prospect of financial gain could affect the design of an investigation, the interpretation of data, or the presentation of results. Indeed, even the appearance of a financial conflict of interest can seriously harm a researcher's reputation as well as public perceptions of science.

【科学研究与个人关系】Personal relationships may also create conflicts of interest. Some funding agencies require researchers to identify others who have been their supervisors, graduate students, or postdoctoral fellows, since these relationships are seen as having the potential to interfere with judgment about grants worthy of funding or papers worthy of publication.

【处理利益冲突】Regulations and codes of conduct specify how some of these conflicts should be identified and managed. Funding agencies, research organizations, and many journals have policies that require researchers to identify their financial interests and personal relationships. Researchers should be aware of these policies and understand how they benefit science and their professional reputation. In some cases, the conflict cannot be allowed, and other ways must be found to carry out the research. Other financial conflicts of interest are managed through a formal review process in which potential conflicts are identified, disclosed, and discussed. However managed, timely and full disclosure of relevant information is important, since in some cases researchers joining a team or project may not be aware of a problem.

【精力投入冲突】Conflicts of interest should be distinguished from conflicts of commitment. Researchers, particularly students, have to make difficult decisions about how to divide their time between research and other responsibilities, how to serve their scientific disciplines, how to respect their employer's interests, mission, and values, and how to represent science to the broader society. Conflicts between these commitments can be a source of considerable strain in a researcher's life and can cause problems in his or her career. Managing these responsibilities is challenging but different from managing conflicts of interest.

As in the case of conflicts of interest, many institutional policies offer some guidance on conflicts of commitment. For example, there are limits in many academic institutions regarding time spent on outside activities by faculty members. Training in laboratory management may offer valuable information on how to manage conflicts of commitment. As with conflicts of interest, identifying the conflict is an important first step in arriving at an acceptable solution.

【个人价值与信仰】Beyond conflicts of interest and commitment are issues related to the values and beliefs that researchers hold. Researchers can have strongly held convictions—for example, a desire to eliminate a particular disease, reduce environmental pollution, or demonstrate the biological underpinnings of human behavior. Or someone might have strong philosophical, religious, cultural, or political beliefs that could influence scientific judgments. Strongly held values or beliefs can compromise a person's science in some instances. The history of science offers a number of episodes in which social or personal beliefs distorted the work of researchers. For example, the ideological rejection of Mendelian genetics in the Soviet Union beginning in the 1930s crippled Soviet biology for decades.

Reference
083

科学研究与公众利益

Scientific Research and Public Benefits

Relevant GRE Issue 相关题库题目 【新 36 题】【新 72 题】【新 15 题】【新 135 题】【新 136 题】【新 98 题】

See Also 相关写作参考 【Ref-078 科学研究】【Ref-082 科学研究与利益矛盾】【Ref-084 科学研究与商业利益】

【满足民众利益】All scientists have a duty to varying degrees to ensure that their work serves socially desirable ends. Without ethical scrutiny, however, scientists could too easily lose sight of their societal responsibilities and duties to taxpayers.

【满足个人利益】Instead, they might choose work with narrow industrial, economic, or military ends, rather than projects that benefit the public at large. For example, although there are numerous benefits from cooperation between university researchers and industry, including development of relevant knowledge and applications, funding to purchase expensive scientific equipment, and helping students obtain future employment, sometimes this cooperation can result in threats to public values, freedom, equity, and authentic growth in knowledge.

【商业影响科学研究】Research being diverted from public to private ends serving special rather than societal interests is not just a problem in the West. Several corporations and countries, interested in African mineral resources, have literally "bought" entire universities in Nigeria, Zaire, and Ethiopia by virtue of paying scientists to do corporate research. Industrial influence over university research also continues to be very great in Japan, where the government awarded large amount in taxpayer monies to fund university-industry research cooperation so as to ensure that Japanese companies dominate the international technology market.

【科研工作者的责任】Because knowledge itself is valuable, there is a prima facie justification for research. Nobel Prize winner Eugene Wigner [21] speaks eloquently of this justification when he shows the ways in which scientific research and the pursuit of knowledge contribute both to our spiritual welfare and to our pleasure while diverting us from the "rampant quest for power." He also notes that Einstein's example shows that one does not have to be a full-time scholar to make an important discovery. Einstein worked at the Swiss patent office while he created the special theory of relativity. Following Einstein's example, many people might be able either to engage in valuable research or at least to do some kind of scholarship that develops their own abilities.

【科研工作者的社会契约】The most serious duty to engage in research in a particular area, however, falls on members of a specific profession. Because researchers are professionals who have received training, education, and benefits from society, they have an implicit contract with society. Hence researchers arguably have the traditional trustee's responsibility to preserve, develop, and extend the intellectual assets that they have received (in part) from the public and that they hold in trust for that society.

According to the trustee model of the professions, there is some historical moment at which each profession took over a specific class of intellectual assets from amateurs in the public. They took over these assets with the understanding that they would manage and expand this societal asset particular types of knowledge and research methods through time.

Moreover, although not every professional has the duty to do innovative and important research, nevertheless scientific professionals collectively have the duty to perform research, to manage and expand the knowledge system over which they are trustees for the public. Because not all professionals are able to make revolutionary breakthroughs,

however, the duty to perform scientific research is proportional to our ability to do so. Steven Cahn's injunction from an ancient Hebrew sage is appropriate here: "It is not your duty to complete the task, but you are not free to desist from it."

【科研工作是“垄断行业”】In addition to research duties that exist by virtue of professionals' roles as trustees of knowledge for the public, scientists trained to do research often have a duty to perform such work because of their contractual obligations to their employer. College, university, laboratory, or industry employers often require scientists to do research. Those highly trained in a particular area likewise have a duty to do research because, as members of specific professions that contain almost all of the available expertise in a certain area, they have a near monopoly over information about, and implementation of, certain socially relevant policies. Because society has helped scientific researchers, in part, to gain this monopoly, these scientists have a duty to make good on the societal investment in them. Because others have not received such an investment, because it gives scientific researchers the benefits of a monopoly, and because researchers exhaust most expertise in a certain area, they have a duty to engage in research and to publicize their findings. Along with specialized knowledge, power, and benefits, however, come special responsibilities. Scientists' responsibilities for research in their respective fields arise largely because they are the only people qualified to perform it. Hence, they have a responsibility because of their trustee status, their ability, their near monopoly over advances in certain areas, their training, and their knowledge.

【多数的研究经费来自社会】Scientists also have a duty to do some research because most research funding comes from society, with the government as the major source. Insofar as the public supports research, scientific professionals have a responsibility not to waste resources and to perform the research agreed on. Even when industry funds research, members of the public at large ultimately pay for the work, in part because they buy the products and thus generate research monies. Because society (through university accreditation, taxes, and so on) often pays for research products or oversees the training and competence of research professionals, individuals who seek advice or counsel from scientific professionals have a right to expect accurate information.

Moreover, to the degree that professionals need to engage in research to remain knowledgeable, they have a duty to do that research. Likewise, students and employers have the right to expect that their professors and employees remain knowledgeable and up-to-date in their professions. Professors at four-year colleges and universities are expected, by virtue of their contracts, to contribute to knowledge in their fields and to work with students of almost any level and ability. To do so, they must perform research. Without doing such research and thereby exposing their ideas and experiments to scrutiny and criticism through publication, professors cannot as easily have their work evaluated. Researchers' submitting their work for publication is thus comparable to pilots' undergoing periodic testing. Both procedures enable professionals to keep their skills at a level necessary to fulfill their duties.

【科研活动多是集体行为】Members of the scientific community have a basic right and responsibility to apply knowledge to the best of their ability to the improvement of the quality of life for all present and future inhabitants of the earth.

Affirming researchers' responsibilities to society often becomes difficult, however, because these obligations are collective; we cannot assign the ultimate moral responsibility to a single researcher because an individual person is usually not causally responsible for a particular research conclusion or for the effects of applying specific research results. As the number of people and processes involved in the production of an outcome increases, the relative causal contribution and therefore the relative ethical responsibility of each agent lessens.

Hence, problems arise in evaluating the level of each researcher's "share" of collective responsibility. It is difficult to define the set whose member acts are performed by agents responsible for the total effects of the research. Moreover, with respect to responsibility for complicated causal systems, negative causation counts as much as positive causation.

【公众的知情权】The primary reason for researchers' duties to society is citizens' related right to free informed consent to decisions affecting their welfare, including decisions about scientific research. To help ensure citizens' ability to exercise this consent, we must specify responsibilities of researchers to society and charge professional organizations with improving their members' communication with the public. Since all beings have a basic right to participate in the making of decisions affecting

them or to have appropriate proxies represent their interests, scientific workers have a special responsibility to take all steps possible to assure that potentially affected parties (or their proxies) have all information necessary to make fully informed decisions.

To understand why helping to ensure citizens' free informed consent requires that researchers have responsibilities to society, consider what would happen if they had no such duties. Researchers without the responsibility to provide the public with information relevant to the common good would open the door to political repression. If scientific researchers did not communicate their findings to the people at large, some political leaders might claim whatever they wished about research matters relevant to public welfare.

【民众需要科学家的帮助】Another reason that scientific researchers have special responsibilities to enhance societal welfare is that the public needs their efforts. Researchers' efforts are needed, for example, in the area of sustainable agriculture because of the decline of productivity of soil and water systems in high-population-growth regions such as Asia, Africa, and Latin America. In situations where researchers' tools, support, and materials are viewed as "public resources," it is more important for ethical goals and public needs to drive research.

【民众投资教育】Researchers' societal responsibilities stem from society's investment in, and licensing control over, them. One of the greatest societal investments in researchers is education. Virtually no student, even in a private school, ever pays the full cost of education; taxes or donations usually supplement that cost. Because of this societal investment in professional education, as well as taxpayers' funding the salaries of many researchers, researchers clearly owe society something in return.

【将信息公布于众】Researchers who keep information from the public ignore the fact that the ultimate responsibility in a democracy resides with individual citizens, and that denying them information pertinent to their own health and welfare effectively deprives them of the rights of citizenship. The writers of our constitution understood this very well. James Madison said: Knowledge will forever govern ignorance. And a people who mean to be their own governors must arm themselves with the power knowledge gives. A popular government without popular information or the means of acquiring it is but the prologue to a farce or tragedy, or perhaps both.

Reference
084

科学研究与商业利益

Scientific Research and Business

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 15 题】【新 135 题】【新 136 题】【新 98 题】

See Also
相关写作参考

【Ref-078 科学研究】【Ref-079 科学研究与资助】【Ref-083 科学研究与公众利益】【Ref-082 科学研究与利益矛盾】

【商业影响科学研究】We found a wide range of disturbing commercial influences on science, and evidence that similar problems are occurring across academic disciplines. Over the past two decades, government policy in the US, UK and elsewhere has fundamentally altered the academic landscape in a drive for profit. Universities have been

pushed to adopt a much more commercial mindset, from taking out patents to prioritizing research that promises short-term economic gains. The rapid spread of partnerships between businesses and universities has led to some disciplines becoming so intertwined with industry that few academics are able to retain their independence.

【影响科研自由和公共利益】Such business-industry connections with academia are not questionable in themselves, of course, because the connections often serve a number of goods, such as increasing the relevance or applicability of scientific research or helping to provide jobs for students or research assistants. Nevertheless, the connections present problems to the degree that they threaten autonomy, freedom of research, and the public interest in research. University-business links can threaten learning: attracting scientists who want to get rich rather than to teach and learn, profit motives' clouding researchers' judgments, and funders' control of university-produced information. Even tax-payer funded research is now less likely to work in the broader public interest. These findings are based on extensive evidence across five sectors: pharmaceuticals, oil and gas, military/defense, biotechnology and tobacco.

【商业对科学研究的负面影响】Government policy has driven a corporate agenda into the heart of universities, undermining their openness and independence. The damaging effects include:

- Research bias – Commercial funding frequently results in only those research findings favorable to the funder being reported;
- Distorted research agendas – Short-term economic goals often shape academic research priorities. Research with social and environmental goals is frequently marginalized;
- Covert funding of science communication – Interest groups, from climate skeptics to patient groups, have been funded to support an industry-friendly viewpoint;
- Conflicts of interest – Academics are increasingly tied into commercial relationships that are not properly monitored;
- Lack of openness – Commercial restrictions have become much more widespread and are impeding the free exchange of data.

【科研与利益冲突】Chemical engineering and geology are strongly linked to oil companies, for example, and it is hard to find an engineering department which does not receive funding from the arms industry. And many life sciences departments have extensive links with the biotechnology and pharmaceutical industries. This creates enormous potential for conflicts of interest. The problem has long been recognized in medical research, and journals are starting to crack down on it, but in other disciplines the problems are rarely even discussed, let alone acted upon. Such problems are a major concern because the can undermine the quality and reliability of research. This is perhaps best illustrated by "sponsorship bias", where research generates results that suit the funder.

【粉饰负面结果】Another well-documented problem is the failure to report results unfavorable to the funder. Research is also undermined by misleading messages put out by industry-funded lobby groups. Again, these tactics are well known from the tobacco and oil industries, with their deliberate questioning of health research and sponsorship of climate skeptics. Less attention has been given to the funding of some patient groups by pharmaceutical companies and the use of Public Relation companies by the biotechnology industry in the debate over genetically modified crops. This does not bode well for public discussions on the risks of synthetic biology.

【威胁公众利益】Another cornerstone of science that is being eroded is the freedom to set the public research agenda so that it serves the public interest. Governments are increasingly focused on delivering competitiveness, and business interests are able to exert pressure on funding bodies through representatives on their boards. As a result, environmental and social problems and 'blue-sky' research commonly lose out to short-term commercial gain. For example, genetics now dominates agricultural science, not least because genetic technologies are highly patentable. This not only dominates privately funded research, but also steers publicly funded research away from work that takes a different approach or explores low-tech solutions. As a result, 'low-input' agriculture, which requires minimal use of chemical fertilizers and pesticides and is cheaper and more useful to poorer farmers, is largely overlooked. Similarly, research on how to improve food distribution receives inadequate support.

Reference
085

科学研究与不确定性

Scientific Research and Uncertainty

Relevant GRE Issue
相关题库题目

【新 36 题】【新 72 题】【新 15 题】【新 135 题】【新 136 题】【新 98 题】

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【Ref-079 科学研究与资助】【Ref-078 科学研究】【Ref-080 科学研究与伦理】【Ref-083 科学研究与公众利益】【Ref-082 科学研究与利益矛盾】【Ref-084 科学研究与商业利益】

【科技是把双刃剑】Science and technology are universally seen as producers not only of enormous benefits, but also of novelties and unknowns that may carry adverse physical, social and ethical consequences. Indeed, uncertainty seems so pervasive that some academic analysts have argued we are living in a 'risk society', in which everyone, regardless of social and economic status, is always to some degree at risk from advances in science and technology. Technological innovations – from cars to computers, vaccines to genetically modified foods, and nuclear power to nanotechnology – have brought unintended consequences, both positive and negative. Global climate change, a side-effect of industrialization, has raised new concerns about long-term risks, intergenerational equity and the potential for disproportionate harm in the poorest countries and sectors of society. Globalization of trade has helped to magnify these concerns. Communication and free trade may raise worldwide levels of welfare, but they also create inequities in the distribution of risks and benefits. This results both from the growing distance between producers and users and from the fact that hazards, such as those linked to climate change, tend to affect the poor disproportionately more than the wealthy.

【如何应对研究的不确定性】Members of the public are often compelled to accept the unknown consequences of research, some of which can harm us. Military research especially nuclear testing, for example has caused massive and catastrophic consequences. However, scientists ought not avoid all work that involves unknown or uncertain consequences. How should researchers respond to such situations of uncertainty?

【做更多的研究】Perhaps the classic scientific response to a situation of uncertainty in research is to do more research. For example, if epidemiologists are uncertain about the precise level of harm associated with a particular pesticide or food additive, they may do additional work using more sensitive tests, in order to reduce the level of their uncertainty. Instead of measuring parts per million of a toxin, they may do additional work that enables them to measure parts per billion of the toxin. When uncertainties about research data arise because of the limited size of the sample considered, further studies with larger samples help to increase the precision and reliability of our knowledge of a phenomenon. For example, if researchers draw conclusions about the effects of background radiation on 100 people, the results would be more precise and reliable if they performed further studies on 1,000 people or if they conducted the studies over a longer period of time.

【保证研究信息透明】Citizens argue that, in the face of research-related environmental and technological uncertainties, the government must take an active role to ensure that members of the public have the best available information so that they can help make knowledgeable policy decisions. Because alleged free choice is free only to the degree that it is informed, the public has a right to know research-related uncertainties and their potential consequences.

【赢得公众许可】The public contends that laypersons, not

researchers or implementers of technology, have the right to exercise free informed consent to the risks imposed on them. For example, government already requires medical researchers to obtain written informed consent from all subjects involved in experiments, to have independent institutional committees to review all proposed research, and to allow audits and site visits to determine the conditions under which they perform research.

【指定法律法规】Society has the duty to use its regulations and laws to protect members made vulnerable to research risks through lack of information, poor education, or poverty. The rationale for protecting the most vulnerable members of society from dangerous effects of research is that everyone has rights to equal protection of life and bodily security.

Quotations on Research

A theory can be proved by experiment; but no path leads from experiment to the birth of a theory.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

No amount of experimentation can ever prove me right; a single experiment can prove me wrong.
Albert Einstein

Aristotle maintained that women have fewer teeth than men; although he was twice married, it never occurred to him to verify this statement by examining his wives' mouths.
Bertrand Russell (1872-1970, a British philosopher, logician, mathematician, historian, and social critic)

In research the horizon recedes as we advance, and is no nearer at sixty than it was at twenty. As the power of endurance weakens with age, the urgency of the pursuit grows more intense.
Mark Pattison (1813-1884, British rector and author)

It requires a very unusual mind to undertake the analysis of the obvious.
Alfred North Whitehead (1861-1947, an English mathematician who became a philosopher)

Man can learn nothing except by going from the known to the unknown.
Claude Bernard (1813-1878, French physiologist)

Research is formalized curiosity. It is poking and prying with a purpose.
Zora Neale Hurston (1891-1960, U.S. writer and folklorist)

Research is fundamentally a state of mind involving continual reexamination of the doctrines and axioms upon which current thought and action are based. It is, therefore, critical of existing practices.
Theobald Smith (1859-1934, U.S. pathologist)

Reference
086

科学宣言

Science for 21st Century[22]

Relevant GRE Issue
相关题库题目

【新 15 题】【新 36 题】【新 72 题】【新 98 题】【新 135 题】【新 136 题】

See Also
相关写作参考

【Ref-081 科学家与社会责任】【Ref-068 科学的自由】【Ref-080 科学研究与伦理】

【前言】Preamble

1. We all live on the same planet and are part of the biosphere. We have come to recognize that we are in a

situation of increasing interdependence, and that our future is intrinsically linked to the preservation of the global life-support systems and to the survival of all forms of life. The nations and the scientists of the world are called upon to acknowledge the urgency of using knowledge from all fields of science in a responsible manner to address human needs and aspirations without misusing this knowledge. We seek active collaboration across all the fields of scientific endeavour, that is the natural sciences such as the physical, earth and biological sciences, the biomedical and engineering sciences, and the social and human sciences. While the Framework for Action emphasizes the promise and the dynamism of the natural sciences but also their potential adverse effects, and the need to understand their impact on and relations with society, the commitment to science, as well as the challenges and the responsibilities set out in this Declaration, pertain to all fields of the sciences. All cultures can contribute scientific knowledge of universal value. The sciences should be at the service of humanity as a whole, and should contribute to providing everyone with a deeper understanding of nature and society, a better quality of life and a sustainable and healthy environment for present and future generations.

2. Scientific knowledge has led to remarkable innovations that have been of great benefit to humankind. Life expectancy has increased strikingly, and cures have been discovered for many diseases. Agricultural output has risen significantly in many parts of the world to meet growing population needs. Technological developments and the use of new energy sources have created the opportunity to free humankind from arduous labour. They have also enabled the generation of an expanding and complex range of industrial products and processes. Technologies based on new methods of communication, information handling and computation have brought unprecedented opportunities and challenges for the scientific endeavour as well as for society at large. Steadily improving scientific knowledge on the origin, functions and evolution of the universe and of life provides humankind with conceptual and practical approaches that profoundly influence its conduct and prospects.

3. In addition to their demonstrable benefits the applications of scientific advances and the development and expansion of human activity have also led to environmental degradation and technological disasters, and have contributed to social imbalance or exclusion. As one example, scientific progress has made it possible to manufacture sophisticated weapons, including conventional weapons and weapons of mass destruction. There is now an opportunity to call for a reduction in the resources allocated to the development and manufacture of new weapons and to encourage the conversion, at least partially, of military production and research facilities to civilian use. The United Nations General Assembly has proclaimed the year 2000 as International Year for the Culture of Peace and the year 2001 as United Nations Year of Dialogue among Civilizations as steps towards a lasting peace; the scientific community, together with other sectors of society, can and should play an essential role in this process.

4. Today, whilst unprecedented advances in the sciences are foreseen, there is a need for a vigorous and informed democratic debate on the production and use of scientific knowledge. The scientific community and decision-makers should seek the strengthening of public trust and support for science through such a debate. Greater interdisciplinary efforts, involving both natural and social sciences, are a prerequisite for dealing with ethical, social, cultural, environmental, gender, economic and health issues. Enhancing the role of science for a more equitable, prosperous and sustainable world requires the long-term commitment of all stakeholders, public and private, through greater investment, the appropriate review of investment priorities, and the sharing of scientific knowledge.

5. Most of the benefits of science are unevenly distributed, as a result of structural asymmetries among countries, regions and social groups, and between the sexes. As scientific knowledge has become a crucial factor in the production of wealth, so its distribution has become more inequitable. What distinguishes the poor (be it people or countries) from the rich is not only that they have fewer assets, but also that they are largely excluded from the creation and the benefits of scientific knowledge.

6. We, participants in the World Conference on Science for the Twenty-first Century: A New Commitment, assembled in Budapest, Hungary, from 26 June to 1 July 1999 under the aegis of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Council for Science (ICSU):

【请思考】**Considering**:

7. where the natural sciences stand today and where they are heading, what their social impact has been and

what society expects from them,

8. that in the twenty-first century science must become a shared asset benefiting all peoples on a basis of solidarity, that science is a powerful resource for understanding natural and social phenomena, and that its role promises to be even greater in the future as the growing complexity of the relationship between society and the environment is better understood,

9. the ever-increasing need for scientific knowledge in public and private decision-making, including notably the influential role to be played by science in the formulation of policy and regulatory decisions,

10. that access to scientific knowledge for peaceful purposes from a very early age is part of the right to education belonging to all men and women, and that science education is essential for human development, for creating endogenous scientific capacity and for having active and informed citizens,

11. that scientific research and its applications may yield significant returns towards economic growth and sustainable human development, including poverty alleviation, and that the future of humankind will become more dependent on the equitable production, distribution and use of knowledge than ever before,

12. that scientific research is a major driving force in the field of health and social care and that greater use of scientific knowledge would considerably improve human health,

13. the current process of globalization and the strategic role of scientific and technological knowledge within it,

14. the urgent need to reduce the gap between the developing and developed countries by improving scientific capacity and infrastructure in developing countries,

15. that the information and communication revolution offers new and more effective means of exchanging scientific knowledge and advancing education and research,

16. the importance for scientific research and education of full and open access to information and data belonging to the public domain,

17. the role played by the social sciences in the analysis of social transformations related to scientific and technological developments and the search for solutions to the problems generated in the process,

18. the recommendations of major conferences convened by the organizations of the United Nations system and others, and of the meetings associated with the World Conference on Science,

19. that scientific research and the use of scientific knowledge should respect human rights and the dignity of human beings, in accordance with the Universal Declaration of Human Rights and in the light of the Universal Declaration on the Human Genome and Human Rights,

20. that some applications of science can be detrimental to individuals and society, the environment and human health, possibly even threatening the continuing existence of the human species, and that the contribution of science is indispensable to the cause of peace and development, and to global safety and security,

21. that scientists with other major actors have a special responsibility for seeking to avert applications of science which are ethically wrong or have an adverse impact,

22. the need to practise and apply the sciences in line with appropriate ethical requirements developed on the basis of an enhanced public debate,

23. that the pursuit of science and the use of scientific knowledge should respect and maintain life in all its diversity, as well as the life-support systems of our planet,

24. that there is a historical imbalance in the participation of men and women in all science-related activities,

25. that there are barriers which have precluded the full participation of other groups, of both sexes, including disabled people, indigenous peoples and ethnic minorities, hereafter referred to as disadvantaged groups,

26. that traditional and local knowledge systems, as dynamic expressions of perceiving and understanding the world, can make, and historically have made, a valuable contribution to science and technology, and that there is a need to preserve, protect, research and promote this cultural heritage and empirical knowledge,

27. that a new relationship between science and society is necessary to cope with such pressing global problems as poverty, environmental degradation, inadequate public

health, and food and water security, in particular those associated with population growth,

28. the need for a strong commitment to science on the part of governments, civil society and the productive sector, as well as an equally strong commitment of scientists to the well-being of society,

【声明】**Proclaim the following**:

I. Science for knowledge; knowledge for progress

29. The inherent function of the scientific endeavour is to carry out a comprehensive and thorough inquiry into nature and society, leading to new knowledge. This new knowledge provides educational, cultural and intellectual enrichment and leads to technological advances and economic benefits. Promoting fundamental and problem-oriented research is essential for achieving endogenous development and progress.

30. Governments, through national science policies and in acting as catalysts to facilitate interaction and communication between stakeholders, should give recognition to the key role of scientific research in the acquisition of knowledge, in the training of scientists and in the education of the public. Scientific research funded by the private sector has become a crucial factor for socio-economic development, but this cannot exclude the need for publicly-funded research. Both sectors should work in close collaboration and in a complementary manner in the financing of scientific research for long-term goals.

II. Science for peace

31. The essence of scientific thinking is the ability to examine problems from different perspectives and seek explanations of natural and social phenomena, constantly submitted to critical analysis. Science thus relies on critical and free thinking, which is essential in a democratic world. The scientific community, sharing a long-standing tradition that transcends nations, religions and ethnicity, should promote, as stated in the Constitution of UNESCO, the "intellectual and moral solidarity of mankind", which is the basis of a culture of peace. Worldwide cooperation among scientists makes a valuable and constructive contribution to global security and to the development of peaceful interactions between different nations, societies and cultures, and could give encouragement to further steps in disarmament, including nuclear disarmament.

32. Governments and society at large should be aware of the need to use natural and social sciences and technology as tools to address the root causes and impacts of conflict. Investment in scientific research which addresses them should be increased.

III. Science for development

33. Today, more than ever, science and its applications are indispensable for development. All levels of government and the private sector should provide enhanced support for building up an adequate and evenly distributed scientific and technological capacity through appropriate education and research programmes as an indispensable foundation for economic, social, cultural and environmentally sound development. This is particularly urgent for developing countries. Technological development requires a solid scientific basis and needs to be resolutely directed towards safe and clean production processes, greater efficiency in resource use and more environmentally friendly products. Science and technology should also be resolutely directed towards prospects for better employment, improving competitiveness and social justice. Investment in science and technology aimed both at these objectives and at a better understanding and safeguarding of the planet's natural resource base, biodiversity and life-support systems must be increased. The objective should be a move towards sustainable development strategies through the integration of economic, social, cultural and environmental dimensions.

34. Science education, in the broad sense, without discrimination and encompassing all levels and modalities, is a fundamental prerequisite for democracy and for ensuring sustainable development. In recent years, worldwide measures have been undertaken to promote basic education for all. It is essential that the fundamental role played by women in the application of scientific development to food production and health care be fully recognized, and efforts made to strengthen their understanding of scientific advances in these areas. It is on this platform that science education, communication and popularization need to be built. Special attention still needs to be given to marginalized groups. It is more than ever necessary to develop and expand science literacy in all cultures and all sectors of society as well as reasoning ability and skills and an appreciation of ethical values, so as to improve public participation in decision-making related to the application of new knowledge. Progress in science makes the role of universities particularly important in the

promotion and modernization of science teaching and its coordination at all levels of education. In all countries, and in particular the developing countries, there is a need to strengthen scientific research in higher education, including postgraduate programmes, taking into account national priorities.

35. The building of scientific capacity should be supported by regional and international cooperation, to ensure both equitable development and the spread and utilization of human creativity without discrimination of any kind against countries, groups or individuals. Cooperation between developed and developing countries should be carried out in conformity with the principles of full and open access to information, equity and mutual benefit. In all efforts of cooperation, diversity of traditions and cultures should be given due consideration. The developed world has a responsibility to enhance partnership activities in science with developing countries and countries in transition. Helping to create a critical mass of national research in the sciences through regional and international cooperation is especially important for small States and least developed countries. Scientific structures, such as universities, are essential for personnel to be trained in their own country with a view to a subsequent career in that country. Through these and other efforts conditions conducive to reducing or reversing the brain drain should be created. However, no measures adopted should restrict the free circulation of scientists.

36. Progress in science requires various types of cooperation at and between the intergovernmental, governmental and non-governmental levels, such as: multilateral projects; research networks, including South-South networking; partnerships involving scientific communities of developed and developing countries to meet the needs of all countries and facilitate their progress; fellowships and grants and promotion of joint research; programmes to facilitate the exchange of knowledge; the development of internationally recognized scientific research centres, particularly in developing countries; international agreements for the joint promotion, evaluation and funding of mega-projects and broad access to them; international panels for the scientific assessment of complex issues; and international arrangements for the promotion of postgraduate training. New initiatives are required for interdisciplinary collaboration. The international character of fundamental research should be strengthened by significantly increasing support for long-term research projects and for international collaborative projects, especially those of global interest. In this respect particular attention should be given to the need for continuity of support for research. Access to these facilities for scientists from developing countries should be actively supported and open to all on the basis of scientific merit. The use of information and communication technology, particularly through networking, should be expanded as a means of promoting the free flow of knowledge. At the same time, care must be taken to ensure that the use of these technologies does not lead to a denial or restriction of the richness of the various cultures and means of expression.

37. For all countries to respond to the objectives set out in this Declaration, in parallel with international approaches, in the first place national strategies and institutional arrangements and financing systems need to be set up or revised to enhance the role of sciences in sustainable development within the new context. In particular they should include: a long-term national policy on science to be developed together with the major public and private actors; support to science education and scientific research; the development of cooperation between R&D institutions, universities and industry as part of national innovation systems; the creation and maintenance of national institutions for risk assessment and management, vulnerability reduction, safety and health; and incentives for investment, research and innovation. Parliaments and governments should be invited to provide a legal, institutional and economic basis for enhancing scientific and technological capacity in the public and private sectors and facilitate their interaction. Science decision-making and priority-setting should be made an integral part of overall development planning and the formulation of sustainable development strategies. In this context, the recent initiative by the major G-8 creditor countries to embark on the process of reducing the debt of certain developing countries will be conducive to a joint effort by the developing and developed countries towards establishing appropriate mechanisms for the funding of science in order to strengthen national and regional scientific and technological research systems.

38. Intellectual property rights need to be appropriately protected on a global basis, and access to data and information is essential for undertaking scientific work and for translating the results of scientific research into tangible benefits for society. Measures should be taken to enhance those relationships between the protection of intellectual property rights and the dissemination of scientific knowledge that are mutually supportive. There is a need to

consider the scope, extent and application of intellectual property rights in relation to the equitable production, distribution and use of knowledge. There is also a need to further develop appropriate national legal frameworks to accommodate the specific requirements of developing countries and traditional knowledge and its sources and products, to ensure their recognition and adequate protection on the basis of the informed consent of the customary or traditional owners of this knowledge.

IV. Science in society and science for society

39. The practice of scientific research and the use of knowledge from that research should always aim at the welfare of humankind, including the reduction of poverty, be respectful of the dignity and rights of human beings, and of the global environment, and take fully into account our responsibility towards present and future generations. There should be a new commitment to these important principles by all parties concerned.

40. A free flow of information on all possible uses and consequences of new discoveries and newly developed technologies should be secured, so that ethical issues can be debated in an appropriate way. Each country should establish suitable measures to address the ethics of the practice of science and of the use of scientific knowledge and its applications. These should include due process procedures for dealing with dissent and dissenters in a fair and responsive manner. The World Commission on the Ethics of Scientific Knowledge and Technology of UNESCO could provide a means of interaction in this respect.

41. All scientists should commit themselves to high ethical standards, and a code of ethics based on relevant norms enshrined in international human rights instruments should be established for scientific professions. The social responsibility of scientists requires that they maintain high standards of scientific integrity and quality control, share their knowledge, communicate with the public and educate the younger generation. Political authorities should respect such action by scientists. Science curricula should include science ethics, as well as training in the history and philosophy of science and its cultural impact.

42. Equal access to science is not only a social and ethical requirement for human development, but also essential for realizing the full potential of scientific communities worldwide and for orienting scientific progress towards meeting the needs of humankind. The difficulties encountered by women, constituting over half of the world's population, in entering, pursuing and advancing in a career in the sciences and in participating in decision-making in science and technology should be addressed urgently. There is an equally urgent need to address the difficulties faced by disadvantaged groups which preclude their full and effective participation.

43. Governments and scientists of the world should address the complex problems of poor health and increasing inequalities in health between different countries and between different communities within the same country with the objective of achieving an enhanced, equitable standard of health and improved provision of quality health care for all. This should be undertaken through education, by using scientific and technological advances, by developing robust long-term partnerships between all stakeholders and by harnessing programmes to the task.

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44. We, participants in the World Conference on Science for the Twenty-first Century: A New Commitment, commit ourselves to making every effort to promote dialogue between the scientific community and society, to remove all discrimination with respect to education for and the benefits of science, to act ethically and cooperatively within our own spheres of responsibility, to strengthen scientific culture and its peaceful application throughout the world, and to promote the use of scientific knowledge for the well-being of populations and for sustainable peace and development, taking into account the social and ethical principles illustrated above.

45. We consider that the Conference document Science Agenda - Framework for Action gives practical expression to a new commitment to science, and can serve as a strategic guide for partnership within the United Nations system and between all stakeholders in the scientific endeavour in the years to come.

46. We therefore adopt this Declaration on Science and the Use of Scientific Knowledge and agree upon the Science Agenda - Framework for Action as a means of achieving the goals set forth in the Declaration, and call upon UNESCO and ICSU to submit both documents to the General Conference of UNESCO and to the General Assembly of ICSU. The United Nations General Assembly will also be seized of these documents. The purpose is to enable both UNESCO and ICSU to identify and implement follow-up action in their respective programmes, and to mobilize the support of all partners, particularly those in the

United Nations system, in order to reinforce international coordination and cooperation in science.

Reference
087

科技促进交流

Technology and Human Interaction

Relevant GRE Issue
相关题库题目

【新 101 题】【新 132 题】

See Also
相关写作参考

【Ref-088 科技让人疏远】【Ref-019 教育与科技】【Ref-105 信息时代】【Ref-069 科学与社会】，全球化

【新生代交流手段】Social software encompasses a range of software systems that allow users to interact and share data. This computer-mediated communication has become very popular with social sites like MySpace, Facebook and etc, media sites like YouTube as well as commercial sites like Amazon.com and eBay. An instant messaging application or client allows one to communicate with another person over a network in real time, in relative privacy. Popular, consumer-oriented clients include AOL Instant Messenger, Google Talk, QQ, MSN Messenger, Skype and Yahoo! Messenger. Internet forums allow users to post a "topic" for others to review. Other users can view the topic and post their own comments in a linear fashion, one after the other. Most forums are public, allowing anybody to sign up at any time. A wiki is a web page whose content can be edited by its visitors. Examples include Wikipedia, Wiktionary, Blogs, short for web logs, are like online journals for a particular person. The owner will post a message periodically, allowing others to comment. Topics often include the owner's daily life, views on politics or a particular subject important to them.

【科技促进社交】Thousands of daily updates come from friends on networks like Facebook and Twitter, but do people actually feel closer to each other? It turns out the size of the common people social circle is larger today than before. In fact, people who regularly use digital technologies are more social than the average people and more likely to visit parks and cafes, or volunteer for local organizations. Does technology cause people to hole up in their pajamas or lose some friendships? The circle of close friends for mobile phone users tends to be larger than for nonusers. People who share online photos or instant messages have larger social circles than nonusers. People using social networks and cellphones, contributes to having more diverse social networks. People who use modern information and communication technologies have larger and more diverse social networks.

【美国调查报告结论】The Pew Internet Personal Networks and Community survey is the first ever that examines the role of the internet and cell phones in the way that people interact with those in their core social network. Its key findings challenge previous research and commonplace fears about the harmful social impact of new technology. Here are some of the other key findings in the Pew Internet report:

- Some have worried that internet use limits people's participation in their local communities, but the Pew Internet report finds that most internet activities have little or a positive relationship to local activity. For instance, internet users are as likely as anyone else to visit with their neighbors in person. Cell phone users, those who use the internet frequently at work, and bloggers are more likely to belong to a local voluntary association, such as a youth group or a charitable

organization.

- Internet use does not pull people away from public places. Rather, Internet use is associated with frequent visits to places such as parks, cafes, and restaurants, the kinds of locales where research shows that people are likely to encounter a wider array of people and diverse points of view. Indeed, internet access has become a common component of people's experiences within many public spaces.
- People's mobile phone use outpaces their use of landline phones as a primary method of staying in touch with their closest family and friends, but face-to-face contact still trumps all other methods.
- Social media activities are associated with several beneficial social activities, including having discussion networks that are more likely to contain people from different backgrounds. For instance, frequent internet users, and those who maintain a blog are much more likely to confide in someone who is of another race. Those who share photos online are more likely to report that they discuss important matters with someone who is a member of another political party.
- While participation in traditional social settings, like neighborhoods, voluntary organizations, and public spaces, remain the strongest predictors for the overall diversity of people's social networks, internet use, and specifically use of social networking services like Facebook, are also associated with knowing more people from a wider variety of backgrounds.

All the evidence point in one direction that people's social worlds are enhanced by new communication technologies. It is a mistake to believe that internet use and mobile phones plunge people into a spiral of isolation.

Reference
088

科技让人疏远

Technology and Human Isolation

Relevant GRE Issue
相关题库题目

【新 101 题】【新 132 题】

See Also
相关写作参考

【Ref-087 科技促进交流】【Ref-019 教育与可以】【Ref-105 信息时代】

【什么是隔绝】Social isolation is characterized by a lack of contact with other people in normal daily living—in the workplace, with friends, and in social activities. It may follow a difficult event in a person's life—the loss of a job, the breakdown of a marriage, illness or financial difficulties. Feelings of isolation can, in turn, make it difficult for that individual to reintegrate socially and can have serious consequences. Social isolation can be a downward spiral: feelings of exclusion affect morale, and lack of contacts with other people may reduce both social and economic opportunities.

【孤独】People are less connected or engaged in their communities. If society is less connected, is it also more lonely? In 2008, some researchers [23] published their findings on loneliness, which identified:

- The lonely sleep less well and less efficiently.
- The lonely can't think as clearly.
- The lonely were more likely to describe a gadget anthropomorphically and the lonely were more likely to believe in the supernatural, and believed in the

supernatural more when they were feeling lonely.

- Lonely people had higher levels of chronic inflammation, a condition associated with heart and artery disease, arthritis, Alzheimer's and other illnesses.
- The inability to sleep well and think clearly has impact on ability to learn.

【科技让人们隔绝】People are increasingly isolating themselves via technology, with friendships and commitment to community dying as we spend more and more time staring at screens and yakking on cell phones, as opposed to seeing people honestly and forthrightly, face to face, with the emotional riches. Even such places as Starbucks, touted as local gathering spots, seem to be filling with people staring at the screens of their laptops, not at friends and fellow customers. The desire to avoid the anxiety of real personal encounters seems to be spreading.

【通讯的内容质量下降】The Internet and other forms of instant communication might be hurting the overall quality of life more than helping by eroding honest discourse, developed thought and civil society. While we tend to think of communication as a good thing in itself, increasingly the electronic communications taking over the world encourage mental static, speed for the sake of speed and attention-deficit disorder. More communication doesn't mean better. With text messages, you can send messages and you can get an instant reply. The phone becomes a remote control for life. Or, if we aren't careful, it can become a substitute for life.

【与世隔绝的生活】Social isolation is becoming more prevalent in our lives and the lives of our loved ones. And during the holidays, feelings of loneliness, isolation, and depression can be magnified. Some people believe part of this phenomenon is linked to our technology obsession-such as internet, iphone, video games, and etc.

【住在隔壁的陌生人】Social isolation has increased over the past decade. People even do not really know their neighbors or their names. Ten years ago, there were neighborhood dinners, parties, neighborhood clubs and invitations to each other's house for an occasional drink or two. We did know more of our neighbors then. Now there's little interaction except in a crisis. None of us leave these electronic devices for more than a few hours during the day, so then who has the time or energy to talk face to face with others? Maybe this is why these blog sites are so popular because you can reach so many people and express your opinion without worrying about anyone's response. If you have these same discussions face to face with people that are in your family, your friends, your neighborhood, your workplace, your place of worship, where will it lead?

【面对面的交流】There is no doubt that technology does help us to communicate anywhere we want as frequently as we want but it's the quality of that communication that concerns us. People are always guilty of this technology obsession and look forward to face-to-face communication as the primary means to stay in touch with friends and family.

【人们行动起来】What could people do to change this trend?

- Spend time visiting with neighbors and reintroducing yourself. Consider bringing them a holiday treat.
- Schedule time to visit with friends and family. All of us have to make time to be with others and that does take planning with our busy schedules.
- Visit shut-ins, nursing home patients, deliver meals on wheels, and bring food to a shelter or food bank. Volunteerism is healing to us and touches others.
- Forgive others and yourself. If you can, fix relationships that you yearn for and are estranged from. It may take pushing your pride out of the way, so you can reunite and reconnect with them.
- Reach out and touch someone you love. When was the last time you hugged and kissed your kids, your friends, and your partner/spouse and really held them tight? Take that moment and cherish it.

Reference
089

全球变暖
Global Warming

Relevant GRE Issue 相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also 相关写作参考 【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】

【全球变暖的原因】Global warming is one of the most controversial science issues of the 21st century, challenging the very structure of our global society. The problem is that global warming is not just a scientific concern, but encompasses economics, sociology, geopolitics, local politics, and individuals' choice of lifestyle.

Global warming is caused by the massive increase of greenhouse gases, such as carbon dioxide, in the atmosphere, resulting from the burning of fossil fuels and deforestation. There is clear evidence that we have already elevated concentrations of atmospheric carbon dioxide to their highest level for the last half million years and maybe even longer. Scientists believe that this is causing the Earth to warm faster than at any other time during, at the very least, the past one thousand years.

From the beginning of the Industrial Revolution through the end of the 20th century, the amount of carbon dioxide in the atmosphere increased 30 percent and the amount of methane more than doubled. This increase may not seem dramatic, but the results may be.

【全球变暖造成的灾难性后果】Global warming will melt some of the polar ice caps, raising sea levels, bringing greater risk of floods to low-lying and coastal regions worldwide, and making violent oceanic storms more common. Heat waves, droughts, hurricanes, and torrential rain will become more common.

Rising temperatures are melting the ice sheets of Antarctica and Greenland. Melt water streaming off the land is causing a rise in sea level, and making polar oceans less salty. Some European butterfly species have moved their habitat from twenty to one hundred and fifty miles north of their previous ranges, and British birds are laying their eggs earlier in the spring.

The summer sea ice in the Arctic has also shrunk to the smallest area ever recorded. This threatens Arctic wildlife such as the polar bear, which lives on the ice. If the sea ice disappears, the polar bear could vanish, too. Water added by melting ice threatens to make average sea levels rise by up to one meter over the next century, and possibly more. The effect of this will be exaggerated in many regions that are exposed to large tides and storm surges.

Coastal cities could be flooded, low-lying lands such as Bangladesh will be swamped, and several island nations will disappear. The ensuing migrations will influence personal lives, agriculture, economies, and national political stabilities. Destructive hurricanes are fueled by the evaporation of warm ocean water. The warmer the oceans, the more fuel these storms have available, so warmer oceans may cause more storms.

【《京都协议》】To prevent global warming, many countries are now trying to reduce their output of carbon dioxide and use renewable energy sources. The politics of the Kyoto Protocol[24] illustrate the importance of power, equity, and efficiency in the formation of global governance regimes for preventing global warming and protecting humanity from climate change. Global warming prevention and adaptation require actions with a global reach, including close cooperation between North and South, as well as national initiatives.

Reference
090

石油危机
Oil Crisis

Relevant GRE Issue 相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also 相关写作参考 【Ref-092 能源安全】【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】

【石油危机如何产生】Oil provides the main source of energy for advanced industrial economies. A sudden rise in the price of oil due to, for example, speculation or to a severe disturbance in the existing relationship between supply and demand can therefore create an oil crisis. This can endanger economic and political stability throughout the global capitalist economy. In the postwar period there have been two major oil crises. The prospects for further crises cannot be discounted.

【第一次石油危机】The first major oil crisis of the postwar era occurred in 1973. This was caused when Arab members of the Organization of Petroleum Exporting Countries (OPEC) decided to quadruple the price of oil to almost $12 a barrel. Oil exports to the United States, Japan, and Western Europe, which together consumed more than half the world's energy, were also prohibited. This decision was made in retaliation for Western support for Israel in the Yom Kippur War[25] with Egypt and in response to a persistent decline in the value of the U.S. dollar (the denominated currency for oil sales), which had eroded the export earnings of OPEC states. With the global capitalist economy already experiencing difficulties, these actions precipitated a steep recession accompanied by rising inflation.

This forced capitalist nations to embark on a process of economic restructuring in order to reduce their dependency on oil and prompted fears that the United States might take military action in order to secure free access to its energy supplies. Although the oil embargo was lifted in 1974, oil prices remained high, and the capitalist world economy continued to stagnate throughout the 1970s.

【第二次石油危机】The second major oil crisis occurred in 1979 as a result of the Iranian revolution.[26] High levels of social unrest severely damaged the Iranian oil industry, leading to a large loss of output and a corresponding rise in prices. This became even worse following the outbreak of the Iran-Iraq War, which further added to the level of instability throughout the region. In 1981, the price of oil was stabilized at $32 per barrel.

By 1983, however, with major capitalist economies having adopted more efficient methods of production, the problems of the 1970s had been transformed into a relative oversupply of oil rather than a shortage. At the present time, world oil prices have reached record levels. This is primarily due to political instability in the Middle East and to a growing demand for oil from developing nations. Despite this, the emergence of another severe energy crisis has so far been averted. This is due to the historically low levels of interest rates being maintained in advanced capitalist economies in response to the onset of a world recession from the turn of the millennium. Nevertheless, the prospect of a future crisis cannot be discounted, especially given the ongoing expansion of the international economy coupled with the finite stock of world oil.

Reference

091

物种灭绝

Species Extinction

Relevant GRE Issue
相关题库题目

【新 31 题】【新 63 题】【新 67 题】

See Also
相关写作参考

【Ref-100 可持续发展】【Ref-117 绿色政治哲学】【Ref-101 原生态区域保护】【Ref-072 科技双刃剑】【Ref-069 科学与社会】

【物种灭绝速度增在加快】The greatest single threat to the world's wildlife is destruction of the habitats where animals live. In many regions, forests are felled, marshes drained, and grasslands cleared to build roads, towns, mines, and dams. Pollution from towns, farms, and factories also poisons wildlife on land and at sea. Most scientists agree that life on Earth is now faced with the most severe extinction. No one knows exactly how many species are being lost because no one knows exactly how many species exist on Earth. Biologists estimate that as many as 27,000 species are becoming extinct each year. This translates into an astounding 3 species every hour.

【物种灭绝的原因】The reasons for species extinction include:

- Species become extinct or endangered for a number of reasons, but the primary cause is the destruction of habitat by human activities
- Nonnative species introduced to a new ecosystem have caused serious native species declines.
- Worldwide commercial exploitation of animals for food and other products has caused many species to become extinct or endangered.
- Drainage of wetlands, conversion of shrub lands to grazing lands, cutting and clearing of forests, urbanization, coral-reef destruction, and road and dam construction have destroyed or seriously damaged and fragmented available habitats.
- Pollution, such like DDT, acid rain, and water and air pollution is another important cause of extinction.

【人类必须采取行动】Why should we worry about species extinction? Individual species have always come into, and gone out of, existence. Because of factors such as natural selection, adaption, and climate change, some species have evolved into new taxa, while other species have gone extinct. Extinction is thus a "natural" process, even though it is forever. What is disturbing about more recent, human-caused extinctions, however, is that they are occurring much more rapidly than earlier, non-human events. Human-induced extinctions occurred at two to four times the rate caused by earlier, nonhuman events. In our own era, economic development of wildlands has accelerated extinction to an incredible degree. Because a majority of species live in tropical forests, and because half of these forests are already gone, extinctions are increasing at an exponential rate.

Today pollution destroys ecosystems even in remote deserts and in the world's deepest oceans. In addition, we have cleared forests for lumber, pulp, and firewood. We have harvested the fish and shellfish of the world's largest lakes and oceans in volumes that make it impossible for populations to recover fast enough to meet our harvesting needs. And everywhere we go, whether on purpose or by accident, we have brought along species that disrupt local ecosystems and, in many cases, drive native species extinct.

【物种灭绝带来的灾难】Such escalating losses are disturbing not only because species are unique and irreplaceable products of millions of years of evolution, but also because species have such beauty and scientific value.

Because species are like the rivets that hold "spaceship earth" together, destroying them might also jeopardize the natural systems they secure. Mangroves cut for firewood cannot protect coastlines from erosion, and earthworms killed by pesticides cannot aerate soils. Likewise, willows bulldozed by developers cannot provide an organic molecule for aspirin, and sea squirts destroyed by chemical runoff cannot provide antiviral medicines. The irreversible loss of biodiversity has a serious impact on the ability of remaining species, including humans, to survive. Humans depend on species diversity and healthy ecosystems to provide food, clean air and water, and fertile soil for agriculture. In addition, we benefit greatly from the many medicines and other products that biodiversity provides.

【世界十大濒临灭绝物种】Top ten endangered species in the world[27]

【黑犀牛】The Black Rhino

The Black Rhino can only be found in remote areas of south-eastern Africa. During the last century, the Black Rhino has suffered the most drastic decline in total numbers of all rhino species. Between 1970 and 1992, the population of this species decreased 96%. In 1970, it was estimated that there were approximately 65,000 Black Rhinos in Africa, but by 1992～1993, there were only 2,300 surviving in the wild. However, since 1996, the intense anti-poaching efforts have had encouraging results. Numbers have been recovering and are now back up to about 3,610 and still increasing. Nevertheless, the poaching threat remains great and there is no cause for complacency.

【欧洲鳇】The Beluga Sturgeon

These ancient living fish fossils are mostly found in the Caspian Sea, and said to live to be 100 years old. Valued throughout the world by connoisseurs for their superior quality caviar, poaching is out of control due to excessive demand and high prices paid for the Sturgeons' "pearllike" caviar.

【大熊猫】The Giant Panda

Within a few years, Giant Pandas could be facing extinction. Living in Asian forests, they eat mostly bamboo. At present, fewer than 1,000 remain in their native habitat of China. Endangerment is due in part to their shy nature and unwillingness to mate and mainly because of poaching and habitat destruction.

【白毛莨】The Goldenseal

The perennial Goldenseal herb is favored by naturopaths for its ability to heal numerous ailments from haemorrhoids[28] to allergies. Home in the hardwood forests of North America, the demand for this cure-all perennial herb has recently leaped more than 30%, which is the main cause for the endangerment.

【孟加拉虎】The Bengal Tiger

They are native to tropical zones in Southeast Asia and temperate regions like the Russian Far East, and strictly carnivorous. Less than 6,000 tigers remain in the wild. The most urgent threat to the species is poaching for body parts and bones used in traditional Asian medicines.

【绿颊鹦鹉】The Green Cheeked Parrot

Native to Mexico, this colorful parrot species, with the ability to mimic the human voice, has been significantly reduced in numbers due to a huge demand for these lovely pet birds, especially from the United States. Even after prohibiting the sale of these green-cheeked birds, droves of the species are still being illegally traded across the Mexico/US border. The other two main causes of its endangerment are careless captive handling and habitat destruction.

【大鳄龟】The Alligator Snapping Turtle

Prized by turtle trappers and dealers for its rare meat, Alligator Snapping Turtles, the largest freshwater turtles from North America, are quickly being depleted due to increased shipments to many international world markets including Asia. They eat almost anything and can live up to 70 years according to records.

【大叶桃花心木】The Bigleaf Mahogany

Demand for the red colored wood goes unabated because of worldwide consumer demand for quality mahogany hardwood furniture. Although mahogany trees are widely distributed in tropical forests from Mexico to the Amazon Basin, the species grows naturally only as individual trees rather than in groups of large forest stands. Wholesale stripping of Amazon forests has resulted in perhaps 70% of the world's supply being depleted. Obviously, the more giant trees that are cut down, the more energy is wasted and the more oxygen is being used up. These are some

serious reasons why logging is such a huge concern.

【灰鲭鲨】The Mako Shark

The Mako Shark is highly sought for its tender meat, and especially in Asian markets, for their shark fins which have even greater value for medical purposes. Some of them are merely stripped of their prized fins by the international fishing fleets and then are thrown back into the depths, left to die. Fins are now among the world's most expensive fisheries products. Values vary according to color, size, and thickness of fins. Like most other shark species, Mako Sharks are particularly susceptible to over-fishing. Because they have long life cycles, the species are fished twice as fast as they are able to reproduce. Mako Sharks mature in seven to twelve years and only then reproduce small litters of baby sharks in their lifetime.

【玳瑁】The Hawksbill Turtle

Found mainly around tropical reefs between the US and the Caribbean, the three foot length Hawksbill Turtle species, named for its distinctive snout and eating mostly sponge for food, is becoming extremely vulnerable due to its slow reproduction rate and high volume of illegal trade for the prized jewel-like "tortoiseshell".

Quotations on Nature

Adopt the pace of nature: her secret is patience.
Ralph Waldo Emerson (1803-1882, an American lecturer, philosopher, essayist, and poet)

How cunningly nature hides every wrinkle of her inconceivable antiquity under roses and violets and morning dew!
Ralph Waldo Emerson

I believe that there is a subtle magnetism in Nature, which, if we unconsciously yield to it, will direct us aright.
Henry David Thoreau (1817-1862, an American author, poet, and best known for his book *Walden*, a reflection upon simple living in natural surroundings, and his essay, *Civil Disobedience*, an argument for individual resistance to civil government in moral opposition to an unjust state)

The poetry of the earth is never dead.
John Keats (1795-1821, a British poet and considered among the greatest in English)

Nature does not hurry, yet everything is accomplished.
Lao Tzu (legendary founder of Daoism)

One touch of nature makes the whole world kin.
William Shakespeare (1564-1616 widely regarded as the greatest writer in the English language and the world's pre-eminent dramatist)

Look deep into nature, and then you will understand everything better.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

Nature will not be admired by proxy.
Winston Churchill (1874-1965, a British politician and statesman known for his leadership of the United Kingdom during the Second World War II)

Reference
092

能源安全
Energy Security

Relevant GRE Issue
相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also 【Ref-072 科技双刃剑】【Ref-069 科学与社会】【Ref-090 石油危机】

【什么是能源安全】Energy Security could be defined as the provision of reasonably priced, reliable and environmentally friendly energy. Securing national energy supply has become the tough realpolitik for every country.

【全球能源格局】Today's game is not only about wrestling for political and economic influence zones; it is also about defining the rules of the game for the energy markets. Russia plays a key role in the future of energy supply for Europe and Asia. The development in Russia's domestic policy also influences its conduct towards its neighbors and the rest of the world. The remaining oil and gas reserves are concentrated in the Persian Gulf, in central Asia and Russia. Europe therefore faces the risk of becoming dependent on the new great energy powers in the future. Violence and instability in much of the Middle East has created a situation where oil production is extremely unpredictable.

The petroleum extracted from oil sands consume large quantities of water heated by natural gas combustion. The environmental impact of large-scale exploitation of oil sand can only be estimated. Energy and foreign politics are also closely linked for China and India, the two upcoming powers of the new century. The economic growth is highly dependent on energy imports from the Middle East, Russia and Central Asia. Reserves of oil and gas are diminishing while demand is increasing. Only coal reserves still appear to be sufficient for a while. However, the combustion of coal reserves would place an enormous burden on the environment, as world wide emissions of the greenhouse gas – carbon dioxide would increase even further.

【能源开采与环境破坏】Exploitation of natural resources is threatening the once pristine environment in the Arctic, in the oceans, and in tropical rain forests and Nordic forests. Poisonous wastes threaten the indigenous fauna and flora.

【代用燃料】The recent soaring of oil prices caused by the ever-decreasing fossil fuel reserves pushes us to speed up solutions to alternative fuel vehicles. Environmental protection is a major consideration. In China, emissions from cars, buses, and trucks are major contributions to air pollution in cities. The increase in the number of motor vehicles in recent years has greatly exacerbated the air pollution problems in the densely populated large cities.

【压缩天然气】CNG (Compressed Natural Gas), which is mainly methane, is potentially a low cost, low emission fuel, and is already in use in commercial vehicles. CNG used in place of existing fuels would produce a significant improvement in urban air quality. However, the effect on global warming could be offset by the corresponding increase in methane emissions, which have a much higher greenhouse effect than .

【液化石油气】LPG (Liquefied Petroleum Gas), which is mainly propane is becoming more widely available to private car users.

【乙醇】Ethanol 85 is a blend of regular unleaded petrol with between 70% and 83% ethanol depending on the geographic location and time of year. Corn-based ethanol is widely used in America, and sugar-based ethanol, is used in Brazil.

【氢气与燃料电池】Hydrogen represents almost the ideal fuel, since it's primary emission product is water vapor. Fuel cells combine hydrogen with atmosphere oxygen to produce water and electricity. The conversion process is highly efficient at up to 70%, which compares favorably with the overall efficiency of petrol and diesel engines that is in the range of 30% to 40% maximum.

Reference

093 克隆

Clone

Relevant GRE Issue 相关题库题目：【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also 相关写作参考：【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】【Ref-094 干细胞研究】【Ref-080 科学研究与伦理】【Ref-086 科学宣言】

【孟德尔奠定遗传学基础】Genetics has come a long way since the Gregor Mendel's experiments with peas (Gregor Mendel (1822-1884), Austrian monk, whose experimental work became the basis of modern hereditary theory) in the 1860s demonstrated that certain "hereditary factors" underlay the transmission of traits.

【发现 DNA 结构】Progress has accelerated since 1953, when biologists James Watson (1928-) and Francis Crick (1916-2004) determined the molecular structure of DNA, the basis of genetic information.

【人类基因组计划】The Human Genome Project, the map of the entire human genome, completed in 2000, promises even more wondrous things to come. However, these scientific advances and their possibilities for human use have also been accompanied by serious ethical questions.

【克隆技术】Human cloning, if it becomes a reality, will be only one of several reproductive technologies that have been developed in recent decades. Among these are artificial insemination, in-vitro fertilization and the resultant "test-tube babies," surrogate mothers, and the injection of sperm directly into egg. Clones are common in nature—a bacterium clones itself by splitting in two, producing two identical bacteria. Now scientists have developed artificial cloning techniques that work with mammals. One possibility envisioned would be to use cloning techniques to treat diseases like diabetes, Parkinson's disease, or perhaps certain cancers of the blood.

【克隆羊多利】The first clone made with DNA from an adult animal was Dolly the sheep in 1997. DNA was taken from an adult sheep (Dolly's biological mother) and inserted into an egg cell (with its own DNA removed) from another sheep. The cell started to divide, and the embryo was taken and put into the womb of a third sheep—Dolly's birth mother. Animal clones could be used for medical research. Sheep can live for 11 to 12 years, but Dolly died when she was six. In some studies, cloned animals seemed to grow old faster and die younger than normal members of the species.

In just the passed decades, many higher mammals have been produced through cloning, including cows, sheep, goats, mice, pigs, and rabbits, etc. In principle, humans could be cloned in the same way as Dolly, perhaps to help a person unable to have a child in any other way.

【造血干细胞研究】Stem cell research is investigating the use of stem cells to repair damaged or diseased tissue. For example, the body cannot repair or replace nerve cells damaged by disease or injury. Transplanted stem cells could be grown to develop into new nerve cells to treat Parkinson's disease. But as with other aspects of genetic engineering, human cloning is controversial, and has already been banned in many countries. Most of the concerns center on efforts to create clones of human beings.

【反对克隆人的声音】People are repelled by many aspects of human cloning. They recoil from the prospect of mass production of human beings, with large clones of look-alikes, compromised in their individuality; the idea of father-son or mother-daughter twins; the bizarre prospect of a woman's giving birth to and rearing a genetic copy of herself, her spouse, or even her deceased father or mother; the utilitarian duplicates of oneself, to be frozen away or created when necessary, in case of need for tissues or organs for transplantation, etc.

One objection to the very idea of cloning a human being is that the person cloned would not be a unique individual. He or she would be the genetic copy of the person from whom the somatic cell was transferred. He or she would be the

equivalent of an identical twin of this person, though years younger.

Critics of this argument may admit that there might be some inclination to have certain expectations for the clone. We might make clones that could be used for doing menial work or fighting wars. We might want to clone certain valued individuals, stars of the screen or athletic arena. In all of these cases, the clone would neither be valued for his or her own self nor respected as a unique person.

Reference
094

干细胞研究
Stem Cell Research

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考

【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】【Ref-085 科学研究与不确定性】

【什么是干细胞】Stem cells are cells that are able to differentiate into specialized cell types but also retain the ability to renew themselves through cell division. They were first identified in embryos. Stem cells of the inner cell mass proceed to develop into all of the tissues and organs of the body.

【干细胞研究的医学价值】Since stem cells have the potential to be differentiated into basically any type of cell, they offer promise in the development of medical treatments for a wide range of conditions. These include damage to the brain, spinal cord, skeletal muscles, and the heart. Treatments that have been proposed follow either physical trauma (e.g. spinal cord injuries), degenerative conditions (e.g. Parkinson's disease), or even genetic diseases (in combination with gene therapy). It is hopeful that stem cells could also repair extensive tissue damage.

【胚胎干细胞研究的争议】There exists a widespread controversy over human embryonic stem cell research that emanates from the techniques used in the creation and usage of stem cells. Human embryonic stem cell research is controversial because, with the present state of technology, starting a stem cell line requires the destruction of a human embryo and/or therapeutic cloning. Some opponents of the research argue that this practice is a slippery slope to reproductive cloning and fundamentally devalues the worth of a human being.

Contrarily, medical researchers in the field argue that it is necessary to pursue embryonic stem cell research because the resultant technologies could have significant medical potential. This in turn, conflicts with opponents in the pro-life movement, who advocate for the protection of human embryos. The ensuing debate has prompted authorities around the world to seek regulatory frameworks and highlighted the fact that embryonic stem cell research represents a social and ethical challenge

Embryonic stem cells have the capacity to grow indefinitely in a laboratory environment and can differentiate into almost all types of bodily tissue. This makes embryonic stem cells an attractive prospect for cellular therapies to treat a wide range of diseases. The social, economic and personal costs of the diseases that embryonic stem cells have the potential to treat are far greater than the costs associated with the destruction of embryos.

【支持：胚胎不代表生命】Embryos, while of value, are not equivalent to human life while they are still incapable of

existing outside the womb (i.e. they only have the potential for life). Approximately 18% of zygotes do not implant after conception. Thus far more embryos are lost due to chance than are proposed to be used for embryonic stem cell research or treatments.

【支持：提高利用率】In vitro fertilization (IVF) generates large numbers of unused embryos. Many of these thousands of IVF embryos are slated for destruction. Using them for scientific research utilizes a resource that would otherwise be wasted. While the destruction of human embryos is required to establish a stem cell line, no new embryos have to be destroyed to work with existing stem cell lines. It would be wasteful not to continue to make use of these cell lines as a resource.

【支持：胚胎干细胞优于骨髓干细胞】Embryonic stem cells make up a significant proportion of a developing embryo, while adult stem cells exist as minor populations within a mature individual (e.g. in every 10,000 cells of the bone marrow, only 10 will be usable stem cells). Embryonic stem cells divide more rapidly than adult stem cells, potentially making it easier to generate large numbers of cells for therapeutic means. In contrast, adult stem cell might not divide fast enough to offer immediate treatment.

【反对：胚胎代表生命】An embryo is actually a human; it should be valued as highly as a human life. The reasoning can be summed up by the fact that, once an egg is fertilized, unless inhibited, it will develop into a fully-developed adult. This opinion is often related to religious doctrines which assert that conception marks the beginning of human life or the presence of a soul. Based upon this reasoning, the subsequent argument against embryonic stem cell research is that human life is inherently valuable and should not be voluntarily destroyed.

【反对：有很多其他选择】Embryonic stem cells should be abandoned in favor of alternatives, such as those involving adult stem cells. It is often claimed by pro-life supporters that the use of adult stem cells from sources such as umbilical cord blood has consistently produced more promising results than the use of embryonic stem cells. Furthermore, adult stem cell research may be able to make greater advances if less money and resources were channeled into embryonic stem cell research.

【反对：干细胞研究是由缺陷的】The use of embryonic stem cell in therapies may be fundamentally flawed. For instance, one study suggests that autologous embryonic stem cells generated for therapeutic cloning may still suffer from immune rejection. Another concern with embryonic stem cell treatments is a tendency of stem cells from embryos to create tumors.

【反对：夸大研究成果】Scientists have long promised spectacular results from embryonic stem cell research, and this has not yet occurred. Conspicuously, such criticism has even come from researchers themselves. For example, in November 2004, Princeton University president and geneticist Shirley Tilghman said, "Some of the public pronouncements in the field of stem-cell research come close to overpromising at best and delusional fantasizing at worst."

Reference
095

转基因食品

Genetically Modified Food

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考

【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】【Ref-093 克隆】【Ref-094 干细胞研究】

【生活中的转基因食品】Genetic engineering is the manipulation of genes of living things. Scientists can now insert gene segments from one organism into another. Whether genetically modified foods are beneficial or harmful is still controversial. Most foods we eat may contain ingredients derived from genetically modified organisms - everything from baby formula milk powder to meat.

【转基因食品的益处】It has been reported that Genetically Modified (GM) food has merit. It can thrive in inhospitable conditions and has tremendous consumer appeal. It seems to resist anything that might kill it. Genetics will bring the capability of speeding and redirecting evolution along paths of our choice. Eliminating genetic diseases, for instance, might take centuries through natural selection but could be accomplished in decades through genetic manipulation.

Future farmers may have near total control over plant genetics. Plants will give higher yields, have longer shelf life, be more resistant to disease, frost, and drought. Livestock will be customized to increase growth, shorten gestation, and enhance nutritional value. hey will have higher protein, lower oil, and more efficient photosynthesis rates than ever before. The first genetically modified (GM) food went on sale in 1994. The gene that makes the tomato soften had been changed to make it ripen more slowly. Genetics will play a central role in pest management. The arms race between insects and pesticides has been marked by humans winning battles, but insects winning the war. Genetics will turn the tide.

【转基因食品的隐忧】While others argue that genetic manipulation is against nature. Its cultivation may lead to unforeseen problems for the environment. It may also devastate biodiversity. One issue voiced by opponents concerned the possible human health risks of genetically modified food. Some farmers are not eager to grow GM crops. One worry is that genes of pesticide-resistant crops introduced into the crop will transfer to other species.

Another concern is that was that crops engineered for herbicide resistance might create “super weeds” by cross-pollinating with wild, weedy relatives growing nearby. Crop antibiotic resistance may transfer to humans. Genetically engineered fish raise problems if they interbreed with other fish that have not been genetically altered. Some experts fear that this process may change the characteristics of wild fish in unpredictable and possibly undesirable ways. An ethical issue that concerns some people is the whole idea of interfering with nature. Are there not natural species of plants as well as animals that we should respect and not manipulate?

Reference
096

低碳生活
Low Carbon

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考

【Ref-100 可持续发展】【Ref-089 全球变暖】【Ref-069 科学与社会】【Ref-117 绿色政治哲学】

【低碳经济】A Low Carbon Economy (LCE) is an economy which has a minimal output of greenhouse gas emissions into the biosphere.

【低碳食品】A low carbon diet minimizes the greenhouse gas emissions released from the production, packaging, processing, transport, preparation and waste of food. Certain foods require more fossil fuel inputs than others, making it possible to go on a low carbon diet and reduce one's carbon footprint by choosing foods that need less fossil fuel and therefore emit less carbon dioxide and other greenhouse gases. Major tenets of a low carbon diet include eating less industrial meat and dairy, eating less industrially produced food in general, eating food grown locally and seasonally, eating less processed and packaged foods and reducing waste from food. Vegans contend that the best choice for reducing individual greenhouse gas emissions is an organic vegan diet. Highly processed foods come in individual packaging, demanding high energy inputs and resulting in packaging waste. Bottled water is one example of a highly packaged, wasteful food product.

【低碳能源】Low-carbon power comes from sources that produce fewer greenhouse gases than traditional means of power generation do. It includes zero carbon power generation sources, such as wind power, solar power, geothermal power and nuclear power, as well as sources with lower-level emissions such as natural gas and also technologies that prevent carbon dioxide from being emitted into the atmosphere.

【低碳建筑】Low-carbon buildings are buildings designed and constructed to release very little or no carbon at all during their lifetime (construction, operation, renovation, and deconstruction).

Reference
097

核武器

Nuclear Weapon

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考

【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】【Ref-086 科学宣言】【Ref-080 科学研究与伦理】

【核武器重创广岛、长崎】It is impossible to imagine a more dramatic and horrifying combination of scientific triumph with political and moral failure than has been shown to the world in the destruction of Hiroshima. From the scientific point of view, the atomic bomb embodies the results of a combination of genius and patience as remarkable as any in the history of mankind. The development of atomic and hydrogen bombs has had so great an impact on the world that historians draw a sharp distinction between the atomic age, or nuclear age, and all previous periods. The aftermath of Hiroshima and Nagasaki quickly made it apparent that humans had succeeded in harnessing enough energy from nature itself to destroy the planet and all its inhabitants.

【美苏冷战】During the Cold War, international attention focused primarily on nuclear weapons, which the United States and the former Union of Soviet Socialist Republics (USSR) produced and deployed in numbers sufficient to destroy the world many times over.

【《不扩散核武器条约》】Beginning in the early 1960s, several nations negotiated limitations on testing, producing, distributing, and deploying nuclear weapons. In addition, over 180 nations have signed the Nuclear Nonproliferation Treaty[29] of 1968, pledging not to acquire nuclear weapons or distribute nuclear weapons technology.

【美国内华达核武器试验】In May 1953, the U.S. government conducted two atomic bomb tests in Nevada.

Fallout rained on ten herds of sheep grazing nearby. Although 4,500 sheep died, and many ranchers went out of business, researchers employed by the U.S. Atomic Energy Commission (AEC) argued that the two weapons tests had not caused the livestock deaths. As a result, federal courts dismissed ranchers' claims for compensation.

Years later, both the scientists and the AEC were implicated for perpetrating a fraud upon the court. Their deception came to light in 1980 after the governor of Utah obtained the release of previously classified federal documents concerning the sheep deaths. The documents showed that the AEC researchers and officials had induced the original scientists to deny their conclusions that radiation had indeed caused the fallout deaths. Researchers' fraud in the weapons testing case, however, has harmed more than sheep.

Between 1951 and 1963, the United States conducted more than one hundred above-ground tests of atomic bombs in Nevada. Despite the tests' scientific, military, and national-security benefits, a 1991 study by physicians concluded that an additional 2.4 million cancer deaths, worldwide, will have been caused by these twelve years of U.S. weapons testing. In 1990 the U.S. Congress decided to compensate many of the citizens who could prove that they or their family members were harmed by fallout.

Quotations on Nuclear Weapon

The genius of Einstein leads to Hiroshima.
Pablo Picasso (1881-1973, a Spanish painter, draughtsman, and sculptor and best known for co-founding the Cubist movement)

The atom bomb is a paper tiger which the United States reactionaries use to scare people.
Mao Zedong (1893-1976, foremost Chinese Communist leader of the 20th century and the principal founder of the People's Republic of China)

The atomic threat...must...have brought us to the brink of silence...to the brink of endurance, to the brink of reserve about our fear and anxiety, and our true opinions.
Christa Wolf (1929-, German writer)

If I had known that the Germans would not succeed in constructing the atom bomb, I would never have lifted a finger.
Albert Einstein (1879-1955, a German-born theoretical physicist who discovered the theory of general relativity)

Man has wrested from nature the power to make the world a desert or to make the deserts bloom. There is no evil in the atom, only in men's souls.
Adlai Stevenson (1900-1965, U.S. statesman)

The Bomb brought peace but man alone can keep that peace.
Winston Churchill (1874-1965, a British politician and statesman known for his leadership of the United Kingdom during the Second World War II)

Science has nothing to be ashamed of, even in the ruins of Nagasaki.
Jacob Bronowski (1908-1974, Polish-born British mathematician, poet, and humanist)

Reference
098

食品安全
Food Security

Relevant GRE Issue 相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also 【Ref-069 科学与社会】【Ref-095 转基因食品】

相关写作参考

【食品：安全？危险？】Our consumption of food has never been such a hazardous activity as it is today, while others insist that thanks to scientific innovations, it has never been safer. Industrialized farming methods produce cheap meat product: beef, pork and chicken. The use of pesticides and fertilizers produces cheap grain and vegetables. The price we pay for cheap food may be already too high: mad cow disease in cattle, salmonella in chicken and eggs, and listeria in dairy products. Intensive farming practices mean that many animals continue to be raised and slaughtered under conditions that invite bacterial defilement. If you think you will abandon meat and become a vegetarian, you have the choice of very expensive organically-grown vegetables or a steady diet of pesticides every time you think you are eating fresh salads and vegetables, or just have an innocent glass of water.

【现代食品安全困惑】Changes in shopping habits, like fewer trips to the shops, mean food is stored for longer periods and increase the chance of infection via bacteria or viruses. So-called 'convenience' foods, despite their names, often require more careful preparation. The range of foods available today is nearly outstripping governmental efforts to inspect them. The global transport of foods, coupled with the need to extend their shelf-life, means the use of chemical treatments. Genetic engineering also may be giving rise to further hazards.

【三聚氰胺事件】More and more food poisoning cases are reported each year. In 2008, China's largest provider of milk powder recalled 700 tons of baby formula milk powder after some children developed kidney problems. The milk powder was contaminated with melamine, a chemical used in making plastics. Melamine is a colorless compound, used in making synthetic resins and for tanning leather. Ingestion for a long period may lead to reproductive damage, bladder or kidney stones, which can lead to bladder cancer. It later emerged that unscrupulous manufacturers had illegally added melamine to food products in China to boost their apparent protein content. Two men were eventually sentenced to death.

Reference
099

水污染
Water Pollution

Relevant GRE Issue
相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考 【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】

More than 97 percent of Earth's water is salt water that is found in the oceans. Only 3 percent is fresh water. Water is essential for living things to grow, reproduce, and carry out other important processes.

【什么是水污染】Water pollution is the contamination of water bodies such as lakes, rivers, oceans, and groundwater caused by human activities, which can be harmful to organisms and plants which live in these water bodies.

【水污染的源头】The major sources of water pollution are human wastes, industrial wastes, agricultural chemicals, and runoff from roads. Some types of pollutants can build up in the bodies of living things. Burying household waste without taking any particular precautionary measures leads to contamination of the water table. Radioactive waste stays poisonous for thousands of years. Plastics and other domestic garbage that are buried underground in landfill sites may take many years to rot away completely. Batteries leak out dangerous chemicals that can pollute soil and water.

【污染物质】Contaminants may include organic and inorganic substances.

【有机污染物种类】Some organic water pollutants are:

- Insecticides, herbicides, and other chemicals;
- Bacteria, often is from sewage or livestock operations;
- Food processing waste, including pathogens;
- Tree and brush debris from logging operations;
- Industrial solvents, from improper storage;
- Petroleum hydrocarbons including fuels (gasoline, diesel, jet fuels, and fuel oils) and lubricants (motor oil) from oil field operations, refineries, pipelines, retail service station's underground storage tanks, and transfer operations.
- Various chemical compounds found in personal hygiene and cosmetic products.

【无机污染物种类】Some inorganic water pollutants include:

- Heavy metals including acid mine drainage;
- Acidity caused by industrial discharges (especially sulfur dioxide from power plants);
- Pre-production industrial raw resin pellets, an industrial pollutant;
- Chemical waste as industrial by products;
- Fertilizers, in runoff from agriculture including nitrates and phosphates;
- Silt in surface runoff from construction sites, logging, slash and burn practices or land clearing sites.

【海洋污染】Accidental oil spills from tankers can kill thousands of seabirds, fish, and other marine life. The world's oceans are also polluted by industrial waste and sewage dumped at sea. Overfishing is the removal of so many fish from the oceans that there are not enough fish left to breed. Many overfished species, such as cod, may eventually die out. There is incredible biodiversity under the ocean. Increase in population, expansion in industries and rising consumption have threatened and, in some cases destroyed some species of marine life and their habitats.

【水污染带来的危害】If severe, water pollution can kill large numbers of fish, birds, and other animals, in some cases killing all members of a species in an affected area. Pollution makes streams, lakes, and coastal waters unpleasant to look at, to smell, and to swim in. Fish and shellfish harvested from polluted waters may be unsafe to eat. People who ingest polluted water can become ill, and, with prolonged exposure, may develop cancers or bear children with birth defects. Wetlands provide habitats for many living things, because of their sheltered waters and rich supply of nutrients.

【湿地破坏】Wetlands provide natural water filtration. As water moves slowly through a wetland, waste materials settle out. Wetlands also help control floods by absorbing extra runoff from heavy rains. Thousands of square kilometers of wetlands were developed for farmland or for building. In order to develop cities, wetlands have been drained for land reclamation. The industrial waste has been poured into the sea. People have dumped so much in the way of pollutants and toxins into the ocean that we have damaged the marine habitats.

【水资源争夺】Over the next half century, it is predicted that water, our most vital natural resource, will replace oil as the prime trigger for international conflicts. Some Middle Eastern countries as well as parts of Asia and Africa are already experiencing water shortages and threats of water wars.

Quotations on Pollution

Pollution is nothing but the resources we are not harvesting. We allow them to disperse because we've been ignorant of their value.

Richard Buckminster Fuller (1895-1983, US engineer and architect)

I am glad to have known our countryside before its roads were too dangerous to walk on...before its butterflies and wild flowers were decimated by arsenical spray, before Shakespeare's Avon frothed with detergents and the fish floated belly-up in the Cam.
E. M. Forster (1879-1970, British novelist)

Mining is like a search-and-destroy mission.
Stewart L. Udall (1920-, U.S. politician and conservationist)

They had escaped pollution on earth, only to discover that they had carried with them another pollution, a pollution that they could not escape. The pollution in their own souls.
Ben Elton (1959-, British comedian and writer)

Reference
100

可持续发展
Sustainable Development

Relevant GRE Issue
相关题库题目 【新 31 题】【新 63 题】【新 67 题】

See Also
相关写作参考 【Ref-072 科技双刃剑】【Ref-069 科学与社会】【Ref-117 绿色政治哲学】【Ref-099 水污染】

【什么是可持续发展】Sustainable development refers to a process of societal advance embodying a more equitable and environmentally aware pattern of development that requires a careful integration of economic, social, and environmental objectives.

【发展的代价】Within industrially advanced countries, reconciling continued economic and social improvement with a radically reduced environmental burden stands at the crux of sustainable development. Although developed states have proven relatively successful in promoting economic growth and social welfare, much of the progress over the past half-century has been purchased at the expense of the global environment. Moreover, evidence suggests that the extension of prevailing patterns of "Northern" consumption across the globe would result in catastrophic damage to the biosphere. Yet there can be no ethical justification for denying people of developing countries access to living standards currently enjoyed in affluent states.

【发展中国家的困惑】Developing countries face a somewhat different set of circumstances, and in this context sustainable development emphasizes the importance of meeting the basic needs of the population—including requirements for clean water, food, housing, fuel supplies, employment, health care, and education. There is a clear recognition that less-affluent countries will necessarily place greater relative weight on achieving economic growth and meeting social priorities. But environmental considerations are not to be neglected. Public health, local livelihoods, and economic prospects can be damaged by environmentally unsustainable practices (for example, uncontrolled deforestation). And developing countries also have responsibilities for protecting the global environmental commons. Sustainable development implies that developing countries should ultimately seek a path of economic advance that avoids many of the destructive practices that were historically employed by today's affluent states.

【威胁的领域】Threats to long-term ecological integrity are

manifest in many other areas, including water use, the management of forests and fisheries, patterns of land utilization, soil degradation, biodiversity loss, chemical releases, and the disposal of wastes.

【可持续发展长期工作】In the longer term, it is clear that more consistent efforts by national governments to confront the challenge of sustainable development will involve a series of tasks including the following:

- Encouraging scientific and technological innovation directed to reducing environmental loadings in the major spheres of production and consumption (energy, transportation, construction, manufacturing, agriculture, and so on);
- Improving the integration of different kinds of knowledge in decision making, including knowledge from the natural and social sciences, lay and traditional knowledge, and knowledge representing different societal vantage points;
- Developing multi-nodal patterns of governance with expansive stakeholder involvement, which will include not just multilevel governance (local, regional, national, international) but also governance nodes organized on functional lines defined by themes, ecosystems, and environmental problems;
- Ensuring continued public discussion and social reflection about existing practices, desired goals, and alternative futures;
- Developing improved systems of measurement and monitoring to track changes in environmental state and the health and environmental impacts of societal activities;
- Deepening the understanding of ecological and social systems, of the reach and limits of current knowledge, and of the potential (but also the limits) of attempts to consciously adjust social and ecological processes;
- Perfecting a more elaborate array of policy instruments, including performance agreements, co-management regimes, ecological fiscal reform, and changes to liability regimes to encourage actors to internalize environmental values;
- Encouraging a public ethic of concern for the environment and the integration of sustainable development issues into the educational and cultural spheres.

Reference 101

原生态区域保护

Wilderness Areas Protection

Relevant GRE Issue 相关题库题目

【新 10 题】【新 31 题】【新 63 题】【新 67 题】【新 125 题】【新 148 题】

See Also 相关写作参考

【Ref-091 物种灭绝】【Ref-100 可持续发展】【Ref-117 绿色政治哲学】【Ref-072 科技双刃剑】【Ref-109 消费】

【原生态区域定义】Wilderness (or wildland) is a natural environment on Earth that has not been significantly modified by human activity. It may also be defined as: "The most intact, undisturbed wild natural areas left on our planet—those last truly wild places that humans do not control and have not developed with roads, pipelines or other industrial infrastructure." Wilderness areas can be found in preserves, estates, farms, conservation preserves,

ranches, National Forests, National Parks and even in urban areas along rivers, gulches or otherwise undeveloped areas.

【原生态区域保护历史渊源】The idea of wilderness has a long history in Western culture, in contrast with cultures that retain aboriginal ways. As farming and herding supplanted hunting and gathering during the Neolithic, an inchoate awareness of distinctions between the artifice of human society and the natural community of life appeared. William Wordsworth's[30] poetry described the wonder of the natural world, which had formerly been viewed as a threatening place. Increasingly the valuing of nature became an aspect of Western culture.

【原生态区域保护的重要性】As the humanization of the planet continues, driven by population growth and economic development, the wilderness idea paradoxically assumes new importance. These areas are considered important for the survival of certain species, biodiversity, ecological studies, conservation, solitude, and recreation. Wilderness is deeply valued for cultural, spiritual, moral, and aesthetic reasons. Some nature writers believe wilderness areas are vital for the human spirit and creativity. They may also preserve historic genetic traits and that they provide habitat for wild flora and fauna that may be difficult to recreate in zoos, arboretums or laboratories.

【科学研究价值】An important objective of wilderness areas reserves is to provide opportunities for scientific research. Wilderness areas are important benchmark ecosystems relatively undisturbed by humans. They are established, in part, to represent the diversity of landscapes and ecosystems. Wilderness areas allow for conducting scientific research, including specimen collection, animal capture for banding or radio collaring, vegetation sampling, digging, habitat manipulation, and vehicle use.

【沟通人与自然】Some human ecologists, psychologists, and others believe that isolation from wild nature jeopardizes essential processes of cognitive and psychological development, arguing that dynamic interactions with animals, plants, and natural habitats shaped human intelligence, that the human species has been and remains embedded in the web of life, and that wilderness experience rekindles awareness of living connections between humans and their environments. Thus encounters with land forms and floral and faunal domains outside the bounds of the built environment are critical to the development and continuing nurture of humans. Critics argue that, in the context of urban, industrial society, wilderness experience is at best atavistic, and at worst an evasion of responsibilities of economically privileged individuals to deal with the problems of global change.

The term "wilderness" conjures up images of vast expanses of unspoiled wild land, devoid of human development and population, full of untapped potential. Wilderness has intrinsic value as a place with its natural characteristics intact, a place that offers restoration from the ills of urbanization. Wilderness also offers extrinsic worth in the form of natural resources — the raw materials that provide employment opportunities and make possible a comfortable lifestyle. From one point of view, having untouched wild land creates an ambience that enriches our lives and provides intangible qualities that we cannot find in material goods. From another point of view we rely on natural resources to provide for our material comforts. Wanting to preserve unspoiled, beautiful areas full of exploitable resources creates a problem of competing uses.

【原生态区域保护的益处】Wilderness areas contribute significantly to human's health and well-being. The major benefits these areas include:

- Water and Air. Wilderness areas are sources of clean water and air. While the benefits of wilderness transcend its boundaries, they are threatened by forces outside wilderness. Pollution decreases water and air quality that people, plants and animals rely on. Preserving wilderness preserves clean water and air.
- Wildlife. Wildlife is protected in wilderness, from grizzly bears to wildflowers. Wilderness protects natural processes, including natural disturbances like fire, which give rise to rich biodiversity. Wildlife is threatened by non-native species, pollutants, and the suppression of natural processes. Preserving wilderness preserves wildlife.
- Recreation. Wilderness was created for the use and enjoyment of human being. People visit wilderness to hike, ride horses, hunt, fish, ski, float, take pictures and stargaze, to name a few. Many people who visit wilderness are inspired and humbled by the feeling of being part of something larger than one's self. Wilderness is a haven for self-discovery and rejuvenation. Visitors must be aware that high use of

sensitive areas threatens the untrammeled quality of wilderness. Preserving the integrity of wilderness preserves its unique recreational value.

- Economics. Wilderness areas have a positive impact on local and regional economies. Counties with wilderness generally have higher income and employment growth rates. From sales to service, the economic benefits of wilderness influence every avenue of business that relies on this resource. Diminishing wilderness character threatens the far-reaching economic benefits of wilderness. Preserving wilderness helps to preserve a healthy economy.

【美国立法】In 1964, US Congress established the National Wilderness Preservation System under the Wilderness Act.[31] US leaders formally acknowledged the immediate and lasting benefits of wild places. That year, in a nearly-unanimous vote, Congress enacted landmark legislation that permanently protected some of the most natural and undisturbed places in America. The Wilderness Act established the National Wilderness Preservation System to "…secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

【国家间原生态保护争议】The first concerns disagreements between nations, especially between governments and environmental NGOs in the Northern Hemisphere and the governments of developing nations in the Southern Hemisphere. Northern Hemisphere conservation groups, for example, favor a preservationist stance on policies affecting tropical rainforests, such as Amazonia, which lies primarily within Brazil. Brazilian interests favor a development stance, arguing that it is unfair for developed nations, who have historically and continue presently to exploit their forests economically, to demand that they preserve theirs.

Developing nations also argue that the Northern Hemisphere fueled its own economic advance by exploiting the natural resources of developing countries, and that global capitalism continues to exert environmentally destructive pressures; thus, the Northern Hemisphere is ethically obligated to pay for the conservation of biodiversity and wildlands in the Southern Hemisphere. Another issue concerns land management: the Southern Hemisphere argues that indigenous people, including subsistence hunters and gatherers, and traditional agriculturists, are good stewards of natural habitats who should not be excluded from wildlands because of conservation agendas of the Northern Hemisphere.

【国内利益集团的争议】Disagreements also exist between interest groups within nations. Localists argue that urban interests in wilderness preservation reflect selfish desires for recreational playgrounds while denying the rights of people who have traditionally mined, logged, grazed, and ranched the land. Preservationists argue that the Wilderness Act allows mining and grazing for preexisting operations, that the amenity value of wilderness far exceeds traditional economic uses, and that the wise-use movement itself is a very small but highly visible group funded by corporate logging and mining interests.

Another issue arises over rights of access between owners of wild lands and groups of people who have traditionally hunted, fished, and gathered on them. Finally, controversies have arisen over the rights of private property holders to develop wild lands, since various agencies have acted to prevent development under the mandate of the Endangered Species Act.

【政策执行方面争议】Another debate involves the policies and procedures used by agencies for designating and managing wilderness. For example,

- Critics argue that wilderness areas are abundant in rock and ice, with scant biodiversity, leaving old-growth ecosystems rich in biodiversity vulnerable to logging;
- That the zoning of wilderness areas too often designates lands that are too small and too isolated to allow the continuation of evolutionary processes;
- That fire suppression is rooted in the failure to understand its role in natural ecosystems;
- That too many people visit wilderness areas, thereby destroying any possibility of wilderness experience;
- That the very notion of wilderness management is oxymoronic; and
- That ecosystem management is more a bureaucratic buzzword than a scientifically grounded procedure.

【影响地区经济发展】Natural resources, whether extracted from public or private lands, provide the raw materials that

help to fuel our national economy. Industries such as logging, mining, drilling, and grazing depend directly upon access to these resources. The material goods and technologies that contribute to our high standard of living rely on the raw materials provided by natural resources.

Some of the wilderness areas contain coal reserves or other natural resources. Mining in general has a very small impact on local economy. The mining industry has been a source of employment. Wilderness designation will destroy local economy development. “Shut down” the coal industry, damage the livelihoods of those living.

【发达国家保护本国资源，将环境问题转嫁发展中国家】Speaking from a Third World perspective, America’s ability to keep areas of wilderness available for aesthetic enjoyment is due to the fact that America’s world dominance gives them the ability to utilize global resources.

In the United States and other developed countries, the wilderness experience has become part of lifestyle. The American has an automobile-centered lifestyle. Americans will drive a thousand miles to visit a national park and enjoy the beauty of the wilderness areas. The United States, along with other industrialized countries, consumes a disproportionate share of the world’s natural resources at the expense of Third World countries.

In 1993, 25% of the world’s population consumed 75% of its energy and produced 80% of the greenhouse gas emissions. The major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries, which is a matter of grave concern, aggravating poverty and imbalances worldwide. This calls into question the ethics of developed nations’ lifestyle. How much longer can the world’s natural resources sustain the lifestyle enjoyed by industrialized nations?

【环境问题的症结：消费主义】Soil provides the foundation of support for plants and animals, up through the food chain. He describes the land as “a fountain of energy flowing through a circuit of soils, plants, and animals. Re-creating our current relationship with the land will necessitate changing the way we think and feel about it. If we continue to view wilderness as a commodity that provides both intrinsic and extrinsic benefits, then our current behavior of overuse and overconsumption will continue.

However, if people are reeducated to understand the environment as our support system then change can occur. Reeducation is possible in many ways — the most obvious is to introduce a curriculum into the formal education system. The biggest challenge will be to reeducate adults about the need to change lifestyle patterns.

Change is not easy even when it is worthwhile and necessary. Human impacts on wilderness areas will continue to degrade the environment unless people reshape their thinking about the land, reevaluate their relationship to it, and curb their appetite for consumption. In other words, humans need to view themselves as citizens of the environmental community rather than conquerors of it.

The human species is the only one capable of destroying or protecting the natural world. Hopefully, global efforts to promote environmental responsibility and develop sustainable living patterns will have a positive impact on localized wilderness debates. Bio-centric thinking will become stronger as more individuals begin to view humanity as part of the environment rather than a species separate from and superior to it.

【以自然为中心】Conservation is getting nowhere because it is incompatible with our Abrahamic concept of land. We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man, nor for us to reap from it the esthetic harvest it is capable, under science, of contributing to culture.

Humans need the land in order to survive. The anthropocentric (human centered) idea of dominion over the land reflects short-term thinking. Depleting natural resources has obvious negative consequences, but land preservation also presents a degree of short-sightedness.

Protecting islands of land as wilderness areas does not diminish the exploitation of natural resources on unprotected lands. At what point will survival depend on using these “islands” for their resources? A long-term approach to this issue involves a biocentric (environment centered) outlook. Viewing the land as the foundation for an interconnected support system that sustains human life gives wilderness a different meaning than when it is viewed as a commodity to support a lifestyle. Human is a member of the land community (that includes plants, animals, water,

and soil), rather than conqueror of it.

Quotations on Wilderness

In Wildness is the preservation of the World.
Henry David Thoreau (1817-1862, an American author, poet, and best known for his book *Walden*, a reflection upon simple living in natural surroundings, and his essay, *Civil Disobedience*, an argument for individual resistance to civil government in moral opposition to an unjust state)

A wilderness in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.
(Wilderness Act, 1964)

Reference
102

保护臭氧层

Ozone Layer Protection

Relevant GRE Issue
相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考 【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】

【臭氧与臭氧层】Ozone is a molecule that consists of three oxygen atoms. Reactions between oxygen and ultraviolet radiation from the sun create a layer of ozone throughout Earth's stratosphere. The ozone layer acts as a screen and absorbs most of the ultraviolet radiation from the sun, preventing harmful ultraviolet rays from reaching the Earth and protecting life on earth from this biologically damaging form of energy.

【紫外线的危害】If all the ultraviolet radiation given off by the Sun were allowed to reach the surface of Earth, most of the life on Earth's surface would probably be destroyed. Short wavelengths of ultraviolet radiation are damaging to the cell structure of living organisms. Ultraviolet radiation causes skin cancer and increases the risk of cataracts. It may also weaken the human body's disease-fighting immune system. On certain days, Australian school children have been advised to stay inside. Ultraviolet radiation threatens other forms of life as well. It may interfere with plant photosynthesis and reduce agricultural production.

【罪魁祸首：氟化物】In the 1970s scientists became concerned when they discovered that a group of widely use gases called chlorofluorocarbons (CFCs) posed a possible threat to the ozone layer. CFCs are commonly used as refrigerants. CFCs are used in fire extinguishers as well. Beginning in the early 1980s, research scientists began to detect a periodic loss of ozone in the atmosphere high above Antarctica, which is so-called ozone hole. Scientists hope that the ozone layer may repair itself by 2050. This will only happen if further damage is prevented.

Reference
103

艾滋病
AIDS

Relevant GRE Issue
相关题库题目
【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考
【Ref-072 科技双刃剑】【Ref-070 科技乌托邦】【Ref-069 科学与社会】

【什么是艾滋病】In the five years between 1981 and 1986, a new, fatal and apparently uncontrollable disease appeared: AIDS (Acquired Immure Deficiency Syndrome). AIDS is caused by the Human Immunodeficiency Virus (HIV), which attacks white blood cells, weakening the immune system. AIDS thus makes a person vulnerable to a wide range of diseases that eventually cause death.

【传播途径】HIV is transmitted from person to person through blood, unprotected sex, semen, or breast milk but not through casual contact such as shaking hands, hugging, sharing towels or dishes, or swimming together or even coughing and sneezing. The risk of transmitting the virus through saliva (as in kissing) is extremely low. The chance of transmitting HIV through sexual activity is greatly reduced by the use of condoms. However, abstinence or a relationship with an uninfected person is the only sure ways to avoid infection.

【历史溯源】First discovered among gay men in San Francisco, it spread geographically across the world and socially among other vulnerable groups, such as intravenous drug users, and finally into the population at large. People were awakened by possible contamination of the blood supply. At-risk groups were asked not to donate blood.

【个人挑战】A person diagnosed with HIV infection faces many challenges, including choosing the best course of treatment, paying for health care, and providing for the needs of the family while ill. The disease's prevalence among gay men or drug users causes many people to avoid telling families or friends about their illness. People with AIDS often feel incredibly lonely as they try to cope with a devastating illness on their own. Loneliness, anxiety, fear, anger, and other emotions often require as much attention as the medical illnesses common to HIV infection.

【国家挑战】For the struggling economies of some developing nations, AIDS has brought yet another burden: AIDS tends to kill young adults in the prime of their lives—the primary breadwinners in families. According to figures released by the United Nations in 1999, AIDS has shortened the life expectancy in some African nations by an average of seven years. In Africa, the disease has had a heavy impact on urban professionals—educated, skilled workers who play a critical role in the labor force of industries such as agriculture, education, transportation, and government. The decline in the skilled workforce has already damaged economic growth in Africa.

【人类挑战】AIDS is viewed as yet another in a series of emerging diseases that demonstrate how vulnerable humans are to newly encountered microbes. With population and land development increasing, humans have encroached farther into rain forests and other formerly wild areas, unleashing previously unknown disease agents. Meanwhile, global travel has become faster, more convenient, and more accessible to many people. Some scientists are worried by these trends, fearing the potential for an as-yet-unknown pathogen to arise and spread quickly and lethally around the globe. Despite the many grim facts of the AIDS epidemic, however, humanity is armed with proven, effective weapons against the disease: knowledge, education, prevention, and the ever-growing store of information about the virus's actions.

Reference
104

贫困
Global Poverty

Relevant GRE Issue
相关题库题目 【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考 【Ref-108 现代化与传统】【Ref-067 技术进步】

Extreme poverty, which threatens people's health or lives, is also known as absolute poverty. Ridding the developing countries of poverty is one of the world's greatest challenges.

【贫困地区的生活】People in poverty cannot get access to clean water, safe shelter, adequate nutrition, health care and education. They live in geographically isolated regions of the world. They farm tiny plots of land, which are too over worked to offer adequate yields to support their family. The lack of proper sanitation, inoculation and other disease prevention has meant that the whole generations of young people grow up too weak to farm successfully or to achieve significant economic progress. Some people believe that poverty results from a lack of adequate resources on a global level—resources such as land, food, and building materials. Others see poverty as an effect of the uneven distribution of resources around the world on an international or even regional scale. Overpopulation, the situation of having large numbers of people with too few resources and too little space, is closely associated with poverty.

【全球贫困的原因】The following facts explain the global poverty:

- Technology. Many people in low-income countries farm the land using human muscle or animal power. With limited energy sources, economic production is modest.
- Population growth. The poorest countries have the world's highest birth rates. An expanding population slows economic development.
- Cultural patterns. Poor societies are usually traditional. Holding on to long-established ways of life means resisting change – even changes that promise a richer material life.
- Social stratification. Low-income societies distribute their wealth very unequally.
- Gender inequality. Gender inequality in poor societies keeps women from holding jobs, which typically means they have many children.
- Global power relationships. Historically, wealth flowed from poor societies to rich nations through colonialism. The countries of Western Europe colonized much of Latin America beginning nearly 500 years ago. Such global exploitation allowed some nations to develop economically at the expense of other nations.

【技术进步让贫困国家更加落后】Modern communication technologies make possible global interactions on a scale never known before However, as the information age continues its amazing march forward; the poorest nations are being left behind. Some regions of the world are falling farther and farther behind as investors hesitate to fund communication infrastructure development because of political instability. Automation diminished the significance of manual labor. Genetic engineering decreases the importance of raw materials, such as hemp, and weakens nations that depend economically on them for export.

【国家间发展差距】In many developing countries, the problems of poverty are pervasive. In recent decades most of these countries have tried to develop their economies with industry and technology with varying levels of success. Some nations have become fairly wealthy, including Malaysia, Singapore, South Korea, and Thailand. Many developing countries, however, lack essential raw materials and the knowledge and skills gained through formal education and training. They also often lack the infrastructure provided by, for example, transportation systems and power generating facilities.

Reference
105

信息时代

Cyber Age

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】【新 132 题】

See Also
相关写作参考

【Ref-087 科技促进交流】【Ref-088 科技让人疏远】【Ref-019 教育与科技】

Today we are experiencing the confusion, chaos and complexity of transition and transformation, as we create the new economic, social, cultural, and political environments of the Cyber Age. In the new networked world we are now part of a network society, operate in an information economy, work in a cyber metropolis, live in a global village, and trade in a borderless world.

【一个新时代】We stand at the start of a new century and a new millennium. At the same time, we are leaving the Industrial Age and crossing the threshold of a new age in human history, the Cyber Age. In this age we will live and work in the very new dimension of cyberspace (the rapidly evolving, global, interactive, and multimedia information and communications network). In fact, many of us have already started to live and work in this new economic, social and political environment.

【信息时代的变革】We are going through a period of rapid and radical change, and a new economy is forming that bears little resemblance to that of the past. The change is so fast, broad and fundamental in nature that it can best be described as an economic metamorphosis. We are experiencing a total and, in historic terms, instantaneous change in the fundamental nature of our corporate and personal worlds. Globalization, deregulation, rationalization, privatization, global alliances and mega-mergers—these are just a few of the radical changes that are affecting all of our lives as we struggle to restructure and transform our lives and organizations in order to meet the new challenges of a new era.

【机遇与挑战并存】The change occurring around us is so rapid and radical that if we also do not change we will quickly fall behind and eventually perish. We, too, must transform if we are to be successful. In fact, it will be our strategies for change and the speed at which we implement them that will determine our future success. Such great change brings great challenges, but also new opportunities. If we choose to be the initiators of change, to be proactive creators and innovators, then we will thrive, prosper and grow in the twenty-first century.

【信息时代与创新】The future will not be an extension of the past, and it is not likely that we can use yesterday's strategies to solve today's problems and expect to be in business tomorrow. If we choose to change by following others, however, we will be forever scrambling to catch up

just to survive. Therefore, we need to adopt entirely new strategies and new strategies require new ideas. In a world of accelerating change and an explosive growth of information, it is not the information that counts, but what we do with it. Our ability to be the first to use new information to develop new ideas and to innovate will become our major competitive advantage.

In the networked world, innovation will be the key to our survival, growth and prosperity in the new economy. In the past, when the rate of change was much slower, we often treated innovation as a corporate convenience or waited for it to occur at random. In the twenty-first century, if we wish to be successful we must strategically develop innovation as a core competency within our organizations.

【社会信息化】The world is currently experiencing a period of major change and transition. As it transforms, virtually every aspect of our lives is being reshaped. We are moving from physical space to cyberspace; from products and processes to information and networks; from paper and postage to e-commerce and the Internet; from mass production to mass customization. At the same time, the foundation of corporations is shifting from material assets to intellectual capital.

In the networked world information is instantaneous, interactive, individual, international, inexhaustible, interconnected and inexpensive; and the world is now the marketplace and source of supply for all goods and services, for all enterprises, regardless of size or geographical location. This has opened up a Pandora's box of new opportunities.

【社会网络化】The network society, of which we are now part, is a virtual society in cyberspace, where interactive multimedia communications allow us to experience instantaneous personal interaction at levels we would have thought impossible just a few years ago. However, we are just at the start of a period of major transformation, and what we are presently experiencing in our cyber relationships is nothing compared with what is yet to come.

As communications become more mobile, cheaper, faster and easier to use, more and more people are joining the network society. The cost continues to drop dramatically and the speed and capacity continue to escalate exponentially. Just a few years ago, only those of us with computers could be members of the network society and thereby interconnected to all of its people and with instantaneous multimedia access to all its information. Today, broadband wireless technology means that access is available not only to those with computers, but also to anyone with an appropriate fixed or mobile communications device.

The growth spurt in new wireless applications and multimedia mobile devices has greatly accelerated the spread of interactive multimedia connectivity, which is rapidly becoming the most common form of communications. There is little doubt that as more and more people join the network society of cyberspace, our lives will continue to change in fascinating ways.

【信息经济时代】We now have easy access to unlimited amounts of information. As more and more people both use and generate even more information at exponential rates, the information economy in which we operate will become larger and larger, and our opportunity for innovation will become greater and greater:

- Information is the building block of knowledge;
- Knowledge forms our foundation for thinking;
- Creative thinking is the source of imagination;
- Imagination is the source of innovation;
- Innovation is the practical application of imagination;
- Innovation creates change, which in turn generates even more information.

Thus the exploding information economy of the networked world is an ever-expanding universe of knowledge that is becoming readily accessible to billions of people.

【网络：世界性都市】The networked world is a gigantic global metropolis, where the transaction and delivery of goods and services involving relationships, information, knowledge and ideas can be carried out without regard to geographical location. In many professions, the physical location of people is now of much less importance, and organizations are outsourcing more and more of their requirements to service providers located anywhere in the world. In cyberspace there is no night and day, and services are continuously supported by networked global service providers, working normal eight-hour shifts that are continuously cycling through three time zones—Europe, Asia and America. In the cyber metropolis we are all shift

workers, and our employers or employees can reside anywhere in the world.

【网络：超越国界】National borders are losing their significance as more and more information that was previously delivered in physical form is now delivered electronically. E-commerce is the most rapidly growing sector of cyberspace, and every day new e-ideas are emerging in e-banking, e-tailing, e-purchasing, e-payments, e-share trading, e-education, e-real estate, e-health, e-medicine and, of course, email.

The fastest growth in e-commerce is in the business-to-business (B2B) sector, where conversion from people-based to electronic transactions can produce huge cost savings and totally transform the way of doing business. B2B commerce has special significance for global businesses, where e-systems easily handle the crossing of cultural borders, language translation, and transactions in different currencies.

In cyberspace the whole world is the marketplace and a source of supply for all goods, services and enterprises, regardless of size or geographical location. This is particularly significant for many of the world's smaller businesses. In the past they could not consider trading in global markets because they lacked the large amount of money, time and people needed for export. Global trading in the borderless world is entirely different. Many small enterprises now sell directly to other small enterprises all over the world, bypassing many of the old links in the supply chain.

Another sector that has contributed greatly to the formation of the borderless world is the business-to-consumer (B2C) sector. Individual on-line orders, delivered in small parcels by mail or courier, now pass unimpeded across national boundaries.

【网络世界村】The effect of the networked world on the development of our emerging economic environment is also mirrored in the development of our emerging social and political environments. In the virtual world of cyberspace we now live in a global village, where our virtual neighbors are just seconds away from us, regardless of their physical location. With interactive multimedia we can see and speak to them in real time, and within the foreseeable future we will be able to virtually smell and touch them.

In the political environment, protest groups with special agendas (or people from any country who share common concerns) pop up simultaneously in all parts of the global village, planning their strategies and coordinating their resources through virtual meetings in cyberspace. Thus, what is of concern in one part of the world can immediately be of concern in another part, and can instantaneously affect societies and politics all around the globe.

Quotations on Internet

The Internet is becoming the town square for the global village of tomorrow.
Bill Gates (1955-, an American business magnate who founded Microsoft with Paul Allen)

A journey of a thousand sites begins with a single click.
(Author Unknown)

Advances in computer technology and the Internet have changed the way America works, learns, and communicates. The Internet has become an integral part of America's economic, political, and social life.
Bill Clinton (1946, 42nd president of the United States (1993-2001))

Hooked on Internet? Help is a just a click away.
(Author Unknown)

Reference

106 网瘾

Internet Addiction Disorder

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 101 题】【新 109 题】

See Also
相关写作参考

【Ref-088 科技让人疏远】【Ref-087 科技促进交流】【Ref-019 教育与科技】【Ref-069 科技与社会】

【什么是网络成瘾】Lingering online for more than six hours a day instead of working or studying, having adverse reactions from not being able to get online have been identified as two symptoms of Internet Addition Disorder. Addictions to online gaming, chat rooms, online gambling and online shopping are also considered types of online abuse. The widespread availability of sexual content online has given rise to a new form of sexual addiction. Cyber-porn and cyber-sexual addictions destroy relationships and ruin one's life.

【网络成瘾的负面影响】People who have internet addiction can lose all track of time or neglect eating and sleeping. Internet addicts make the Internet a priority more important than family, friends, and work. They are willing to sacrifice what they cherish most in order to continue their unhealthy behavior. Internet serves as an escape or to fill a void.

People are so easily sucked into computer games after a hard day at work. For some online gamers, the allure of their fantasy identity has become so compelling that they become addicted. More and more teenagers are addicted to the Internet and that their devotion to the cyber world has created serious negative effects in their school and home lives. College students are the highest risk for Internet addiction. It may start with a curiosity. Students may waste too much of their youth in front of a computer screen.

【网络成瘾导致青少年犯罪】Many students log onto the Internet for long and reduce interpersonal communication. If their Internet access is cut off, they react strongly. Most juvenile crimes in the city are Internet-related, because youngsters tend to imitate crimes they have read about on websites or steal money to pay for their online habit. Internet addicts suffer from emotional problems such as depression and anxiety and often use the fantasy world of the Internet to psychologically escape stressful situations.

【解决办法】Associating more with family and friends can really help internet addicts kick the habit. Parents nowadays are busy, but if they just spend more time communicating with their kids, they can help avoid their children from becoming addicted to the internet.

Reference

107 全球化

Globalization

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】【新 132 题】

【世界地球村】You've probably heard it said that "the world is getting smaller." Obviously that's not literally true: What it means is that advances in transportation and communication effectively bring people and places around the world closer to us. In this sense, the world has been "shrinking" since the beginning of human history.

【全球化的原因】Globalization is the result of advances in communication, transportation, and information technologies. Globalization also involves the growth of transnational corporations. Distant events often have an immediate and significant impact, blurring the boundaries of our personal worlds. Items common to our everyday lives—such as the clothes we wear, the food we eat, and the cars we drive—are the products of globalization.

【交通更便利】In 1873, when Jules Verne published his novel *Around the World in 80 Days*, it seemed almost impossibly daring to travel completely around the globe in under three months' time. Today, you can fly around the world in a tiny fraction of that time: just a couple of days. The prevalence and relative affordability of passenger air travel means that a middle-class citizen of a developed country can comfortably manage to visit other continents at least a few times in their life, and can fairly routinely fly around their own continent. In 1873, the fastest way to get from place to place was by train, or perhaps by water if the winds and currents were favorable. Today, if you're not flying you can drive from city to city. This means that not only can you road-trip across a continent in a few days, you can comfortably commute each day from one side of a sprawling metro area to the other.

【通讯更发达】E-mail is so efficient, in fact, that postal services around the world are struggling with the rapid decline in mail volume — especially the volume of business mail. The daily delivery of standard mail to average households may soon be a thing of the past. The development of reliable Internet service in major cities — and, increasingly, small towns and rural areas — around the world is an unprecedented advance in communication technology. Massive volumes of information ricochet around the world in virtually no time, at relatively tiny cost. There have been game-changers before, though: the printing press, the telephone, radio broadcasting, television broadcasting. Each has created such a seismic change in the way people live that they've taken decades to adjust to.

【全球化：喜忧参半】Globalization has both negative and positive aspects. Among globalization's benefits are a sharing of basic knowledge, technology, investments, resources, and ethical values. Among the negative aspects are the rapid spread of diseases, illicit drugs, crime, terrorism, and uncontrolled migration. Clearly there are criticisms to be made of some elements of Western societies that are showing up around the world.

Pilgrims to the Himalayas in search of the ultimate wilderness find Everest strewn with rubbish, the tins, plastic bags, Coca-Cola bottles and all the remnants of the global picnicker. Explorers of the Arctic complain that empty plastic bottles of washing-up liquid are embedded in the ice.

Inequalities in living standards and participations in the global economy are a serious political problem in an era of globalization. Some countries have been unable to function at even a minimum standard of basic competence in the globalized economy. The only profitable economic activity in some of these countries is linked to criminal behaviors, such as the trade in illegal drugs, smuggling, and extortion of various kinds.

Reference

108 现代化与传统

Modernization and Tradition

Relevant GRE Issue
相关题库题目

【新 5 题】【新 117 题】【新 119 题】

See Also
相关写作参考

【Ref-179 城市与展示文化】【Ref-172 文化身份与全球化】【Ref-107 全球化】【Ref-105 信息时代】

【现代化的特点】Four major characteristics of modernization:

- The decline of small, traditional communities.
- The expansion of personal choice.
- Increasing social diversity.
- Orientation toward the future and a growing awareness of time.

【现代化的四个阶段】According to Walt W. Rostow, modernization occurs in four stages:

- Traditional stage. Socialized to honor the past, people in traditional societies can not easily imagine how life can be very different. Therefore, they build their lives around families and local communities, following well-worn paths that allow for little change. Life is often spiritually rich but lacking in material goods.
- Take-off stage. As a society shakes off the grip of the tradition, people start to use their talents and imagination, sparking economic growth. A market emerges as people produce goods not just for their own use but to trade with others for profit. Greater individualism, a willingness to take risks, and a desire for material goods also take hold, often at the expense of family ties and time-honored norms and values.
- Drive to technological maturity. During this stage, "growth" is a widely accepted idea that fuels a society's pursuit of higher living standards. A diversified economy drives a population eager to enjoy the benefits of industrial technology. At the same time, however, people began to realize and sometimes regret that industrialization is eroding traditional family and local community of life. Cities swell with people who leave rural villages in search of economic opportunity. Specialization creates the wide range of jobs.
- High mass consumption. Economic development steadily raises living standards as mass production stimulates mass consumption. Simply put, people soon learn to "need" the expanding array of goods that their society produces,

【现代化与传统】Moderation theory identifies tradition as the greatest barrier to economic development. In some society, strong family systems and a reverence for the past discourage people from adopting new technologies that would raise their living standards. Increasing population, the growth of the cities, and specialized economic activity driven by the Industrial Revolution, people come to know one another by their jobs rather than by their kinship group or home town. People look on most others simply as strangers. The face-to-face communication of the village is eventually replaced by the impersonal mass media: newspaper, radio, television, and computer networks.

【传统社会的特点】Even today, many people – from the North America Amish to Islamic people in rural regions of the Middle East and Asia to Semai of Malaysia – oppose technological advances as a threat to their family relationships, customs, and religious beliefs. The characteristics of traditional societies are as followed:

- Many people now still live in small communities where social life revolved around family and neighborhood. Such traditional worlds give each person a well-defined place that, although limiting range of choice, offer a strong sense of identity, belonging, and purpose.

- Members of traditional societies view their life as shaped by forces beyond human control – gods, spirits, or simply rate. As the power of tradition weakens, people come to see their lives as an unending series of options.
- In traditional societies, strong family ties and powerful religious beliefs enforce conformity and discourage diversity and change. The growth of cities, the expansion of impersonal bureaucracy, and the social mix of people from various backgrounds combine to foster diverse beliefs and behavior.

【亚洲国家的现代化】The progress of modernization in East Asia in the past hundred years or so has unfolded in the context of great tension between tradition and modernity. In the nineteenth century, Japan sought to "leave Asia and enter Europe". In the twentieth century, there were a number of virulent anti-tradition movements in China. From the beginning, the modernization of the East Asian region has been linked to the success or failure of the nation-state. The modernization of the nation-state concentrated its attention on the role of the state in "enriching the country and strengthening the army". East Asian countries first understanding of modernity was from a modern fleet and guns.

Quotations on Tradition

A love for tradition has never weakened a nation, indeed it has strengthened nations in their hour of peril.
Winston Churchill (1874-1965, a British politician and statesman known for his leadership of the United Kingdom during the Second World War II)

I must point out that my rule of life prescribed as an absolutely sacred rite smoking cigars and also the drinking of alcohol before, after, and if need be during all meals and in the intervals between them.
Winston Churchill

A tradition without intelligence is not worth having.
T.S. Eliot (1888-1965, American born English editor, playwright, poet and critic)

Tradition is an explanation for acting without thinking.
(Author Unknown)

Science and technology revolutionize our lives, but memory, tradition and myth frame our response.
(Author Unknown, contributed to Arthur Schlesinger, Jr.)

Contemporary man has rationalized the myths, but he has not been able to destroy them.
Octavio Paz (1914-1998, Mexican author and poet)

With the loss of tradition we have lost the thread which safely guided us through the vast realms of the past, but this thread was also the chain fettering each successive generation to a predetermined aspect of the past.
Hannah Arendt (1906-1975, German-born U.S. philosopher and historian)

Reference
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消费
Consumption

Relevant GRE Issue
相关题库题目
【新 77 题】【新 93 题】

See Also
相关写作参考
【Ref-157 形象与实际】【Ref-175 流行文化】【Ref-117 绿色政治哲学】【Ref-100 可持续发展】

【消费主义】Consumerism is a social and economic order that is based on the systematic creation and fostering of a desire to purchase goods and services in ever greater amounts.

【消费文化】Our consumption of goods obviously is a function of our culture. Only by producing and selling things and services does capitalism in its present form work, and the more that is produced and the more that is purchased the more we have progress and prosperity. The single most important measure of economic growth is, after all, the gross national product (GNP), the sum total of goods and services produced by a given society in a given year. It is a measure of the success of a consumer society, obviously, to consume.

However, the production, processing, and consumption, of commodities requires the extraction and use of natural resources (wood, ore, fossil fuels, and water); it requires the creation of factories and factory complexes whose operation creates toxic byproducts, while the use of commodities themselves (e.g. automobiles) creates pollutants and waste.

【炫耀性消费】Conspicuous consumption is a term used to describe the lavish spending on goods and services acquired mainly for the purpose of displaying income or wealth. In the mind of a conspicuous consumer, such display serves as a means of attaining or maintaining social status. Material things comfort us in some ways but divert us from the security and satisfaction that come from close relationships and spiritual strength.

【消费与社交】In most communities, people socialize primarily with others of more or less the same social standing. To some extent, this is because we tend to live near others like ourselves. People with very different social standing commonly keep their distance from one another. Well-dressed people walking down the street on their own way to an expensive restaurant, for example, might move across the street to avoid getting close to others they think are homeless people. Everyone realizes that the way we dress, the car we drive, and even the food and drink we order say something about our budget and personal taste. Invidious consumption, a necessary corollary, is the term applied to consumption of goods and services for the deliberate purpose of inspiring envy in others.

【消费一族】Americans and Western Europeans have had a lock on unsustainable over-consumption for decades. But now developing countries are catching up rapidly. Many people worldwide now belong to the "consumer class"—the group of people characterized by diets of highly processed food, desire for bigger houses, more and bigger cars, higher levels of debt, and lifestyles devoted to the accumulation of non-essential goods.

【大平方住宅】In the U.S., a trend in 1950s towards large houses began, with the average size of a home about doubling over a period of 50 years. This trend has been compared to the rise of the SUV, also often a symbol of conspicuous consumption. People have purchased huge houses even at the expense of the size of their yard, the inability to save funds for retirement, or a greatly increased commute time, up to a couple of hours. Such large homes can also facilitate other forms of consumption, in providing extra storage space for vehicles, clothes, and other objects.

【从奢侈品到必需品】Globalization is a driving factor in making goods and services previously out of reach in developing countries much more available. Items that at one point in time were considered luxuries—televisions, cell phones, computers, air conditioning—are now viewed as necessities.

【消费主义的有利影响】Consumerism is appreciated in Western economies since a person's standard of living is valued by his or her material possessions. There are certain positive effects such as:

- More industrial production;
- A higher growth rate economy;
- More goods and services available;
- More advertising since goods manufactured have to be sold;
- Increased production will result in more employment opportunities;
- A variety of goods and services to choose from;
- More comforts for a better living style.

【消费主义的负面影响】There are always certain pitfalls to

a given situation in a society. Material prosperity may be there in consumerism but, it has its negative effects on the people and society at large. Negative consumerism effects include:

- Craving for goods is high. The wants and desires of the people increase. The better their income, the better their purchasing power. But in case, they are not able to do so, then they feel dissatisfied.
- One is in a rat race to earn more and is forced to cope up with stress and other work related tensions.
- Material wealth is the deciding factor about whether a society is highly developed or not. Spiritual values are underplayed. This may not be suitable to a person from the East, who generally is appreciative of spiritual values.
- Over-dependence on labor saving devices.
- A car for each individual would mean gradual erosion of public transport.
- Crime rate also increases as wants to possess expensive gadgets increase. Thefts become common and daylight robberies take place.
- Personal relationships also get affected as people are busy trying to earn more to maintain their standard of living.
- Cheaper goods are imported from other goods affecting the growth of locally based manufacturing industries.
- Consumerism has also resulted in ecological imbalances. The natural habitat is being destroyed to create more goods and build more buildings affecting the weather. Global warming will eventually result in health problems. Industrial pollution is affecting people in many ways.
- People lifestyles have also changed in the sense they are more lavish, full of material comforts rather than focusing on simplicity. The Eastern spiritualism and philosophy has always laid emphasis on simplicity. Gandhian principles and values favor a non-materialistic approach to life.
- Consumerism is also depleting the natural resources of the respective country.
- Psychological health also can get affected if one's desires are not meant such as depression. Jealousy and envy can lead to crime.

【消费主义与环境破坏】Even though it creates jobs and keeps the economy moving, consumerism is taking a toll on the environment. Natural resources are being depleted and the ecosystems are being compromised by disposable plastic products, bottles, and shopping bags. Many items, which were once thought of as luxury items have become necessities.

Products are made, quickly become obsolete and are replaced. Items that are disposable, are made to be used only once, or just for fun, flood our markets. The cost of producing products, the raw materials needed and the energy consumed, is not taken into account when cost is measured. Reliance on automobiles, even in countries such as China, where not long ago bicycles outnumbered cars, has made an enormous impact on the environment in the form of pollution and the dependence on fossil fuels.

Another negative impact from consumerism is the over consumption of meat, processed food, and fast, ready-made food. Raising livestock to meet the demands of the consumer impacts the water supply, and produces the destructive greenhouse gas, methane. Manure laden runoff from livestock pens, threatens fresh water streams and lakes.

Producing products to fill the need of today's consumers is a strain on our natural resources. The factories needed to produce the goods create by-products that pollute the air and water supply. Consumers need to become more aware of the impact their buying practices have on the environment and if not cut down on spending at least learn how to counteract the environmental consequences by educating themselves about ways to combat the damage caused by consumerism.

【快餐消费与环境破坏】Junk-food chains, including KFC and Pizza Hut, are under attack from major environmental groups in many developed countries because of their environmental impact. Intensive breeding of livestock and poultry for such restaurants leads to deforestation, land degradation, and contamination of water sources and other natural resources. For every pound of red meat, poultry, eggs, and milk produced, farm fields lose about five pounds of irreplaceable top soil. The water necessary for meat breeding comes to about 190 gallons per animal per day, or

ten times what a normal Indian family is supposed to use in one day, if it gets water at all. Overall, animal farms use nearly 40 percent of the world's total grain production. In the United States, nearly 70 percent of grain production is fed to livestock.

Quotations on Consumption

Infinite growth of material consumption in a finite world is impossibility.
E. F. Schumacher (1966-, German born British economist)

Production and consumption are the nipples of modern society. Thus suckled, humanity grows in strength and beauty; rising standard of living, all modern conveniences, distractions of all kinds, culture for all, the comfort of your dreams.
(Author Unknown)

Consumption is the sole end and purpose of all production; and the interest of the producer ought to be attended to, only so far as it may be necessary for promoting that of the consumer.
Adam Smith (1723-1790, was a Scottish social philosopher and a pioneer of political economy, whose *Wealth of Nations* (1776) laid the foundations of classical free-market economic theory)

Man is the only creature that consumes without producing.
George Orwell (1903-1950, British writer)

Conspicuous consumption of valuable goods is a means of reputability to the gentleman of leisure.
Thorstein Bunde Veblen (1857-1929, U.S. social scientist and economist)

We take it as a fundamental psychological rule of any modern community that, when its real income is increased, it will not increase its consumption by an equal absolute amount.
John Maynard Keynes (1883-1946, British economist and the author of *The General Theory of Employment, Interest, and Money*)

Reference
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恐怖主义
Terrorism

Relevant GRE Issue
相关题库题目 【新 19 题】【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考 【Ref-125 危机管理】【Ref-171 跨文化交流】

【恐怖主义的特点】Terrorism refers to acts of violence or the threat of violence used as political strategy by an individual or a group. The terrorism has four distinguishing characteristics:

- Terrorists try to pain violence as a legitimate political tactic, even though such acts are condemned by virtually every nation.
- Terrorism is used not just by groups but also by governments against their own people. State terrorism is the use of violence, generally without support of law, by government officials as a way to control the population.
- Democratic societies reject terrorism in principle, but they are especially vulnerable to terrorists because

they give extensive civil liberties to their people and have less extensive police networks.

- Terrorism is always a matter of definition. Governments claim the right to maintain order, even by force and may label opposition groups that use violence as “terrorists.”

Terrorism is violence or the threat of violence undertaken to create alarm and fear. Terrorism is also often designed to disrupt and weaken the government’s control.

【实例：美国 911】The events of September 11, 2001, seem destined to remain permanently etched in the minds and memories of everyone. Few, if any, will ever forget where they were when they first heard the horrendous news that terrorists had attacked and destroyed the Twin Towers of the World Trade Center in New York and severely damaged the Pentagon in Washington.

The events of 9/11 shattered the preexisting, prevailing sense of personal, national, and international security. The presumed safety and euphoria of a peaceful and prosperous post-Cold War era were soon seen as an illusion. The primary product of 9/11 was the generation of fear. “America is full of fear,” proclaimed a jubilant Osama bin Laden in the taped message he broadcast in anticipation of the US response to his slaughter of thousands of innocent people.

A basic reason for terrorism is to gain recognition or attention – an advertisement of the cause. Violence and bloodshed always excite human curiosity. Publicity may be the highest goal of some groups. Today, in an interdependent world, the need for international recognition encourages transnational terrorist activities, with escalation to ever more destructive and spectacular violence.

Prior to 9/11, the primary purpose of terrorism was publicity – to elicit attention and sympathy for the terrorist’s cause. An awakened world began to recognize that terrorists had begun to engage in new practices for new purposes – intentionally seeking not simply to coerce changes in enemies’ policies, but to annihilate enemies; they now want a lot of people dead. The acts on 9/11 took the ancient practice to a new level, making terrorism something far more menacing. As audience grows larger, more diverse, and more accustomed to terrorism, terrorists must go to extreme lengths to shock.

【恐怖主义产生的原因】The internal and external conditions stimulate terrorist activity. The former include indigenous sources of terrorisms, such as discontent emerging from perceived political, social, and economic inequities within states, as well as the resentments to repel the foreign cultural and material influences they perceive to intrude on their cultural traditions and thereby to oppress them. The latter include the transnational links between terrorist groups such as the networks among these transnational movements and their state sponsors.

If terrorists see the state as unjust, morally corrupt, and violent, then terrorism may seem legitimate and justified. Terrorism is inherently international in character, so that the more individual states improve their national measures to combat global terrorism, the more it becomes attractive for the terrorists to cross national frontiers.

Under the conditions of globalization, everything becomes connected to everything else throughout globe. Local tyranny and global terror go hand in hand. Without awareness of the roots from which acts of global terrorism spring, it is extremely unlikely that a cure to its outbreak and spread will be found.

【全球携手解决恐怖主义】How can the peace-loving people on the planet escape the plight that terrorizes them? How can people learn to walk daily in the valley of the shadow of death without fear? The controls of the global terrorism range from combating violence with violence to nonviolent remedies.

Global terrorism represents one of the defining elements of politics on the world’s stage today. The realization of the extent of vulnerability has stimulated the search for understanding and communication, and for some tectonic foreign policy changes.

Quotations on Terrorism

Every nation in every region now has a decision to make: either you are with us or you are with the terrorists.
George W. Bush (1946-, 43rd president of the United States)

They violate our land and occupy it and steal the Muslims' possessions, and when faced by resistance they call it terrorism.
Osama bin Laden (1957-, Saudi Arabian multimillionaire and

Reference
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人工智能
Artificial Intelligence

Relevant GRE Issue
相关题库题目 【新 1 题】【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also
相关写作参考 【Ref-069 科技与社会】【Ref-070 科技乌托邦】

【什么是智力】Intelligence is best defined as the ability of an individual to adapt his/her behavior to new circumstances. Human intelligence is not a single ability but is rather a composition of abilities like learning, reasoning, problem solving, perception and understanding of language.

【人工智能的历史】Artificial Intelligence, the study and engineering of intelligent machines capable of performing the same kinds of functions that characterize human thought. Since ancient times, people have been thinking of designing machines that will replicate human intelligence. The concept of thinking machines appears in Greek myths like the 'Talos of Crete'. John McCarthy coined the term, 'artificial intelligence' in 1956. He defines artificial intelligence as the science and engineering of making intelligent machines. AI Researchers hope to invent intelligent machines, which can perceive, learn and reason like humans. General intelligence is their long-term goal. By general intelligence they mean to incorporate other aspects like social intelligence, judgment, commonsense, robotics and self-awareness into machines. Researchers dream of bringing into machines, the capacity for wisdom and the ability to feel.

【实例：挑战"深蓝"】In 1997 Russian chess master Garry Kasparov lost a highly publicized series of matches to an IBM computer named Deep Blue. The computer used artificial intelligence to process 200 million chess moves per second in developing its strategy. This was the first time that an international chess grand master had lost a series to a computer, suggesting to some observers that advances in artificial intelligence may be surpassing human capacity in some areas.

【人工智能的优势】Pros of Artificial Intelligence include:

- Artificial intelligence finds applications in space exploration. Intelligent robots can be used to explore space. They are machines and hence have the ability to endure the hostile environments of the interplanetary space. They can be made to adapt in such a way that planetary atmospheres do not affect their physical state and functioning.
- Intelligent robots can be programmed to reach the Earth's nadirs. They can be used to dig for fuels. They can be used for mining purposes. The intelligence of machines can be harnessed for exploring the depths of oceans. These machines serve human so well especially where human intelligence has serious limitations.
- Intelligent machines can replace human beings in many areas of work. Robots can do certain laborious tasks. Painstaking activities, which have long been carried out by humans can be taken over by the robots.

Owing to the intelligence programmed in them, the machines can shoulder responsibility to a certain extent. They can be made to manage themselves and their time to complete the assigned tasks.

- Emotions that often intercept rational thinking of a human being are not a hindrance for artificial thinkers. Lacking the emotional side, robots can think logically and take the right decisions. Sentiments are associated with moods that affect human efficiency. This is not the case with machines with artificial intelligence.
- Thus artificial intelligence can be utilized in the completion of repetitive and time-consuming tasks efficiently. Intelligent machines can be employed to do certain dangerous tasks. Machines equipped with artificial intelligence can be made to thoughtfully plan towards the fulfillment of tasks and accordingly adjust their parameters such as their speed and time. They can be made to act quickly, unaffected by anything like emotion and take the tasks towards perfection.

【人工智能的劣势】Cons of Artificial Intelligence include:

- The first concern regarding the application of artificial intelligence is about ethics and moral values. Is it ethically correct to create replicas of human beings? Do our moral values allow us to recreate intelligence? Intelligence is after all a gift of nature. It may not be right to install it into a machine to make it work for our benefit.
- The idea of machines replacing human beings sounds wonderful. It appears to save us from all the pain. But is it really such an exciting idea? Concepts such as wholeheartedness and dedication in work bear no existence in the world of artificial intelligence.
- Imagine robots working in hospitals. Do you picture them showing care and concern towards the patients? Imagine intelligent machines employed in creative fields. Do you think the robots will excel in such fields? Thinking machines lack a creative mind. Human beings are emotional intellectuals. They think and feel. Their feelings guide their thoughts.
- If robots begin replacing humans in every field, it may lead to unemployment. People will be left with nothing to do. Empty time may result in its destructive use. Thinking machines will govern all the fields and populate all positions pre-occupied by people.
- Apart from all these issues, there is a fear of robots superseding us! Ideally human beings should continue being the masters of machines. If things turn the other way round, the world will turn into chaos. Intelligent machines may prove to be smarter than us; they might enslave us and start ruling the world. Man's greedy creativity may endanger mankind!
- Eventually, it is up to you whether to stand by artificial intelligence or warn yourself of the likely disaster that it may lead to. In my view, there is no ideal replacement for human beings. Artificial intelligence can help alleviate the difficulties faced by man but intelligent machines can never be 'human'.

Reference

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老龄化

An Aging Society

Relevant GRE Issue
相关题库题目

【新 33 题】【新 36 题】【新 72 题】【新 109 题】

See Also

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【老龄化的原因】In high-income nations, the share of elderly people is increasing rapidly. There are two reasons for this increase:

- Low birth rates (people are having fewer children);
- Increasing longevity (people are living longer).

【低生育率】The birth rate in the US has been falling for more than a century. This is the usual trend as societies industrialize. Because children are more likely to survive into adulthood, couples bear fewer children. Children no longer add to their family's financial well-being, but instead are a major expense burden. As more and more women work outside the home, they choose to have fewer children. This choice is made possible by advances in birth control technology during the past century.

【寿命延长】This longer life span is one result of the Industrial Revolution. Greater material wealth and advances in medicine have raised living standards so that people benefit from better housing and nutrition. In addition, medical advances have almost eliminated infectious diseases – such as small pox, diphtheria, and measles – that killed many infants and children a century ago.

【老龄化对社会的影响】This major increase in the elderly population will change our society in many ways. As the number of older people retiring from the labor force goes up, the proportion of nonworking adults will demand more health care and other resources. The ratio of working-age adults to nonworking elderly people, called the old-age dependency ratio, will fall from the current level. With fewer and fewer workers to support tomorrow's swelling elderly population.

【人体衰老的特征】Growing old brings on predictable changes: gray hair, wrinkles, heights and weight loss, and declining strength and vitality. After age fifty, bones become more brittle, so injuries take longer to heal, and the odds of developing chronic illness and life-threatening conditions rise. The senses – taste, sight, touch, smell, and especially hearing – become less sharp with age.

【老年与孤独】Being alone can cause anxiety at any age, but isolation is most common among elderly people. Retirement closes off one source of social interaction, physical problems may limit mobility, and negative stereotypes of the elderly as "over the hill" may discourage younger people from close social contact with them. But the greatest cause of social isolation is the death of significant others, especially the death of a spouse.

【中年，上有老下有小】The elderly needs caring from people, especially from family members. Indeed, today's middle-aged adults are called the "sandwich generation" because many will spend as much time caring for their aging parents as for their own children.

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尾注
Endnotes

[1] From *Scientific Philosophy* (Samir Okasha, 译林出版社, 2009)

[2] 约翰内斯·谷登堡（1400-1468）近代印刷术的发明人。他的发明导致了一次媒介革命，迅速地推动了西方科学和社会的发展。

[3] 勒德运动，开始于 1811 年，源于一些英国纺织工人因害怕工业革命给他们带来失业而发起的毁坏纺织机器的暴动。

[4] 儒勒·凡尔纳（1828-1905），19 世纪法国著名的科幻小说和冒险小说作家，被誉为“现代科学幻想小说之父”。曾写过《海底两万里》、《地心游记》等著名科幻小说。

[5] 柏拉图（公元前 427-前 347）古希腊哲学家。

[6] 亚里士多德（公元前 384-前 322 年）古希腊哲学家。

[7] 奥古斯丁（354-430），罗马帝国基督教思想家，他创立了中世纪前期的教父哲学。教父哲学讲柏拉图主义哲学与基督教教义结合起来，主张灵魂是实体，有独立的存在。

[8] 阿奎奈（1226-1274），意大利中世纪神学家和经院学家。在他的著作《神学大全》中，他成功建立了一种将亚里士多德的思想与天主教神学相协调的思想体系。

[9] 威廉·康拉德·伦琴（1845-1923）德国物理学家。1901 年，首届诺贝尔奖颁发，伦琴获得诺贝尔物理学奖。

[10] 氰亚铂酸钡

[11] 路易·巴斯德（1822-1895）法国微生物学家、化学家，微生物学的奠基人之一。他是第一个创造狂犬病和炭疽的疫苗的科学家。

[12] 弗里德里希·奥古斯特·凯库勒·冯·斯特拉多尼茨（1829-1896）德国有机化学家。据凯库勒本人的著作称，他在梦见一条蛇首尾相接的时候发现了苯环结构。

[13] 爱德华·詹纳（1749-1823）英国医生，以研究及推广牛痘疫苗，防止天花而闻名，被称为免疫学之父。

[14] 腔棘鱼：腔棘鱼科的一种大部已灭绝的鱼，直到 1938 年发现其仅有的一个活着的类种（非洲海水系的 Latimeria chalumnae）之前，仅知其为化石形式存在。

[15] 有芒刺的草。

[16] 弗兰西斯·培根（1561-1626）堪称“未来科学预言家”，在他著作的《新大西岛》中，培根虚构一个科学技术高度发达的国度，这个国家由“所罗门宫”的科学家管理，而所罗门宫是一个有组织的科学研究机构。

[17] 富兰克林·德拉诺·罗斯福（1882-1945）第 32 任美国总统。，通常以其姓名英文缩写 FDR 称之。他是 20 世纪世界经济危机和世界大战的中心人物之一。自 1933 年至 1945 年，他连续出任四届美国总统。

[18] 万尼瓦尔·布什（1890-1974），美国著名工程师，科学家管理者。他于二战期间为曼哈顿计划发挥了巨大的政治作用。

[19] 国家科学基金会是一个美国政府机构，支持除医学领域外的科学和工程学基础研究和教育。在某些领域，如数学、计算机科学、经济学和社会科学，NSF 是主要的联邦赞助者。

[20] 古巴导弹危机，是 1962 年冷战时期在美国、苏联与古巴之间爆发的一场政治、军事危机。

[21] 耶诺·帕尔·维格纳（1902-1995）匈牙利-美国物理学家，1963 年获诺贝尔物理学奖。

[22] From *Declaration on Science and the Use of Scientific Knowledge* (UNESCO, the World Conference on Science, 1999)

[23] *Loneliness: Human Nature and the Need for Social Connection* (John Cacioppo and William Patrick)

[24] 《京都议定书》（全称《联合国气候变化框架公约的京都议定书》）是《联合国气候变化框架公约》（United Nations Framework Convention on Climate Change，简称 UNFCCC）的补充条款。是 1997 年 12 月在日本京都由联合国气候变化框架公约参加国三次会议制定的。其目标是“将大气中的温室气体含量稳定在一个适当的水平，进而防止剧烈的气候改变对人类造成伤害”

[25] 赎罪日战争（又称第四次中东战争）发生于 1973 年 10 月 6 日至 10 月 26 日。起源于埃及与叙利亚分别攻击六年前被以色列占领的西奈半岛和戈兰高地。

[26] 伊朗伊斯兰革命（又称 1979 年革命）是 1970 年代后期在伊朗发生的历史事件，伊朗君主政体在革命过程中被推翻，而后成立了伊斯兰共和国。

[27] From tiger.towson.edu

[28] 痔疮。

[29] 《不扩散核武器条约》（又称《核不扩散条约》）是 1968 年 1 月 7 日由英国、美国、苏联和其他 59 个国家缔结签署的一项国际条约。宗旨是防止核扩散，推动核裁军和促进和平利用核能的国际合作。

[30] 威廉·华兹华斯（1770-1850），英国浪漫主义诗人。

[31] 1964 年美国颁布了世界第一部《荒野法案》（Wilderness Act）。同年，设立美国国家荒野保护系统（National Wilderness Preservation System）。