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Nature Around Us

Учебное пособие

Part I

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Nature Around Us: Учебное пособие. – Саратов, 2018. – 52 с.

Учебно-методическое пособие «Nature Around Us» предназначено для студентов, обучающихся по естественнонаучным направлениям, изучающих английский язык. Данное пособие представляет собой сборник текстов на естественнонаучную тематику и задания к ним.

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Содержание

Предисловие

Настоящее учебно-методическое пособие предназначено для студентов дневного отделения по естественнонаучным направлениям, изучающих английский язык. В нем предоставлены тексты на естественнонаучную тематику и задания к ним.

Тексты приведены по темам: природа, земля, погода, окружающая среда, землетрясения, глобальное потепление и т.д. К каждому тексту предоставляются задания. Работа с текстом предполагает устный перевод и ответы на вопросы, контролирующие понимание всего текста. Также предоставляются задания, подразумевающие работу с лексикой.

Данное пособие рассчитано, в основном, на устное выполнение всех упражнений. Однако предложенная структура пособия позволяет выполнение заданий письменно и, таким образом, допускается использование пособия в учебном процессе для студентов заочной формы обучения.

Nature

Nature, in the broadest sense, is the natural, physical, or material world or universe. "Nature" can refer to the phenomena of the physical world, and also to life in general. The study of nature is a large part of science. Although humans are part of nature, human activity is often understood as a separate category from other natural phenomena.

The word nature is derived from the Latin word natura, or "essential qualities, innate disposition", and in ancient times, literally meant "birth". Natura is a Latin translation of the Greek word physis (φύσις), which originally related to the intrinsic characteristics that plants, animals, and other features of the world develop of their own accord. The concept of nature as a whole, the physical universe, is one of several expansions of the original notion; it began with certain core applications of the word φύσις by pre-Socratic philosophers, and has steadily gained currency ever since. This usage continued during the advent of modern scientific method in the last several centuries.

Within the various uses of the word today, "nature" often refers to geology and wildlife. Nature can refer to the general realm of living plants and animals, and in some cases to the processes associated with inanimate objects–the way that particular types of things exist and change of their own accord, such as the weather and geology of the Earth. It is often taken to mean the "natural environment" or wilderness–wild animals, rocks, forest, and in general those things that have not been substantially altered by human intervention, or which persist despite human intervention. For example, manufactured objects and human interaction generally are not considered part of nature, unless qualified as, for example, "human nature" or "the whole of nature". This more traditional concept of natural things which can still be found today implies a distinction between the natural and the artificial, with the artificial being understood as that which has been brought into being by a human consciousness or a human mind. Depending on the particular context, the term "natural" might also be distinguished from the unnatural or the supernatural.

I. Correct the false statements and translate them:

1. "Nature" can refer to the phenomena of the spiritual world
2. The study of nature is a small part of science.
3. The word nature is derived from the Greek word natura.
4. Within the various uses of the word today, "nature" often refers to biology and wildlife.
5. Nature is often taken to mean the "natural environment" or wilderness– domestic animals, rocks, forest.

II. Give the English for:

человеческая деятельность
явления природы
вселенная
неодушевленные предметы
различие

III. Give the Russian for:

in the broadest sense
a separate category
essential qualities
core applications
the various uses
human intervention
a human consciousness

IV. Answer the questions:

1. What is nature in the broadest sense?
2. What word is the word nature derived from?
3. What does "nature" often refer to?
4. Are manufactured objects and human interaction generally considered part of nature?
5. How is the artificial understood?

Earth

Earth is the third planet from the Sun and the only object in the Universe known to harbor life. According to radiometric dating and other sources of evidence, Earth formed over 4 billion years ago. Earth's gravity interacts with other objects in space, especially the Sun and the Moon, Earth's only natural satellite. Earth revolves around the Sun in 365.26 days, a period known as an Earth year. During this time, Earth rotates about its axis about 366.26 times.

Earth's axis of rotation is tilted, producing seasonal variations on the planet's surface. The gravitational interaction between the Earth and Moon causes ocean tides, stabilizes the Earth's orientation on its axis, and gradually slows its rotation. Earth is the densest planet in the Solar System and the largest of the four terrestrial planets.

Earth's lithosphere is divided into several rigid tectonic plates that migrate across the surface over periods of many millions of years. About 71% of Earth's surface is covered with water, mostly by oceans. The remaining 29% is land consisting of continents and islands that together have many lakes, rivers and other sources of water that contribute to the hydrosphere. The majority of Earth's polar regions are covered in ice, including the Antarctic ice sheet and the sea ice of the Arctic ice pack. Earth's interior remains active with a solid iron inner core, a liquid outer core that generates the Earth's magnetic field, and a convecting mantle that drives plate tectonics.

Within the first billion years of Earth's history, life appeared in the oceans and began to affect the Earth's atmosphere and surface, leading to the proliferation of aerobic and anaerobic organisms. Some geological evidence indicates that life may have arisen as much as 4.1 billion years ago. Since then, the combination of Earth's distance from the Sun, physical properties, and geological history have allowed life to evolve and thrive. In the history of the Earth, biodiversity has gone through long periods of expansion, occasionally punctuated by mass extinction events. Over 99% of all species that ever lived on Earth are extinct. Estimates of

the number of species on Earth today vary widely; most species have not been described. Over 7.6 billion humans live on Earth and depend on its biosphere and natural resources for their survival. Humans have developed diverse societies and cultures; politically, the world has about 200 sovereign states.

I. Correct the false statements and translate them:

1. According to radiometric dating and other sources of evidence, Earth formed over 4 million years ago.
2. Earth is the densest planet in the Solar System and the smallest of the four terrestrial planets.
3. Earth's lithosphere is divided into several soft tectonic plates that migrate across the surface over periods of many millions of years.
4. The majority of Earth's polar regions are covered in sand, including the Antarctic ice sheet and the sea ice of the Arctic ice pack.
5. Estimates of the number of species on Earth today vary widely; all species have been described.

II. Give the English for:

согласно чему-либо
взаимодействовать
поверхность
состоять из чего-то
свойство

III. Give the Russian for:

to harbor life
sources of evidence
rigid tectonic plates
to remain

to affect

extinction

IV. Answer the questions:

1. When did Earth form?
2. How many times does Earth rotate about its axis during an Earth year?
3. What does the gravitational interaction between the Earth and Moon cause?
4. How many terrestrial planets are there in the Solar System?
5. What has allowed life to evolve and thrive on Earth?

Weather

On Earth, the common weather phenomena include wind, cloud, rain, snow, fog and dust storms. Less common events include natural disasters such as tornadoes, hurricanes, typhoons and ice storms. Almost all familiar weather phenomena occur in the troposphere (the lower part of the atmosphere). Weather does occur in the stratosphere and can affect weather lower down in the troposphere, but the exact mechanisms are poorly understood.

Weather occurs primarily due to air pressure, temperature and moisture differences between one place to another. These differences can occur due to the sun angle at any particular spot, which varies by latitude from the tropics. In other words, the farther from the tropics one lies, the lower the sun angle is, which causes those locations to be cooler due the spread of the sunlight over a greater surface.

Because the Earth's axis is tilted relative to its orbital plane, sunlight is incident at different angles at different times of the year. In June the Northern Hemisphere is tilted towards the sun, so at any given Northern Hemisphere latitude sunlight falls more directly on that spot than in December.

The uneven solar heating (the formation of zones of temperature and moisture gradients, or frontogenesis) can also be due to the weather itself in the form of cloudiness and precipitation. Higher altitudes are typically cooler than lower altitudes, which the result of higher surface temperature and radiational heating. In some situations, the temperature actually increases with height.

The atmosphere is a chaotic system. As a result, small changes to one part of the system can accumulate and magnify to cause large effects on the system as a whole. This atmospheric instability makes weather forecasting less predictable than tides or eclipses. Although it is difficult to accurately predict weather more than a few days in advance, weather forecasters are continually working to extend this limit through meteorological research and refining current methodologies in

weather prediction. However, it is theoretically impossible to make useful day-to-day predictions more than about two weeks ahead, imposing an upper limit to potential for improved prediction skill.

I. Correct the false statements and translate them:

1. Almost all familiar weather phenomena occur in the stratosphere.
2. The farther from the tropics one lies, the higher the sun angle is.
3. In June the Northern Hemisphere is tilted towards the moon.
4. Higher altitudes are typically hotter than lower altitudes.
5. The atmosphere is an organized system.

II. Give the English for:

ураган
давление
полушарие
широта
затмение

III. Give the Russian for:

natural disasters
to occur
the sun angle
precipitation
to cause
to accurately predict
in advance

IV. Answer the questions:

1. What does the common weather phenomena include on Earth?
2. Where do almost all familiar weather phenomena occur?
3. What does weather occur primarily due to?
4. Why is sunlight incident at different angles at different times of the year?
5. What makes weather forecasting less predictable than tides or eclipses?

Environment (biophysical)

The biophysical environment is the biotic and abiotic surrounding of an organism or population, and consequently includes the factors that have an influence in their survival, development, and evolution. The biophysical environment can vary in scale from microscopic to global in extent. It can also be subdivided according to its attributes. Examples include the marine environment, the atmospheric environment and the terrestrial environment. The number of biophysical environments is countless, given that each living organism has its own environment.

The term environment is often used as a short form for the biophysical environment, e.g. the UK's Environment Agency. The expression "the environment" often refers to a singular global environment in relation to humanity.

All life that has survived must have adapted to conditions of its environment. Temperature, light, humidity, soil nutrients, etc., all influence any species, within any environment. However life in turn modifies, in various forms, its conditions. Some long term modifications along the history of our planet have been significant, such as the incorporation of oxygen to the atmosphere. This process consisted in the breakdown of carbon dioxide by anaerobic microorganisms that used the carbon in their metabolism and released the oxygen to the atmosphere. This led to the existence of oxygen-based plant and animal life, the great oxygenation event. Other interactions are more immediate and simple, such as the smoothing effect that forests have on the temperature cycle, compared to neighboring unforested areas.

Environmental science is the study of the interactions within the biophysical environment. Part of this scientific discipline is the investigation of the effect of human activity on the environment. Ecology, a sub-discipline of biology and a part of environmental sciences, is often mistaken as a study of human induced effects on the environment. Environmental studies is a broader academic discipline that is

the systematic study of interaction of humans with their environment. It is a broad field of study that includes the natural environment, built environments and social environments.

Environmentalism is a broad social and philosophical movement that, in a large part, seeks to minimise and compensate the negative effect of human activity on the biophysical environment. The issues of concern for environmentalists usually relate to the natural environment with the more important ones being climate change, species extinction, pollution, and old growth forest loss.

One of the studies related include employing Geographic Information Science to study the biophysical environment.

I. Correct the false statements and translate them:

1. The number of biophysical environments is limited, given that each living organism has its own environment.
2. Some long term modifications along the history of our planet have been significant, such as the incorporation of hydrogen to the atmosphere.
3. Environmental science is the study of the interactions within the biochemical environment.
4. Ecology, a sub-discipline of biology and a part of environmental sciences, is often mistaken as a study of animal induced effects on the environment.
5. Environmentalism is a narrow social and philosophical movement.

II. Give the Russian for:

влияние

подразделять

условия

существование

взаимодействие

III. Give the English for:

to vary

in extent

countless

humanity

significant

oxygenation event

IV. Answer the questions:

1. How can the biophysical environment vary?
2. What are the examples of environment according to its attributes?
3. What does the expression "the environment" often refers to?
4. What influences any species?
5. What does environmentalism seek to minimise and compensate?

Pollution

Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of chemical substances or energy, such as noise, heat or light. Pollutants, the components of pollution, can be either foreign substances/energies or naturally occurring contaminants.

Air pollution has always accompanied civilizations. Pollution started from prehistoric times when man created the first fires. According to a 1983 article in the journal Science, "soot" found on ceilings of prehistoric caves provides ample evidence of the high levels of pollution that was associated with inadequate ventilation of open fires." Metal forging appears to be a key turning point in the creation of significant air pollution levels outside the home. Core samples of glaciers in Greenland indicate increases in pollution associated with Greek, Roman and Chinese metal production, but at that time the pollution was comparatively small and could be handled by nature.

Air pollution comes from both natural and human-made (anthropogenic) sources. However, globally human-made pollutants from combustion, construction, mining, agriculture and warfare are increasingly significant in the air pollution equation.

Motor vehicle emissions are one of the leading causes of air pollution. China, United States, Russia, India, Mexico, and Japan are the world leaders in air pollution emissions. Principal stationary pollution sources include chemical plants, coal-fired power plants, oil refineries, petrochemical plants, nuclear waste disposal activity, incinerators, large livestock farms (dairy cows, pigs, poultry, etc.), PVC factories, metals production factories, plastics factories, and other heavy industry. Agricultural air pollution comes from contemporary practices which include clear felling and burning of natural vegetation as well as spraying of pesticides and herbicides

Some of the more common soil contaminants are chlorinated hydrocarbons (CFH), heavy metals (such as chromium, cadmium–found in rechargeable batteries, and lead–found in lead paint, aviation fuel and still in some countries, gasoline), MTBE, zinc, arsenic and benzene.

Pollution can also be the consequence of a natural disaster. Larger scale and environmental damage is not uncommon when coastal oil rigs or refineries are involved. Some sources of pollution, such as nuclear power plants or oil tankers, can produce widespread and potentially hazardous releases when accidents occur.

In the case of noise pollution the dominant source class is the motor vehicle, producing about ninety percent of all unwanted noise worldwide.

Pollution control is a term used in environmental management. It means the control of emissions and effluents into air, water or soil. Without pollution control, the waste products from overconsumption, heating, agriculture, mining, manufacturing, transportation and other human activities, whether they accumulate or disperse, will degrade the environment. In the hierarchy of controls, pollution prevention and waste minimization are more desirable than pollution control. In the field of land development, low impact development is a similar technique for the prevention of urban runoff.

I. Correct the false statements and translate them:

1. Pollution can take the form of geographical substances or energy, such as noise, heat or light.
2. Pollution started from prehistoric times when man created the first houses.
3. Motor vehicle emissions are one of the leading causes of soil pollution.
4. In the case of noise pollution the dominant source class is the loud music.
5. Pollution control means the reduction of emissions and effluents into air, water or soil.

II. Give the Russian for:

химические вещества

источник

значительный

химические заводы

тяжёлая промышленность

транспортные средства

III. Give the English for:

contaminant

pollutants

samples of glaciers

combustion

mining

motor vehicle emissions

oil refineries

consequence

waste minimization

IV. Answer the questions:

1. What form can pollution take?
2. When did pollution start?
3. What does core samples of glaciers in Greenland indicate?
4. What is one of the leading causes of air pollution?
5. What does term pollution control mean?

Water on Earth

Part I

Water is a transparent and nearly colorless chemical substance that is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living organisms. Its chemical formula is H2O, meaning that each of its molecules contains one oxygen and two hydrogen atoms that are connected by covalent bonds. Strictly speaking, water refers to the liquid state of a substance that prevails at standard ambient temperature and pressure; but it often refers also to its solid state (ice) or its gaseous state (steam or water vapor). It also occurs in nature as snow, glaciers, ice packs and icebergs, clouds, fog, dew, aquifers, and atmospheric humidity.

Water covers 71% of the Earth's surface. It is vital for all known forms of life. On Earth, 96.5% of the planet's crust water is found in seas and oceans, 1.7% in groundwater, 1.7% in glaciers and the ice caps of Antarctica and Greenland, a small fraction in other large water bodies, 0.001% in the air as vapor, clouds (formed of ice and liquid water suspended in air), and precipitation. Only 2.5% of this water is freshwater, and 98.8% of that water is in ice (excepting ice in clouds) and groundwater. Less than 0.3% of all freshwater is in rivers, lakes, and the atmosphere, and an even smaller amount of the Earth's freshwater (0.003%) is contained within biological bodies and manufactured products. A greater quantity of water is found in the earth's interior.

Water on Earth moves continually through the water cycle of evaporation and transpiration (evapotranspiration), condensation, precipitation, and runoff, usually reaching the sea. Evaporation and transpiration contribute to the precipitation over land. Large amounts of water are also chemically combined or adsorbed in hydrated minerals.

Safe drinking water is essential to humans and other lifeforms even though it provides no calories or organic nutrients. Access to safe drinking water has improved over the last decades in almost every part of the world, but

approximately one billion people still lack access to safe water and over 2.5 billion lack access to adequate sanitation. However, some observers have estimated that by 2025 more than half of the world population will be facing water-based vulnerability. A report, issued in November 2009, suggests that by 2030, in some developing regions of the world, water demand will exceed supply by 50%.

Water plays an important role in the world economy. Approximately 70% of the freshwater used by humans goes to agriculture. Fishing in salt and fresh water bodies is a major source of food for many parts of the world. Much of long-distance trade of commodities (such as oil and natural gas) and manufactured products is transported by boats through seas, rivers, lakes, and canals. Large quantities of water, ice, and steam are used for cooling and heating, in industry and homes. Water is an excellent solvent for a wide variety of chemical substances; as such it is widely used in industrial processes, and in cooking and washing. Water is also central to many sports and other forms of entertainment, such as swimming, pleasure boating, boat racing, surfing, sport fishing, and diving.

Oceans

An ocean is a major body of saline water, and a principal component of the hydrosphere. Approximately 71% of the Earth's surface (an area of some 361 million square kilometers) is covered by ocean, a continuous body of water that is customarily divided into several principal oceans and smaller seas. More than half of this area is over 3,000 meters deep. Average oceanic salinity is around 35 parts per thousand (ppt) (3.5%), and nearly all seawater has a salinity in the range of 30 to 38 ppt. Though generally recognized as several 'separate' oceans, these waters comprise one global, interconnected body of salt water often referred to as the World Ocean or global ocean. This concept of a global ocean as a continuous body of water with relatively free interchange among its parts is of fundamental importance to oceanography.

The major oceanic divisions are defined in part by the continents, various archipelagos, and other criteria: these divisions are (in descending order of size)

the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean, and the Arctic Ocean. Smaller regions of the oceans are called seas, gulfs, bays and other names. There are also salt lakes, which are smaller bodies of landlocked saltwater that are not interconnected with the World Ocean. Two notable examples of salt lakes are the Aral Sea and the Great Salt Lake.

I. Correct the false statements and translate them:

1. Chemical formula of water is H2O, meaning that each of its molecules contains one oxygen and two hydrogen atoms that are connected by valence bonds.
2. On Earth, 96.5% of the planet's crust water is found in rivers.
3. Evaporation and transpiration contribute to the precipitation over ocean.
4. Safe drinking water is essential to humans and other lifeforms, it provides a lot of calories and organic nutrients.
5. Approximately 70% of the freshwater used by humans goes to construction.
6. An ocean is a major body of fresh water, and a principal component of the hydrosphere.

II. Give the Russian for:

составная часть

жидкое состояние

твердое состояние

осадки

приблизительно

разделять

III. Give the English for:

transparent

prevail

atmospheric humidity

evaporation

organic nutrients

a major source

solvent

interconnected

V. Answer the questions:

1. What does water refer to?
2. How does water occur in nature?
3. How does water on earth move?
4. Do all people have access to safe water?
5. What role does water play in the world economy?
6. How much of the Earth's surface is covered by ocean?
7. What is the World Ocean or global ocean?

Water on Earth

Part II

Lakes

A lake (from Latin lacus) is a terrain feature (or physical feature), a body of liquid on the surface of a world that is localized to the bottom of basin (another type of landform or terrain feature; that is, it is not global) and moves slowly if it moves at all. On Earth, a body of water is considered a lake when it is inland, not part of the ocean, is larger and deeper than a pond, and is fed by a river. The only world other than Earth known to harbor lakes is Titan, Saturn's largest moon, which has lakes of ethane, most likely mixed with methane. It is not known if Titan's lakes are fed by rivers, though Titan's surface is carved by numerous river beds. Natural lakes on Earth are generally found in mountainous areas, rift zones, and areas with ongoing or recent glaciation. Other lakes are found in endorheic basins or along the courses of mature rivers. In some parts of the world, there are many lakes because of chaotic drainage patterns left over from the last Ice Age. All lakes are temporary over geologic time scales, as they will slowly fill in with sediments or spill out of the basin containing them.

Ponds

A pond is a body of standing water, either natural or man-made, that is usually smaller than a lake. A wide variety of man-made bodies of water are classified as ponds, including water gardens designed for aesthetic ornamentation, fish ponds designed for commercial fish breeding, and solar ponds designed to store thermal energy. Ponds and lakes are distinguished from streams via current speed. While currents in streams are easily observed, ponds and lakes possess thermally driven micro-currents and moderate wind driven currents. These features distinguish a pond from many other aquatic terrain features, such as stream pools and tide pools.

Rivers

A river is a natural watercourse, usually freshwater, flowing toward an ocean, a lake, a sea or another river. In a few cases, a river simply flows into the ground or dries up completely before reaching another body of water. Small rivers may also be called by several other names, including stream, creek, brook, rivulet, and rill; there is no general rule that defines what can be called a river. Many names for small rivers are specific to geographic location; one example is Burn in Scotland and North-east England. Sometimes a river is said to be larger than a creek, but this is not always the case, due to vagueness in the language. A river is part of the hydrological cycle. Water within a river is generally collected from precipitation through surface runoff, groundwater recharge, springs, and the release of stored water in natural ice and snowpacks (i.e., from glaciers).

Streams

A stream is a flowing body of water with a current, confined within a bed and stream banks. In the United States, a stream is classified as a watercourse less than 60 feet (18 metres) wide. Streams are important as conduits in the water cycle, instruments in groundwater recharge, and they serve as corridors for fish and wildlife migration. The biological habitat in the immediate vicinity of a stream is called a riparian zone. Given the status of the ongoing Holocene extinction, streams play an important corridor role in connecting fragmented habitats and thus in conserving biodiversity. The study of streams and waterways in general involves many branches of inter-disciplinary natural science and engineering, including hydrology, fluvial geomorphology, aquatic ecology, fish biology, riparian ecology, and others.

I. Correct the false statements and translate them:

1. On Earth, a body of water is considered a lake when it is inland, not part of the ocean, is larger and deeper than a pond, and is fed by a sea.
2. Natural lakes on Earth are seldom found in mountainous areas, rift zones, and areas with ongoing or recent glaciation.

3. A pond is a body of standing water, only natural, that is usually smaller than a lake.
4. Ponds and lakes are distinguished from streams via size and shape.
5. A stream is a flowing body of water without a current.
6. In the United States, a stream is classified as a watercourse more than 60 feet (18 metres) wide.

II. Give the Russian for:

пруд

осадок

различать

течение

ручей

III. Give the English for:

the bottom of basin

to harbor

rift zones

fish breeding

spring

riparian zone

biodiversity

IV. Answer the questions:

1. What is considered a lake on Earth?
2. Where are natural lakes generally found on Earth?
3. What is a pond?
4. How are ponds and lakes distinguished from streams?
5. Where does a river flow?

6. What is water within a river generally collected from?
7. Why are streams important?

Will species die as the Earth Heats Up?

Our planet is warming because of human activity, and that may contribute to mass extinctions in our lifetimes

By Thomas A. Lewis

Part 1

THE PLANET EARTH seems to have a slight fever. It can not be discerned readily, only as a slowly-emerging pattern obscured by short-term fluctuations. But scientists now generally agree that the average temperature of the global atmosphere has been increasing for a century, and will likely continue to do so throughout the next.

The apparent cause of this temperature increase is human activity. In spreading across the globe, humans and their increasingly complex technology have continuously spewed various substances into their environment. One of these, not much noticed until recent years, has been a largely innocent gas called carbon dioxide, generated by a number of natural life processes, and in recent times, by the burning of fossil fuels. During the last century, most climatologists now agree, a man-made buildup of carbon dioxide and other gases has increased the amount of solar heat retained in the lower atmosphere — a process that has come to be known as the greenhouse effect.

For a number of years, experts have been discussing what might happen if the fever continues, as expected, to climb. Thermal expansion of the oceans and the melting of glaciers could cause sea levels to rise five feet during the next century, inundating coastal wetlands and developments. If substantial heating were to continue, partial melting of the south polar ice cap could eventually flood entire cities.

What has not been discussed, until very recently, is the question of what these changes will do to wild plants and animals, particularly those already threatened with extinction. But Peters has noticed two new factors in the

greenhouse equation that may have serious and far-reaching consequences for ecosystems and wildlife. For one thing, he says, this climate change will be much faster than past warmings or coolings of the Earth, outracing the ability of many species to adapt. For another, the changes will find thousands of species blocked by farm fences and fields, four-lane highways, housing developments and other man-made barriers as they try to escape to cool safety near the poles or at higher altitudes. The very refuges and parks now set aside to preserve wildlife may prove to be deadly traps.

The combined effects of these influences may mean mass extinctions within the next hundred years, especially since they are happening during a time when species are already at unprecedented risk. “There is reason to believe,” says Peters, “that the impact on the natural world could rival that of the last Ice Age.”

The diagnosis of the fever — that the world’s average temperature has increased less than a degree Fahrenheit during the past century — seems at first glance an underwhelming statistic. But the current prognosis is that the average temperature (now 59 degrees F) will continue to climb between three and eight more degrees during the next century, possibly the next 50 years. This would make the Earth warmer than at any time in the last 100,000 years.

How much harm could result from a change of a few degrees? Consider what happened in the American South during the summer of 1986 — a single season of higher- than-average temperatures and lower-than- normal rainfall. The wood duck population plummeted when hatchlings emerged from their nests to find themselves on dry ground, vulnerable to their predators, instead of safely afloat. Many quail eggs did not hatch at all because of the heat and drought. Alligator nests, ordinarily inaccessible in their boggy swamps, were ravaged by raccoons and bears taking advantage of the firmer ground. Immature acorns began dropping three months earlier than usual, thus greatly reducing the all-important winter food supply for much of the area’s wildlife.

I. Correct the false statements and translate them:

1. Scientists now generally agree that the average temperature of the global ocean has been increasing for a century.
2. The apparent cause of this temperature increase is the environment .
3. Most climatologists now disagree, a man-made buildup of carbon dioxide and other gases has decreased the amount of solar heat retained in the lower atmosphere.
4. The melting of glaciers could cause river levels to fall five feet during the next century.
5. The current prognosis is that the average temperature (now 59 degrees F) will continue to fall between three and eight more degrees during the next millennium, possibly the next 70 years.
6. This would make the Earth warmer than at any time in the last century.

II. Give the English for:

вещества
окружающая среда
южный полюс
неизбежное последствие
парниковый эффект

III. Give the Russian for:

a slight fever
short-term fluctuations
trend
profound implications
mass extinctions
carbon dioxide

fossil fuels

thermal expansion of the oceans

the melting of glaciers

at higher altitudes

IV. Answer the questions:

1. What can you say about the average temperature of the global atmosphere?
2. What is the apparent cause of this temperature increase?
3. What is the greenhouse effect?
4. What could cause sea levels to rise five feet during the next century?
5. What may the combined effects of these influences mean?
6. How much harm could result from a change of a few degrees?

Will species die as the Earth Heats Up?

Part 2

Such short-term heat waves and droughts are common events, of course; even drastic, long-lived changes in climate have occurred many times before. During the billion years that life has been on the land, much of the Earth has been a hot place. Only during seven ice eras, each millions of years in length, has the climate cooled to levels familiar to humans. Each of these periods was apparently studed with dozens of ice ages, followed by milder periods called interglacials.

Trees and grasses and shrubs and animals were able to shift away from the advancing cold, then back again with the returning warmth, since the changes were relatively slow, taking place over hundreds, perhaps thousands of years. During a warming trend, individuals in the hotter extremes of their range generally faced the biggest difficulties while those in more temperate regions survived, often moving into new territory. This dispersal was facilitated on the American continents by the absence of such barriers as east-west mountain ranges. Peters points out that during previous interglacials, "Osage oranges grew near Toronto, manatees swam in New Jersey, wild pigs foraged in Pennsylvania and Cape Cod had a forest like that of present-day North Carolina."

Even at that glacial pace, however, many species lost the race for survival, either because they could not move fast enough or because something prevented them from moving far enough. In Europe, the advancing glaciers trapped many species between the unstoppable surges of cold and such immovable barriers as the Pyrenees, the Alps or the Mediterranean. The sweet gum, tulip poplar, magnolia and hemlock trees, once plentiful in Europe, were squeezed out of existence there while they survived in the open spaces of North America.

This time, says Peters, if the greenhouse effect is working as expected, the warmup will occur within a few decades. In the Northern Hemisphere the areas where present vegetation can live will shift long distances, perhaps 200 miles

northward, during the next century, he says. This seems a leisurely pace until one compares it with the average speed with which vegetation can move; dispersal rates for many North American tree species are under 25 miles per century.

But even if we were to lose some trees— a forest here, a swamp there—surely wild animals would simply move on to better habitat, as they have done during previous ice ages and interglacials? Probably so, if this were a previous ice age or interglacial . But today's species are faced by that endless array of human barriers. A city is as effective as a mountain range in preventing the propagation of a forest.

In 1982, for instance, when drought struck Botswana's Kalahari Desert, a quarter of a million thirsty wildebeest migrated north to traditional watering points. Many never made it. Some 80,000 were funneled into one small area of range. Blocking their route to water was a 100-mile-long fence built to protect cattle from disease. Scores of the antelopes died.

Just as in the Botswana drought, the refuges that constitute humankind's principal effort to preserve the world's biological diversity—parks, national forests, wildlife sanctuaries, wilderness areas and the like—may well prove to be traps should a rapid climate change take place. In the 200-mile shift of habitat envisioned, no parks will be large enough to provide scope for the dispersal required. Because their habitat abruptly ends, countless plant and animal species could be caught against the boundaries of these reserves and extinguished there.

The threat would seem to be much less for such mobile and abundant animals as deer, which are physically capable of moving to new areas. But Peters points out that some deer species are wedded to certain combinations of cover and browse, and by habit move surprisingly short distances in their lifetimes—just a mile or two per year. They may be unwilling or unable to move away from familiar habitat even if it is drought-stricken.

The implications of the Peters scenario for the management of national parks and reserves designed to protect wildlife and plants are staggering. “Conservationists have tended to assume a constant climate,” he writes, “as though, once we have preserved a piece of a community from the immediate threats of development, we have saved it in perpetuity. Now we know this is not so.”

The preservation of existing species during a drastic climate change in the Northern Hemisphere, he says, might require such measures as dramatic northward expansion of present reserves; heroic efforts to maintain the suitability of existing reserves by artificial means, such as irrigation; or the physical transportation and introduction of species to other reserves. Even if technically possible, notes Peters, such efforts will be “costly and perpetual.”

While it is too early to expect any country to undertake such astronomically expensive measures, it is also too late to ignore the possible consequences of taking no action at all. “We need more knowledge,” says Peters. “We must refine our ability to predict future conditions in reserves. We also need to know more about how temperature, precipitation, carbon dioxide concentrations and interspecific interactions determine range limits.”

There are signs of a growing consensus in the scientific community that the need for such research is urgent. When Peters proposed a symposium on the possibility of mass extinctions because of the greenhouse effect, he received support from such U.S. organizations as the Environmental Protection Agency and the Smithsonian Institution. The gathering is scheduled for the spring of 1988.

In the meantime, Peters is campaigning for increased awareness of the potential danger, and for some appropriate interim measures. Although not many new parks and refuges are being created these days, he recommends that special attention be paid to preserving, expanding and creating reserves that are topographically diverse. Species can much more easily shift a short distance up a mountain than a long distance cross-country; a 1,600-foot increase in altitude is

roughly equivalent, in terms of climate change, to a 200-mile trip toward the poles. Overall, he says, the appropriate rule of thumb for a changing Earth is: “Don’t put your reserves where your species won’t be.”

For the moment, despite the slight fever, the patient remains vigorous and generally healthy. But more and more experts are watching the various temperature readings and test results with furrowed brows. More tests are being requested, more information sought, and there is an increasing sense of urgency as the fever continues to climb.

I. Correct the false statements and translate them:

1. Such long-term heat waves and droughts are common events, of course .
2. During the million years that life has been on the land, much of the Earth has been a cold place.
3. In the Northern Hemisphere the areas where present vegetation can live will shift long distances, perhaps 200 miles northward, during the next decade.
4. The threat would seem to be much less for such mobile and abundant animals as fox, which are physically capable of moving to new areas.
5. When drought struck Botswana’s Kalahari Desert, a million thirsty wildebeest migrated north to traditional watering points.

II. Give the English for:

виды
меры
развитие
засуха
дикие животные
мигрировать на север
Северное полушарие

III. Give the Russian for:

glacial pace
better habitat
the propagation of a forest
implications
to undertake
precipitation
topographically diverse
put your reserves

IV. Answer the questions:

1. What periods are called interglacials?
2. What will these changes do to wild plants and animals?
3. What did individuals face in the hotter extremes of their range?
4. Did many species lose the race for survival?
5. What are today the species faced by?
6. What happened in 1982?

V. Make up the nouns

1. Global
2. To contribute
3. Possibly
4. Active
5. To discuss
6. To alter
7. Safe
8. Absent
9. To survive
10. To exist

VI. Speak about the Earth heating up.

Report Urges Greenhouse Action Now

Part 1

As Earth stands on the brink of a global temperature increase unprecedented in the history of human civilization, the international scientific and policy communities are mobilizing to minimize the effects of a greenhouse warming. Scientists' views of the future are as murky as ever, but there is a new sense of urgency, fueled in part by disquieting surprises in the stratosphere.

The U.S. droughts and the century-long global warming culminating in the 1980s (Science, 5 February, p. 559, and 13 May, p. 883) are catching the public's attention, despite scientists' refusal to link any one climate extreme to the greenhouse. Even the claim by a lone expert that the greenhouse has arrived has failed to gain support from other scientists.

Instead, it is basic scientific understanding, the dearth of time for effective action, and a growing uneasiness about man's fiddling with the atmosphere that is driving a new international organizing process. This movement is akin to the one that J recently produced agreement on how to deal with destruction of stratospheric ozone.

The international approach to greenhouse control took on a high public profile with the release of a report this month calling for more study but also immediate action. The report is the product of a process initiated and monitored by three major international organizations— the United Nations Environment Program (UNEP), the World Meteorological Organization (WMO), and the International Council of Scientific Unions. The three sponsored a conference in Villach, Austria, in 1985 that led to two 1987 workshops, one in Villach and the second in Bellagio, Italy.

The Bellagio report does not draw on any fundamentally new evidence, but it does project the future warming in some novel ways. Instead of emphasizing the oft-quoted 1.5° to 4.5°C global warming expected with a doubling of carbon

dioxide, the primary greenhouse gas, the report estimates rates of temperature increase due to carbon dioxide plus other greenhouse gases. In a worst case scenario, in which greenhouse gas emissions are unrestrained and the climate is highly sensitive, the estimated rate is 0.8°C per decade. That is 16 times faster than the average rate of past century's warming.

An extrapolation from present emission trends and moderate climate sensitivity yields a rate of 0.3°C per decade. At that rate, after 20 years Chicago's summers would be as warm as New Orleans' are now. A lower bound scenario that assumes strong global restraint of emissions and low climate sensitivity produces only 0.06°C warming per decade, or about the rate of the past century. That would still carry Earth by late in the next century into a climate as warm as any for hundreds of thousands of years.

The warming could hardly go unnoticed. The sea would warm and expand while glaciers melt, pushing up sea level about 30 centimeters by the middle of the next century and possibly as much as 1.5 meters. Even the more modest rise would erode most sandy beaches along the U.S. Atlantic and Gulf Coasts at least 30 meters. The heat and some regional dryness would disrupt agriculture in some places, especially semiarid regions where agriculture is marginal to begin with.

Unmanaged ecosystems would not be as lucky as agriculture, according to the report. Each 1°C of warming pushes climatic zones 100 to 150 kilometers northward. By the mid-21st century, the climate that nurtures Yellowstone National Park could be well into Canada. The tundra of the Arctic National Wildlife Refuge could be pushed into the sea. If forests are pushed too fast, they would not migrate northward fast enough to keep up. As Michael Oppenheimer of the Environmental Defense Fund, a steering committee member, has noted, the conservation ethic would not pertain to a world in which there is no stability, only change.

Uncertainties remain, the report notes, but the assumption that the climate of the past century is a reliable guide to the future "is no longer valid." A prudent

response would be twofold, the report says. The first, adaptation to climate change, may already be under way. Beach front property owners arc building sea walls or abandoning the beach altogether . The second, limitation of climate change by reducing greenhouse gas emissions, will be inevitable as the cost of adapting becomes prohibitive.

And policy-makers cannot wait to act, argues the report. “If decision-makers were to wait until the scientific uncertainty is ‘acceptably1 small, most policy responses would be too late.” That is because the lead times involved are huge by society’s standards. The thermal inertia of the oceans delays the warming itself by several decades. On top of that are the 30- to 50-year delays inherent in society’s responses, such as intro during alternatives to burning fossil fuels.

I. Correct the false statements and translate them:

1. The international scientific and economic communities are mobilizing to minimize the effects of a greenhouse warming.
2. The report is the product of a process initiated and monitored by Russia.
3. The warming went unnoticed.
4. The air would warm and expand while glaciers melt.
5. Can we stop global warming? What should be done to stop global warming?

II. Give the English for:

научные сообщества
минимизировать последствия
недостаток времени
разрушение
часто цитируемый
выбросы газа
средний показатель

III. Give the Russian for:

sense of urgency
a growing uneasiness
a growing uneasiness
initiated and monitored by smth
a high public profile
emphasizing
with the release of a report
extrapolation
to become prohibitive

IV. Answer the questions:

1. What are scientists' views of the future?
2. What could happen to the tundra of the Arctic National Wildlife Refuge?
3. What are beach front property owners building?
4. Why will limitation of climate change by reducing greenhouse gas emissions be inevitable?

Report Urges Greenhouse Action Now

Part 2

The Bellagio report recommends some immediate responses to the greenhouse threat, many of which can be justified solely on other grounds. At the top of the list is prompt approval and implementation of the Montreal Protocol on ozone. Chlorofluorocarbons both destroy stratospheric ozone and act as a greenhouse gas. The Protocol's provisions would lead to a 15% to 25% decrease in the rate of warming.

Long-term energy policies should be reexamined, the report says. Increased efficiency in the consumption of energy would reduce carbon dioxide emissions. So would a shift toward alternative energy sources such as solar energy and nuclear power. Emissions per unit of energy would decrease with a shift away from coal, a high carbon dioxide-emitting fuel , toward natural gas.

Deforestation has numerous drawbacks, the release of carbon dioxide being one that should now be considered. Reforestation would remove carbon dioxide from the atmosphere, among other benefits.

The report also advocates immediate steps to improve understanding of the greenhouse effect and clarify the options for dealing with it, including consideration of a law of the atmosphere, like the Law of the Sea, or a convention such as the one for ozone. The likely effects of the greenhouse are so large that "a coordinated international response seems inevitable and rapid movement towards it is urged," the report concludes.

The ozone hole is among the reasons that major environmental groups such as the Environmental Defense Fund and the World Resources Institute are starting to put time and money into the problem. But that placed it thirteenth out of 16 problems, beating out only x-rays, indoor radon, and radiation from microwave ovens. ■ Richard A. Kerr

I. Correct the false statements and translate them:

1. Stratospheric ozone both destroy chlorofluorocarbons and act as a greenhouse gas.
2. The Protocol's provisions would lead to a 15% to 25% increase in the rate of warming.
3. Short-term energy policies should be reexamined, the report says.
4. Increased efficiency in the consumption of energy would reduce ozone emissions.

II. Give the English for:

многочисленные недостатки
ядерная энергия
возможные последствия
общественное сознание
рентгеновское излучение
излучение

III. Give the Russian for:

Chlorofluorocarbons
stratospheric ozone
prompt approval and implementation
carbon dioxide

d

deforestation
convention

IV. Answer the questions:

1. What does the Bellagio report recommend?
2. What would increased efficiency in the consumption of energy reduce?
3. What would reforestation remove from the atmosphere?
4. What can you say about the future of our ecosystem?
5. What must be done to preserve nature for the future generation?
6. Do you think that environment protection is government responsibility? Why?

Earthquakes

An earthquake is one of the worst natural disasters on our earth. We think that the ground we stand on is very stable, but it isn't. It moves quite a lot. Earthquakes happen when there is a sudden vibration in the earth's crust. It's like a large lorry that travels down your street. When it passes by, you feel your house shake.

Earthquakes can be caused by a lot of things:

• Volcanoes that suddenly erupt
• Meteorites that hit the earth
• Undergrounds explosions

But most earthquakes happen because the earth's plates move.

Some plates slide past each other— for example, one moves north and the other moves south. When these plates move along faults a lot of energy is released and the biggest earthquakes happen.

We only hear about earthquakes once in a while, but they really happen every day. There are more than 3 million earthquakes every year—about 8,000 every day or one every 11 seconds.

But most of them are very weak or they happen in places where nobody lives. Some of them take place on the sea floor.

Where do earthquakes happen?

Earthquakes occur all over the world but there are places where they happen more often. Big earthquakes can be found where plates meet.

80% of the world's earthquakes happen around the Pacific Ocean—near the east coast of Asia and the west coast of America. Japan has over 2,000 earthquakes every year and California and South America are also very active earthquake zones. The edge of the Pacific Ocean is also called the "Ring of Fire" because there are also many active volcanoes in this region.

Man-made earthquakes

Sometimes people can make earthquakes happen. They can fill man-made lakes with water after building a dam—or they test atomic bombs underground. Some of these tests can help scientists find out how quakes happen.

How earthquakes are measured

With a machine called a seismograph scientists can tell where an earthquake happened and how strong it was.

The place in the earth where the movement takes place is called the focus or hypocentre. From here, waves start to spread out in all directions. This focus can be very near to the surface or it can be hundreds of km below it. The area on the surface exactly above the focus is called the epicentre. This is the place where the waves hit first and where the most damage is done.

Whenever an earthquake hits us you hear how powerful it is. The Richter Scale is used to rate the magnitude of earthquakes. Small quakes have a rating of under 4. You won't see a lot of damage here. Medium-sized earthquakes reach between 5 and 7 on the scale, and the really big ones are above 7. The largest earthquake that has ever been registered was at 9.5 on the Richter scale.

There are more than 100 seismograph stations all over the world. When the earth shakes seismologists compare the information they get and then they can tell where the earthquake really happened.

Effects of earthquakes

Earthquakes make the ground move. Buildings shake and many of them collapse. Landslides also happen when rocks get loose.

Another danger is fire. In 1906 San Francisco was hit by a big earthquake and many houses burned down because they were made of wood.

When an earthquake occurs on the sea floor, big waves - called tsunamis - hit the coast. They often come without any warning and they kill many people and destroy buildings and streets near the coast.

Earthquakes also can lead to diseases, especially in developing countries. When water supplies are destroyed people don't have safe water to drink. Sometimes earthquakes also hit hospitals where injured people are treated.

Dealing with earthquakes

We understand earthquakes a lot better today than we did 50 years ago, but we still can't do very much about them. They are so powerful, that we cannot control them.

Scientists can tell us in which regions earthquakes will probably happen, but they can't tell us exactly where.

So what can we do about earthquakes? We can make our houses we live in and buildings we work in safer. Today architects use materials that won't collapse when an earthquake hits—like steel and concrete.

The biggest earthquakes in history

1138 An earthquake in Aleppo, Syria kills 230,000

1556 The deadliest earthquake in history hits Shensi province in China. Almost 1 million people are killed.

1908 Messina, Sicily is totally destroyed by a large earthquake. About 70,000 people are killed.

1923 Tokyo, Japan is destroyed by an earthquake with a magnitude of 8.3. 150,000 people are killed.

1976 The biggest earthquake ever recorded in China leaves 242,000 people dead.

I. Correct the false statements and translate them:

1. Earthquakes can be caused by the greenhouse effect.
2. The ground we stand on is not very stable.
3. Earthquakes happen every day: one every 11 seconds.
4. But most of them are very strong or they happen in places where many people live.

5. Earthquakes also can lead to diseases.
6. California and South America are very passive earthquake zones.
7. People test atomic bombs underground. It can make earthquakes happen.

II. Give the English for:

землетрясение
подземные взрывы
эпицентр
западное побережье Америки
шкала Рихтера

III. Give the Russian for:

energy is released
Man-made earthquakes
San Francisco was hit by a big
natural disasters
without warning
the earth's plates move
Sicily is totally destroyed

IV. Answer the questions:

1. Why do most earthquakes happen?
2. Where do earthquakes happen?
3. What do you know about man-made earthquakes?
4. How can scientists tell where an earthquake happened and how strong it was?

5. What is the hypocenter?
6. What is called the epicenter?
7. Why is the Richter Scale used?
8. What are the effects of earthquakes?
9. What is tsunami ?
10. What biggest earthquakes in history do you know?

Global Warming

Scientists made an alarming discovery in the 1980s. They found out that the average temperature of the Earth's surface was slowly rising. This trend is called global warming. Today we know that global warming is increasing because more and more gases get into the atmosphere.

Greenhouse effect

A greenhouse is a glass house in which plants grow. The glass lets light in and at the same time keeps heat from getting out. This heat keeps the plants warm, even when it is cold outside. The same happens to the Earth's atmosphere. It lets sunlight in and keeps carbon dioxide and other gases from getting out. We need these gases but too much of them trap more heat.

Causes of global warming

For a long time people on our Earth didn't think a lot about greenhouse gases. The situation changed when people started using more and more energy in the form of fossil fuels, like oil, gas and coal. We burn fossil fuels to power factories, run cars, produce electricity and heat houses. As fossil fuels burn they let carbon dioxide into the atmosphere.

During the last few decades people have also cut down many forests. Trees use carbon dioxide when they make their own food. Fewer trees mean that less carbon dioxide is taken out of the atmosphere.

Possible effects of global warming

Scientists have different opinions on how warm the Earth's surface will really get. The increase may be between 1.5° C and 6° C by the year 2100. Warmer weather will make ice caps and glaciers melt. Sea levels could rise dramatically. Plants, animals and people living in coastal areas all could be in danger. The weather may change in many areas of the world. Floods, droughts and damaging storms could be the result.

People in colder regions might welcome warmer weather but those who live in regions that are already hot may suffer from new diseases. At the same time some animals may not survive because they cannot adapt to the new environment. They could move to other places in order to live there.

Reducing global warming

Finding a solution to solve the world's biggest environmental problem is not an easy task. Although we need energy to make our economy grow there are things that could be done to fight off this problem. Carpools or travelling by public transport could take many cars off the roads. You could turn off lights, TV sets, computers and other electrical items if you don't need them. Companies have been spending a lot of money to produce items that use little energy.

We also need to use more alternative energy, like sunlight, wind power or wave power. Car companies have started to produce a new type of cars known as hybrids. It works like an electric car but also has a small petrol engine.

I. Correct the false statements and translate them:

1. As fossil fuels burn they let carbon dioxide into the atmosphere.
2. Trees use oxygen when they make their own food.
3. More trees mean that less carbon dioxide is taken out of the atmosphere.
4. Warmer weather will make ice caps and glaciers melt.

II. Give the English for:

глобальное потепление
общественный транспорт
ледники
уровень моря

III. Give the Russian for:

an alarming discovery

survive

few decades

fossil fuels

IV. Answer the questions:

1. What is called global warming?
2. Why is global warming increasing?
3. What are possible effects of global warming?
4. Can people reduce global warming?

Список использованных источников

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