

# ***Ships in the Desert***

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# Study the title

What does the title remind you of?



Environment

# Type of Writing

Exposition:

to inform or to explain.

Ways of developing an exposition:

- By comparison and contrast;
- By definition;
- By example / illustration;
- By classification;
- By cause and effect

# Organization

Part I (para 1-9) images of environmental destruction and our response.

Part II (para 10-20) classification of environmental problems and their causes.

Part III (para 21-26) Solution

# Aral Sea

(source: <http://www.envis.maharashtra.gov>)





# Aral Sea

The Aral Sea is situated in Central Asia, between the Southern part of Kazakhstan(哈萨克斯坦) and Northern Uzbekistan.

Up until the third quarter of the 20th century it was the world's fourth largest saline lake, and contained 10grams of salt per liter.



# Aral Sea

The Soviet government decided in the 1960s to divert those rivers so that they could irrigate the desert region surrounding the Sea in order to favor agriculture rather than supply the Aral Sea basin.

The water level in the Aral Sea started drastically decreasing from the 1960s onward. In normal conditions, the Aral Sea gets approximately one fifth of its water supply through rainfall, while the rest is delivered to it by the Amu Darya (阿姆河) and Syr Darya (锡尔河) rivers. Evaporation causes the water level to decrease.



## The Aral Sea

Image sources: [www.alexandre.leroux.net/water/pictures/boat\\_over\\_aral\\_sea.jpg](http://www.alexandre.leroux.net/water/pictures/boat_over_aral_sea.jpg)  
and [maguires.com/patupe/photos.htm](http://maguires.com/patupe/photos.htm)



## Detailed study of the text

**understatement**: careful about what you say or do, so that you do not offend, upset, or embarrass people or tell secrets” 《朗文当代高级英汉双解词典》

1. “A bit sticky, things are pretty sticky down there.”（有点棘手，下面有点棘手）
1. “Ladies and Gentlemen, this is your Captain speaking. We have a small problem. All four engines have stopped. We are doing our damndest to get them going again. I trust you are not in too much distress.”

## Revision:

1. 虽然前进的路上有很多困难，我们成功的希望看起来也很渺茫，我们必须鼓起勇气，全力以赴，一鼓作气干到底。

1. Although there may exist tremendous difficulties on the way ahead and our **prospects** of success look very **bleak**, we must **round up our courage, redouble our effort and rush through** with a magnificent **dash and daring**.

## Revision:

2.原本湛蓝色海涛轻拍船舷的景象已不复存在，取而代之的是干燥灼热的沙漠，蔓延至天边。由于兴建了一项考虑欠周的水利工程，原来注入咸海的水被引入沙漠灌溉棉田。人类活动为环境造成了巨大威胁。

2. Where there should have been **gentle** blue-green waves **lapping** against the side of the ship, there was nothing but hot dry sand, which **stretched all the way to** the horizon. Because of **an ill-considered** irrigation scheme, the water that used to **feed** the Aral sea has been **diverted** to grow cotton in the desert. Human activities are **posing great threat** to the environment.

# Detailed study of the text: Images

Image 1:





## Detailed study of the text

Q: If you are asked to use one word to describe the picture, what will the word be?

Q: How is the paragraph developed?

Q: The paragraph has been written in the first 'I'. What is the function of writing in this way?

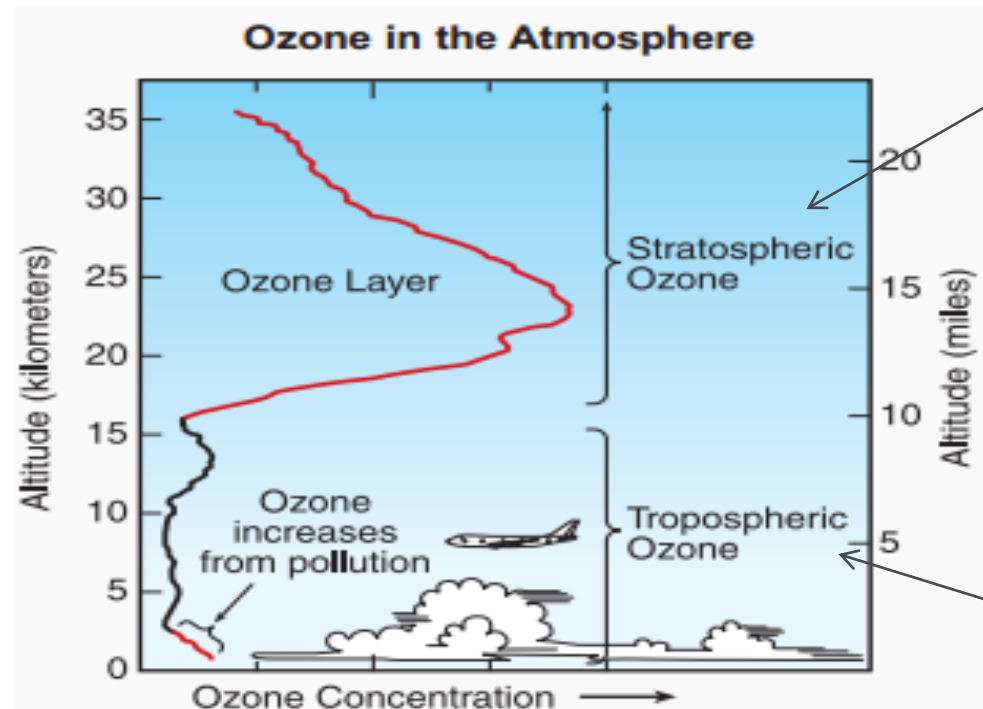
Q: What does the ill-considered irrigation scheme indicate or represent?

## Detailed study of the text: Images

Image 2: South Pole Trans-Antarctic Mountain 南极山脉



# Detailed study of the text: Images



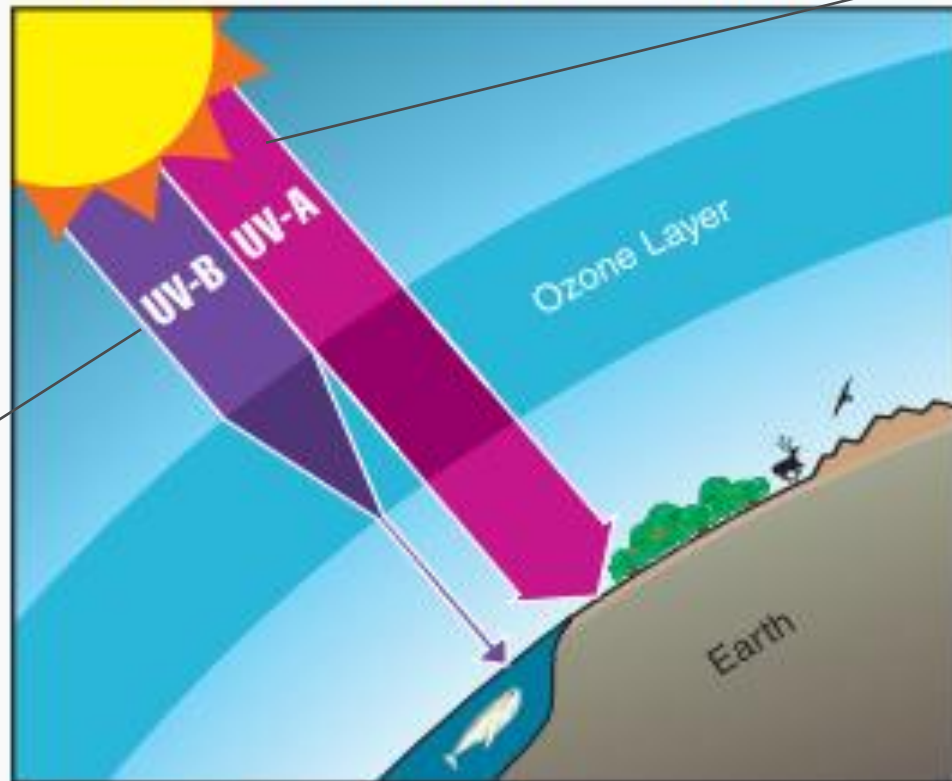
平流层

对流层

**Figure Q1-2. Atmospheric ozone.** Ozone is present throughout the lower atmosphere (troposphere and stratosphere). Most ozone resides in the stratospheric "ozone layer" above Earth's surface. Increases in ozone occur near the surface as a result of pollution from human activities.

# Detailed study of the text: Images

UV Protection by the Ozone Layer



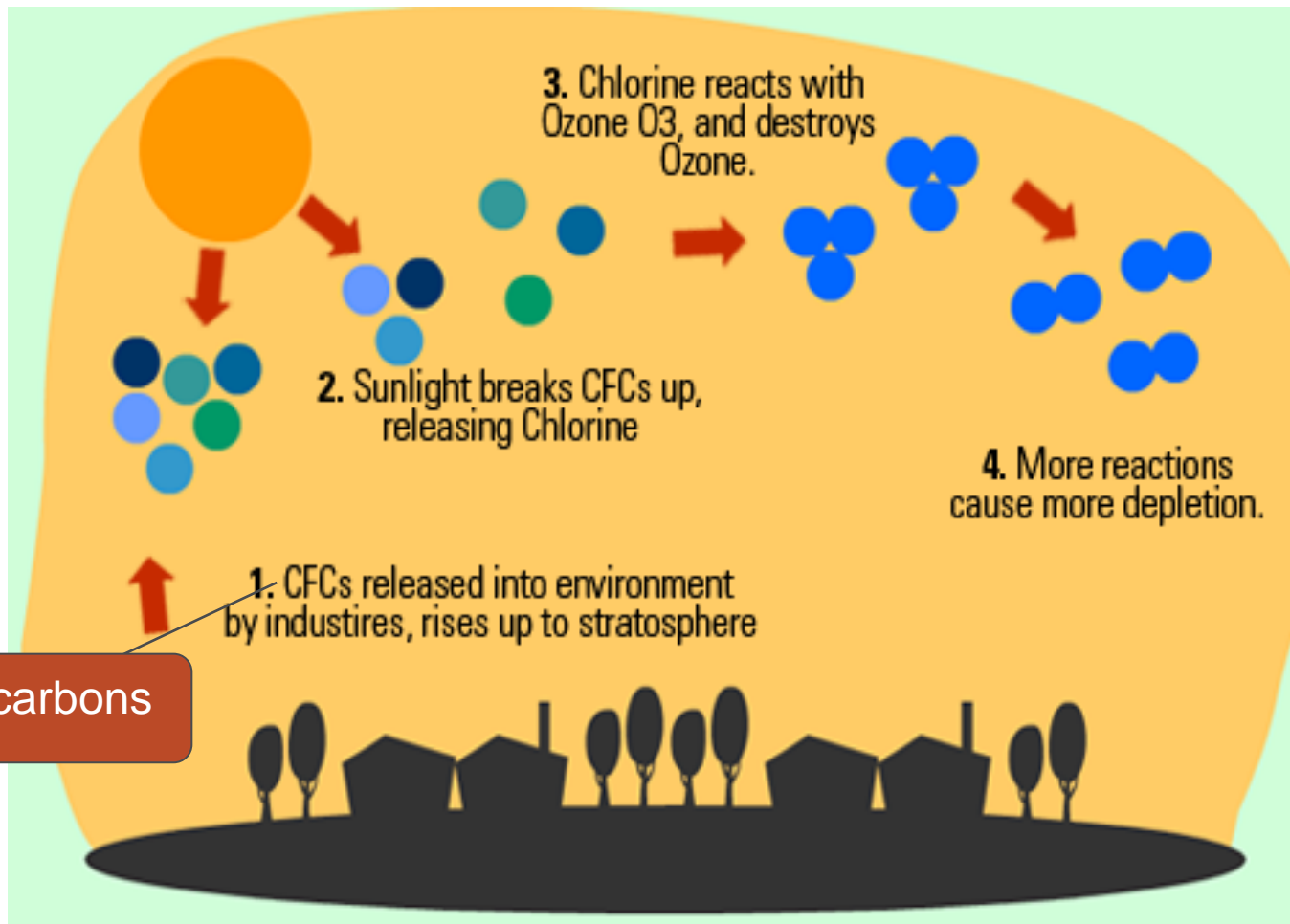
长波紫外线

中波紫外线

Figure Q3-1. UV-B protection by the ozone layer.

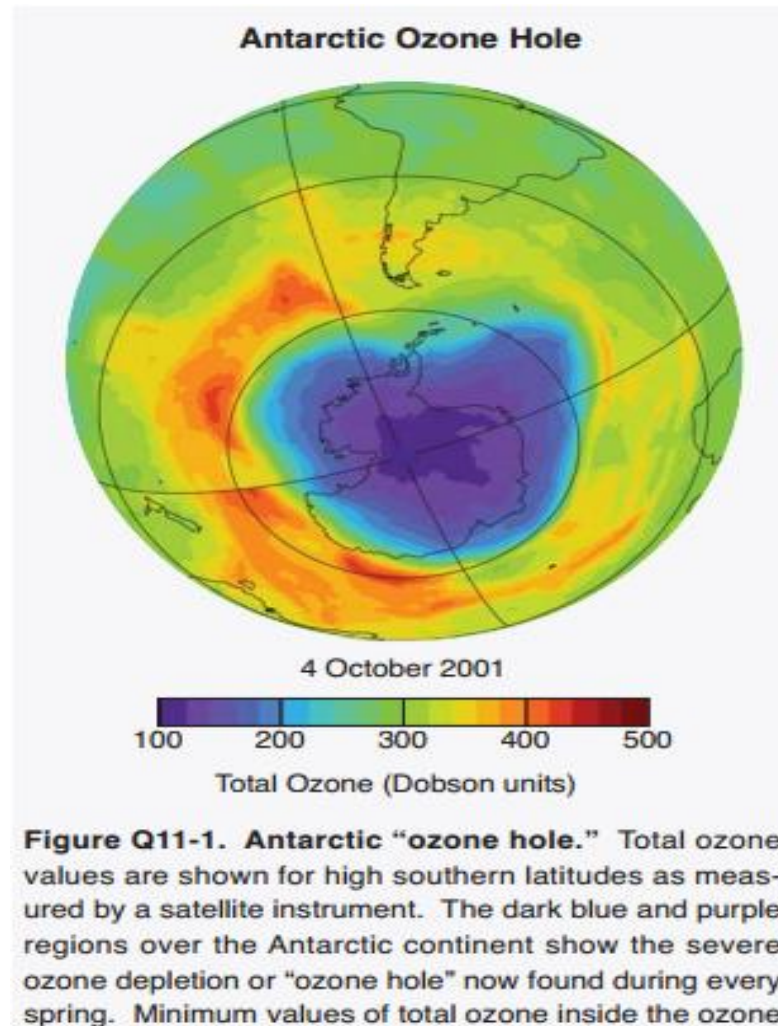


# Ozone layer depletion



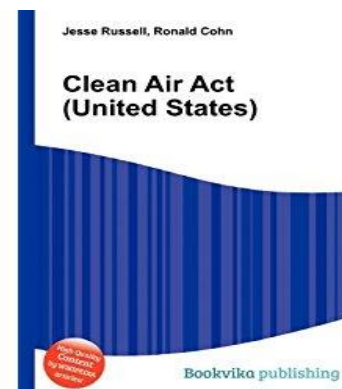
chlorofluorocarbons

# Ozone layer depletion



## Clean Air Act:

- American Congress passed the Clean Air Act in 1970, which is one of the oldest environmental laws of the U.S. as well as the most far-reaching, the costliest, and the most controversial.
- The Clean Air Act is the law that defines EPA's . **(Environmental Protection Agency)** responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer.



## Revision:

1. 许多志愿者花费了大量的时间和精力从事环境保护。他们为了寻找环境危机的原因，环游世界，考察和研究环境破坏的事例，其中最骇人听闻的事例便是臭氧层空洞。
1. Many volunteers **devote their time and energy to** environmental protection. Their search for the **underlying** causes of the **environmental crisis** has led them to travel around the world **to examine** and study many of the **images of destruction**, among which ozone depletion is the most appalling one.

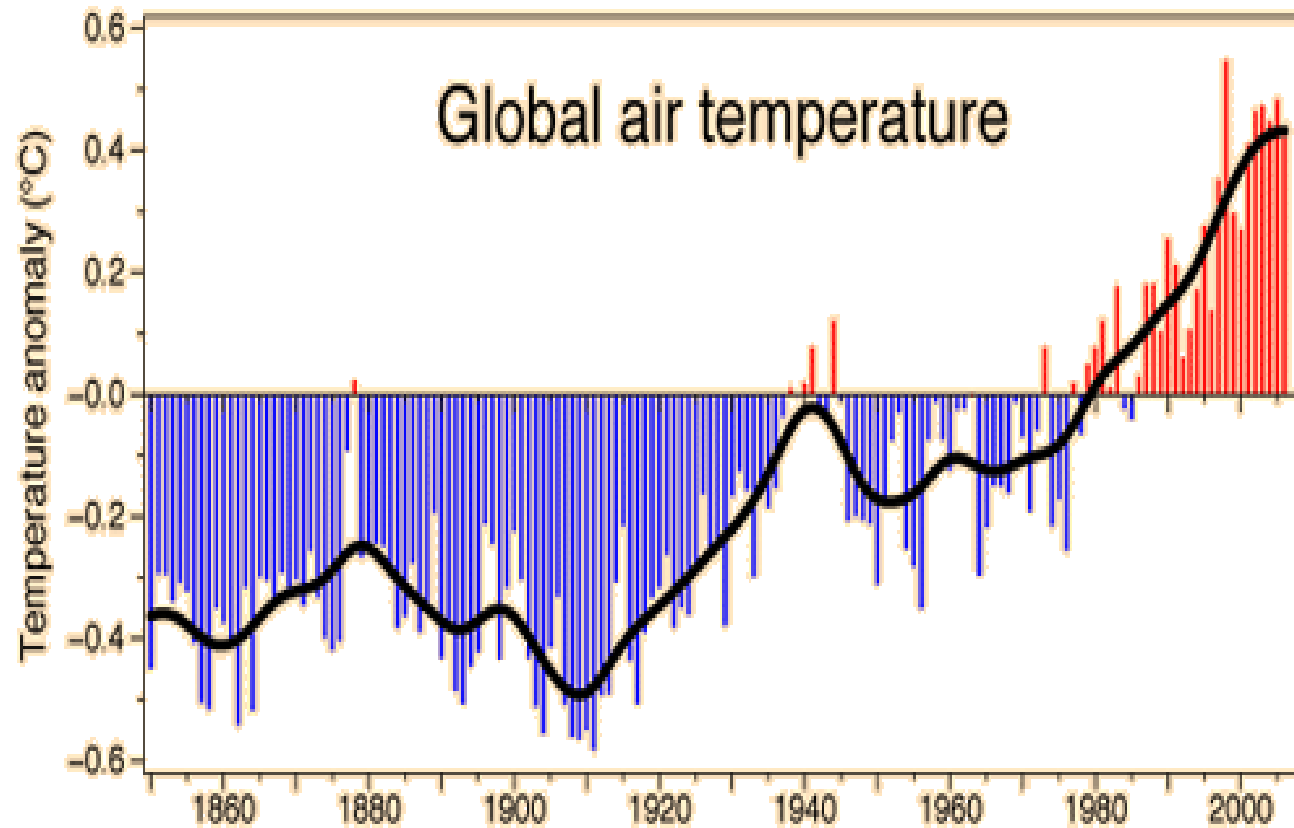


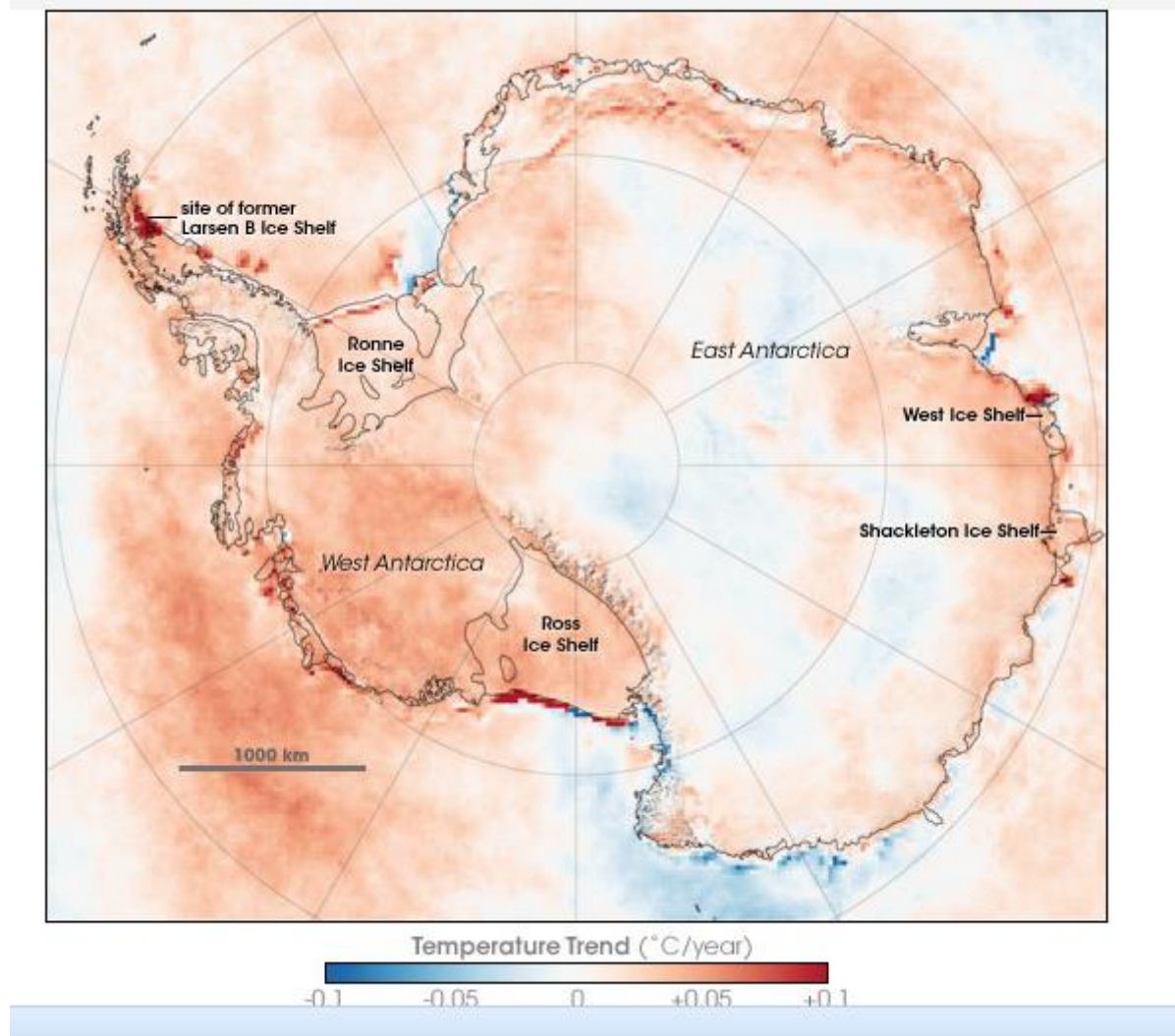
## Revision:

- 美国的《空气清洁法案》表明，世界上任何一个国家只要将废气排放量减少一点，在空气污染程度上引起的相应变化便能在南极这个地球上最偏远、最人际难至的地方显示出来。 1

1. U.S. Clean Air Act indicates that even a small reduction in one country's **emissions** can change the amount of pollution found in Antarctic, **the remotest** and **least accessible** place on earth.

## Paragraph 3:





## What is the effect of industrial revolution?





## **The first industrial revolution (1765-1840):**

- the emergence of factory system
- revolution in textile
- revolution in transportation

New fuels such as coal and petroleum, were incorporated into new steam engine.

## **The second industrial revolution (1870-1914): technological revolution: started by steel and oil**

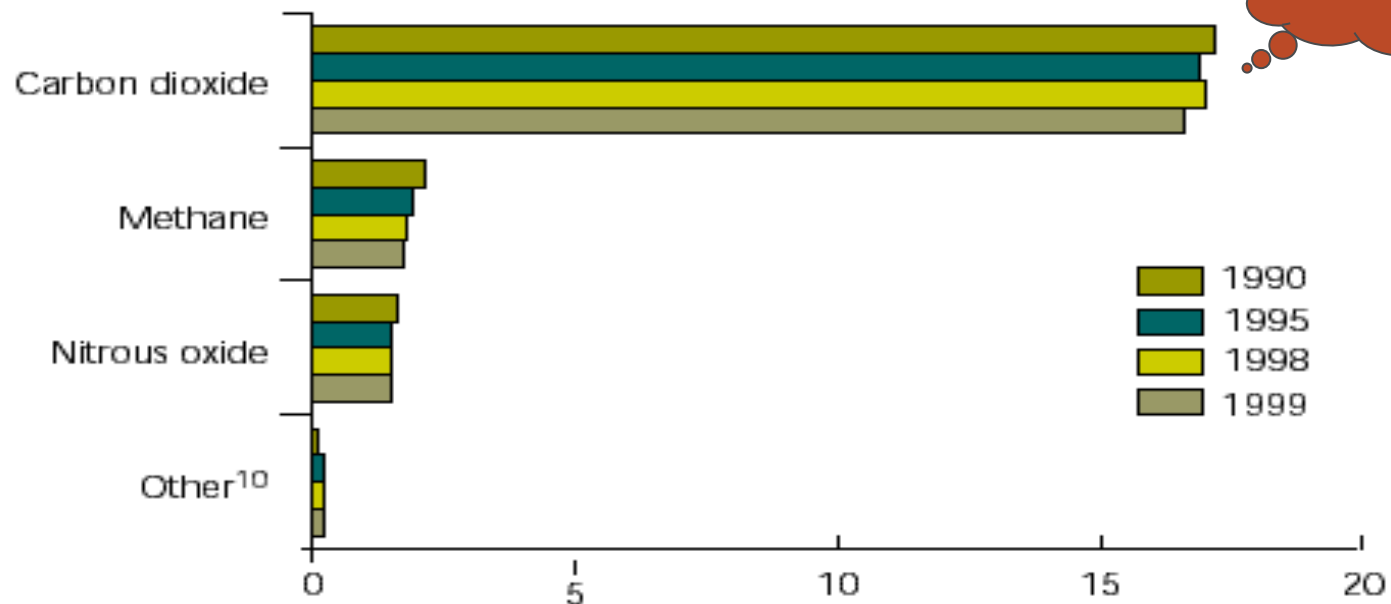
- Steel made the second industrial revolution possible;
- Advancements in oil refinement affected the industrial revolution.
- Better transportation: railway, cars, airplanes
- Telegraph and telephone

Heat trapping

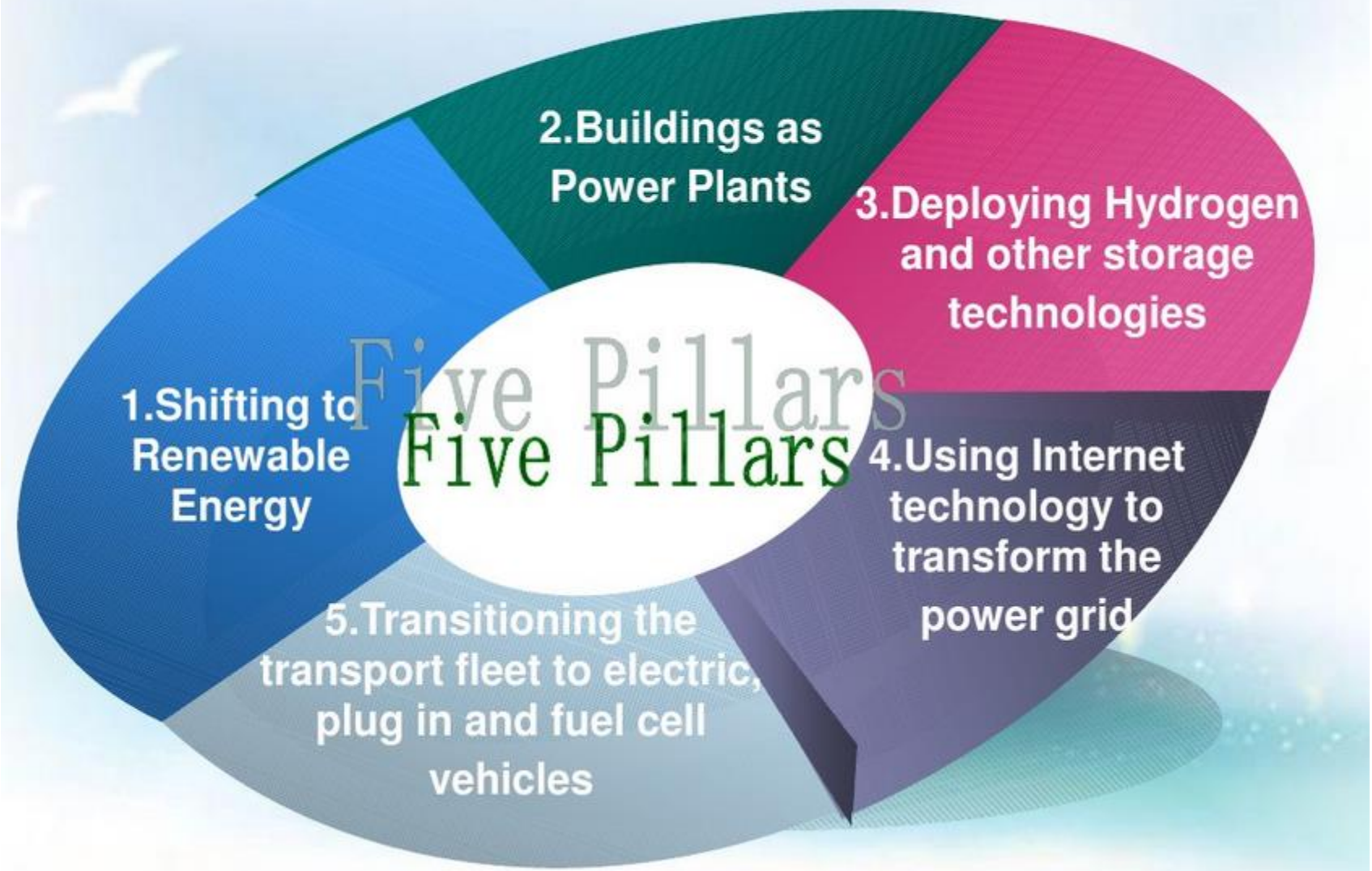
## Greenhouse gases:

### Greenhouse Gas Emissions Weighted by Global Warming Potential<sup>9</sup>: 1990-1999

Emissions (million tonnes of carbon equivalent)



# The Third Industrial Revolution



## Image 3: Arctic ocean (the thinning of polar cap)





## ■ Image 3: Arctic ocean (the thinning of polar cap)

1. What is the environmental threat to the Arctic ocean?
2. What are pressure ridges? What causes the pressure ridges?
3. What might be the consequences of a thinning polar cap? (rising sea level, people and animals, climate)

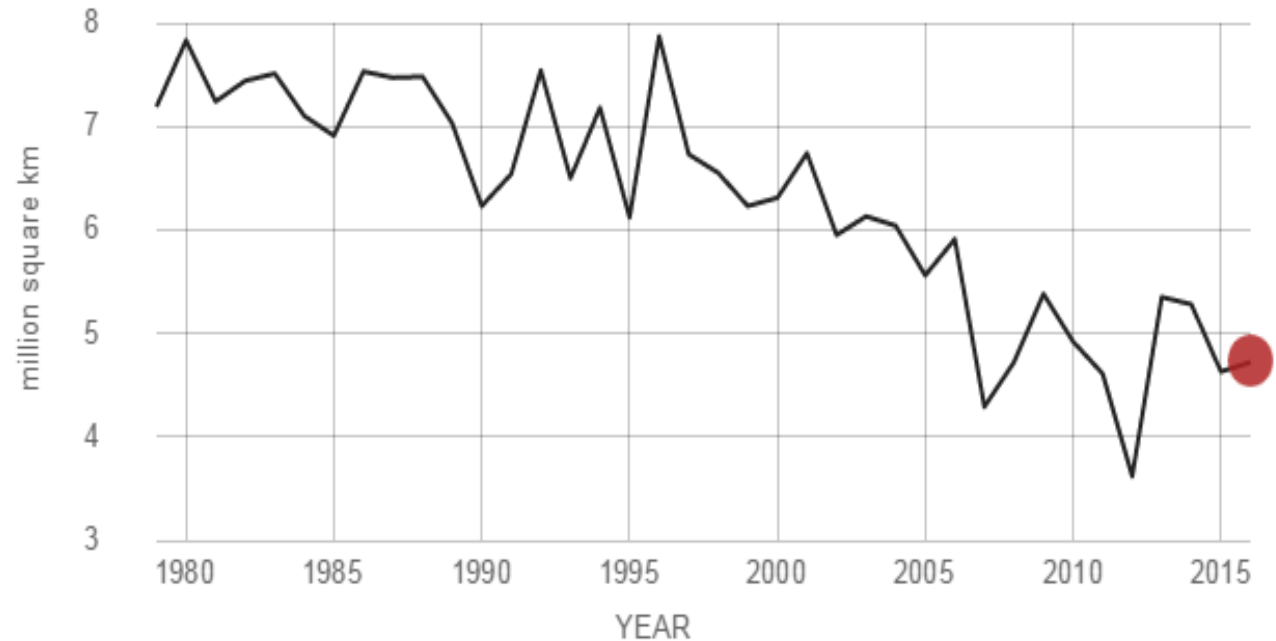
Arctic sea ice reaches its minimum each September. September Arctic sea ice is now declining at a rate of 13.3 percent per decade.

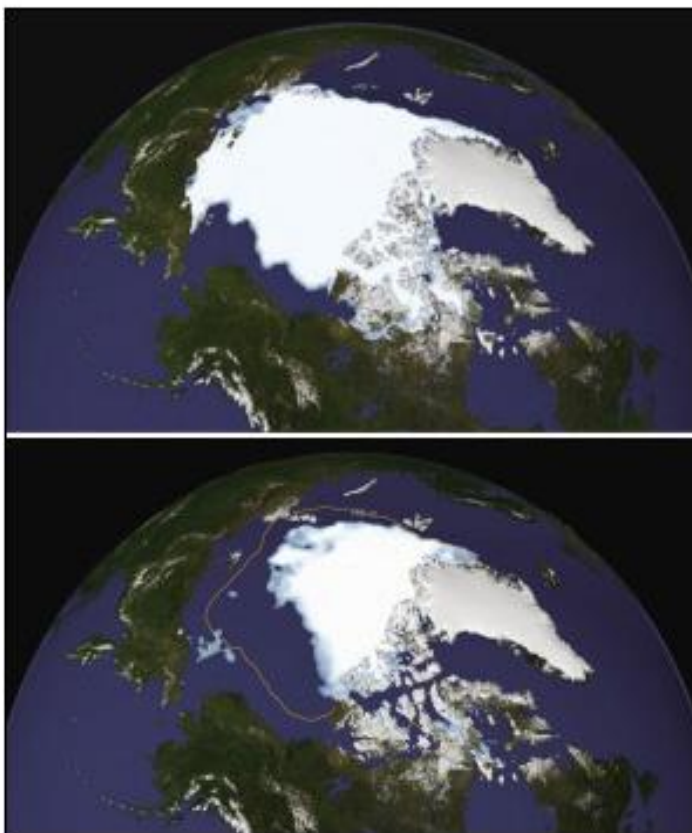
## AVERAGE SEPTEMBER EXTENT

Data source: Satellite observations. Credit: [NSIDC/NASA](#)

## RATE OF CHANGE

↓ 13.3  
percent per decade





(Taken in 2007 & 2012)

**The Arctic could see ice-free summers by the end of the 21<sup>st</sup> century if the current rate of ice cap shrinking continues, according to the Natural Resources Defense Council (NRDC). The largest block of ice in the Arctic is breaking into pieces, and the summer polar ice cap has shrunk some 20 percent since 1979. Melting ice caps affect local residents and wildlife.**

## **Consequences:**

**1. Oceans around the world rise – the rising sea level**



**freshwater contamination, flooding and beach erosion**



**a devastating impact on island nations and cities.**



## Consequences:

2. The melting polar ice caps have a wide-ranging impact on ecosystems. Migratory animal species that depend on the Arctic as a place to feed and reproduce are negatively affected by a loss of sea ice. Species that are native to the Arctic, such as polar bears and seals, are particularly hard hit by sea ice reduction.



An icebreaker or a nuclear-powered submarine can use the Northwest Passage through the Arctic Ocean to go between the Pacific and Atlantic oceans.



Sonar  
tracks

**an acronym for sound navigation ranging: an apparatus using sound waves for finding the position of underwater objects, such as mines or submarines**

## Revision:

1. 迄今为止，地球大气层最重要的变化始于19世纪初的工业革命，变化速度自那以后逐渐加快。工业意味着煤，后来是石油。我们燃烧了大量的煤和石油—导致大气层中二氧化碳含量的增加，使得更多的热量得以留存在大气层中。

1. The most significant change so far in the earth's atmosphere is the one that began with the industrial revolution early in the last century and has picked up speed ever since. Industry means coal and later oil, and we began to burn lots of it, bringing rising levels of carbon dioxide, with its ability to trap more heat in the atmosphere.

## Revision:

1. 随着极地气温的升高，这里的冰层会融化变薄。由于南北极的冰帽对全球的气候有着至关重要的调节作用，它们的融化将会带来灾难性的后果。

As the polar air warms, the ice here will melt and get thinner. Since the polar cap plays such a crucial role in the world's weather system, the consequences of a thinning cap could be disastrous.

## Image: Equator



In the final part of his journey, Simon travels to Latin America. Here are some of the highlights...



## Image: The Amazon Rainforest



The Amazon is the world's largest tropical rainforest, spanning Brazil, Colombia, Ecuador(厄瓜多尔), Peru, Bolivia(玻利维亚), and Venezuela(委内瑞拉). Within the 2.5 million square miles of the Amazon Basin resides a wealth of life richer than any place else on earth, including 500 mammals, 175 different lizards, 300 other reptile species, tree climbers of every kind, and a third of the world's birds.

## Image: Amazon rainforest



## Image: Amazon rainforest



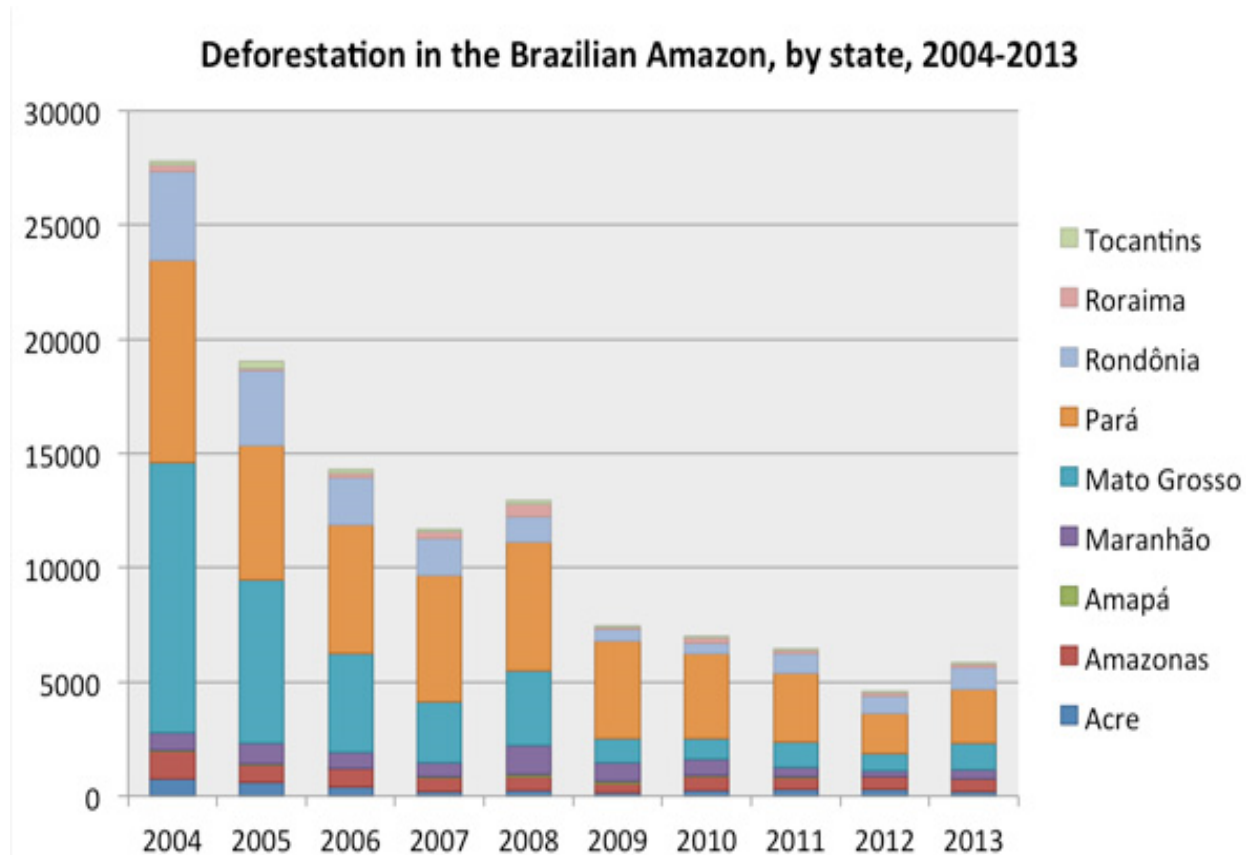
## Image: Amazon rainforest



Billowing  
clouds of  
smoke



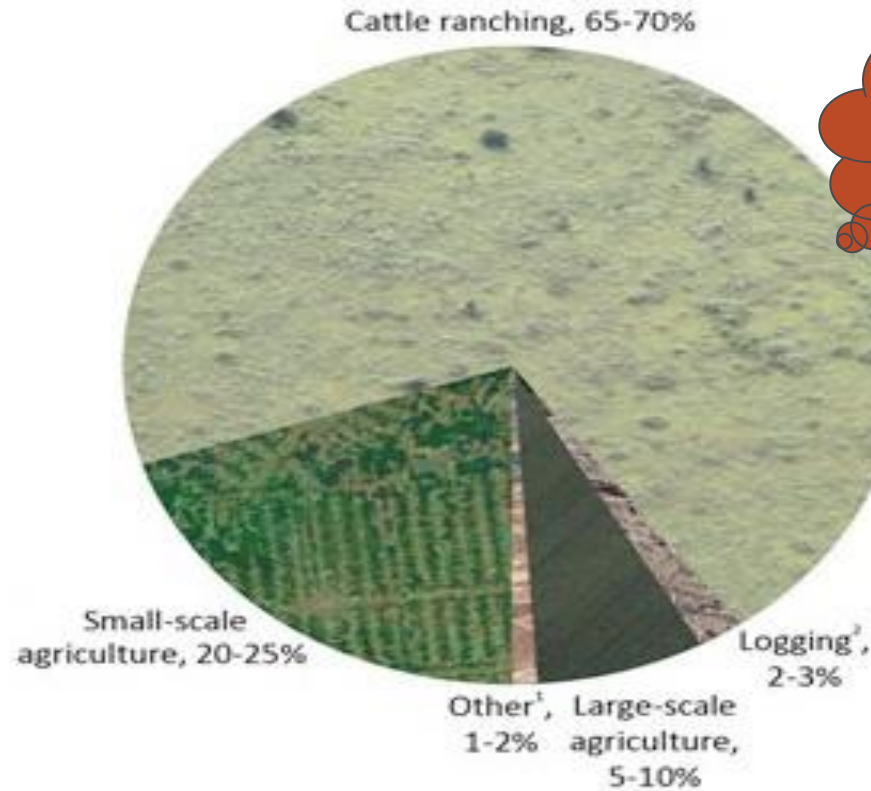
# Image: Amazon rainforest





# Image: Amazon rainforest

## Causes of Deforestation in the Brazilian Amazon 2000-2005



fast pasture  
for fast-food  
beef

Share of deforested land ultimately converted for extensive agriculture<sup>3</sup>

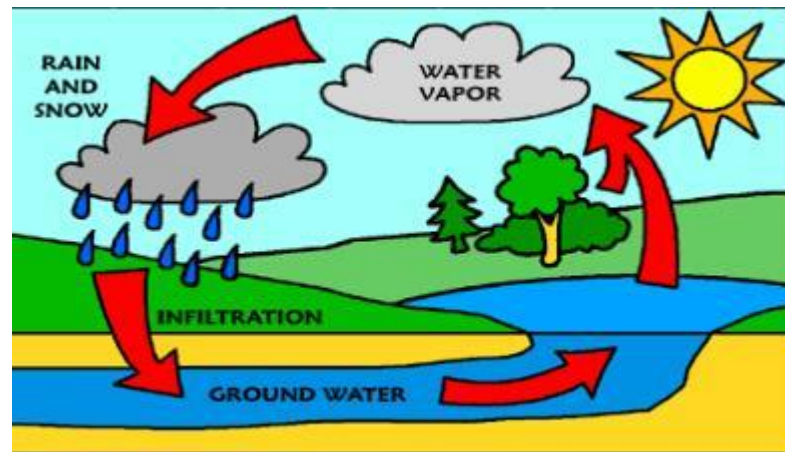


# What are the consequences of deforestation?

**Erosion of soil:** When forest areas are cleared, the soil is exposed to the sun, making it very dry and eventually, infertile, due to volatile nutrients being lost. In addition, when there is erosion, rainfall washes away the rest of the nutrients, which flow with the rainwater into waterways.



**Disruption of the water cycle:** Trees contribute in a large way in maintaining the water cycle. They take in water via their roots, which is then released into the atmosphere. A large part of the water that circulates in the ecosystem of rainforests, for instance, remains inside the plants. When these trees are cut down, it results in the climate getting drier in that area.



**Loss of biodiversity:** The unique biodiversity of various geographical areas is being lost on a scale that is quite unprecedented. Due to massive deforestation, about 50 to 100 species of animals are being lost each day. This puts the extinction of animals and plants on a massive scale.

## Image: Amazon rainforest





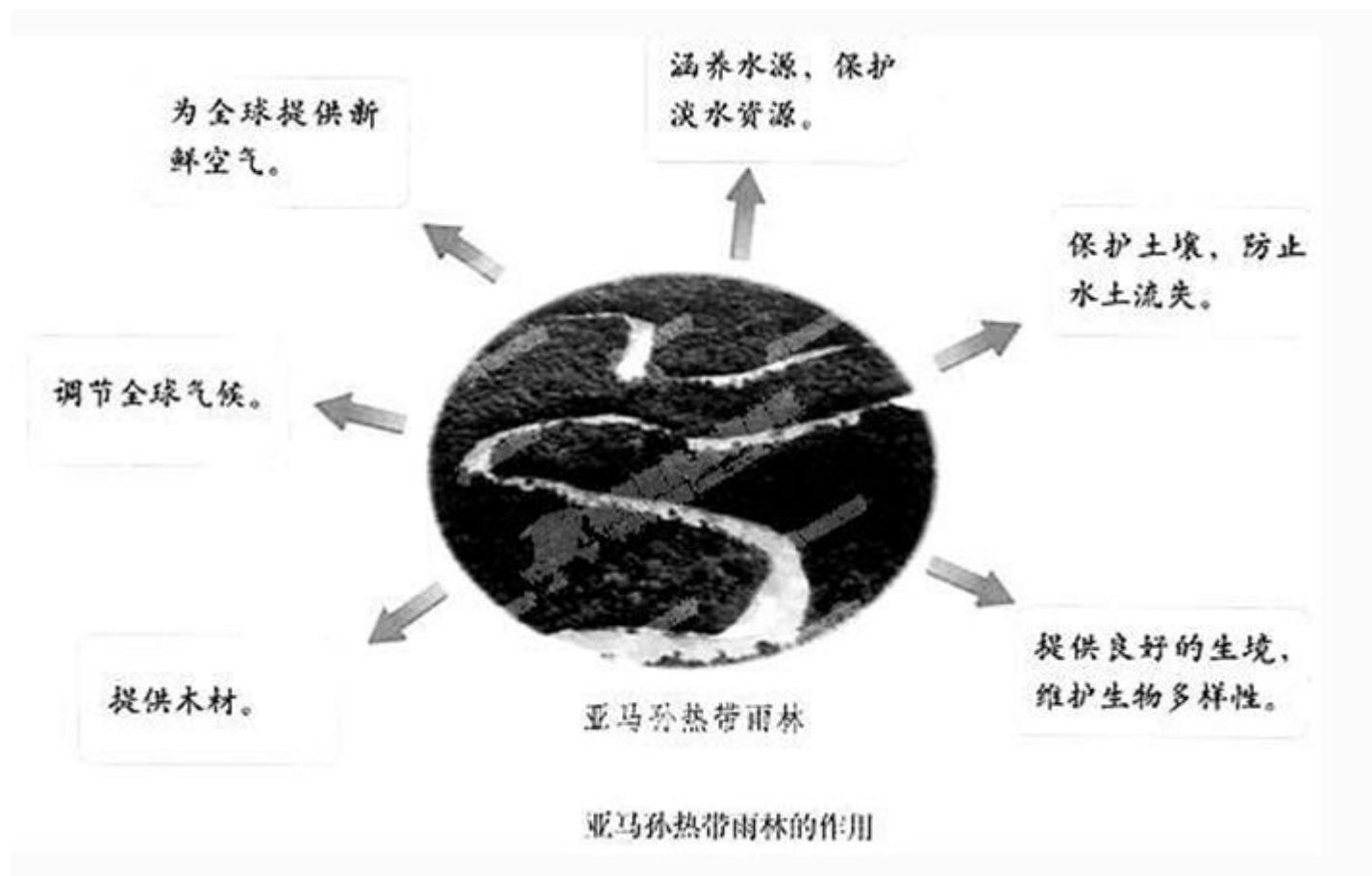
**Flooding and drought:** One of the vital functions of forests is to absorb and store great amount of water quickly when there are heavy rains. When forests are cut down, this regulation of the flow of water is disrupted, which leads to alternating periods of flood and then drought in the affected area.





**Climate change:** Global warming is being caused largely due to emissions of greenhouse gases into the atmosphere. Trees absorb carbon dioxide from the atmosphere. When deforestation occurs, many of the trees are burned or are left to rot, which results in releasing the carbon that is stored in them as carbon dioxide. This in turn leads to greater concentration of carbon dioxide in the atmosphere.

## Image: Amazon rainforest



## Word Study: a striking picture

1. **disturbing** image
2. **billowing** clouds of smoke
3. **blacken** the sky
4. **slash** the rainforest
5. **fast** pasture for **fast**-food beef
6. **silencing** the songs

## Image: high northern latitudes



noctilucent  
clouds 夜光云

strange;

ghostly;

shimmering;

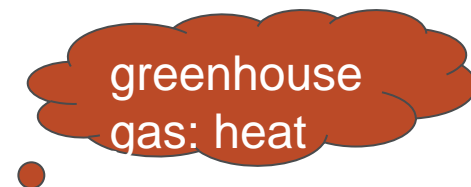
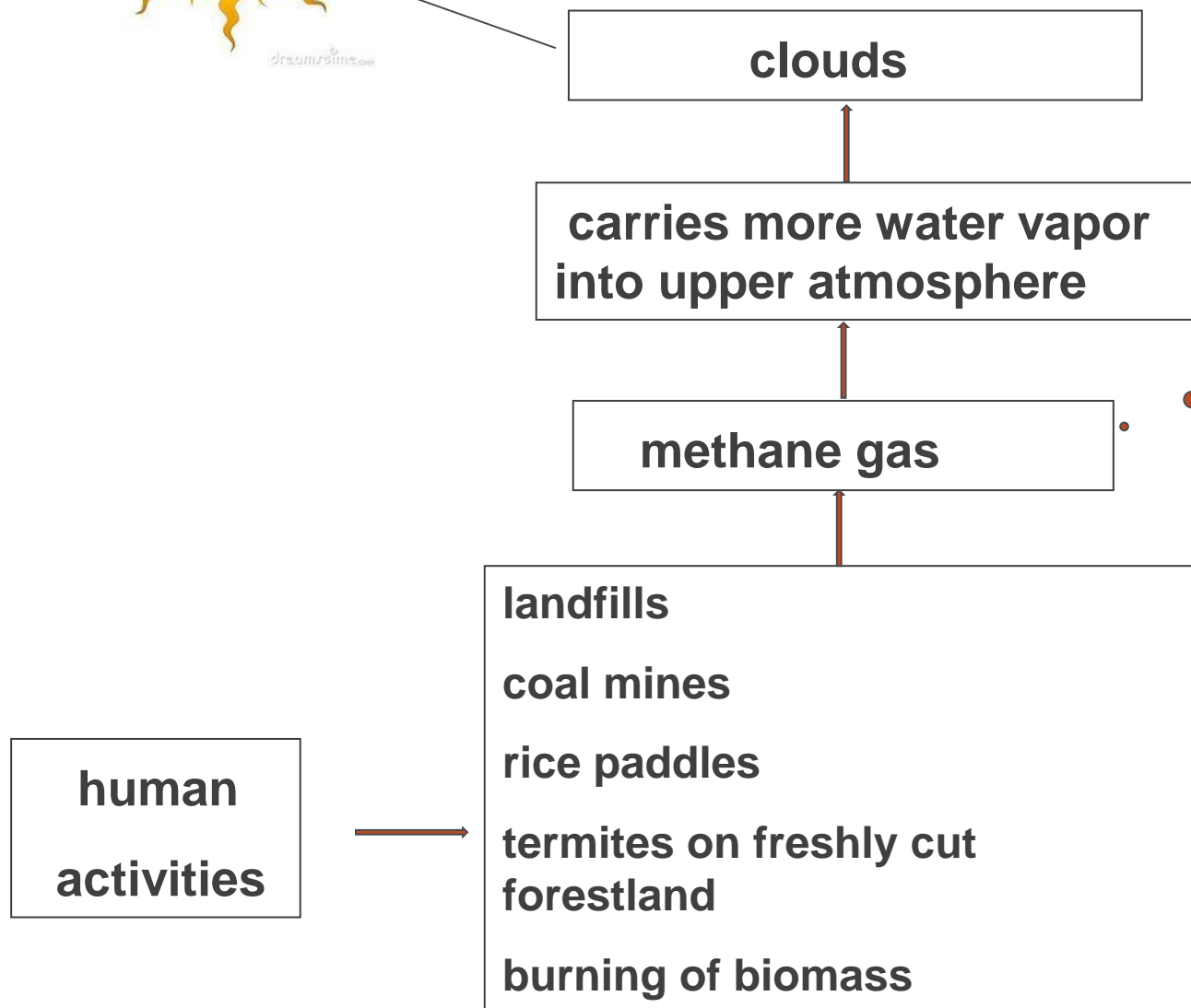
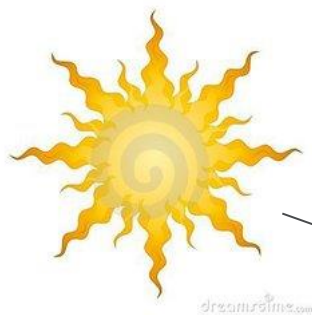
translucent  
whiteness;

unnatural

**1. What are the functions of the first two sentences of this paragraph?**

**2. What do noctilucent clouds signal?**

**3. How do noctilucent clouds come into being?**





## Revision:

1. 人们无需周游世界便能目睹人类对地球的破坏。当今世界，预示着地球生态危机的景象随处可见。

## Revision:

1. One does not have to travel around the world to witness humankind's assault on the earth. Images that signal the distress of our global environment are now commonly seen almost anywhere.

## Revision:

2. 滚滚浓烟时常 笼罩在辽阔但又面临破坏的亚马逊热带雨林的上空。亚马逊雨林正在被人们大片大片地烧毁以便腾出空地做饲养速食肉牛的牧场；每年都有面积比整个田纳西还大的大片森林遭到砍伐焚烧。

## Revision:

2. Billowing clouds of smoke regularly blacken the sky above the immense but now threatened Amazon rainforest. Acre by acre, the rainforest is being burnt to create fast pasture for fast-food beef. Each year, more than one Tennessee's worth of rainforest is slashed and burned.

## **Para 8:**

**Q: How would you feel if you saw noctilucent clouds in the sky? Simple wonder or the mix of emotions?**

**Q: What accounts for the noctilucent clouds in the sky according to the author?**

**Q: Make comments on the last two sentences of the paragraph. What questions are they?**

## **Linguistic study:**

- 1. awe / reverence**
- 2. tear tusks**
- 3. rip matter from its place**
- 4. in such quantity / in such volume**
- 5. startle**
- 6. the bright lights of civilization**
- 7. the violent collision between human civilization and the earth**

## **Para 9:**

- 1. What is the key point that the writer addresses in this paragraph?**
- 2. How is the paragraph developed?**
- 3. What is your understanding of ‘paralysis’ and ‘distraction’?**
- 4. Pick out the adjectives and adverbs used typically in this paragraph.**

## Para 9: Human's puzzling response

1. Even though it is sometimes hard to see their meaning, we have by now all witnessed surprising experiences that signal the damage from our assault on the environment—whether it's the **new frequency** of days when the temperature exceeds 100 degrees, the **new speed** with which the sun burns our skin, or the **new constancy** of public debate over what to do with growing mountains of waste.

**Paraphrase:** We have by now all witnessed surprising phenomena that show the damage caused by human's violent attack on nature, although sometimes it is hard to fully understand their implications. These experiences include the fact that recently there are more hot days when the temperature is over 100 degrees Fahrenheit, or the fact that the sun burns our skin more quickly than in the past, or the fact that the public debate over the ways of disposing of our growing amounts of waste comes up constantly.

**Further explanation:** A public debate over what to do with growing amounts of garbage is currently going on in many countries. As the number of landfills is limited, there is less and less space for burying garbage in urban areas. Some suggest building incineration plants to burn garbage. Others, especially those living near the sites of planned plants, are strongly opposed to this for fear of the bad smells and air pollution that such plants may produce. Still, others argue that the best way to dispose of waste is to classify and reduce garbage.



2. But our response to these signals is puzzling.

But our reaction to these signals is so baffling that it is difficult to understand. The author implies that we are not responding to these signals in the right way.

3. Why haven't we launched a massive effort to save our environment? To come at the question another way.

1) **launch**: begin with vigor; give impetus to

e.g. We were going to launch a counterattack. 我们准备发起反攻。

The company researched the market demand and decided to launch their new product. 这家公司调查了市场需求，决定推出新产品。

2) **to approach the question in a different way**; to put the question in another way

4. Why do some images startle us into immediate action and focus our attention on ways to respond effectively? And why do other images, though sometimes equally dramatic, produce instead a kind of paralysis, focusing our attention not on ways to respond but rather on some convenient, less painful distraction?

- 1) **startle**: cause sb to be suddenly surprised; give an unexpected shock to  
e.g. The least noise would startle the child. 最小的响声也会使孩子受惊。  
Many students were startled by Trump's negative words on international talent exchange.
- 2) **equally dramatic**: as striking and surprising as (the other images)
- 3) **paralysis**: loss of the ability to move a body part . Here it is used figuratively, indicating inactivity to do sth. indifference in the face of sth.  
e.g. The strike caused total paralysis in the city. 罢工使这座城市完全瘫痪。
- 4) **convenient**: handy and easy to get
- 5) **distraction**: drawing someone's attention away from something;  
e.g. You must reject distraction and concentrate on your work at hand.  
你必须停止分心，集中精力在你手头的工作上。

4. Why do some images startle us into immediate action and focus our attention on ways to respond effectively? And why do other images, though sometimes equally dramatic, produce instead a kind of paralysis, focusing our attention not on ways to respond but rather on some convenient, less painful distraction?

- 6) And why do other symbols, though sometimes no less surprising, only cause a kind of loss and inactivity and we concentrate our attention not on the ways to deal with them but instead, on some other aspects which are easy and less painful to handle?
- 6) In this paragraph the author asks three questions, which deserve serious consideration.

## Para 10-Para16: Ways to classify environmental problems and causes of environmental problems

**Para. 10.** Still, there are so many distressing images of environmental destruction that sometimes it seems impossible to know how to absorb or comprehend them. Before considering the threats themselves, it may be helpful to classify them and thus begin to organize our thoughts and feelings so that we may be able to respond appropriately.

- 1) distressing: causing worry or anxiety

Upon hearing the distressing new, she burst into tears.

He feared to touch on distressing memories.他害怕触及到令人伤心的往事。

- 2) It may be useful to arrange them into different groups, thus getting our thoughts and feelings straightened out so that we will be able to take the most suitable action.

## Para 11.

1. A useful system comes from the military, which frequently places a conflict in one of three different categories, according to the theater in which it takes place.

1) **theater**: any place where events take place; scene of operation 场所, 战场  
e.g. the European theater

2) Can you predict how the following part will be developed?

2. There are ‘local’ skirmishes, ‘regional’ battles, and ‘strategic’ conflicts. This third category is reserved for struggles that can threaten a nation’s survival and must be understood in a global context.

1) **strategic**: of great importance within an integrated whole or to a planned effect.

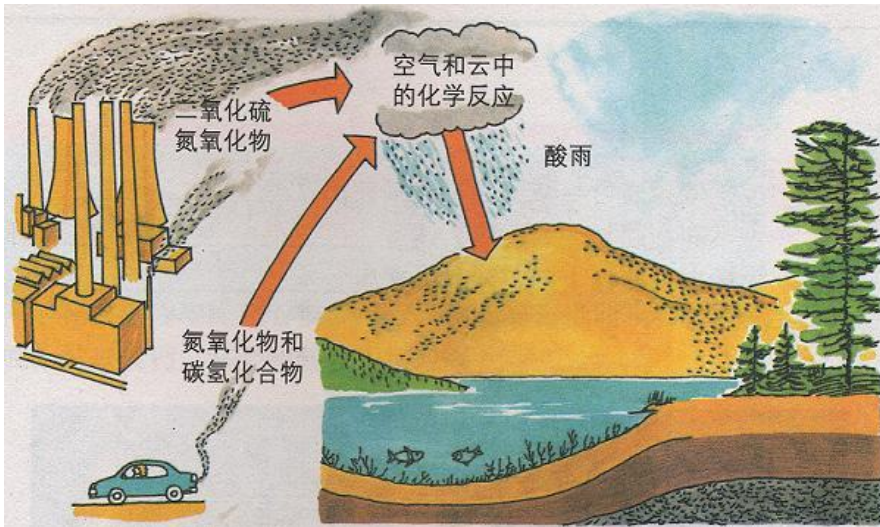
2) **reserve**: keep for the special use of, or for a special purpose 留作专用  
We should seek common ground and **reserve** differences on this issue. 在这个问题上, 我们应当求同存异

3) Only struggles that will endanger a nation’s existence and must be viewed against the background of the world will be considered as ‘strategic’ conflicts.

## Para 12. categories of environmental threats (local and regional threats )

1. Environmental threats can be considered in the same way. For example, most instances of water pollution, air pollution, and illegal waste dumping are essentially local in nature. Problems like acid rain, the contamination of underground aquifers and large oil spills are fundamentally regional.

- 1) **illegal waste dumping**: the disposal of waste in a way that violates the law.
- 2) **acid rain**: rain with a high concentration of acids produced by sulfur dioxide (二氧化硫), nitrogen oxide (一氧化硫), etc. emitted during the combustion (燃烧) of fossil fuels. It has a destructive effect on plant and aquatic life, buildings, etc. 酸雨



酸雨危害树木 (挪威)



Para 12. categories of environmental threats (local and regional threats )

3) **aquifer**: underground bed or layer yielding ground water for wells and springs  
etc 含水土层(含水量足以成为井水或泉水)

4) **Oil spill**: an oil spill is a release of a liquid petroleum hydrocarbon(碳氢化合物) into the environment due to human activity. The term often refers to marine oil spills, where oil is released into the ocean or coastal waters. An oil spill is a form of pollution. Usually it takes months or even years to clean up large oil spills. The recent oil spill in the Gulf of Mexico in 2010 flowed for three months. The impact of the spill continued even after the well was capped. It is the largest accidental marine oil spill in history.



2) In both of these categories, there may be so many similar instances of particular local and regional problems occurring simultaneously all over the world that the pattern appears to be global, but the problems themselves are still not truly strategic because the operation of the global environment is not affected and the survival of civilization is not at stake.

1) **the pattern appears to be global:** it seems that the problem has acquired a global nature since so many similar things occur at the same time all over the world.

2) **The operation of the global environment:** the working of world environment as a whole

3) **The survival of civilization is not at stake:** The existence of mankind has not been endangered.

**at stake:** at risk; at issue

e.g. If the sea level rises, many countries will be at stake.

In Paragraph 10 to 12, the author divides up environmental threats into three categories by borrowing the military system: local, regional and strategic. He defines each category and gives examples of local and regional environmental problems. It can be anticipated that the author is going to focus on the strategic environmental threats in the following parts.

### Para 13.

1. However, a new class of environmental problems does affect the global ecological system, and these threats are fundamentally strategic.

The word ‘However’ is a transitional device. After mentioning examples of local and regional environmental problems, the author is now introducing a new group of problems which are strategic in nature. The first example is the increase of chlorine in the atmosphere.

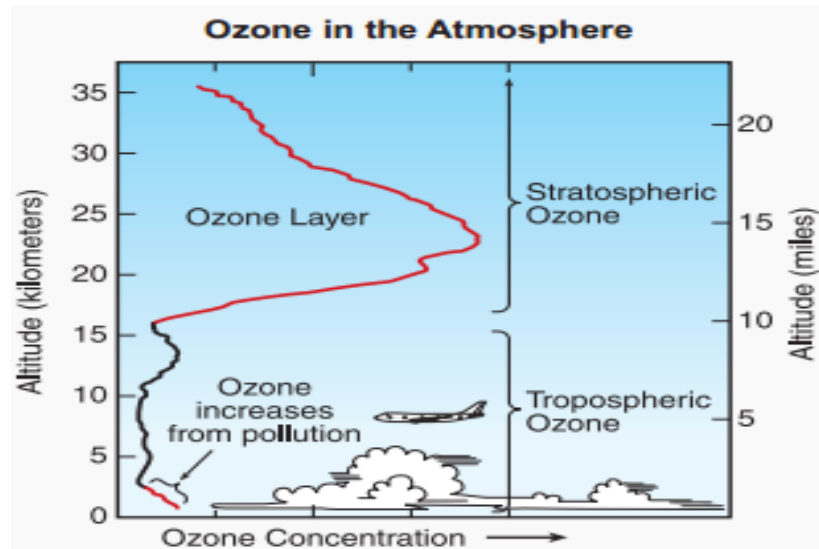
2. The 600 percent increase in the amount of chlorine in the atmosphere during the last forty years has taken place not just in those countries producing the chlorofluorocarbons **responsible** but in the air above every country, above Antarctica, above the North Pole and the Pacific Ocean—all the way from the surface of the earth to the top of the sky.

**Analyze the sentence:** During the past forty years the amount of chlorine (氯气) has increased 600 percent. This has taken place not only in the air above the countries responsible for producing the chlorofluorocarbons (氟利昂). It has also happened above Antarctica, above the North Pole and the Pacific Ocean and even all the way from the surface of the earth to the top of the sky.

3. The increased levels of chlorine disrupt the global process by which the earth regulates the amount of ultraviolet radiation from the sun that is allowed through the atmosphere to the surface; and if we let chlorine levels continue to increase, the radiation levels will also increase—to the point that all animals and plant life will face a new threat to their survival.

- 1) Analyze the sentence structure
- 2) The increased amounts of chlorine disturb the earth's function of handling and controlling the amount of ultraviolet radiation the earth receives from the sun. If we don't take action to control this increase, the amount of ultraviolet radiation will increase to a degree that will threaten the survival of all animal and plant life on the earth.
- 3) to the point: to such a degree

The ozone layer, or rather, stratospheric ozone, is essentially the planet's sunscreen. It consists of a thick layer of the naturally occurring ozone gas ( $O_3$ , a molecule comprising of three oxygen atoms) near the stratosphere, a layer of the atmosphere located between 10 and 31 miles above sea level. Its primary function is to absorb some of the sun's harmful ultraviolet radiations. Without the protection of the ozone layer, humans will have a higher chance of developing skin cancer, immune problems, cataracts(白内障), and a variety of other medical conditions.



**Figure Q1-2. Atmospheric ozone.** Ozone is present throughout the lower atmosphere (troposphere and stratosphere). Most ozone resides in the stratospheric "ozone layer" above Earth's surface. Increases in ozone occur near the surface as a result of pollution from human activities.



Para 14.

1. Global warming is also a strategic threat. The concentration of carbon dioxide and other heat-absorbing molecules has increased by almost 25 percent since World War II, posing a worldwide threat to the earth's ability to regulate the amount of heat from the sun retained in the atmosphere. This increase in heat seriously threatens the global climate equilibrium that determines the pattern of winds, rainfall, surface temperatures, ocean currents, and sea level. These in turn determine the distribution of vegetative and animal life on land and sea and have a great effect on the location and pattern of human societies.

- 1) Comment on the coherence between sentences in this paragraph.
- 2) 'The concentration...in the atmosphere': Since World War II, the levels of carbon dioxide and other heat-trapping particles have increased by 25 percent. This big increase has upset the earth's ability to regulate the amount of heat from the sun which is kept in the atmosphere.

Para 14.

- 3) In *An Inconvenient Truth* (难以忽视的真相), the author explains, ‘Under normal conditions, a portion of the outgoing infrared radiation is naturally trapped by the atmosphere—and this is a good thing because it keeps the temperature on Earth within comfortable bounds. The problem we now face is that this thin layer is being thickened by huge quantities of human-caused carbon dioxide and other greenhouse gases. And as it thickens, it traps a lot of the infrared radiation(红外线照射)’ that would otherwise escape the atmosphere and continue out to the universe. As a result, the temperature of the Earth’s atmosphere--and oceans—is getting dangerously warmer. That is what the climate crisis about.’

4) This increase in heat seriously threatens the global climate equilibrium that determines the pattern of winds, rainfall, surface temperatures, ocean currents, and sea level.

**Paraphrase:** The global climate balance determines the pattern of winds, rainfall, surface temperature, ocean currents and sea level. Once this state of balance is upset, winds, rainfall and ocean currents will become abnormal; surface temperature and sea level will rise.

5) These in turn determine the distribution of vegetative and animal life on land and sea and have a great effect on the location and pattern of human societies.

**Paraphrase:** Ultimately human societies will be affected as a consequence of changes in nature. For instance, the rise of sea level will threaten and in fact is already threatening the existence of some low-lying Pacific islands. If things continue to get worse, some coastal cities will be threatened too, and people living in these cities will have to evacuate to safer places.

1) **in turn:** in proper sequence or succession

2) **vegetative:** of vegetation or plant

## Para 15

1. In other words, the entire relationship between humankind and the earth has been transformed because our civilization is suddenly capable of affecting the entire global environment, not just a particular area.

1) What is the function of this sentence?

The phrase ‘in other words’ is another transitional device, pointing out that the two strategic environmental problems imply that the entire relationship between humankind and the earth has been changed because of human activity, and paving the way for further discussion on this relationship. ‘In other words’ is a device that signals that the writer and speaker will express the same idea, but differently.

2) lexical choice: transform

2. All of us know that human civilization has usually had a large impact on the environment; to mention just **one example**, there is evidence that even **in prehistoric times**, vast areas were sometimes intentionally burned by people in their search for food. And **in our own time** we have reshaped a large part of the earth's surface with concrete in our cities and carefully tended rice paddies, pastures, wheat fields, and other croplands in the countryside.

- 1) by example; by comparison.
- 2) ...to mention just one example...for food: to give just one example, evidence proves that in prehistoric times humans intentionally set fires in vast areas in order to look for food
- 3) in prehistoric times: in periods before recorded history
- 4) And in our own time... in the countryside: in modern times, we have changed a large part of the earth's surface by human endeavor—constructing buildings, roads, etc. in the cities and by cultivating rice paddies, pastures, wheat fields and other croplands in the countryside.

**reshape:** to give new shape or form to...

**concrete in our cities:** paved roads, bridges, buildings.

**carefully tended:** carefully taken care of

3. But these changes, while sometimes appearing to be pervasive, have, until recently, been relatively trivial factors in the global ecological system.

1) Although some times these changes seem to be taking place everywhere in the world, they have, until recently, been relatively insignificant in terms of the impact on the ecological system of the world. Under normal conditions, the ecological system is capable of self-restoration. In prehistoric times, the world's population was very small compared to today's and the damage caused by humans then was very limited and could be healed by itself. In modern times, until now, we did a lot to change nature, but the damage was not significant enough to threaten the survival of the entire civilization.

2) **trivial:** unimportant, insignificant, of little value

4. Indeed, until our lifetime, it was always safe to assume that nothing we did or could do would have any lasting effect on the global environment. But it is precisely that assumption which must now be discarded so that we can think strategically about our new relationship to the environment.

- 1) Pay attention to the time adverbial: until our lifetime
- 2) How are these two sentences connected semantically? assume—assumption
- 3) What we should get rid of is exactly that kind of view which has been taken for granted. Our relationship to the earth has fundamentally changed, and therefore we must view this new relationship in a long term, overall way.
- 4) The sentence construction ‘It is ...which...’ and the phrase ‘precisely’ are for emphasis to give more force to the argument that we must think strategically about our new relationship to the environment.



Para 16: the dominant cause of environmental destruction

1. Human civilization is now the dominant cause of change in the global environment.

Topic sentence: a strong argument.

2. Yet we resist this truth and find it hard to imagine that our effect on the earth must now be measured by the same yardstick used to calculate the strength of the moon's pull on the oceans or the force of the wind against the mountains.

- 1) **yardstick**: a standard basis of calculating: a yardstick for measuring astronomical distances. The author implies that the effect of human activities on the environment is as basic and permanent as the effect of the moon on the ocean or the wind on a mountain and can be measured as scientifically.
- 2) **the moon's pull on the ocean**: the moon's gravitational pull on the oceans.
- 3) We refuse to accept this truth and find it hard to think that we should estimate and assess the human impact on the earth by the same standard of calculation used to calculate the moon's gravitational pull on the oceans or the wind's effect on the mountains. **Here the author emphasizes that human civilization is the dominant cause of change in the global environment (such as global warming) and points out that some people refuse to accept the truth.**

3. And if we are now capable of changing something so basic as the relationship between the earth and the sun, surely we must acknowledge a new responsibility to use that power wisely and with appropriate restraint. So far, however, we seem oblivious of the fragility of the earth's natural systems.

1) By 'something so basic as the relationship between the earth and the sun', the author is referring to global warming caused by rising levels of greenhouse gases that trap more heat which the earth receives from the sun due to human activity. As humans have great power to make basic changes in the global environment, we must recognize that we have the responsibility to use the newly acquired capability in a cautious way and with proper restraint.

2) Up until now, we seem to be unaware of the fact the earth's natural systems are vulnerable and can easily be damaged.

In Para 13 to Para 16, the author first discusses two examples of strategic environmental problems. These examples illustrate how human civilization is capable of affecting the entire global environment. Consequently our relationship to the environment has changed, and we must see that humans are the dominant cause of change in the global environment and become aware of the fragility of the earth's ecological systems.

**Para 17-Para 23:** Two key factors explaining why human civilization becomes the dominant cause of change in global environment.

**Para 17:** This century has witnessed **dramatic** changes in two key factors that define the physical reality of our relationship to the earth: **a sudden and startling surge** in human population, with the addition of one China's worth of people every ten years, and a **sudden acceleration** of the scientific and technological revolution, which has allowed an almost **unimaginable magnification** of our power to affect the world around us by burning, cutting, digging, moving and transforming the physical matter that makes up the earth.

1) physical reality:

Technology does not need to estrange us from one another... the **physical reality** comes alive with the human stories we have told there. 技术未必要让我们彼此疏远，正是因为有了那些富有人情味的故事，真实世界才显得有生活气息。

2) surge: a sudden increase in something.

3) worth: equal in size or number

4) magnificence: the act of magnifying (enlarging); the state of being magnified;

5) physical matter: material substance

## Para 18: The surge in population

1. The surge in population is both a cause of the changed relationship and one of the clearest illustrations of how startling the change has been, especially when viewed in a historical context.

- 1) Paraphrase: The sudden increase of world population is one of the major causes of the changed relationship and at the same time it clearly illustrates how shocking the change has been, especially when we try to understand the change in relation to what happened in the past, in a historical context. The sudden big increase of population is a major cause of the change in our relationship to the earth because we are putting more pressure on the planet for more food, energy and other natural resources.
- 2) The following paragraph will illustrate why the author thinks the population increase in recent years is sudden and shocking.

## Para 18: The surge in population

2. From the emergence of modern humans 200,000 years ago until Julius Caesar's time, fewer than 250 million people walked on the face of the earth.

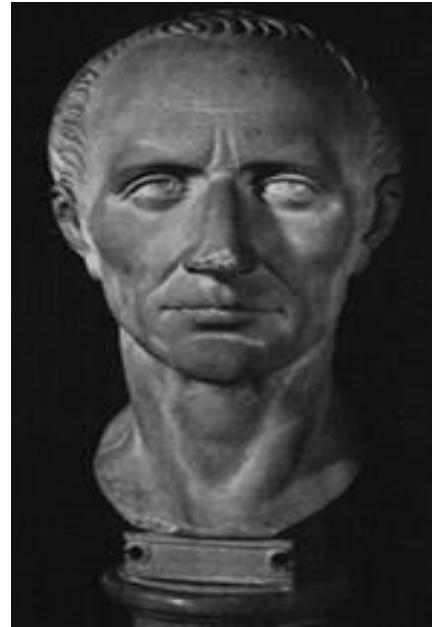
**Paraphrase:** It is hard to say exactly when the human species emerged. It is estimated the emergence took place between 160,000 to 190,000 years ago according to current scientific research findings. The world population was fewer than 250 million at Julius Caesar's time, that is, around 100 B.C -44 B. C.

3. When Christopher Columbus set sail for the New World 1500 years later, there were approximately 500 million people on earth.

**Paraphrase:** The world population had increased to approximately 500 million by around 1492. in a long period of 1500 years the world population doubled, growing from 250 million to 500 million.

# Julius Caesar (100-44 BC)

- He is the best-known of all the ancient Roman leaders, and the first to land in Britain with an army in 55 and 54 BC respectively, although Britain did not become part of the Roman empire until nearly a hundred years later.





# Christopher Columbus

Christopher Columbus was an Italian explorer and navigator. In 1492, he sailed across the Atlantic Ocean from Spain in the Santa Maria, with the Pinta and the Niña ships alongside, hoping to find a new route to India.

Between 1492 and 1504, he made a total of four voyages to the Caribbean and South America and has been credited – and blamed – for opening up the Americas to European colonization.



3. By the time Thomas Jefferson wrote the Declaration of Independence in 1776, the number had doubled again, to 1 billion. By midway through this century, at the end of World War II, the number had risen to just above 2 billion people.

- 1) By 1776, the world population had increased to 1 billion. This time it took only about 280 years for the world population to double.
- 2) At the end of World War II, the world population rose to 2 billion. This doubling took only 170 years.

How is this paragraph developed?

--by statistics; by contrast

Para 19:

1. In other words, from the beginning of humanity's appearance on earth to 1945, it took more than ten thousand generations to reach a world population of 2 billion people.

1) 'In other words' is a transitional device, which introduces a summary or the repetition of ideas, but in different words.

2. Now, in the course of one human lifetime—mine—the world population will increase from 2 to more than 9 billion, and it is already more than halfway there.

1) In the course of our human lifetime: during the life span of an individual

2) The figures are used to support the fact that human population increase is sudden and startling.

## Para 20: the other key factor: the acceleration of the scientific and technological revolution

1. Like the population explosion, the scientific and technological revolution began to pick up speed slowly during the 18<sup>th</sup> century.
- 1) **Like the population explosion:** This prepositional phrase is used for paragraph transition, from discussing population explosion in the last paragraph to the scientific and technological revolution in the new paragraph. The phrase signals there will be some similarities.
- 2) **population explosion:** the recent great growth in human numbers resulting from increased survival and exponential population growth.
- 3) **pick up speed:** to increase speed; gain speed

2. And this ongoing revolution has also suddenly accelerated exponentially.

- 1) **exponentially**: of or relating to an exponent (using a sign that show how many times a number is to be multiplied by itself) 数字中的指数
- 2) **suddenly accelerated exponentially**: suddenly grew at a speed that double and tripled the original speed

3. For example, it is now an axiom in many fields of science that more new and important discoveries have taken place in the last ten years than in the entire previous history of science.

- 1) What is the function of this sentence?
- 2) **axiom**: a statement, especially on that is short, that is generally accepted as true and doesn't need to be proved.

4. While no single discovery has had the kind of effect on our relationship to the earth that nuclear weapons have had on our relationship to warfare, it is nevertheless true that, taken together, they have completely transformed our cumulative ability to exploit the earth for sustenance—making the consequences of unrestrained exploitation every bit as unthinkable as the consequences of unrestrained nuclear war.

- 1) **Paraphrase:** Although no individual scientific discovery has changed the human relationship to the earth as much as nuclear weapons have fundamentally changed the relationship between humankind and warfare, it must be acknowledged that taken together, these scientific discoveries have basically changed our ability to utilize the earth for survival. Originally this ability grew by gradual addition, but now these discoveries have suddenly enabled humans to exploit the earth without any restraints, and the consequences of assaulting the earth this way will be just as terrible and disastrous as the consequences of a full-scale nuclear war.
- 2) **cumulative:** increasing by successive additions
- 3) **sustenance:** food and means of support
- 4) **every bit as:** used when saying strongly that someone is just as good, important, etc. as someone else  
e.g. She is *every bit as* smart as her brother.

## Para 21: The cause of environmental problems

1. Now that our relationship to the earth has changed so utterly, we have to see that change and understand its implications.

‘Now that ’ is another transitional device. Since our relationship to the planet has changed completely, we have to face the change and try to understand what it means.

2. Our challenge is to recognize that the startling images of environmental destruction now occurring all over the world have much more in common than their ability to shock and awaken us.

**Paraphrase:** Our task is to see and to understand that those frightening examples of environmental destruction that are taking place all over the world are just alike because they shock and wake us up. They have something more to tell us.



3. They are symptoms of an underlying problem broader in scope and more serious than any we have ever faced.

- 1) **Paraphrase:** They are signs and indications showing that there exists a much greater and more serious problem than we have ever encountered.
- 2) **symptom:** the physical condition which shows one has a particular illness; a sign that a serious problem exists. 症状、征兆  
e.g. The doctor made his diagnosis after studying the patient's symptoms. 医生研究病人的症状后，作出诊断。

4. Global warming, ozone depletion, the loss of living species, deforestation—they all have a common cause—the new relationship between human civilization and the earth's natural balance.

- 1) This sentence points out the cause of environmental problems: the new relationship between human civilization and the earth's ecological balance. In other words, they are all caused by human activities.
- 2) From this sentence, we can predict that the writer is going to give a further explanation of the cause in the following part of the text.

## Para 22: two aspects to the challenge

1. There are actually two aspects to this challenge. The first is to realize that our power to harm the earth can indeed have global and even permanent effects. The second is to realize that the only way to understand our new role as a co-architect of nature is to see ourselves as part of a complex system that does not operate according to the same simple rules of cause and effect we are used to.

- 1) What is implied in **the first challenge**?—we cannot abuse our power.
- 2) **The second challenge** means: Human beings' new role is to plan for nature together with nature, as its partner rather than its master or conqueror, and according to natural laws rather than human laws. The only way to understand this new role of ours is to regard ourselves as part of a complicated system which does not function according to the simple rules of cause-effect we are familiar with.
- 3) **co-:(prefix)** with, together, jointly  
coexistence; co-author

## Para 22: two aspects to the challenge

2. The problem is not our effect *on* the environment so much as our relationship *with* the environment.

- 1) Make comments on the use of prepositions ‘on’ and ‘with’. What is implied here?
- 2) What is involved is a matter of human relations with nature, rather than how mankind will affect nature.

3. As a result, any solution to the problem will require a careful assessment of that relationship as well as the complex interrelationship among factors within civilization and between them and the major natural components of the earth’s ecological system.

**Paraphrase:** As a result, if we want to solve the problems, we will have to carefully determine and weigh the importance of our relationship with the planet and the importance of the complicated interaction among factors inside human society and the relationship between these factors and the main natural parts of the global ecological system.

### Para 23. the real solution to the problem

1. The strategic nature of the threat now posed *by* human civilization to the global environment and the strategic nature of the threat *to* human civilization now posed by changes in the global environment present us with challenges and false hopes.

- 1) What is implied in the use of the prepositions 'by' and 'to' ?
- 2) **Paraphrase:** Human civilization poses a global and permanent effect on the earth, causing changes in the global environment. This, in turn, presents us humans with challenges and false hopes.
- 3) The author has already discussed the challenges in Para 22 and now he is going to talk about the false hopes in the next sentence.
- 4) **false:** completely untrue; not real but seem real and deceive people

## Para 23. the real solution to the problem

2. Some argue that a new ultimate technology, whether nuclear power or generic engineering, will solve the problem.

1) **Paraphrase:** One of the examples of false hopes is to rely on a new ultimate technology, whether it is nuclear power or genetic engineering, for solving the problem.

2) **ultimate:** the best or most extreme of its kind

e.g. Hard work is the ultimate source of success. 努力工作是成功之本。

Our ultimate objective is the removal of all nuclear weapons. 我们的最终目标是消除所有核武器。

3) **generic engineering:** the group of applied techniques of genetics and biotechnology used to cut up and join together genetic material, especially DNA from one or more species of organism, and to introduce the result into another organism in order to change one or more of its characteristics. 基因工程

### Para 23. the real solution to the problem

3. Others hold that only a drastic reduction of our reliance on technology can improve the conditions of life—a simplistic notion at best.

**Paraphrase:** Others hold just the opposite opinion, that is, we must drastically reduce our reliance on technology. But this is an oversimplified view even under the most favorable interpretation, at most a view which makes complex problems unrealistically simple.

4. But the real solution will be found in reinventing and finally healing the relationship between civilization and the earth.

**Paraphrase:** What, according to the author, should be the real solution? The real solution lies in a careful reconsideration and transformation of the relationship between human civilization and the earth.

### Para 23. the real solution to the problem

5. This can only be accomplished by undertaking a careful assessment of all the factors that led to the relatively recent dramatic change in the relationship. The transformation of the way we relate to the earth will of course involve new technologies, but the key changes will involve new ways of thinking about the relationship itself.

**Paraphrase:** This transformation of our relationship with the planet will no doubt involve new technologies, but the essential change will require us to think about this relationship itself in new ways. New technologies may refer to those related to clean and renewable energies, recycling of waste, carbon emission reduction, etc. To sum up, the final solution to the problem does not lie in technology but in how humans regard our relationship with the earth.