北京大学试用教材

英语

（三）

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ENGLISH

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Lesson One

Hydroponics and Chemurgy

Although agriculture is the oldest industry in the world, new methods are being discovered all the time. From long experience people have known that no artificial fertilizer is quite so good as the natural ones, but it took time for them to discover the reason. In natural fertilizers there are tiny amounts of organic compounds called plant hormones. They do for plants what vitamins do for animals. People are now finding out more about these substances and making them available for practical use in the soil.

During the last few years, such discoveries have led to an interesting new way of raising plants without the use of soil at all! This method is called hydroponics. In one way of doing it, the plants are held with their roots dipped into a tank containing the chemicals they need, and air is bubbled through the solution to furnish oxygen to the roots. Such careful control is needed that this method will probably never take the place of ordinary farming for the staple crops such as grain. But it works out well for raising certain vegetables and flowers.

Another development of the last few years is the discovery of soil conditioners These are not fertilizers—their job is only to make the soil porous. The conditioners cause the soil parti-

cles to form granules for air to get the spaces between them. Breaking up the soil in this way makes it easier for roots to push outward and for spouts to force their way upward. As a result, plants grow faster and reach a larger size when the soil is treated with conditioners. Thus will come the time for vegetable growers to use these compounds widely.

Although we think of the farm mainly in connection with food, some farm products never come to our table at all but go direct to factories where a great many other things are made from them. There is an important branch of practical chemistry, called chemurgy that deals with the use of organic farm products in industry. Each year through the science, millions of tons of farm wastes are changed into valuable materials.

Chemurgy supplies us with an amazing variety of things. Potatoes and grains, for example, can be worked on by bacteria and yeasts to produce alcohol, which has important chemical uses Peanuts are valuable for making ink, rubber substitues, soap and dyes. And many other waste materials can be changed into something useful.

Chemistry has brought about enormous improvements in farm methods and farm products. In return, agriculture has furnished many of the most valuable raw materials for chemical industry. It is clear that chemistry has a close relation with agriculture.

New Words and Expressions

1. hydroponics [ˌhaidrə'pɔniks] n. 水栽法
2. chemurgy ['kemə:dʒi] n. 农业化学
3. industry ['indəstri] n. 工业
4. farmer n. 农民；农场主
5. fertilizer ['fə:tilaizə] n. 肥料
6. organic [ɔ:'gænik] a. 有机的
7. hormone ['hɔ:məun] n. 激素
8. vitamin ['vitəmin] n. 维生素
9. available [ə'veiləbl] a. 可用的；可得到的；可达到的
10. root n. 根
11. dip vt. 浸
12. tank n. 桶
13. bubble ['bʌbl] vt. 使冒泡，n. 气(水)泡
14. furnish vt. 提供
15. control [kən'trəul] n. 控制；(实验的)对照，vt. 控制
16. probably ['prɔbəbli] ad. 很可能；大概
17. staple ['steipl] a. 大宗生产的
18. crop n. 作物；庄稼；(鸟类等)的嗉囊
19. vegetable ['vedʒitəbl] n. 蔬菜；植物
20. conditioner [kən'diʃnə] n. 土壤团粒结构促进剂
21. granule ['grænju:l] n. 细粒
22. outward ['autwəd] ad. 向外，a.外面的
23. sprout [spraut] n. 芽，vt. 发芽
24. upward ad. 向上
25. treat vt. 处理；探讨；对待
    treat with 对待；探讨
26. grower n. 种植者
27. mainly ad. 主要
28. connection [kə'nekʃn] n. 连结；联系
    in connection with 和……有关系
29. branch [brɑ:nʧ] n. 枝；部门；分科
30. amazing [ə'meiziŋ] a. 令人惊异的
31. potato [pə'teitəu] n. 马铃薯；土豆
32. bacteria [bæk'tiəriə][复]n. 细菌
33. yeast [ji:st] n. 酵母

34. peanut ['pi:nʌt] n. 花生
35. substitute ['sʌbstitjut] n. 代用品，vt. 用……代替
36. dye n. 染料
37. enormous [i'nɔ:məs] a. 巨大的；庞大的

Notes to the Text

1. They do for plants what vitamins do for animals.

植物激素之于植物，犹如维生素之于动物一样。

句中 what 的用法，表示两个关系相等的事物；"A do for B what X do for Y"，或"A do that for B which X do for Y"。what = that which，在句中用作 do 的宾语。还有用作表语的，较为常见，例如：

Air is to man what water is to fish.

人离不开空气，犹如鱼离不开水。

这个句型，也可写成如下几种形式：

A is to B as X is to Y.

As X is to Y, so is A to B.

A is that to B which X is to Y.

2. In one way of doing it, the plants are held with their roots dipped into a tank containing the chemicals they need……

一种水栽法是把植物竖立起来，将根浸在桶子里，桶内有它们所需的化学制剂……

"with their roots dipped into a tank" 是由 with 引入的带有逻辑主语的分词结构（见本书第三课语法），用作状语，表示伴随情况，说明 are held；介词 with 无词义。现在分词 containing 用作定语，说明 tank。

3. Such careful control is needed that this method will probably never take the place of ordinary farming for the staple crops such as grain.

需要如此小心的控制，以致这种方法也许决不会取代像生产谷类这样的主要作物所采用的普通耕作法。

第一个 such 和 that 连用，引入结果状语从句；第二个 such 和 as 连用，引入同位语 grain，和 crops 同位。

4. Thus will come the time for vegetable growers to use these compounds widely.

因此，蔬菜种植者广泛使用这些化合物的时日将会到来。

因为主语较长，用倒装语序，把谓语(will come)放在主语(the time)之前。

Grammar

带逻辑主语的不定式结构 不定式前往往用介词 for 引入它的逻辑主语。这种 "for＋名词(或代词)＋不定式"结构可用作

1. 主语：

It is necessary *for the peasants to know something about science.*

农民知道一点科学是必要的。

2. 宾语：

We think it possible *for them to fulfil their production plan in a few weeks.*

我们认为他们几周内完成生产计划是可能的。

3. 定语：

That was probably the best way *for us to overcome the difficulties.*

那也许是我们克服困难的最好方法。

4. 状语：

This question is too difficult *for him to answer.*

这个问题太难，他回答不了。

He opened the window *for the fresh air to come in.*

他打开窗子好让新鲜空气进来。

Exercises

I. Questions on the text:

1. Which is better, artificial fertilizer or natural fertilizer?
2. Why are natural fertilizers called plant hormones?
3. What is hydroponics?
4. Will hydroponics take the place of ordinary farming for the staple crops? Why?
5. What are soil conditioners?
6. What do the conditioners do to the soil particles?
7. What is chemurgy?
8. How is alcohol produced?
9. What can be made from peanuts?
10. Explain the close relation between chemistry and agriculture.

II. Point out the "infinitive with sense-subject" construction in each of the following sentences and explain its function. Then translate the sentences into Chinese.

1. It takes a whole year for the earth to travel round the sun once.
2. It is easy for us to understand that the space close to the earth is much smaller than the far-away outer space.
3. There are always new problems for scientists to work on.
4. It is a great help for us to be able to get oxygen from some of the compounds and mixtures it is hidden in.
5. The fog was too dense for us to see anything a little far away.
6. Do you have anything more for me to do?
7. In order for an earth satellite to stay in an orbit above the earth's surface, the speed it needs is about 5 miles a second.
8. The teacher considers it important for the students to remember that simply mixing two materials may bring about a chemical change.
9. It would take millions of molecules to make a speck big enough for you to see with a microscope.
10. An increase in the temperature of a volume of gas produces an

increase in the internal pressure within the gas and the result is a tendency for the gas to expand.

11. The time was long for the people to discover the reason why the natural fertilizer is much better than the artificial one.
12. The conditioners cause the soil particles to form granules for air to get the spaces between them.

Ⅲ. Complete each of the following sentences with expressions listed below in their proper forms and translate the sentences into Chinese:

(in connection with, deal with, as a result, all the time, take the place of, supply…with, work on, furnish…to, have a close relation with, in return, work out)

1. The earth is travelling round the sun_____.
2. Is it possible for a computer_____humen brain?
3. _____, air can get the spaces between granules so formed by the conditioners.
4. If this plan_____well, it will be used in other factories.
5. Chemistry is a branch of science that_____how substances are made up, how they combine and how they act under different conditions.
6. Can you think of dyes and soap_____peanuts?
7. Natural fertilizers_____plants_____tiny amounts of organic compounds called plant hormones.
8. It is necessary for bacteria_____the elements needed by plants before they can use them.
9. The plant_____sugars_____the bacteria, which,_____, form proteins out of nitrogen gas from the air or the soil, and thus builds some of the proteins into its own cells.
10. Humidity_____how hot we feel on a hot day and how cold we feel on a cold day.

Ⅳ. Translate the following into English:

1. 在工业上某些废料已经用来代替橡胶制品。
2. 有些农业产品主要是同化学工业有关的。研究利用有机作物的学科叫做农业化学。
3. 人们从经验知道人造橡胶制品差不多跟天然橡胶制品一样好。
4. 下雨给他昨天没有参加会议提供了理由。
5. 一些庄稼废物用化学药品处理可以变为宝贵的原料。
6. 水和肥料对蔬菜的生长是必需的。
7. 我认为学生在两小时内做完这个实验是可能的。
8. 有时候人造肥料对植物的作用跟天然肥料一样。
9. 结果，我们找到了两种不同的方法解决这个问题。
10. 团粒结构促进剂的作用只是使土壤变得多孔，以使空气更易进入土壤粒子中去。

Reading Material

Plants and Bacteria

In order to feed the people of the world, the farmer must carry on a constant battle against the forces of nature. Luckily he is not alone in this battle. There is a great deal of work for bacteria to do as well.

When food crops or other plants are taken from the ground, the chemicals of which they are made must be put back into the soil in order to keep it fertile. It is good for the farmer to do this by adding a fertilizer. The most important elements in a complete fertilizer are nitrogen, phosphorus and potassium, all needed by growing plants. However, before the plants can use these elements, they must be worked on by bacteria. And these bacteria themselves need still other elements such as iron, copper, magnesium and sulfur in order to live.

So when the farmer spreads fertilizer, he is not only providing for his crops but is feeding bacteria at the same time.

Bacteria specialize in certain jobs. Some are able to break down these materials. Others can attack those. In the huge, well-organized chemical factory that we have in the soil, bacteria produce many useful things for the plants to grow.

feed vt. 喂养，供养
(fed, fed)
fertile ['fə:tail] a. 肥沃
potassium [pə'tæsjəm] n. 钾
magnesium [mæg'ni:ziəm] n. 镁
sulfur ['sʌlfə] n. 硫
specialize ['speʃəlaiz] vi. 专业化
well-organized [wel'ɔ gənaizd] a. 有组织的

Lesson Two

How Sound Travels

Our earth is full of sound because it is full of motion, like trucks rolling along the highway or jets zooming into the sky.

Sometimes a sound is far away and yet it is often possible for us to hear it clearly. We may hear a jet droning so far above the earth that we can barely see it.

How do such far-away sounds travel toward our ears? This, too, has something to do with motion.

All sounds travel to our ears in about the same way and come to us in waves that can be seen only with special electronic equipment.

Most of the sound waves that reach our ears travel through air, but sound can also travel through water. Sound travelling in still air is at a speed of about one kilometer in three seconds. If there is a wind, the sound will go faster in the direction of the wind. Against the wind, it will go more slowly.

The speed of sound travelling through water is much faster than that through air——about one and a half kilometers in one second. If sound passes through iron, it will speed along five kilometers in one second, about fifteen times as fast as

through air.

With a long iron pipe we can make an interesting experiment. Tap one end of the pipe with a hammer. When the ear is put close to the other end, two sounds can be heard with one blow of the hammer if the pipe is long enough. The sound through the iron comes more quickly than that through the air. The longer the pipe, the later the sound will be heard through the air Thus we may see that sound travels through different substances with different velocities.

Now we know that sound moves and travels. But what kind of movement causes sound waves to start travelling outward in all directions?

Sound is caused by vibrations. A vibration is simply a back and forth movement.

Stretch an elastic band tightly between two nails that are fastened to a wooden board. When we pull back on the band and then let go, it will suddenly jump forward. But before returning to its original position the elastic band will quickly move back and forth a number of times——in other words, it will vibrate

If we look very carefully, we can see that this happens within a few seconds. If we listen closely, we may hear the faint humming sound made by the vibrations.

It is such vibrations that make sound waves. It is evident for strong vibrations to make loud sounds and for weak vibrations to make soft sounds.

New Words and Expressions

1. motion *n.* 运动
2. truck *n.* 卡车
3. roll [rəul] *vi.* 滚动
4. highway ['haiwei] *n.* 公路
5. yet *ad.* 还；仍然，and yet 然而，可是
6. drone *vi.* 嗡嗡叫 *n.* 雄蜂
7. barely *ad.* 仅仅，几乎没有
8. electronic [ˌilek'trɔnik] *a.* 电子的
9. equipment [i'kwipmənt] *n.* 设备
10. tap *vt.* 轻拍
11. velocity [və'lɔsəti] *n.* 速度
12. movement ['mu: vmənt] *n.* 运动
13. outward ['autwəd] *ad.* 向外
14. vibration [vai'breiʃn] *n.* 振动
15. forth *ad.* 向前
    back and forth 来来往往地，(前后)来回
16. stretch [stretʃ] *vt.* 拉紧
17. elastic [i'læstik] *a.* 弹性的
18. band *n.* 带
19. fasten ['fɑ:sn] *vt.* 扣紧
20. wooden ['wudn] *a.* 木头的
21. board [bɔ:d] *n.* 木板
22. let go 放掉
23. forward ['fɔ:wəd] *ad.* 向前
24. in other words 换句话说
25. vibrate *vi.* 振动
26. faint *a.* 微弱的
27. hum *vi.* 嗡嗡响
28. evidenty ['evidənt] *a.* 明显的
29. loud *a.* 响亮的
30. soft *a.* 柔和的

Grammar

带逻辑主语的动名词结构 动名词的逻辑主语往往用一个名词或代词的所有格（如不在句首，名词也可用普通格）放在动名词前面来表示。这种结构可用作

1. 主语：

   Sound travelling in still air is at a speed of about one kilometer in three seconds.

声音在平静的空气中传播的速度是大约每三秒钟一公里。

2. 表语：

The question is their having to face a lot of difficulties.

问题是他们不得不面对很多困难。

3. 宾语：

No one can deny sound moving and travelling.

谁也不能否认声音会运动，也会传播。

4. 介词的宾语：

Our earth is full of sound because it is full of motion, like *trucks rolling along the highway* or *jets zooming into the sky*.

地球上到处都有声音，因为到处有运动，像卡车在公路上奔驰，或者像喷气式飞机隆隆地钻上天空。

The speed of *sound travelling through water* is much faster than through air.

声音通过水传播的速度比通过空气快得多。

Exercises

I. Questions on the text:

1. Why is our earth full of sound?
2. How do the far-away sounds travel toward our ears?
3. How can you see the sound waves?
4. What is the speed of sound travelling in still air per second?
5. How fast does sound pass through iron in one second?
6. How can you prove that sounds travel through different substances with different velocities?
7. By what is sound caused?
8. What is a vibration?
9. What do strong vibrations make?
10. What do weak vibrations make?