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理科适用

英语

第三册

北京大学西语系 编
公共英语教研室



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Lesson One

The Great Proletarian Cultural Revolution Pushes China's Science and Technology Forward

Through the Great Proletarian Cultural Revolution, science has made further progress in our country. The Chinese people have mastered many new scientific and technological techniques, such as atomic energy, jet propulsion, radio electronics, computing technology, automatic control and lasers, by maintaining independence and through self-reliance.

Successful tests have been made of atomic and hydrogen bombs, guided missiles carrying nuclear weapons and man-made earth satellites, one of which has been recovered. Facts forcefully bear out the truth that **only socialism can save China**. Under the leadership of Chairman Mao and the Communist Party, **the Chinese people have high aspirations, they have ability, and they will certainly catch up with and surpass advanced world levels in the not too distant future.**

Guided by Chairman Mao's proletarian revolutionary line, high energy physicists have advanced the new theory of the "straton model" in the study of the internal structure of elementary particles. Medical workers have attained many new successes such as acupuncture anaesthesia.

Engels pointed out 100 years ago : **"Life is the mode of existence of albuminous bodies,"** and **"the origin of life ... must have been the result of chemical action."** To probe the secret of life, a group of young scientific workers took up the heavy task of using chemical processes to make synthetic protein. During the Great Proletarian Cultural Revolution, they succeeded in de-

termining the crystal structure of insulin by the X-ray diffraction method. After repeated experiments, they won complete success in determining the crystal structure of pig insulin at a resolution of 1.8 angstroms within a comparatively short period, reaching the advanced world levels.

“The mass movement is necessary in all work. Things won’t go without the mass movement.” To launch vigorous mass movements in scientific and technological work is one of the main features in the development of our science and technology. Our country now has a large contingent of scientific and technical workers composed mainly of workers, peasants and soldiers as well as professional researchers and cadres. Over 10 million people now take part in scientific experiments in the rural areas. There are experimental stations and groups in most rural people’s communes and production brigades. Scientific farming has contributed greatly to rich harvests. Relying on the masses, we have made some achievements in earthquake prediction and forecasting. **“The masses are the real heroes.”** Numerous inventions and innovations have been made by the worker-peasant-soldier masses. Scientific experiments have become the undertaking of the broad masses of the Chinese people.

All the achievements we have made in science and technology are all great victories for Mao Tsetung Thought.

We believe that under the leadership of the Central Committee of the Communist Party of China headed by Chairman Hua, through deepening the great mass movement to expose and criticize the “gang of four”, and eradicate its pernicious influences in the field of science, our scientific and technical workers will win still greater achievements.

NEW WORDS AND EXPRESSIONS

1. forward *ad.* 向前

2. master ['mɑ:stə] *vt.* 掌握

3. propulsion [prə'pʌlʃən] *n.* 推进(力)
jet propulsion 喷气推进
4. automatic [ˌɔ:tə'mætɪk] *a.* 自动的
5. laser *n.* 激光
6. independence [ɪndɪ'pendəns] *n.* 独立自主
7. self-reliance ['self-ri'laɪəns] *n.* 自力更生
8. missile ['mɪsaɪl] *n.* 投射器, 导弹
guided missile 导弹
9. weapon *n.* 武器
10. bear out 证明
11. aspiration [ˌæspi'reɪʃən] *n.* 志气
12. catch up with 赶上
13. surpass *vt.* 超过
14. level *n.* 水平
15. straton model 层子模型
16. internal [ɪn'tə:nl] *a.* 内部的
17. elementary [ˌeli'mentəri] *a.* 基本的
18. acupuncture [ˌækju'pʌŋktʃə] *n.* 针刺
19. anaesthesia [ˌænis'θi:zjə] *n.* 麻醉(法)
20. mode *n.* 方式
21. albuminous [æl'bjʊ:mɪnəs] *a.* 蛋白质的
22. origin ['ɒrɪdʒɪn] *n.* 起源
23. probe *vt.* 探查
24. secret ['si:krit] *n.* 秘密
25. synthetic [sɪn'θetɪk] *a.* 合成的
26. diffraction [dɪ'frækʃən] *n.* 衍射(法)
27. repeat *vt.* 重复
28. resolution [ˌrezə'lʊ:ʃən] *n.* 分解
29. angstrom [ˈæŋstrəm] *n.* 埃
(光线或一般辐射线波长单位, 一厘米的一亿分之一)
30. period ['piəriəd] *n.* 时期
31. launch [lɔ:ntʃ] *vt.* 发动; 发射
32. feature ['fi:tʃə] *n.* 特征
33. contingent [kən'tɪndʒənt] *n.* 分遣队; 一批人
34. professional [prə'feʃənl] *a.* 职业的; 专业的
35. researcher *n.* 研究人员
36. rural ['rʊərəl] *a.* 农村的
37. station *n.* 站; 局
38. brigade *n.* 大队
39. farming *n.* 耕种, 种田
40. contribute [kən'tribju:t] *vi.* 贡献
41. harvest ['hɑ:vɪst] *n.* 收成
42. rely (on) [ri'laɪ] *vi.* 依靠
43. earthquake ['ə:θkweɪk] *n.* 地震
44. prediction [pri'dɪkʃən] *n.* 预告
45. hero *n.* 英雄
46. undertaking *n.* 事业
47. achievement [ə'tʃi:vmənt] *n.* 成就
48. eradicate [ɪ'rædɪkeɪt] *vt.* 根除
49. pernicious [pə:'niʃəs] *a.* 有毒的

NOTES TO THE TEXT

1. Successful tests have been made of atomic and hydrogen bombs, guided missiles carrying nuclear weapons and man-made earth satellites, one of which has been recovered. 关于原子弹和氢弹, 运载核武器的导弹以及人造地球卫星 (其中有一个已返回地面), 都做了许多成功的试验。

“of” 及其宾语 bombs, missiles 和 satellites 构成的介词短语, 作定语, 说明 tests, 为避免主语部分太长, 放在谓语动词之后。

2. The Chinese people have high aspirations, they have ability, and they will certainly catch up with and surpass advanced world levels in the not too distant future. 中国人民有志气, 有能力, 一定要在不远的将来赶上和超过世界先进水平。
3. The mass movement is necessary in all work. Things won't go without the mass movement. 什么工作都要搞群众运动, 没有群众运动是不行的。

READING MATERIAL

The 1975 rich harvest was achieved under the guidance of Chairman Mao's proletarian revolutionary line and as a result of taking class struggle as the key link, deepening the movement to learn from Tachai in agriculture and tenaciously fighting against natural disasters. From the beginning of 1975, dry spells, low temperatures and long overcast days, plant diseases and insect pests, floods and water-logging struck in different parts of the country and their severity was unheard-of in recent years. As a result of the Great Proletarian Cultural Revolution, the movement to criticize Lin Biao and Confucius and the movement to study the theory of the dictatorship of the proletariat, however, commune members and cadres worked with a single mind and joined efforts to triumph over the elements by relying on the strength of the collective economy and displaying a dauntless revolutionary spirit. According to statistics, with the exception of a few stricken areas where output was the same as or slightly lower than that of 1974, most regions had rich harvests, and total grain production in over half the country reached or topped all previous records.

Now the mass movement to learn from Tachai in agriculture is actively progressing. Hundreds of millions of people have been aroused and a million cadres have gone to agricultural front line. The revolutionary drive to build Tachai-type counties throughout the country is surging ahead. By the end of the next five years, China will have over one-third of its counties built into Tachai-type counties and agriculture in China will in the main be mechanized.

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. It comes to us in waves that can be seen only with special electronic equipment.

Most of the sound waves that reach our ears travel through the air, but sound can also travel through water. In still air, sound travels 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.

Through water, sound travels much faster than through air — about one and 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 it returns 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. highway ['haiwei] <i>n.</i> 公路 | 10. kilometer ['kiləmi:tə] <i>n.</i> 公里 |
| 2. jet <i>n.</i> 喷气飞机 | 11. pipe <i>n.</i> 管子 |
| 3. zoom [zu:m] <i>vi.</i> 轰轰响; 攒升 | 12. tap <i>vt.</i> 轻拍 |
| 4. drone <i>vi.</i> 嗡嗡叫 | 13. hammer <i>n.</i> 锤 |
| 5. barely <i>ad.</i> 仅仅; 几乎没有 | 14. blow <i>n.</i> 打击 |
| 6. special ['speʃəl] <i>a.</i> 特别的; 专门的 | 15. velocity [vi'ləsiti] <i>n.</i> 速度 |
| 7. electronic [ilek'trɒnik] <i>a.</i> 电子的 | 16. outward ['autwəd] <i>ad.</i> 向外 |
| 8. equipment [i'kwipmənt] <i>n.</i> 设备 | 17. vibration [vai'breiʃən] <i>n.</i> 振动 |
| 9. still <i>a.</i> 静止的 | 18. back <i>a., ad.</i> 向后 |
| | 19. forth <i>ad.</i> 向前 |
| | back and forth 往复, 来来
来回 |

- | | |
|---------------------------------|-------------------------------|
| 20. stretch [stretʃ] vt. 拉紧 | 的 |
| 21. elastic [i'laestik] a. 弹性的 | 29. in other words 换句话说 |
| 22. band n. 带 | 30. vibrate vi. 振动 |
| 23. tightly ['taɪtli] ad. 紧 | 31. second n. 秒 |
| 24. nail n. 钉 | 32. faint a. 微弱的 |
| 25. fasten ['fɑ:sn] vt. 扣紧 | 33. hum vi. 嗡嗡响 |
| 26. board [bɔ:d] n. 木板 | 34. evident ['evidənt] a. 明显的 |
| 27. let go 放掉 | 35. loud a. 响亮的 |
| 28. original [ə'ridʒənəl] a. 原来 | 36. soft a. 柔和的 |

NOTES TO THE TEXT

If sound passes through iron, it will speed along five kilometers in one second, fifteen times as fast as through air. 声音如果通过铁, 将以每秒 5 公里的速度前进, 比通过空气快 14 倍。

speed along 迅速前进

GRAMMAR

- I. 带逻辑主语的不定式结构: 不定式的逻辑主语要表示出来, 往往由介词 for 引入, 例如:

It is of first importance *for us to study Chairman Mao's works.* 我们学习毛主席著作是头等重要的事。

Sometimes a sound is far away and yet it is often possible *for us to hear it clearly.* 有时声音很远, 然而我们往往能听得清楚。

There is necessity *for us to combine theory with practice.* 我们有必要把理论和实践结合起来。

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。

- II. 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,例如:

Master Li's learning from others' advanced technology is always combined with his own creations. 李师傅学习别人的先进技术总是和他自己的创造结合起来。

Our earth is full of sound because it is full of motion, like *trucks rolling along the highway or jets zooming into the sky*. 地球上充满声音,因为它充满着运动,像卡车在公路上隆隆奔驰,或像喷气飞机轰地横上天空。

The old poor peasants agreed to *her becoming a barefoot doctor*. 老贫农都同意她成为赤脚医生。

EXERCISES

- I. 在下面的短文中,找出带逻辑主语的不定式结构和带逻辑主语的动名词结构,并译成汉语:

There are some things for us to learn about all waves from waves we can see, waves in water. If you drop a stone into a quiet pool of water, a disturbance is started where the rock enters the liquid. However, the disturbance is not confined to that place alone, but spreads out in wider and wider circles until they reach the edge of the pool.

All waves are started this way. They radiate outward from a disturbance in these widening circles. If you could see sound waves and light and heat and radio waves, they would make a pattern similar to the circles in the pool. You see those circles only on the surfaces of the water, but sound and light and heat waves extend in every direction, like a balloon being blown bigger and bigger.

- I. 阅读材料:

If a bottle of ammonia is opened in one corner of a closed room, the odor is soon apparent in all parts of the room even though there are no air currents. Why is it possible for the ammonia molecules to reach the observer? It is because of their moving quickly through the air. The molecules in the air of the room are

relatively far apart. As the ammonia molecules move, they pass between the molecules of the air with occasional collisions. Some of the molecules reach every part of the enclosure in a short time. The process of one substance mixing with another because of molecular motion is called diffusion. If the gas is confined in a small container and the pressure is reduced, diffusion takes place more rapidly, for the gas molecules are farther apart and collisions are less frequent.

I.

quiet *a.* 平静的

pool *n.* 池塘

disturbance [dis'tɜ:bəns] *n.* 骚动

rock *n.* 岩石

confine *vt.* 限制

circle *n.* 圆; 圈

radiate ['reɪdɪeɪt] *vi.* 辐射; 发散

widen *vi.* 变宽

pattern ['pætən] *n.* 式样, 图案

similar (to) ['sɪmɪlə] *a.* 类似的

extend [ɪks'tend] *vi.* 扩展

balloon [bə'lu:n] *n.* 气球

II.

ammonia [ə'maʊnjə] *n.* 氨(阿摩尼亚)

corner *n.* 角落

odo(u)r ['oʊdə] *n.* 气味

apparent [ə'pærənt] *a.* 明显的

apart *ad.* 分离

collision [kə'liʒən] *n.* 碰撞

enclosure [ɪn'klaʊzə] *n.* 范围; 墙围

mix *vi.* 混和

diffusion [dɪ'fju:ʒən] *n.* 扩散

container [kən'teɪnə] *n.* 容器

pressure ['preʃə] *n.* 压力

frequent ['fri:kwənt] *a.* 频繁的

Lesson Three

Conduction of Electricity

Conduction of electricity in solids consists of the drift of electrons that have been temporarily detached from the parent atoms. However, conduction in liquid electrolytes is ionic in nature. Ions, produced by dissociation of molecules, drift through the solution when a potential difference is maintained. Whereas in solid conduction a single kind of charged particle, the negative electron, moves in the process, in electrolytic conduction both positively and negatively charged particles take part in the motion, the positive particles moving in one direction while the negative move in the opposite. Moreover, the particles moving in electrolytic conduction are of atomic or molecular mass, consisting of charged atoms or groups of atoms, while in solids the moving particles have the mass of the electron, much smaller than that of the smallest atom.

A third type of conduction occurs in gases. This type of conduction is similar to liquid conduction in that both positive and negative ions move in the process, but it differs in the very important respect that very few of the ions exist before the beginning of the conduction process. Most of the ions are produced as a result of collisions between moving particles and molecules of the gas. Also the ions are of both atomic and electronic nature.

Under normal conditions a gas is a very poor conductor of electricity. There are very few ions present to take part in the conduction. A low voltage being applied to the specimen of gas, each ion moves toward the appropriate terminal. In this motion

the ions collide frequently with molecules of the gas. In these collisions further ionization rarely takes place, because the ion colliding with a molecule seldom has enough energy to remove an electron from the molecule. As the potential difference applied to the gas is increased, each ion will acquire more energy, on the average, between collisions. When the voltage is great enough that an ion acquires between collisions sufficient energy to ionize the atom or molecule that it strikes, two or more new ions are produced, one being the electron knocked off the atom and the other being the atom less its electron. Thus the number of ions builds up very rapidly and a disruptive discharge, or spark, occurs. This process of cumulative ionization is called ionization by collision.

Nowadays we have a new type of conduction that occurs in a vacuum. In order to have conduction in a vacuum charges must be introduced. This is most conveniently done by thermionic emission, the emission of electrons by a conductor when it is heated to a sufficiently high temperature. This type of conduction has been widely used in electron tubes of radio, television, and many other modern devices.

NEW WORDS AND EXPRESSIONS

- | | |
|---------------------------------------------------------|---------------------------------------------------------------------------------|
| 1. conduction [kən'dʌkʃən] <i>n.</i>
传导 | 8. ionic [ai'ɒnik] <i>a.</i> 离子的 |
| 2. drift <i>n.</i> 漂流; 流动
<i>vi.</i> 漂流; 流动 | 9. ion [aɪən] <i>n.</i> 离子 |
| 3. electron [i'lektɹən] <i>n.</i> 电子 | 10. dissociation [di'səʊsi'eɪʃən] <i>n.</i>
分离; 离解 |
| 4. temporarily ['tempərəɪli] <i>ad.</i>
暂时地 | 11. potential [pə'tenʃəl] <i>a.</i> 势的,
位的
potential difference 势差;
位差 |
| 5. detach <i>vt.</i> 分开; 分离 | 12. maintain [men'tein] <i>vt.</i> 维持;
保持 |
| 6. parent ['pæərənt] <i>n.</i> 母体 | 13. whereas <i>conj.</i> 而; 反之 |
| 7. electrolyte [i'lektrolaɪt] <i>n.</i> 电
解质; 电解(溶)液 | |