Lesson One

Text: Electricity Today

Grammar:

助动词 { have / be / will } 与 { 时态 / 语态 / 语气 } 的关系

Reading Materials

I. Direct And Alternating Currents

II. Advantage of A.C. Over D.C. Power Transmission

Text

Electricity Today

This has been called the age of electricity, for electricity is now used for such a variety of purposes that it appears to be able to replace all other agencies for doing things. It has caused many changes both inside and outside our homes, but the developments in science to be brought about due to a fuller knowledge of electricity are expected to be even more extensive and fundamental [1].

Let us consider briefly some of the more obvious and general changes which are due to the use of electricity. The last century was boastfully spoken of as the age of steam, for steam power had been growing from small beginnings until it had transformed the whole course of manufacture and had caused an industrial revolution. For the first time, power to drive machines was made available at a low cost. This power, however, had to be used close to the spot where it was generated.

Nowadays the transmission of power by electri-city has brought about a great change. This change is due to two facts: first, power can be transmitted over a great distance with practically negligible loss if it is carried by electric current[2]; secondly, power can be converted from mechanical form to the electrical form and back again to the mechanical form with almost 100 percent efficiency[3]. These two facts explain the preference for electricity in industry today.

But electricity has not replaced steam. Steam still provides power, of which electricity is the obedient carrier, it being capable of transmitting power in any desired amount and to any place where it is

necessary to use it.

In countries where abundant waterfalls are found the generation of power does not depend upon fuel but is supplied by the energy of falling water.

We know the first central electric power stations to have been built for the supply of electric light. As the electric energy can easily be carried over long distances, the places for these large power-stations are to be chosen on a river from which a large supply of water can be drawn, another important factor to be considered in choosing the place being the availability of coal in ample quantities.

In addition to its efficiency and convenience, as a means of carrying power, electricity has many other properties peculiar to itself, which have applications of great practical value. The first property used was the high speed of travel of an electric signal along a wire. Many attempts for nearly a hundred years having been made to use this property in a reliable system of signalling, the eletric telegraph was made a practical device about the middle of the last century.

The methods of sending and receiving the messages had been continually improved along with

the advances in the design of the cables until a single line could transmit simultaneously several messages at the same time in both directions.

Such a feat requires a perfect adjustment and timing of all the apparatus employed and has only been made possible by an intensive study of the manner in which pulses of electricity travel along wires, and the development of instruments capable of detecting these pulses[4].

When we turn to telephony, or the transmission of speech by electric current[5], the achievements are even more surprising. To-day, it is possible to get a call through to almost any part of the inhabited world. This great extension of the distance is entirely due to the invention of the thermionic valve which brought about the real growth of long-distance telephony.

Electricity has also been the means of many improvements in manufacture. In the chemical industry, for example, new electrical processes for making materials in general use, such as washing soda, have displaced the older methods, and many new materials of considerable value and usefulness have been produced—of these aluminium, carborundum and artificial graphite are examples[6]. Electric furnaces

of to-day installed in different mills are known to attain such high temperatures which could not be formerly approached in any fuel burning furnace.

To get an idea of how all these uses of electricity are linked up by simple fundamental properties, an elementary study of force, work, and energy necessary[7].

New Words

1. a variety of		种种；一种
2. appear	[ə'piə] v.	出现；好像
3. agency	['eidʒənsi] n.	力量；手段
4. cause	[kɔ:z] v.	引起；发生
5. change	[tʃeindʒ] n.	变化
6. due to		由于
7. full	[ful] a.	满；充分
8. fundamental	['fʌndə'mentl] n.	重要；基本
9. briefly	['bri:fli] abv.	简单地
10. obvious	['ɔbviəs] a.	明显的；显著的
11. boastfully	['bəustful] adv.	夸张地
12. manufacture	[mænju'fæktʃə] n.	制造；生产
13. industrial	[in'dʌstriəl] a.	工业的
14. available	[ə'veiləbl] a.	可用的

15.nowadays	['nauədeiz] adv.	现今
16.negligible	['neglidʒəbl] a.	一点点；微不足道的
17.preference	[p'refərəns] n.	特选；选用
18.obedient	[əbi:djənt] a.	顺从的；驯服的
19.carrier	['kæriə] n.	运载工具
20.capable of…		能…的，可以…的
21.desire	[di'zaiə] vt.	要求；需要
22.abundant	[ə'bʌndənt] a.	丰富的
23.waterfall	['wɔ:təfɔ:ll] n.	瀑布
24.in addition to		除…之外
25.convenience	[kən'vi:njəns] n.	方便
26.peculiar	[pi'kju:ljə] a.	特有的
27.attempt	[ə'tempt] n.	尝试；努力
28.reliable	[ri'laiəble] a.	可靠的
29.practical	['præktikəl] a.	实际的
30.cable	['keibl] n.	电缆
31.simultaneously	['siməlteiniəsli] adv.	同时
32.adjustment	[ə'dʒʌstmənt] n.	调节
33.timing	['taimiŋ] n.	时间的选择
34.apparatus	['æpər'eitəs] n.	装置；设备
35.pulse	[pʌls] n.	脉冲
36.inhabit	[in'hæbit] vt.	居住于

37. thermionic	[θə:mi'ɔnik] a.	热离子的
38. soda	['səudə] n.	纯碱；苏打

Notes

(1)… the development in science to be brought about due to a fuller kwowledge of electricity are expected to be even more extensive and fundamental.

这句中的are expected 是被动语态，它的主动语态相当于People expect the development in science…，不能译为“…科学发展期望着更加广泛，更加重要”，应译为“（人们）可以预期…科学发展将更加广泛，更加重要。”其次，动词不定式 to be（或to do）往往表示将要发生的动作，所以这里的 to be even more extensive and fundamental 译成汉语应加上“必将”两字；它在句中作主语development的补足语。

(2) First, power can be transmitted over a great distance with practically negligible loss…

这里的 practically 不作“实际上”解，而是作“almost”解，因此不能译为“实际上其损耗可以不计”，应译为“其损耗几乎可以不计”。

(3)…secondly power can be converted from

mechanical form to the electrical form and back again to the mechanical form with almost 100 percent efficiency.

这句中的状语with almost 100 percent efficincy不单单修饰(can be converted)back again to the mechanical form,因此不能译为“动力能够由机械形式转为电的形式，并能够几乎以百分之百的效率重新转为机械形式”；实际上，它也修饰前面的can be converted from mechanical form to the electrical form，所以译文中应将“几乎以百分之百的效率”移在“由机械形式转为电的形式”之前，使这个状语的含义贯穿到后面整个部分。

(4)Such a feat requires a perfect adjustment and timing of…and has only been made possible by an intensive study of the manner…and the development of instruments capable of detecting these pulses.

这句中的 the development 前面不是省略了(an intensive study) of，因此不是和manner 并列，而是省略了(has only been made possible)by，和study并列。这里的development和study都是表示动作的抽象名词。因此这句不能译为“…通过对能够检测这些电脉冲仪器的发展的仔细研究…”，应译为“……只有在能够检测这

些电脉冲的仪器研制成功之后…”。

(5)When we turn to telephony, or the transmission of speech by electric current…,

这句中的or不作“或者”解，这里的or表示同位关系，作“即”、“换言之”、“就是说”解。这句话应译为“谈到电话技术，即由电流传送言语的技术”。

(6)…many new materials of considerable value and usefulness have been produced…of these aluminium, carborundum and artificial graphite are examples.

这句中的these不能用作定语修饰 aluminium 等元素，这里的 these 用作of 的宾语，指主语 materials，of these 也可放在句末 examples 的后面。破折号之后的句子可以改为 aluminium, carborundum and graphite are examples of these(materials)，这句话应译为“铝、碳化硅和人造石墨便是这些材料的例子”。

(7)To get an idea of how all these uses of electricity…,

注意这里all these uses of electricity中的uses是可数名词作“用途”解，而前一段里materials in general use 中的 use 是不可数名词，作“使用”解，所以前者译为“电的所有用途”，后者译为“(日)常(使)用(的)物品”。

助动词 { have / be / will } 与 { 时态 / 语态 / 语气 } 的关系

在英语中一般有十六种时态，二种语态，三种语气，而时态、语态、语气，又是互相连系的。一般教科书、语法书，常用三种表格来说明其变化规律，（参见附表）。但这类表格，易看难记，在实际应用中也容易混淆。如果以此表为基础加以分析，不难看出，这三种语法现象，虽然变化多样，但基本的变化规律是以三个助动词为基础的，即：

be { am / are / is }	have—has	will(shall)—would(should)

无论时态、语态和语气如何变化，它们总是由以上三个助动词或由这三个助动词的组合加现在分词(—ing)，或过去分词(—ed)构成的。下面就这些变化规律进行分析。

一、助动词be构成 { 进行时态 / 被动语态 }

1) 助动词be的形态变化

现在时		am
		are
		is
过去时		was
		were
将来时		shall be
		will be

现在分词→being

过去分词→been

2) be+现在分词 构成进行时态，

The motor is still running.[现在进行时]

这台电动机仍在运转。

Most of the time yesterday, the motor was going well.[过去进行时]

在昨天的大部分时间中，这台电动机运转良好。

3) shall / will be+现在分词 构成将来进行时：

We shall be testing the motor this time tomorrow.

明天这个时候我们将在试验电动机。

4) be+过去分词 构成被动语态：

Machines are driven by electric motors.

机器由电动机带动。

The integrated circuit is welcomed by most of users.

集成电路受到广大用户的欢迎。

二. 助动词have构成
- 完成时态
- 虚拟语气

1)助动词have的形态变化
- 现在时 { have / has }
- 过去时—had
- 现在分词having（用于独立结构或分词词组中）
- 助动词 have 无过去分词

2) have+过去分词 构成现在完成时态

We have just studied the motion of a body.

我们刚才研究了物体的运动。

How many new products have you turned out?

你们出了多少新产品?

3) have been+现在分词 构成现在完成进行时

Until now we have been discussing direct

current motors.

到此为止我们所讨论的都是直流电动机。

4)

条件状语从句	had＋过去分词
主　句	would(should)＋have＋过去分词

构成与过去事实相反的虚拟语气.

If it had not been for the invention of transistors, the process of miniaturization could not have started.

假如不是发明了晶体管的话，小型化过程不可能开始。[用would(should)表示的与过去事实相反的虚拟语气，见三]

三、助动词shall和will:

1) 助动词 shall / will 的形态变化

将来时	shall / will
过去将来时	should / would

2) shall / will ＋动词原形 构成将来时：

We shall do experiments in physics once a week.

我们将每周做一次物理实验。

Ice will change into water if it melts.

冰溶化就变成水。

3)

条件状语从句	动词过去式（be用were）
主　　句	would(should)＋动词原形

构成与现在事实相反的虚拟语气

If there were no friction, an automobile could not move.

没有摩擦力，汽车就不能开动。

If a steel ship were solid throughout, it would sink into water.

假如钢船是完全实心的，它就会沉入水中。

4)

条件状语从句	had＋过去分词
主　　句	would(should)+have+过去分词

构成与过去事实相反的虚拟语气，

It would have taken them a long time to solve the complicated problem if electronic computers had not been used.

如果不是使用电子计算机，他们解决这个复杂问题就要花很长时间。

5)

条件状语从句	should+动词原形(或were+不定式)
主　　句	would(should)＋动词原形

构成将来不可能实现或实现可能性很小的虚拟语气。

Should he come here, I should speak to him.

要是他来这里我就和他谈。

If we should throw the ball at a speed of about five miles a second, it would not fall back to the ground.

如果我们以每秒约五英里的速度抛出这个球，球就不会再落回地面。

综上所述，助动词的时态、语态、语气虽然变化较多，但可以用以下方法分析并加强记忆。

(1)Some plastics have been discovered by accident.

有些塑料是偶然发现的。(被动语态的现在完成时)

上句中有两个助动词，have, been. 只要我们记住 have＋－ed 是组成完成时态，而 be＋－ed 组成被动语态，也就是说此句话中即含有时态又含有语态，如果加到一起就是：

have＋过去分词＋be＋过去分词

因两个助动词用的是一个过去分词，所以可以省略

一个过去分词，这样就成了，

have+be+过去分词

由于have做助动词构成完成时态，后面必须跟过去分词，因而be就相应的变为been，即简化为：

have+been+过去分词

构成被动语态的现在完成式。

(2)More radios and TV sets will be made to meet the needs of the people

将要制造更多的收音机和电视机来满足人们的需要。（被动语态的一般将来时）

句中是被动语态的一般将来时。

will+动词原形

构成一般将来时，

be+过去分词

构成被动语态.

因为 will 做助动词构成将来时态，后面一般跟动词原形，所以构成被动语态的be没有人称和数的变化，即：

will+be+过去分词

构成被动语态的一般将来时。

(3)He told me that he had been waiting for

me for two hours

他对我说他等了我两小时。（过去完成进行时）

句中有两个助动词 had,been,

had＋过去分词	构成过去完成时态，
be＋现在分词	构成进行时态，

由于had构成完成时后面必须跟过去分词，因而 be 变为been，而要表现出进行时态，必须用现在分词，所以就形成了，

had＋been＋现在分词	构成过去完成进行时。

(4)My father told me that he would have been living in the small town for twenty years by next May.

我父亲告诉我．到明年五月他在这个小镇上已经住了二十年。（过去将来完成进行时）

句中有三个助动词，一个现在分词，组成了过去将来完成进行时。这句话既包括过去时又包括将来时，所以用will的过去时态 would 这一助动词来构成过去将来时。would后要求动词原形，因而用have表示完成时，have构成完成时态时，后面要求跟过去分词，因此 have been 构成了完成时，而 been＋现在分词living又构成了