

理工科英语阅读小丛书

6

清华大学外语系
第一英语教研组

选注



A TECHNICAL READER FOR
ADVANCED STUDENTS

高级工程技术英文选

清华大学出版社

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内 容 提 要

本丛书第六集选编了国外科技专家所写的科普文章二十篇。内容包括天文、地质、海洋、采矿、无线电、电视、钢铁、建筑以及管理等方面的文章。

文章语言精练,流畅,图文并茂,词汇量大。对提高阅读能力和理解能力颇有帮助。

书中难懂之处,酌作注释。适合高校理工科学生及科技人员阅读。书后附有词汇表。

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前 言

在理工科大学的英语教学中，我们常常感到如何提高学生的阅读能力是一个不太容易解决的难题。现有的精读教材，由于篇幅和内容的限制，词汇量往往偏窄，各种语言现象的出现和重复受到极大的影响，这样就不利于培养学生的阅读能力。

学习外语必须通过实践，有了这种实践，才能积累和扩大词汇量，巩固已掌握的语言知识，并在此基础上进一步学习一些新的习惯表示法，从而提高阅读速度，增强理解力。为此，我们编选了一套理工科大学英语阅读小丛书。在选材方面尽量考虑到内容的知识性，科学性和趣味性；力求语言生动活泼，清新明快，简洁易懂。每本书后附有总词汇表，以利查阅和记忆。对疑难之处作了适量的注释。本丛书总共有十册。内容有传记、小品、科普文选、工程技术等方面的文章。

本册由李相崇同志审阅。由栾诚明、佟纪元同志注释。

由于我们水平有限，缺乏经验，缺点和错误在所难免，热切希望得到广大读者的批评和指正。

清华大学外语系

第一英语教研组

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1. Two Modern Cranes

THE mobile or tower crane *is characterized by*¹ a high tower with a long jib able to slew through 360°, and is an electrically driven self-propelled machine running on rails. *By virtue of its height, long reach*² and mobility, it is possible through one machine to ^⑤ *cover*³ a building site with a means of vertical and horizontal transport.

As compared with the power-driven hoist, tower cranes have certain distinct advantages. Firstly, loads may be transferred *in one operation*⁴ from stock pile, ^⑩ production point or delivery vehicle *practically*⁵ to their destination on the building. Secondly the size of the handling team is reduced and its composition is not appreciably affected by the type of load being moved. Lastly, considerably greater loads in both ^⑮ weight and size can be handled. This is particularly noticeable when dealing with concrete shuttering. This can now be prefabricated on the ground in units which are easily assembled, *without being too severely limited as to size*⁶. *In fact, units of formwork* ^⑳ *extending the length of the component to be cast can readily be handled*⁷. In addition the crane can not only

hoist the unit into position, but can maintain it there until the necessary fixing is complete.

- The tall buildings which are now going up in our city centres have, however, introduced new handling
- ⑤ problems. Mobile tower cranes can be used *to very good effect up to*⁸ building heights of about 100 ft., *but in excess of this it becomes increasingly difficult to utilize the travelling motion on a crane of economic size*⁹. A recent development fortunately presents an
- ⑩ alternative method of use *which is of particular interest*¹⁰. The 'Climbing Crane,'¹¹ originally developed

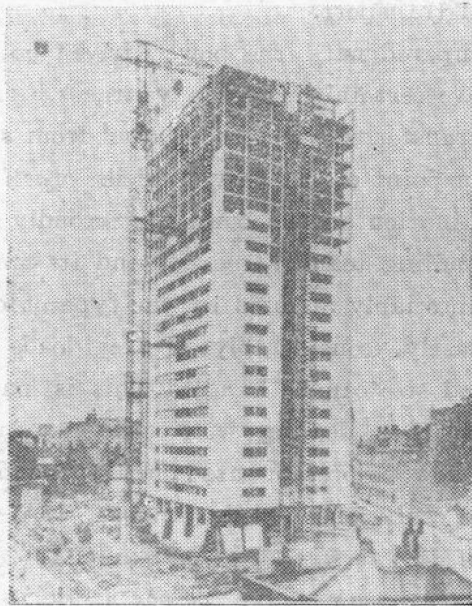


Figure 1. A tower crane.

in Russia and Sweden, has recently been introduced for use on high buildings as shown in Figure 2.

This type of crane has a short fixed tower but in many other respects is similar to a mobile tower crane. The crane is first erected as a fixed crane to ⑤ a height of about 50 ft. by securing it to a prepared base inside the building. As the building grows in height, and the floors are installed, *holes are left for the passage of the tower*¹², and *at a suitable height two guide-collars embracing the tower are mounted* ⑩ *on adjacent floors*¹³. The whole crane is then raised by means of a winch and fixed to the collars at a

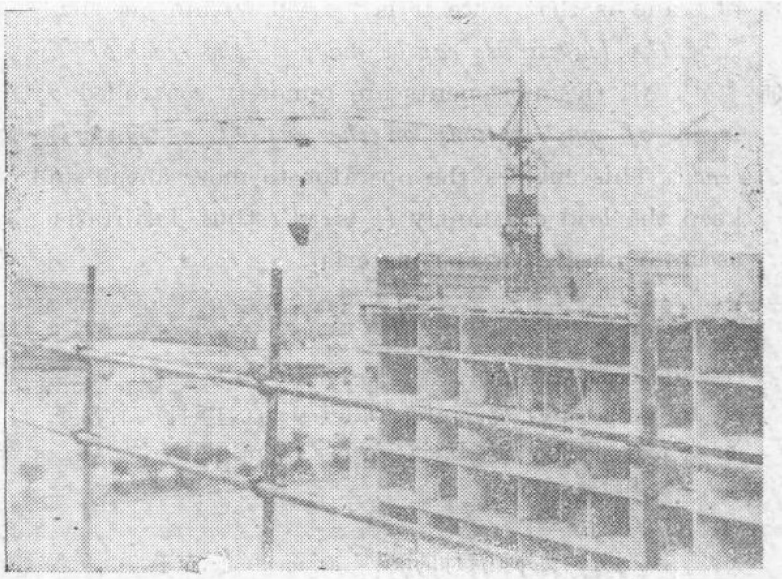


Figure 2. A climbing crane.

higher position. The climbing process is repeated every two or three floors and the ultimate height it can serve is only limited by the amount of rope that can be wound on to *the hoist drum*¹⁴.

- ⑤ The use of the crane in this way naturally involves the structural designer, because all its loads, including both lateral and vertical forces, are transmitted to the building. If weights greater than about 30 *cwt*¹⁵ are likely to be handled by the
- ⑩ crane, special provision may have to be made in the design *to withstand the loads transmitted in this way to the structure*¹⁶. A notable advantage of this type of crane is that since it is located within the building *the fullest use can be made of the reach of the*
- ⑮ *jib*¹⁷. All the movements are remotely controlled by means of *push-buttons on the end of a wandering lead*¹⁸. This enables the operator to move about and keep the load constantly *in view*¹⁹, thus facilitating accurate placing of the material.

Notes

1. ...is characterized by, 特点是…….
2. By virtue of..., 凭借, 由于. long reach, (起重机)外伸幅度.
3. to cover 原意为“覆盖”, 此处意思为“(足)够用”.
4. 一次操作地.
5. 几乎.
6. “不致过分地受外型尺寸的限制”. as to, 关于, 至于.
7. “实际上需要浇铸的构件可以加长成为构件组, 这样吊装很容易”.

8. to very good effect: 最有效地; up to 是介词,“最多到,最高可达……”。
9. 译为:“超过这个限度以后,在一般经济的起重机上做这种移动就非常困难了”。in excess of: 超过。
10. which 引出定语从句,说明 method,“提出另外一种令人感兴趣的办法”。
11. 攀缘式起重机。
12. “留出起重机通过的孔道”。
13. 译为:“在适当高度,两个支撑吊塔的导轨卡圈装在相邻的楼板上。”(guide-collars—strong metal supports which guide and hold the tower of the crane.)
14. 起重机漆筒。
15. cwt(s)=hundredweight(s),英担,1/20吨。
16. “承受由此而传到结构上的荷载”。
17. 为can make the fullest use of ...的被动形式。(Jib—the long arm of a crane).
18. “通过装在游荡导线末端的电钮来控制”。(wandering lead—long, flexible electric cable which enables the operator to move away from the crane.)
19. in view: 看见,在观察中,是load的宾语补足语。

2. Radio Stars

- At the end of 1931 an American engineer, Jansky, made the surprising discovery that radio waves apparently emanating from regions beyond the solar system were reaching the earth. Jansky's historic
- ⑤ discovery was published in a radio engineering journal and it seems doubtful whether many astronomers knew of his work. In any case it caused little interest and *the only important additions*¹ to his results before the Second World War were obtained by Grote
- ⑩ Reber, an amateur investigator who built *apparatus of advanced design*² in the garden of his home in Illinois. In fact, Reber constructed the first radio telescope of the type *with which*³ we are familiar to-day. It was thirty feet in diameter and received ra-
- ⑮ dio waves on a wavelength of about two metres. This instrument could be readily *pointed at*⁴ different parts of the sky. With it Reber confirmed Jansky's discovery that radio waves were reaching the earth from outer space and he made the first serious
- ⑳ attempt to find out in more detail from where they came. He found that the radio signals were strongest from directions near the centre of *the Milky Way*⁵,

and that the radio signals were roughly proportional in strength to the concentration of stars in the direction to which the radio telescope was pointing. On the other hand, Reber failed completely to detect any signals from the bright stars or from other prominent features visible in telescopes. ⑤

This paradox led him to the view that⁶ the radio signals were being generated in the very rarefied hydrogen gas which fills interstellar space. This represented the extent of our knowledge of these radio waves from space in 1945⁷, but the six years lost to fundamental research during the war⁸ were soon to appear as a rich investment for astronomical research. By a strange twist of fate the Second World War placed in the hands of⁹ astronomers a new and enormously powerful tool for the exploration of space. The concentration of work on radio and radar for military purposes resulted in technical advances, in the space of a few years, which might have otherwise occupied a generation of research workers, and when these techniques were applied to the investigation of these radio waves generated in the cosmos spectacular results were obtained. The discoveries of the last few years have rivalled in excitement the more conventional developments with the American optical telescopes¹⁰. ⑥

The first measurements confirmed Reber's results

and there seemed to be no direct connection between the radio signals and the astronomical objects which comprise the universe familiar to the human senses.

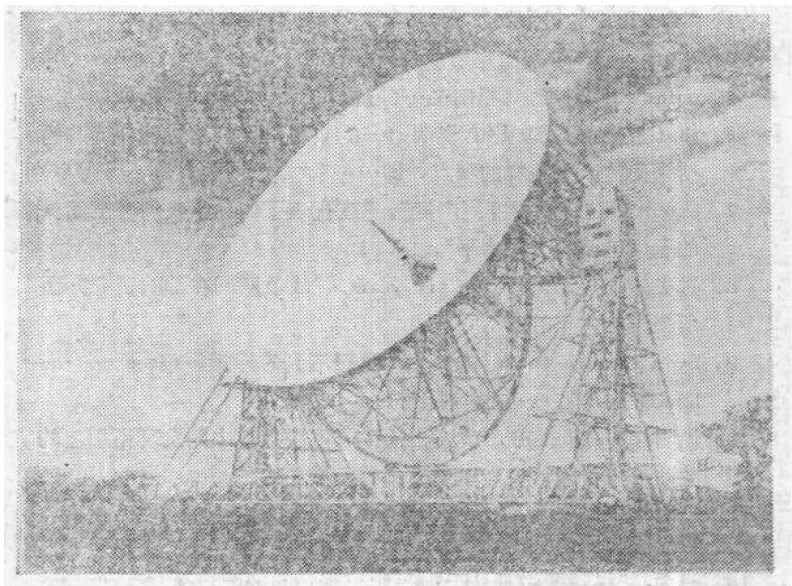
Reber's idea, that the emissions were generated in

- ⑤ the interstellar gas, remained for some time the only realistic suggestion but in 1948 *came the first of a sequence of discoveries*¹¹ which stimulated the interest of astronomers throughout the world. Bolton and Stanley in Sydney, followed immediately by Ryle and
- ⑩ Smith in Cambridge, found that at least some of the radio waves were coming from discrete or localized sources in space, subsequently called radio stars. The two most intense of these sources were in the constellations of *Cygnus and Cassiopeia*.¹² If these radio
- ⑮ sources had coincided with any prominent visual objects the discovery would not, perhaps, have occasioned much surprise; but *although both lay in densely populated stellar regions there were no particular visual objects to which the radio emissions could be*
- ⑳ *attributed*¹³.

Subsequently many other, less intense, radio stars were discovered and there seemed to be no correlation with any class of star known to astronomers; neither did any of the common stars appear to emit radio

- ⑫ waves which could be detected on the earth. The belief arose that we were dealing with a new type of body in the heavens, dark or only faintly luminous

but with the facility of emitting powerful radio waves; moreover, a type which appeared to be of frequent occurrence and distributed throughout the Galaxy in a manner similar to that of the common stars. For some time there was uncertainty as to whether ⑤ the extragalactic nebulae might be similarly endowed with the facility of emitting intense radio waves, but any such doubts were laid to rest in 1950, when the scientists at Jodrell Bank used a very large radio telescope and showed that the nearest ex- ⑩



The reflector bowl and aerial of the radio telescope at Jodrell Bank, Cheshire, England.

tragalactic nebulae in Andromeda behaved in a manner similar to the local Galaxy, *as far as emission of radio waves was concerned*¹⁴. Subsequently the emissions from many more remote nebulae were detected, ⑤ and it is now widely accepted that the type of radio source responsible for the emission in the Milky Way system must be widely dispersed throughout the extragalactic star systems which comprise the universe.

Notes

1. “唯一重要的进展”。
2. “设计先进的仪器”。
3. with which...引出定语从句,说明the type.
4. point at: 对准, 指向……(方位)。
5. 银河系。
6. that 引出同位语从句,说明view的具体内容,“这种似是而非的结果使他产生这样的观点,即……”。
7. extent 意思是“程度、广度”。“这代表了1945年我们对空间来的无线电波的知识水平”。
8. 过去分词短语,说明the six years. “战争期间在基础研究方面所损失的六年时间”。
9. by a strange twist of fate: 意想不到的转折。place in the hands of: 把……交付(托付)。
10. 说明 development, 表示原因。“过去几年中的发现所引起的激动可与美国常规光学望远镜的发展相比。”
11. 这是一个倒装句,主语是the first, 谓语是came。
12. 天鹅座和后仙座。
13. 译为: “尽管两者都处于恒星比较密集的区域,都没有可以认为是发出无线电波的特殊的可见的星体。”
14. “就发射无线电波来说……。”

3. Pest Control in Africa

THE land bordering the Victoria Nile between Lake Victoria and Lake Kioga a distance of some 45 miles, has for many years been the hunting ground of a small blood-sucking fly, appropriately called *Simulium damnosum*. This fly breeds in large numbers (5) in the aerated river water, and spreads far and wide throughout the neighbouring countryside. It is often found over thirty miles from its breeding places. Not only does the fly inflict injury which is painful and irritating *out of all proportion to its* (10) *size,*² but it transmits a filarial worm which causes a chronic inflammation of the skin. In some cases the worm also damages the eye, and blindness is not an uncommon sequel.

As a result of experiments in Kenya, Canada (15) and the Belgian Congo, it was found that low concentrations of D.D.T. introduced into the river water, or sprayed on the vegetation on river banks, were capable of interrupting the life cycle of *Simulium*, and it was decided to attempt to control the (20) fly in the Victoria Nile by this means.

In 1953 the insecticide was introduced into the

river from a launch,³ the aim being to achieve a concentration of some 0.5 parts per million of D.D.T. over a period of thirty minutes, repeating this dose weekly on six occasions.⁴ The source of the river, where

- ⑤ it falls away from Lake Victoria, is over 200 yards wide and the mean flow of water is approximately 600 cubic metres per second. In the event, the treatment produced dramatic results. The flies disappeared completely from the scene within a few weeks,
- ⑩ not a single larva being found after careful examination of breeding places along the 45-mile stretch of river where they had previously existed in millions. In places where over 200 adult flies were being captured per hour before the operation, not a single fly was
- ⑮ found three weeks later. Although there has since been some evidence of re-infestation, it seems likely that a highly irritating and dangerous pest can in future be kept under control, if not eliminated completely, by a simple and inexpensive form of treat-
- ⑳ ment. The effects of this project have already been felt over an area of some 1,500 square miles of valuable land, which had become sparsely populated because of the high density of *Simulium*. The incidence of worm infestation due to the fly was as high
- ㉓ as 100 per cent in some areas, which meant a heavy degree of incapacity.⁵ Now, as a result of fly control, there is every reason to expect the growth of a stable