

铁路科技英语

西南交通大学出版社

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西南交通大学出版社

一九八七年三月

铁 路 科 技 英 语

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西南交通大学出版社出版

(四川 峨眉)

西南交通大学出版社印刷厂印刷

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开本: 787×1092 1/16 印张: 16.125

1987年3月第一版 1987年3月第一次印刷

字数: 412 千字 印数: 1—8000 册

ISBN 7—81022—001—2

H 001

统一书号: 9478·02 定价: 2.70 元

前 言

按照 1982 年在北京举行的铁路高等院校公共外语教学协作会议关于选编铁路通用专业阅读教材的建议,我们选编了这本教材,供铁路院校学完公共英语课的高年级学生提高班、铁路部门英语进修班、培训班使用,也可作为具有一定英语水平的铁路工程技术人员的自学教材。其目的是为了进一步提高上述各类人员的专业英语水平,以便顺利阅读铁路科技资料,并为进行这方面的翻译工作打下良好基础。

本书内容与目前铁路院校使用的“铁道概论”大体相似,结合国内外具体情况,介绍铁路车、机、工、电各方面的基本概念和基础知识以及铁路上各种常用的名词术语。此外还专门介绍了我国铁路的历史、现况和将来的发展。本书材料绝大部分选自原文铁路书刊,便于读者学习标准的英语表达方法。因此,本书实际上相当于一本英文的“铁道概论”,所以也可以作为铁路高校铁道概论课的教材或参考书。

全书共 18 课,可供 120 教学学时使用。每课课文后附有生词表,并有较详细的注释,对课文中疑难点和复杂的句型结构从语法上和意义上进行解释和翻译,便于自学。每课配有练习,包括问答题、解释大意和翻译,以便复习巩固课文内容。课后还附有阅读材料,以进一步扩大与课文有关的专业知识和词汇。附录中备有课文的参考译文,供科技人员自学使用。

本书成书过程中,承长沙铁道学院运输系贾肇谦副教授提供了许多宝贵意见,谨在此表示衷心的感谢。

由于编者水平有限,书中一定有不少缺点错误,衷心希望广大读者提出宝贵意见。

编 者

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Lesson One

The Significance of Rail Transport

Transport is one of the most important branches of material production. As it is a branch of socialist national economy, its task is to move products produced in the national economy from the places of production to those of consumption.

Under capitalism transport, like other branches of its national economy, is nothing but a tool of exploiting and oppressing the working people, but under socialism transport not only facilitates the rational location of productive forces and planned distribution of means of production and consumer's goods, but also helps to promote the development of economy and culture. In contradistinction to the capitalist system of economy, under which prevails fierce competition among different forms of transport ⁽¹⁾, in socialist countries, all forms of transport are integrated into a unified transportation system, working closely together according to a unified plan of the national economy ⁽²⁾. Operating on the basis of a plan, taking account of the requirements of the national economy for transportation as well as of the capacity and relative advantages of each form of transport, the socialist transport has been advancing at a rapid pace.

In our country the basic form of transport for the handling of freight traffic is rail transport, which carries annually 85% of the total traffic of the nation.

In the future the role to be played by waterways will surely become more important, but the greater portion of traffic will undoubtedly still be handled by rail.

The reason why rail transport plays the leading role in the whole transportation system and at the same time is of such great importance in the national economy lies in that it possesses such advantages as comparatively low costs, rapidity, regularity, reliability and suitability for mass transportation.

The important superiority of our socialist rail transport consists in that it works on the basis of plans. The planning of transport enables us to know beforehand the prospective volume of traffic on each division of different lines of the railway system; to predetermine thereby the requirements of rolling stock

necessary for fulfilment of the transportation plan; to carry out, in accordance with the planned volume of transport, the development of railroad lines, stations, depots and other technical means of transport, and finally, to eliminate all irrational movements of traffic. All these characteristics of socialist transport are on principle entirely different from those of railroads in the capitalist countries.

Vast possibilities of further development of transport in our country, just as the development of our entire national economy, are determined by the very nature of our planned socialist system of economy as well as by the great superiority of our government system.

New Words

- consumption [kən'sʌmpʃən] *n.* 消费
 facilitate [fə'siliteit] *vt.* 便利, 促进, 助长
 rational [ˈræʃənəl] *a.* 合理的
 location [lou'keɪʃən] *n.* 布局, 设置, 位置
 distribution [distri'bju:ʃən] *n.* 分配, 分布
 consumer [kən'sju:mə] *n.* 消费者, 用户
 contradistinction [ˌkɒntɹədɪs'tɪŋkʃən] *n.* 对比, 截然相反
 prevail [pri'veɪl] *v.* 盛行, 流行
 unified [ˈju:nɪfaɪd] (unify 的过去分词) 统一的
 requirement [ri'kwaɪəmənt] *n.* 要求, 需要
 freight [freɪt] *n.* 货物 freight traffic 货物运输
 portion [ˈpɔ:ʃən] *n.* 部分
 undoubtedly [ʌn'daʊtɪdli] *ad.* 无疑地
 possess [pə'zes] *v.* 具有, 占有
 comparatively [kəm'pærətɪvli] *ad.* 比较地
 rapidity [rə'pɪdɪti] *n.* 迅速
 regularity [regju'lærɪti] *n.* 规律性
 reliability [rɪlaɪə'bɪlɪti] *n.* 可靠性
 suitability [sju:tə'bɪlɪti] *n.* 适合, 适宜性
 superiority [sju:ˌpiəri'ɔrɪti] *n.* 优越性
 beforehand [bi'fɔ:hænd] *ad.* 事先, 预先
 prospective [prəs'pektɪv] *a.* 预期的, 预料得到的
 division [dɪ'vɪʒən] *n.* 区段
 predetermine [pri:di'tə:mɪn] *v.* 预定
 rolling stock [ˈroulɪŋ stɒk] *n.* 铁路车辆 (总称)
 thereby [ˈðeəbaɪ] *ad.* 因此, 从而

depot ['depou] *n.* (英) 仓库 ['di:pou] (美) 车站
 eliminate [i'limineit] *v.* 消除, 淘汰
 characteristic [kæriktə'ristik] *n.* 特性, 特征

Phrases and Expressions

is nothing but 不过是

例如: It is nothing but a joke.

in contradistinction to 与……截然不同, 与……对比

to take account of something 考虑到某事

the role to be played 将要起的作用

lie in = exist in 存在于, 在于

例如: The trouble lies in the engine.

consist in 在于, 便是

例如: Correct English consists in the correct use of words and phrases.

in accordance with = in agreement with 与……相一致

例如: in accordance with custom (the regulations, your wishes, ...)

Notes

1. In contradistinction to the capitalist system of economy, under which prevails fierce competition among different forms of transport, ...

〔句型分析〕 Under which prevails fierce competition among different forms of transport 这是一个定语从句。关系代词 which 的先行词是 the capitalist system of economy, which 本身在从句中作介词 under 的宾语, 而 under which 则是从句中的状语。从句的谓语是 prevails, 因为主语 fierce competition among different forms of transport 较长, 所以采用倒装语序, 把主、谓语颠倒。

〔译文〕 与资本主义经济截然不同, 在那里, 各种不同的运输方式之间, 普遍进行着剧烈的竞争, ...

2. in socialist countries, all forms of transport are integrated into a unified transportation system, working closely together according to a unified plan of the national economy.

〔句型分析〕 working closely together ... 是现在分词短语, 作状语, 表示伴随性的动作。

〔译文〕 在社会主义国家, 各种运输方式结合到一个统一的运输系统之中, 按照统一的国民经济计划, 密切协作。

Exercises

I. Answer the following questions:

1. What is the task of transport?

2. What role does transport play under capitalism? And what role under socialism?

3. Why does rail transport play a leading role in the whole transportation system?

4. What is the important superiority of our socialist rail transport?

II. Translate the following passage into Chinese.

It is obvious that industry and agriculture of different magnitude require means of transport of different size. The social economy embraces production, circulation and consumption. It is an indivisible whole. Transport is the continuation of production in the sphere of circulation. Generally speaking, without transport production would cease. The use value of the products cannot be realized without transport which links production with consumption. Whenever transport lags behind the requirements of industrial and agricultural growth, further development of the economy is throttled. Of course, when the scale of transport exceeds the real requirements of the social economy, it is a great waste of social wealth. Therefore, since there are "large, medium and small" industries, we must also have "large, medium and small sized" means of transport.

Reading Material

Rail Transport in America

Railroads are one of the great industrial achievements of modern civilization. It is impossible to imagine the building of our Nation's commercial and military strength without the railroads. Railroading has a proud tradition, and the industry remains an indispensable part of our economy.

The railroad industry is one of high fixed costs and long-lived investments; if those investments are made incorrectly, they will affect the industry's efficiency long into the future. The rail industry has always been significantly affected by public policy, and changes made in public policy will affect the destiny not only of the railroads, but also other modes of transportation.

The railroad industry is a common carrier mode, which means that it provides service to all customers, under published rates and terms. Railroads are able to provide services to many shippers at far lower costs than other modes, depending on the type of service, commodity characteristics, and distances. Railroads contribute daily to the fight against inflation because if they did not exist, the cost of consumer goods would be much higher.

Railroads are the principal mode of transport for many bulk materials and agricultural products. They handle over 70 percent of coal ton-miles and 60

percent of grain ton-miles. They are also the primary mode for such manufactured products as: pulp and paper products (77 percent); automotive products (73 percent); food stuffs (66 percent); chemicals (60 percent); and primary metals (60 percent).

Without rail service, these industries would suffer major dislocations and would be faced with the need for vast new investments in transport and warehouse facilities, as well as with higher operating costs. These extra costs to the economy would exceed many times the investment needed to keep railroads functioning efficiently.

The rail mode is the most energy efficient form of transport for many goods, especially long-distance movements of bulk goods. On long hauls, trains consume only about one-third as much energy as trucks to haul a given amount of freight. Because of the circuitous and directional flow of waterways, railroads often have an energy advantage over barges as well.

Railroads are essential to achievement of the Nation's energy goals, which include greatly increased reliance on coal. Railroads employ large numbers of workers and provide important and continuing economic stimulus to local communities across the land. Railroads are essential to exports, especially for commodities such as coal and grain. Rail movement of domestic materials for the energy, automotive, and steel industries reduces the amount of petroleum and heavy industries goods that otherwise would have to be imported.

New Words

Nation *n.* 国家, 此处指美国

indispensable [ˌɪndɪsˈpensəbl] *a.* 不可缺少的, 必需的

mode of transportation 运输方式

carrier [ˈkæriə] *n.* 承运人, 运输工具

inflation [ɪnˈfleɪʃən] *n.* 通货膨胀

bulk [bʌlk] *a.* 散装的, 大量的

bulk material 散装材料

pulp [pʌlp] *n.* 纸浆

automotive [ɔːtəˈmɒtɪv] *a.* 汽车的, 自动的

dislocation [ˌdɪsləʊˈkeɪʃən] *n.* 混乱, 脱节

haul [hɔːl] *n.* 拖动, 牵引, 运输

circuitous [səˈkjuɪtəs] *a.* 迂回的, 曲折的

barge [bɑːdʒ] *n.* 驳船, 平底船

stimulus [ˈstɪmjələs] *n.* 刺激, 促进因素

Lesson Two

Centenary of Chinese Railways

Chairman Mao likened the railways to an "advanced party" which must precede the development of the national economy. This shows how important railways are.

Trains have the advantage of transporting goods at high speed and low cost. Long-distance hauls of big loads are essential to a country like ours with a vast territory of 9.6 million square kilometres. Of the modern means of transport, such as trains, trucks, ships, aeroplanes and pipes, it is the trains that carry a very great part of freight⁽¹⁾. More than 70 per cent of our railway freight are materials for use in farm production, consumer goods for the domestic market and raw and semi-finished materials for industrial use, especially coal, iron, steel and other materials for the metallurgical industry.

The 73 Pre-Liberation Years

The 14-kilometre-long narrow-gauge railway from Shanghai to Wusung was the first railway line in China. It was built in 1876 by Jardine & Matheson⁽²⁾ and 26 other British and American firms with the backing of their diplomatic envoys. Strong opposition on the part of the Chinese people against the fraud involved in the building of this line forced the British imperialists to let the Qing government redeem the railway with silver. Then the rails were pulled apart and the carriages thrown into the Huangpu River. Therefore, the line did not last long.

Following the Opium War in 1840 when the Western imperialists invaded China with the gunboats, they vied with each other in building railways in China as an important means of carrying on their aggression. Statistics in 1937 showed that 46.6 per cent of the length of railways in the country were run by the foreigners themselves, 44.1 per cent were under their control and only 9.3 per cent were managed by ourselves. AS China's Railways, a book published at that time, put it, "looking around the vast land of China, one finds that nearly all the railways have something to do with foreign capital."

In the 73 pre-liberation years between 1876 and 1949 only a little over 21,000 kilometres of railways(main lines) were built in old China, averaging

300 kilometres a year. At the time of liberation in 1949, only 11,000 kilometres were open to traffic.

To facilitate their plunder of China's resources, the imperialists built the railways mainly in the coastal areas and northeast China. This resulted in an extremely irrational distribution of railways. Moreover, the imperialist countries set their own standards and specifications with regard to construction and management, including the gauge and dispatching system, so as to preserve their patent rights⁽³⁾. All this accounted for the confusion in railways management and backwardness in techniques and equipment.

The 28 Post-Liberation Years

After the founding of New China, the People's Government controlled the railways. In the several five-year plans for the development of the national economy, railway construction always topped the list of state investments in various fields of endeavour.

Over the past 28 years, big advances have been made and a nationwide network of tens of trunk lines with Beijing as the hub has been completed. As compared with the early post-liberation years, the mileage open to traffic has more than doubled, the length of rail lines more than trebled, and the number of passengers and volume of cargoes have increased more than five and nine-fold respectively⁽⁴⁾. The railways have thus made due contributions to the development of the national economy.

The distribution of railways has also undergone great changes as a result of the completion of many new lines linking the hinterland and frontier regions, which were once inaccessible, with the coastal areas. On the arid highland in northwest China, there was only 0.2 metre of railway per square kilometre before liberation. Today, however, there is a railway network made up of the Tianshui-Lanzhou, Baotou-Lanzhou, Lanzhou-Xining and Lanzhou-Urumqi Railways linking up different parts and with Lanzhou as the centre. In places frequently hit by windstorms and drifting sands, scientists and railway workers have successfully put up windbreaks in the sandy areas to ensure the smooth running of the trains.

In southwest China which has been described as a "forbidden zone" for railway construction because of its complicated geological features marked by high mountains and deep valleys, we have built several railway lines including those from Chongqing to Guiyang, Guiyang to Kunming and Chengdu to Kunming, forming a network of railways. In addition, there are the Chengdu-Chongqing, Baochi-Chengdu, Guiyang-Liuzhou and Chuzhou-Guiyang lines

which link the southwest with other parts of the country.

To raise transport efficiency, we have double tracked the major trunk lines from Beijing to Guangzhou, Shanghai and Shenyang and built special lines leading to factories, mines, harbours and forest areas. In addition, 11 provinces and autonomous regions have built mini-railways to meet their own needs.

We have completed the Chengu-Kunming Railway which passes through one of the few areas in the world regarded as wellnigh impossible for building any railway. In addition, we have built a bridge spanning the Yangtze at Nanjing where the river runs deep and rock formations are complex, and we have completed two electrified railway lines and trained a backbone force of more than 70,000 technicians.

China could not make locomotives and rolling stock before liberation, and even the spare parts and accessories had to be imported. Today it can batch-produce passenger coaches, goods wagons⁽⁵⁾ and steam engines and build diesel and electric locomotives, king-size special-purpose vehicles, extra large bridges and communications and signal equipment.

However, for various reasons, our railways have failed to develop at a still faster pace. At present, we have only a few railway networks and there is still a strain on both passenger and freight transport. Much remains to be improved in railway science and technology so as to catch up with the advanced world levels.

The smashing of the "gang of four" has ushered in a new period of development in our socialist revolution and constuction. In order to develop the national economy at high speed and bring about the four modernizations as planned, we must build a national railway network employing advanced techniques and equipment, make more electric and diesel locomotives, double track existing lines or build new double lines, and raise the level of automation in railway communications and signals, so that our railway transport will catch up with and surpass the standard of industrially developed countries both in quality and efficiency.

New Words

centenary [sen'ti:nəri] *n.* 一百年, 一世纪

advanced party 先行官

long hauls on the railways 铁路上长距离运输

metallurgical [,metə'lə:dʒikəl] *a.* 冶金的

narrow-gauge railway 窄轨铁路

gauge, gage [geɪdʒ] *n.* 轨距

fraud [frɔ:d] *n.* 欺诈行为
 carriage ['kæridʒ] *n.* 铁路客车车厢, 美国称 car
 Huangpu River 黄浦江
 the Opium War 鸦片战争
 vie [vai] (with) *v.* 竞争
 statistics [stə'tistiks] *n.* 统计, 统计数字
 traffic ['træfik] *n.* 交通, 运输, 运输量
 dispatch [dis'pætʃ] *v.* 调度, 调车
 patent ['peɪtənt] *n.* 专利权, 专利证 *v.* 取得……的专利
 trunk line 铁路干线
 top [tɒp] *v.* 居首位
 mileage ['mailidʒ] *n.* 里程
 hub [hʌb] *n.* 中心, 枢纽
 endeavour [in'devə] *n.* 努力
 smooth running 顺利进行
 windbreak 防风林
 drifting sands 流沙
 geological feature 地质特点
 double track *v.* 铺双线, 铺复线 *n.* 双线, 复线
 mini-railway 小铁路
 span [spæn] *v.* 跨越 *n.* 跨度, 桥跨
 wellnigh ['welnai] *ad.* 几乎
 locomotive ['ləʊkə,məʊtɪv] *n.* 机车
 electric locomotive 电力机车
 diesel locomotive 内燃机车
 batch-produce 成批生产
 king-size(d) *a.* 特大的, 特长的
 special-purpose car 专用车辆
 coach [kəʊtʃ] *n.* 客车
 steam engine 蒸汽机车
 vehicle ['vi:ɪkl] *n.* 车辆
 signal ['si:gnəl] *n.* 信号 *v.* 打信号
 strain ['streɪn] *n.* 紧张
 accessory [æk'sesəri] *n.* 附件

Phrases and Expressions

liken ... to ... 把……比喻作……
 on the part of ... 在……方面, 在……一边
 to be open to traffic 通车

result in 导致

account for 是(造成)……原因,引起

with regard to 在……方面,关于

with ... as the hub(centre) 以……为枢纽(中心)

for various reasons 由于种种原因

usher in 宣告,迎接

bring about 实现

catch up with 赶上

Notes

1. Of the modern means of transport, such as trains, trucks, ships, aeroplanes and pipes, it is the trains that carry a very great part of freight.

〔句型分析〕 这是一个 *it is ... that ...* 形式的强调句型, 强调主语 *the trains*。试与下面的句子比较: *The trains carry a very great part of freight.*

〔译文〕 在现代的运输工具中, 诸如火车、卡车、轮船、飞机和管道, 运输很大一部分货物的是火车。

2. Jardine & Matheson

怡和洋行, 亦名渣甸洋行, 为英殖民者对旧中国进行经济侵略的重要机构。1782年设于广州, 后在上海, 汉口, 天津等地设行, 经营航运, 造船、地产、公用、铁路等业务。解放后该行在中国的机构结束。

3. Moreover, the imperialist countries set their own standards and specifications with regard to construction and management, including the gauge and dispatching system, so as to preserve their patent rights.

〔译文〕 不仅如此, 帝国主义国家还规定了它们自己的修建和管理铁路的标准和规范, 包括轨距和调度系统, 以便保住它们的专利权。

4. As compared with the early post-liberation years, the mileage open to traffic has more than doubled, the length of rail lines more than trebled ... have increased more than five and nine-fold respectively.

〔译文〕 与解放初期比较, 通车里程增加了一倍多。线路长度增加了两倍多, 旅客人数和货物运输量分别增加了四倍多和八倍多。

注意英语中倍数的表示法: *has more than doubled* 为增加到两倍多, 即增加了一倍多; *(has) more than trebled* 为增加到三倍多, 即增加了两倍多。同样: *to increase more than five-fold* 为增加到了五倍多, 即增加了四倍多; *to increase more than nine-fold* 为增加到九倍多, 即增加了八倍多, 在英语中某数 *increase n times* 是包括该数本身在内的, 应为增加到 *n* 倍, 即增加了 $(n-1)$ 倍。

5. 有些铁路名词, 英国与美国说法不同, 如铁路英国为 *railway*, 美国为 *rail-road*; 客车英国为 *passenger coach*, 美国为 *passenger car*; 货车英国为 *goods waggon*, 美国为 *freight car*; 行李车英国为 *luggage van*, 美国为 *baggage car*; 列车员英国为 *(railway) guard*, 美国为 *(railroad) conductor* 等。

Exercises

I. Answer the following questions:

1. Why are the railways likened to an "advanced party"?
2. Why was there confusion in the management of railways in old China?
3. Why were railways irrationally distributed in China before liberation?
4. What has been done to change the irrational distribution of railways in China since liberation?
5. What measures have been taken to raise transport efficiency of our railways?
6. What great achievements have we gained in railway construction since liberation?
7. What should we do in railway construction and transport in order to develop the national economy at high speed?

II. Translate the following sentences into Chinese:

1. Long-distance hauls of big loads are essential to a country like ours with a vast territory of 9.6 million square kilometres.
2. Strong opposition on the part of the Chinese people against the fraud involved in the building of this line forced the British imperialists to let the Qing government redeem the railway with silver.
3. The distribution of railways has also undergone great changes as a result of the completion of many new lines linking the hinterland and frontier regions, which were once inaccessible, with the coastal areas.
4. Much remains to be improved in railway science and technology so as to catch up with the advanced world levels.
5. We have completed the Chengdu-Kunming Railway which passes through one of the few areas in the world regarded as wellnigh impossible for building any railway.

III. Translate the following passage into English:

解放前我国交通运输很落后，从1876到1949的73年之间只修建了22,000公里铁路，而且其中只有一部分通车。那时中国不能制造机车，甚至修理机车的配件（fittings）也要进口。

新中国成立后，铁路事业有了很大的发展。经过三十多年的努力，我国的铁路网开始形成了，随着工农业生产的发展，铁路运输量年年增加。现在除西藏外全国各省、自治区都有了铁路。中国铁路运输的落后面貌已经开始改变了。

1952年中国开始创办机车工业，制造蒸汽机车。1958年，中国工人克服技术和设备上的种种困难，成功设计和制造了内燃机车。现在，为了满足铁路运输的需要，我国正在生产内燃机车、电力机车和流线型客车。