

高等学校试用教材

英 语

第 三 册

(土建、水利类)

湖 南 大 学 主 编

人 民 教 育 出 版 社

高等学校试用教材

英 语

第三册

(土建、水利类)

湖 南 大 学 华 东 水 利 学 院
西 南 交 通 大 学 同 济 大 学
合 编

人 民 教 育 出 版 社

本书是根据高等学校工科外语教材编写会议的要求编写的《英语》第三册(土建、水利类)教材,内容为与土建水利各专业有关的科普或科技文章。全书共十六课,并附有补充读物15篇。

本册可接续大连海运学院、上海交通大学和天津大学主编的三种《英语》教材(一、二两册)的任何一种,可供土建水利类专业学生选用。

高等学校试用教材

英 语

第三册

(土建、水利类)

湖南大学 主编

*

人民教育出版社出版

新华书店北京发行所发行

人民教育出版社印刷厂印装

*

开本 787×1092 1/32 印张 10 字数 242,000

1979年5月第1版 1979年10月第1次印刷

印数 000,001—50,000

书号 9012·047 定价 0.73 元

前 言

本书系高等工科院校《英语》第三册(土建、水利类)试用教材。

全书共 16 课,其中包括 3 个复习课。复习课又分为 A、B 两课,A 为水利类内容,B 为土建类内容,可供有关专业选用。除复习课外,每课有阅读材料一篇。16 课后还附有补充读物 15 篇。本书选材为科普与科技文章,均选自英美原著。个别课文因考虑教学需要作了少量的删节。

本教材配有语法及翻译各 7 讲,目的在于复习并加深已学过的某些语法内容和概略介绍英译汉的基本知识。

本书 16 篇正课文每课教学参考学时平均为 7 学时,全书 16 篇正课文共需 110 学时左右学完。

参加本书编写的有:湖南大学谢倬杰(主编)、王益民,华东水利学院魏中明,西南交通大学王世馥,同济大学徐乃琛。

参加本书审稿的单位有:合肥工业大学(主审)、成都科技大学、广西大学、武汉水利电力学院、大连工学院、西安冶金建筑学院。

本教材在编写过程中,曾得到湖南大学土木系主任殷之澜教授,美籍英语教师菲德·玛利安娜(Mariana Fehd)和菲德·罗纳尔德(Ronald Fehd)的大力协助,谨在此表示感谢。各编写单位、审稿单位和兄弟院校的有关专家、教授也曾对本书提出许多宝贵意见,在此一并表示谢意。

编者

1979 年 4 月

Contents

Lesson One	1
Text: Force	
Translation: Brief Introduction to Translation	
Increase and Decrease of the Number of Words	
Shift of Word Functions	
Reading Material: Forces	
Lesson Two	15
Text: Forces on Structures	
Grammar: The Uses of AND, BUT, OR	
Reading Material: Stress and Deformation	
Lesson Three	28
Text: Equilibrium	
Translation: Choice and Extensions of Word Meanings	
Reading Material: The Lever	
Lesson Four	44
Text: The Use of Steel in Reinforced Concrete	
Grammar: The Uses of THAT	
Reading Material: What is Prestressing?	
Lesson Five	60
Text: (A) Hydrology	
(B) Modern Artificial Materials	
Review Exercises	
Lesson Six	74
Text: Water Supply	
Translation: How to Translate Sentences in the Passive Voice	
Reading Material: Water Supplies — a Growing Problem	
Lesson Seven	87
Text: Structural Elements	

Grammar: The Uses of IT	
Reading Material: Structural Elements	
Lesson Eight	101
Text: Structures	
Translation: How to Translate Attributive Clauses	
Reading Material: Buildings	
Lesson Nine	115
Text: Dams	
Grammar: The Uses of AS	
Reading Material: Building Dams	
Lesson Ten	129
Text: (A) Hydro Powerhouses	
(B) Designing for High Speed Railways	
Review Exercises	
Lesson Eleven	145
Text: High-Rise Buildings	
Grammar: The Uses of WHAT, WHO(WHOM), WHOSE, WHICH	
Reading Material: Tall Buildings	
Lesson Twelve	158
Text: Shiplocks	
Translation: Ways of Translating Negative Sentences	
Reading Material: Navigation Locks	
Lesson Thirteen	169
Text: Bridge Building	
Grammar: The Uses of WHEN, WHERE, WHY	
Reading Material: Bridges	
Lesson Fourteen	179
Text: Traffic Tunnels	
Grammar: Analysis of Long Sentences	

Reading Material: Tunnelling	
Lesson Fifteen	195
Text: Foundations	
Translation: Translation of Long Sentences	
Reading Material: Structural Foundations	
Lesson Sixteen	207
Text: (A) Harbors	
(B) Ventilation	
Review Exercises	
Supplementary Readings	
1. How Is Moving Water Put to Work	220
2. Stress and Strain	222
3. Real and Idealized Structures.....	225
4. Forms	227
5. The Hydrologic Cycle.....	229
6. Surveying and Mapping	231
7. Building Design.....	233
8. Tidal Power	235
9. Road Foundation	237
10. Spillways	240
11. Computers	242
12. Basic Considerations in Design	244
13. Construction	246
14. Multi-Purpose Hydraulic Projects	248
15. Railway Track	251
Expressions	254
Vocabulary	265
Index	311

Lesson One

Text

Force

The word force is a general term for any push or pull. A force is always exerted on a body by another body, or on a part of a body by another part. Though a force is really an action of one body on another, it is customary and convenient to speak of the force itself as acting on the body to which it is applied. ①

Your earliest ideas about forces were based on your own experience with forces exerted by or on yourself. ② For example, when moving a heavy body you realized that the force you applied had 1) magnitude, according to how hard you pushed or pulled, 2) direction, according to whether you pushed or pulled up, down, to the right, or left, and 3) place of application, according to where you grasped the body. These three attributes — magnitude, direction, and place of application — serve to describe a force and are called the elements or characteristics of a force.

Force is always measured in units of weight, e.g. pounds or tons, and the direction of a force can be represented by an arrow. For example, if the wind is blowing horizontally on to a building with a total uniform pressure of 10 tons, it can be depicted as in Fig. 1-1.

The words "pressure", "load", "pull", "push" etc., are frequently used as alternatives to the word "force".

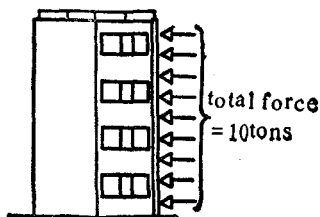


Fig. 1-1

A stationary object exerts force by virtue of its weight. In Fig. 1-2 (a) the two men, by merely standing on the beam, are exerting active forces in a downward direction, and this can be represented conventionally as in (b). The passive resisting forces or reactions exerted by the supports are in an upward direction.

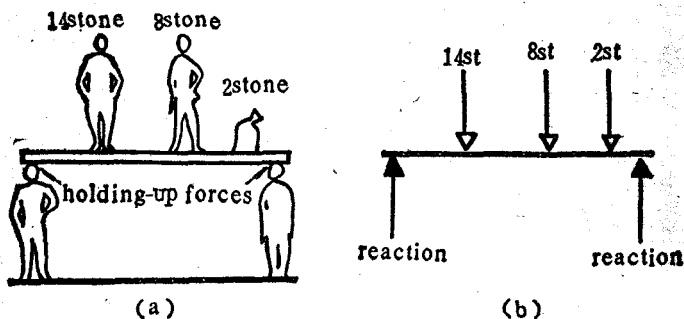


Fig. 1-2

Water exerts force in all directions, and its force on any surface is always at right angles to that surface. The intensity of the force increases with the depth of the water (Fig. 1-3).

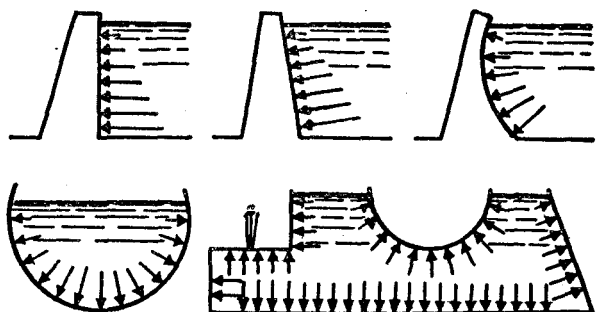


Fig. 1-3

Words and Expressions

- | | |
|---|---|
| <p>1. general ['dʒenərəl] <i>a.</i>
一般的, 总的 <i>n.</i> 一般, 普遍</p> <p>2. term [tɜ:m] <i>n.</i>
术语, 专门名词; 期限</p> <p>3. exert [ig'zɜ:t] <i>vt.</i>
尽(力); 施加</p> <p>4. customary ['kʌstəməri] <i>a.</i>
通常的; 惯例的</p> <p>5. convenient [kən'vi:njənt] <i>a.</i>
便利的, 方便的</p> <p>6. act [ækt] <i>n.</i>
动作, 行为 <i>vi.</i> 行动, 起作用
act on (upon)
对...起作用, 作用在</p> <p>7. idea [ai'diə] <i>n.</i> 概念; 意见</p> <p>8. base [beis] <i>n.</i>
底; 基础; 地基 <i>vt.</i> 基于
(be) based on (upon)
以...为基础, 基于; 根据</p> | <p>9. experience [iks'piəriəns] <i>n.</i>
经验</p> <p>10. realize ['ri:əlaiz] <i>vt.</i>
认识; 理解; 实现</p> <p>11. magnitude ['mægnitju:d]
<i>n.</i> 大小</p> <p>12. direction [di'rekʃən] <i>n.</i>
方向
in all directions
向四面八方</p> <p>13. left [left] <i>n.</i> 左边 <i>a.</i>
左边的</p> <p>14. grasp [grɑ:sp] <i>vt.</i> 抓住</p> <p>15. attribute ['ætrɪbjʊ:t] <i>n.</i>
品质, 属性, 特征</p> <p>16. describe [dis'kraɪb] <i>vt.</i>
描述(绘); 说明</p> <p>17. characteristic
[,kærɪktə'rɪstɪk] <i>a.</i></p> |
|---|---|

- 特有的 *n.* 特征, 特性
18. unit ['ju:nit] *n.* 单位
19. represent [,reprɪ'zent] *vt.*
表示
20. arrow ['ærəʊ] *n.* 箭, 箭头
21. blow [bləʊ] *vt., vi.* 吹
blew [blu:]
blown [bləʊn]
22. horizontally [,hɒrɪ'zɒntəli]
ad. 水平地
23. uniform ['ju:nɪfɔ:m] *a.*
一致的, 均匀的
uniform pressure 均匀压力
24. depict [dɪ'pɪkt] *vt.* 描绘
25. figure ['fɪgə] *n.*
外形; 图形; 插图(常缩写为
Fig.); 数字
26. frequently ['fri:kwɒntli]
ad. 经常地, 频繁地
27. alternative [ɔ:l'tə:nətɪv] *a.*
两者(或两者以上)挑一的;
供选择的 *n.* 两者挑一;
替换物
28. stationary ['steɪʃənəri] *a.*
不动的, 静止的
29. merely ['miəli] *ad.* 仅仅
30. beam [bi:m] *n.* 梁; (光)束

31. active ['æktɪv] *a.*
积极的; 主动的
32. downward ['daʊnwəd] *a.*
向下的 *ad.* 向下
33. conventionally
[kən'venʃənəli] *ad.*
惯例地, 常规地
34. passive ['pæsɪv] *a.*
消极的; 被动的
35. resist [rɪ'zɪst] *vt.*
反抗; 抵制
passive resisting force
被动抗力
36. reaction [rɪ(:)'ækʃən] *n.*
反作用; 反作用力
37. support [sə'pɔ:t] *vt.*
支撑, 支持 *n.* 支承; 支座,
支柱
38. stone [stəʊn] *n.* 石头;
吨(重量单位, 常用来表示体
重, 等于 14 磅或 6.33 公斤)
39. angle ['æŋɡl] *n.* 角度, 角
at right angles to
与...成直角
40. intensity [ɪn'tensɪti] *n.*
强度; 密(集)度
41. depth [depθ] *n.* 深度

1. to speak of ... as 把...说成是(叫做)
2. by virtue ['vɜ:tju:] of 依靠(...的力量), 凭借
3. to increase with 随...增加

Notes

1. ... it is customary and convenient to speak of the force itself as acting on the body to which it is applied.

…习惯上，为了方便起见我们常把力本身说成是作用在受力的物体上。

itself 是反身代词，在句中作 force 的同位语，用来加强语气，通常译为“本身”，“自己”。例如：

The motor itself is all right, only the power is too small.

这个马达本身还不错，就是功率太小。

2. ... were based on your own experience with forces exerted by or on yourself.

…是根据你自己在施力或受力时的亲身体验得来的。

介词 with 在这里作“对于”解。介词短语 with forces ... 作定语，修饰 experience。exerted by or on yourself 是分词短语，作定语，修饰 forces。

A Basic Knowledge of Translation from English into Chinese

英译汉基本知识

Translation

Brief Introduction to Translation

Increase and Decrease of the Number of Words

Shift of Word Functions

翻译概述、词量增减和词类转换

I. 翻译概述

我们学习外语的目的之一，就是培养阅读和翻译国外科

技文章的能力,为实现四个现代化服务。

翻译是进行科技文化交流的一个重要手段。因此,在翻译科技文章时,译文必须达到两个基本要求:

1. 忠实原文 准确而完整地表达原文的意思。为此,必须对原文的语法现象、上下文关系以及专业内容等方面作细致的分析,正确理解原文。例如:

1) In industry the technology of certain mixtures of metals or alloys has been greatly developed.

从语法上分析,连接词 or 可连接 metals 和 alloys,也可连接 certain mixtures of metals 和 alloys,因此,全句可能有两种理解;但是从专业意义上讲却只能是后者,or 连接的两部份为同位关系。

全句应译成:在工业中某些金属混合物即合金的工艺已经大大发展了。(不能译成:某些金属或合金的混合物)

2) Air pressure at a certain time was 740 mm of mercury.

名词 mercury 可作“水银”和“水银柱”解。但是,在本句中,根据整句的意义来看只能译为“水银柱”。

全句应译成:有时气压为740mm水银柱。

3) There is a hammer and sickle on the cover of the book. It was designed by a famous painter.

书的封面上有一幅锤子和镰刀图案。这幅图案是一位著名的画家设计的。(第一句话,如果不看下文,很容易误译成:在书的封面上放着一把锤子和镰刀。)

2. 通顺易懂 译文必须简练、流畅、符合汉语习惯。例如:

1) An earth dam can be built at lower cost.

全句的意思是清楚的。如果按照原文的语言结构,

应译成：土坝可以以较低的价格修筑。这种译法文字生硬，不符合汉语的表达习惯。因此，宜译成：土坝的修建费用较低。

- 2) To specify a force, it is necessary to know its three attributes.

为了把力说清楚，就必须知道力的三个特征。(specify 通常是“说明”或“详细说明”的意思。上述译法比译成“为了说明一个力”更符合汉语习惯，而且切近原文。)

英汉语是两种完全不同的语言。在语言结构，词汇手段，表达方式等方面都有很大的差别。因此，翻译时不宜照词直译，而应采用增减词量，转换词类，引伸词义等翻译方法进行灵活处理。此外，译文应力求保持科技文章说理清楚、文字简练、逻辑性强等特点。

I. 词量增减

英汉语在表达同一概念时，用词的数量是不相等的。因此，译文中有时要根据汉语的习惯适当增加或省略一些词，这就称为词量增减。

词量增减是翻译时常采用的一个重要方法，但增减词量必须注意不能损害原意。

1. 词量的增加

词量的增加一般有两种情况：一是出于修辞手段或汉语习惯的需要；一是增补原文中某些省略的部分。例如：

- 1) Air pressure decreases with altitude.

气压随海拔高度的增加而下降。(增加：海拔，的增加)

- 2) The cost of such a powerhouse is a relatively small portion of the total cost of the

development.

这样一个发电站的修建费用仅占该开发工程总费用的一小部分。(增加:工程)

- 3) Matter can be changed into energy, and energy into matter.

物质可以转化为能,能也可以转化为物质。(增补:也可以转化)

- 4) An object is said to be hot if its temperature is much higher than that of our bodies, or cold if its temperature is much lower.

如果物体温度比我们体温高得多,我们就说它热;如果比我们体温低得多,我们就说它冷。(增补:比我们体温,我们就说它)

2. 词量的减少

英语中有些词如冠词(a, an, the)、连接词、介词、代词等用得极为广泛,但汉语无冠词,连词、介词等用得也远不如英语那样普遍,因此翻译时,在不损害原意的前提下,常把这些词省略掉。例如:

- 1) *The direction of a force can be represented by an arrow.*

力的方向可用箭头表示。(the, a, an 不译)

- 2) *The door into the classroom has been opened.*

教室门已经开了。(into 不译)

- 3) *A wire lengthens while it is heated.*

金属丝受热则伸长。(while, it 均不译)

Ⅲ. 词类转换

翻译时为了更好表达原意,使译文符合汉语习惯,往往需要把英语中属于某一词类的词,译成汉语另一词类,这种方法

就称为词类的转换。例如:

- 1) We must do our best to accelerate the development of science and technology in our country.

我们必须尽一切力量加速发展我国的科学技术。

(名词 development 译成动词)

- 2) If a body weighs 50 kilograms, it means that the earth attracts the body with a force of 50 kilograms.

如果一物体重 50 公斤, 这就是说, 地球对该物体的吸引力为 50 公斤。(动词 attract 译成名词)

- 3) We are sure this experiment will be a success.

我们相信这个实验会成功。(形容词 sure 和名词 success 分别译成动词和形容词)

- 4) Modern industry would be out of the question without iron and steel.

没有钢铁, 就谈不上现代化工业。(介词短语 out of the question 和介词 without 都译成动词)

Exercises

1. Answer the following questions in English:

- 1) What are the three elements of a force?
- 2) How does water exert force on the walls of its container?
- 3) What is the relation between the depth of the water and the intensity of its pressure?
- 4) What do you realize when moving a heavy body?

2. Put the following expressions into Chinese:

- 1) to exert a force on a body
- 2) to speak of the force of gravity of the earth upon a body as its weight

- 3) to be based on your own experience with forces
- 4) to serve to describe the wind load
- 5) by virtue of the force of gravity of the earth
- 6) in an upward direction
- 7) to be represented conventionally as in Fig. 1-2
- 8) the intensity of water pressure
- 9) to measure the depth of the water
- 10) according to whether you push or pull the object

8. Put the following expressions into English:

- 1) 作用点
- 2) 如图 1 所描绘的那样
- 3) 向四面八方施加力
- 4) 与桌面成直角
- 5) 用箭头来表示力的方向
- 6) “力”这个词的替换词
- 7) 你对石头所施加的力
- 8) 力的三个特征
- 9) 在钢梁的表面上
- 10) 随着物体的重量而增加

4. Fill in the blanks with proper prepositions:

- 1) It is convenient to speak of the force itself acting on the body which it is applied.
- 2) We can calculate the work done the force applied the body and the distance it travelled.
- 3) The distance stars are usually measured units light-year.
- 4) Snow falls the roof virtue its weight.
- 5) The force a liquid any surface is always right angles that surface.
- 6) Please tell me your experience forces exerted or yourself.