高职高专规划教材

机电工程专业英语

JIDIAN GONGCHENG ZHUANYE YINGYU

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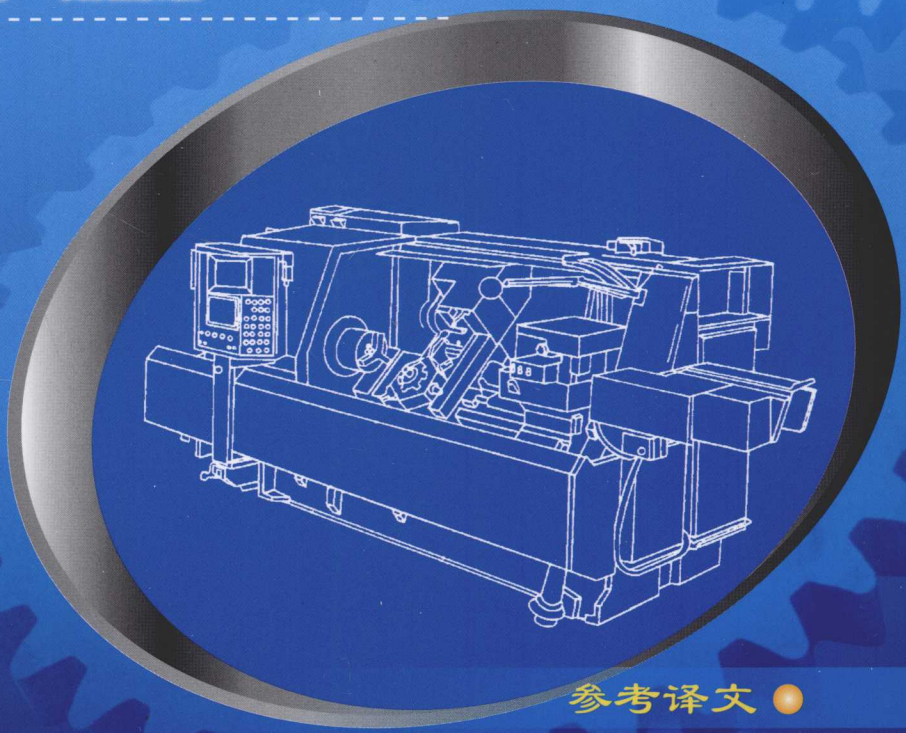

参考译文

习题答案

电子教案

化学工业出版社

高职高专规划教材

机电工程专业英语

马佐贤　主　编
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·北京·

本书共有12个单元，内容包括机电一体化、切削刀具、工业机器人、CAD/CAM、钢的热处理、材料的特性、机械制造概念、计算机数控机床的优缺点、可编程逻辑控制器、自动控制系统、模具材料、英文简历。每个单元由对话、课文、阅读材料、练习和科技英语翻译技巧五个部分构成。书的最后列有附录，将一般机电缩略语、词汇按字母顺序列表，并附有练习答案和课文参考译文。为方便教学，配套有电子教案。

本书可作为高职高专院校的机电一体化、机械制造及自动化、数控技术、模具设计与制造、工程机械等机电类专业的专业英语教学用书，也可供工程技术人员学习参考。

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前言

本书是按照高职高专机电专业教学大纲编写的。编者在多年教学实践经验的基础上，根据经济全球化、文化全球化的大背景带来的学生就业方式多样化的形势需要，力求按专业培养的宽口径，使专业英语教材具有良好的通用性；其次是遵照高等技术教育的应用性特征，使专业英语具有较强的实用性和针对性；本着先进、实用的选材原则和简明、系统的组织原则，充分吸收当前最新技术成果和教学成果，为机电工程专业学生提供一个提高英语水平和专业素养的平台。

本书共 12 个单元，充分考虑到英语与专业、普通英语与专业英语的衔接，融会贯通。从机电一体化的历史与发展前景谈起，介绍了切削刀具、工业机器人、CAD/CAM 应用、钢的热处理、制造的概念、材料的特性、CNC 机床的优缺点、PLC、模具材料等方面的机电工程技术知识，最后以找工作为结束。

本书在编写过程中力求体现下列特点：

1. 本书立足于现代制造业，针对机电工程技术主题，用原汁原味的英语，全面、系统地描述了机电工程技术相关的各类信息。本书介绍了机电工程领域的最新技术和知识，以图文并茂的方式表达，通过专业知识帮助来促进英语水平的提高。具有一定的趣味性，让读者感觉轻松。

2. 根据目前学生现有的基础水平，从实际生产应用出发，突出了机电技术专业英语词汇的专业性和内容的实用性、趣味性、可行性。

3. 各个单元配以与内容相关的插图，图文并茂，更直观，易于理解。

4. 生词加注音标，便于学生朗读，形成正确的发音。

5. 课后习题着眼于专业知识，内容丰富，形式多样。

6. 书的最后列有附录，如将一般机电缩略语、词汇按字母顺序列表，便于读者查询。

7. 结合教学内容，穿插介绍了科技英语翻译的基本技巧。

8. 每个单元分对话、课文、阅读、翻译四个部分，各部分又自成体系。

9. 每个单元配有练习题，供学生复习巩固。

本书可作为高职高专院校机电工程专业的英语教材，也可以作为工程技术人员的自学参考书。

本书由江苏联合职业技术学院马佐贤主编，江苏电大武进学院张雪娟担任副主编，参加本书编写的还有江苏联合职业技术学院的唐丽和殷莹。

本书的编写分工是：马佐贤编写第一单元、第二单元、第三单元、第五单元和第六单元；张雪娟编写第四单元、第七单元、第九单元、第十单元和第十二单元；唐丽编写第八单元；殷莹编写第十一单元。

在本书的编写过程中，得到了江苏联合职业技术学院无锡机电分院领导及外语教研室和机电教研室各位老师的大力支持，他们为本书提出了宝贵的意见，在此一并表示感谢。

本书有配套电子教案，可赠送给用本书作为授课教材的院校和老师，如果有需要，可发邮件至 hqlbook@126.com 索取。

由于我们经验不足，难免有不妥之处，敬请读者批评指正！

编　者

2010 年 6 月

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Unit 1

Mechatronics

Tom: Hi, Mary. Who's the man outside?

Mary: He's my new colleague, Jack.

Tom: What's his job?

Mary: He is an engineer, and he is in charge of after-sales services. Come here, Jack. This is Tom.

Tom: How do you do, Jack?

Jack: How do you do, Tom. Nice to meet you.

Tom: Nice to meet you, too. May I ask you a question?

Jack: Go ahead.

Tom: Could you introduce something about your work to us?

Jack: After-sales service is also key work for our company. We supply customer services, including dealing with feedback information and complaint and claims according to the contract.

Tom: Thank you, Jack. I hope we can visit your department some time.

Jack: Welcome! I have to go to call my boss now. See you!

Tom and Mary: Bye!

Mechatronics

Mechatronics is the combination of mechanical engineering, electronic engineering and software engineering. The purpose of this interdisciplinary engineering field is the study of automata from an engineering perspective and serves the purposes of controlling advanced hybrid systems. The word itself is a portmanteau of "Mechanics" and "Electronics". Fig. 1-1 can clearly show that the various fields make up Mechatronics.

Mechatronics is centered on mechanics, electronics, control engineering, computing, molecular engineering. The portmanteau "Mechatronics" was first coined by Mr. Tetsuro Mori, a senior engineer of the Japanese company Yaskawa, in 1969. Mechatronics may alternatively be referred to as "electromechanical systems" or less often as "control and automation engineering".

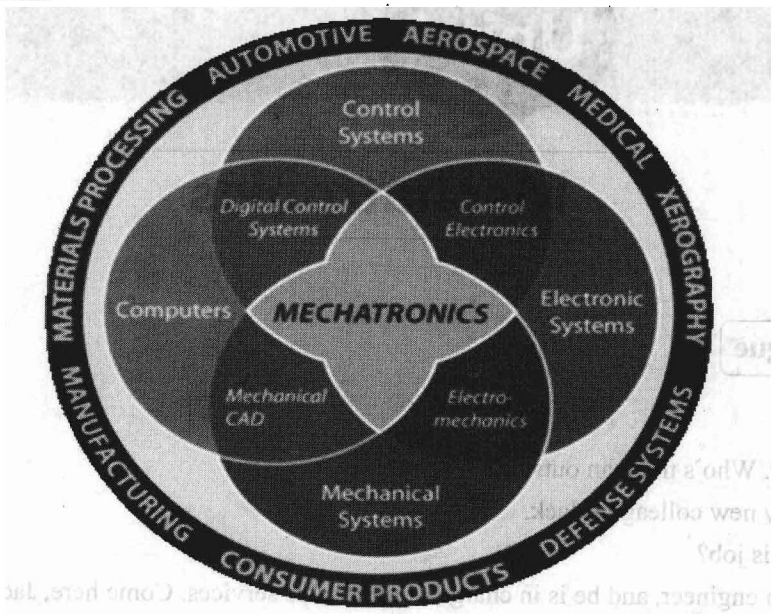


Fig. 1-1 The various fields that make up Mechatronics

Engineering cybernetics deals with the question of control engineering of mechatronic systems. It is used to control or regulate such a system. Through collaboration the mechatronic modules perform the production goals and inherit flexible and agile manufacturing properties in the production scheme. Modern production equipment consists of mechatronic modules that are integrated according to a control architecture. The most known architectures involve hierarchy, polyarchy, heterarchy and hybrid. The methods for achieving a technical effect are described by control algorithms, which may or may not utilize formal methods in their design. Hybrid-systems important to Mechatronics include production systems, synergy drives, planetary exploration rovers, automotive subsystems such as anti-lock braking systems, spin-assist and every day equipment such as autofocus cameras, video, hard disks, CD-players, washing machines.

New Words and Expressions

interdisciplinary [ˌintə(:)'disiplinəri] *adj.* 跨学科的
automata ['ɔ:təmətə] *n.* 自动控制
perspective [pə'spektiv] *n.* 前景
hybrid ['haibrid] *n.* 混合源物;合成物
combination [ˌkɔmbi'neiʃən] *n.* 结合
portmanteau [pɔ:t'mæntəu] *n.* 混合词
alternatively [ɔ:l'tə:nətivli] *adv.* 可选地
cybernetics [saibə: netiks] *n.* 控制论
regulate ['regjuleit] *v.* 调整
collaboration [kəˌlæbə'reiʃən] *n.* 合成
module ['mɔdju:l] *n.* 模块
inherit [in'herit] *v.* 传承，继承
agile ['ædʒail] *adj.* 敏捷的
property ['prɔpəti] *n.* 特性
integrated ['intigreitid] *adj.* 集成的
architecture ['a:kitekʧə] *n.* 工艺，建筑学
hierarchy ['haiəra:ki] *n.* 层次结构
polyarchy ['pɔlia:ki] *n.* 多元化结构
heterarchy ['hetəraki] *n.* 变态分层结构
algorithms ['ælgəriðəm] *n.* 算法
utilize [ju:'tilaiz] *v.* 利用
autofocus ['ɔ:təuˌʃəukəs] *n.* 自动对焦，自动聚焦装置

after-sales services 售后服务
feedback information 反馈信息
mechanical engineering 机械工程
software engineering 软件工程
hybrid systems 混合系统
be centered on 集中于
molecular engineering 分子工程
be coined by 被提出
electromechanical systems 电机系统
control and automation engineering 控制与自动化工程
engineering cybernetics 工程控制论
consist of 包括
synergy drives 协同驱动系统
planetary exploration rovers 行星探测器系统
anti-lock braking systems 反抱死刹车系统

Exercises

Ⅰ. Work with your partner to answer the following questions.

1. Why do we say the word "Mechatronics" is a portmanteau?
2. Describe the advantages of using the mechatronic modules.
3. Describe the architectures mentioned in this passage.
4. What are every-day equipment utilizing hybrid-systems?
5. Why do we say "Mechatronics is interdisciplinary engineering field "?

Ⅱ. Match column A with column B according to the meaning.

A	B
1. mechatronic	a. to fix or adjust the time, amount, degree, or rate of
2. portmanteau	b. a usually packaged functional assembly of electronic components for use with other such assemblies
3. architecture	c. a mechanism that is relatively self-operating
	d. an interdisciplinary engineering field
4. integrated	e. art and science of building
5. automata	
6. regulate	f. a word or whose form and meaning are derived from a blending of two or more distinct forms

Ⅲ. Review the text and translate the following phrases into Chinese or English.

1. after-sales services
2. feedback information
3. mechanical engineering
4. hybrid systems
5. 集中于
6. 被提出
7. 包括
8. 自动对焦

Ⅳ. Translate the following passage into Chinese.

Engineering cybernetics deals with the question of control engineering of mechatronic systems. It is used to control or regulate such a system. Through collaboration the mechatronic modules

perform the production goals and inherit flexible and agile manufacturing properties in the production scheme. Modern production equipment consists of mechatronic modules that are integrated according to control architecture. The methods for achieving a technical effect are described by control algorithms, which may or may not utilize formal methods in their design.

Supplementary Reading

Intelligent Manufacturing Systems

Production engineering and manufacturing industries face difficulties in developing a new paradigm to cope with the post mass-production era. Consumers' preferences change very quickly and vary over a wide range of taste. A product's life cycle becomes shorter and shorter. Thus, rapid prototyping techniques have been requested, and some new concepts on manufacturing have been presented including Flexible Manufacturing System, Factory (or Flexible) Automation, Computer Integrated Manufacturing System, and Concurrent Engineering.

After the termination of the cold war, many regional economies combined through international trade and dynamically evolved into global economies. Such change had significant effects on manufacturing industries and consequently on production engineering. As a new paradigm in the post mass-production era, the creation of manufacturing culture has been advocated by Prof. Hiroyuki Yoshikawa, President of University of Tokyo. It contains not only the movement towards standardization of conventional manufacturing knowledge but also the development of a global manufacturing system with use of computerization. At his advocation, the international research project of Intelligent Manufacturing Systems (IMS) was initiated. This bimonthly journal is a special issue on the IMS project and similar topics widely covering intelligent manufacturing systems.

The former part of the contents is the description of the IMS project. It consists of the commentary articles quoted from the IMS news and the latest reports of IMS international test cases. The Japan IMS center publishes the IMS news and strongly supports the IMS project itself with collaboration of Ministry of International Trade and Industry of Japan (MITI). The authors of these reports are primarily enrolled in the actual responsibility to promote their projects and newly write the articles for this journal. I would like to thank the IMS center and each author for their contributions to this special issue on the IMS project.

The latter part of the contents consists of the articles on the Standard for the Exchange of Product model data (STEP) and some technical papers on manufacturing. A conference report on the 2nd Japan-France Congress on Mechatronics is also provided in this issue. I would like to thank all contributors for their cooperation in creating this special issue.

As can be easily seen, this issue focused on the forthcoming advancement on production engineering and manufacturing through the movement of Intelligent Manufacturing Systems.

As the editor of this special issue on Intelligent Manufacturing Systems, I hope that the readers pay attention to this new movement and become involved in the near future.

New Words and Expressions

paradigm ['pærədaim, -dim] *n.* 范例
era ['iərə] *n.* 时代
preference ['prefərəns] *n.* 偏好
dynamically [dai'næmikəl] *adv.* 动态地
evolve [i'vɔlv] *n.* 发展
consequently ['kɔnsikwəntli] *adv.* 从而
standardization [ˌstændədai'zeiʃən] *n.* 标准化
conventional [kən'venʃənl] *adj.* 传统的
computerization [kəmˌpju:tərai'zeiʃən] *n.* 计算机化
advocation [ˌædvə'keiʃən] *n.* 提倡，支持
commentary ['kɔməntəri] *n.* 评述
contributor [kən'tribju(:)tə] *n.* 贡献
cope with 处理
rapid prototyping techniques 快速成形技术
Flexible Manufacturing System 柔性制造系统
Factory (or Flexible) Automation 工厂自动化
Computer Integrated Manufacturing System 计算机集成制造系统
Concurrent Engineering 并行工程
Intelligent Manufacturing Systems (IMS) 智能制造系统
Ministry of International Trade and Industry of Japan (MITI) 日本国际贸易和产业部
Standard for the Exchange of Product model data (STEP) 产品模型数据交换标准

Exercises

Ⅰ. Mark the following statements with T (true) or F (false) according to the text.

1. A product's life cycle becomes longer and longer. ( )
2. The Japan IMS center publishes the IMS news and strongly supports the IMS project itself with collaboration of Ministry of International Trade and Industry of Japan (MITI). ( )
3. A conference report on the 2nd Japan-France Congress on Mechatronics is also provided in this issue. ( )

Ⅱ. Review the text and translate the following phrases into Chinese or English.

1. 处理
2. 快速成形技术
3. 工厂自动化
4. Flexible Manufacturing System
5. Intelligent Manufacturing Systems (IMS)
6. Computer Integrated Manufacturing System

Translating Skill (1)

科技英语翻译概述

Ⅰ. 翻译概述

翻译是把一种语言已经表达出来的一切用另一种语言准确、流畅地重新表达出来。它不

同于写作，译者不能随心所欲地表达自己的思想，而必须忠实、准确、通顺、完整地把原文的思想内容、感情及风格等重新表达出来。也就是说，在把原文变成另一种文字时，译者必须做到不增添、不减少、不篡改原文的本意和风格。因此，从某种意义上讲，翻译比写作还要困难。

翻译固然很难，但每种语言都有其固有的特点和规律。翻译就是通过不同语言特点和规律上的对比、找出相应的表达手段。在某种情况下，翻译可以是两种不同语言有规律的转换，但绝不是机械转换和简单变易。那种认为有了一点外语知识，加上一本词典就能进行翻译的想法是非常错误的。采用“对号入座”的办法，翻译出来的文章不是晦涩难懂，就是令人不知所云，根本算不上翻译。

翻译的范围很广，种类繁多。按翻译方式来分，有外语译成本族语及本族语译成外语两种。按翻译手段方式来分，有口译、笔译和机器翻译三种。从翻译的内容来分，有政论、文艺、科技和其他几种不是一个类别的翻译等。

科技英语 (English for Science and Technology, EST) 诞生于 20 世纪 50 年代，是第二次世界大战后科学技术迅猛发展的产物。20 世纪 70 年代以来。科技英语在国际上引起了广泛的注意和研究，目前已经发展成一种重要的英语语体，在词汇、语法、修辞等方面具有自己的特色。对科技英语的研究始于 20 世纪 50 年代，随着科学技术的迅猛发展，人们进入了所谓的“信息爆炸”的时代，记录和传播信息的文献资料和有声资料浩如烟海。英语是世界上使用最广泛的语言之一，科技英语既然有其特点，翻译时也有不同的要求。例如，文学作品的翻译对译文讲究文采及语言和艺术形象的动人与优美，经常运用各种意象和修辞手法 (如夸张、比喻、对照等) 表达作品的思想内容，要求传达出原作的神韵。但科技英语则注重科学性、逻辑性、正确性与严密性。因此，从事科技英语翻译时较少运用修辞手段，而是注重事实与逻辑，要求技术概念明确清楚，逻辑关系清晰突出，内容准确无误，资料准确精密，文字见解明了，符合技术术语表达习惯，体现科技英语的科学、准确、严谨的特征。

提高翻译水平的有效途径是进行大量的翻译实践。但是,为了使翻译实践脱离盲目性而具有更高的水平,就必须要以必不可少的翻译理论和技巧作为准则与指南。自然,很少有人会期望只通过掌握某些翻译理论和技巧就可以得心应手地进行翻译。另一反面，也绝不能否定翻译理论和技巧的重要性。有的人强调只要跳到水中就可以学会游泳，只要进行翻译实践就可以学会翻译，认为翻译理论可有可无，这也是片面的。诚然，即使没有理论的指导，一个人只要跳到水里去游泳，也可以学会。但若无理论的指导和科学的训练，他则极难成为游泳健将。翻译也是如此。总之，翻译首先在于实践，应该在实践中学习翻译理论和常用技巧，遵循“实践——认识——再实践——再认识”的规律，不断练习，不断总结，才能有效地提高翻译的能力。本教材将简要地介绍科技英语翻译中常用的技巧，并通过大量例句帮助读者开阔视野，开拓思路，加强翻译实践，提高科技英语的阅读和翻译水平。

Ⅱ. 翻译的标准

翻译的标准是衡量译文质量的尺度，又是指导翻译实践的准则。因此，翻译理论首先涉及的就是这个问题。

清末翻译家严复 (1853—1921) 1898 年在《天演论》(Evolution and Ethics and other Essay) 的“译例言”中就提出了著名的“信、达、雅”的准则。近年来，翻译理论又有了新大发展，有的翻译家提出了文学翻译要“重神似而不重形似”，把翻译纳入了文艺美学的范畴。有的提出“译者和原作者要达到一种心灵上的契合，这种契合超越时间和空间上的限制，打破了种族上和文化上的樊笼。”有的则认为“文学翻译的最高标准是‘化’”。即译文不因习惯的差异而露出牵强的痕迹，又能完全保存原有的风味，这就算得入于“化境”。

对翻译的标准尽管有许多争论，但“信”和“达”，即“忠实”和“通顺”，今天已经成为公认的两条翻译标准。鲁迅先生说：“凡是翻译必须兼顾着两面：一则当然力求其易解，一则保存着原作的风姿……”。因此可以把翻译标准概括为“忠实、通顺”四个字。科技英语虽自有特点，其翻译具有文体上的特殊要求，但“忠实、通顺”这个标准仍然是适用的。

所谓忠实，首先指译文必须忠实、正确地传达原文的内容，对原文的意思既不歪曲，也不能任意增减。内容除了指原文所叙述的事实、说明的道理、描写的景物，也包括作者在叙述、说明和描写过程中所反映的思想、观念、立场和感情。

“忠实”这一标准对科技翻译尤为重要。科技作品的任务是准确而系统地论述科学技术问题，对准确性的要求特别严格，因此，科技翻译也应特别强调准确性，译文必须确切，明白，不能模糊不清，模棱两可，以免产生歧义，致使差之毫厘，失之千里。

所谓“通顺”，指的是译文的语言必须通顺易懂，符合汉语规范。要按照汉语的语法和习惯来选词造句，没有文理不通，结构混乱或逻辑不清的现象。理想的译文必须是纯正的中文，没有生硬拗口，“中文欧化”等弊病。要做到行文流畅通顺，学习者尤其要注意避免逐字死译，生搬硬套。应该在深刻领会原文的基础上，尽量摆脱原文形式的束缚，选用符合汉语习惯的表达方法，把原意清楚明白表达出来。

忠实和通顺是辩证的统一关系，两者互为依存，不可分割。译文不通顺，读者看不懂，就谈不上忠实。通顺而不忠实，歪曲原意或随意增减，便成了乱译甚至杜撰。因此，要使译文忠实，就必须通顺。反之，译文的通顺也必须以忠实于原文为基础和前提。在翻译中不能把两者割裂开来，说忠实只针对原文理解的一面，通顺只针对译文文字的一面。在整个翻译过程中都要注意准确和流畅。要防止对忠实的片面理解，一味的追求形式上的相似，造成逐字死译，产生翻译上的形式主义。试比较下列各句的不同译文：

In certain cases friction is an absolute necessity.

(1) 在一定场合下，摩擦是一种绝对的必需品。

(2) 在某些情况下，摩擦是绝对必需品。

The tendency of evolving organisms to follow a trend is widespread.

(1) 进化着的有机体遵循着一种趋向，这种趋向是普遍的。

(2) 不断进化的各种生物，基本上都有共同的进化趋向。

另一方面，也要防止片面理解“通顺”的要求，过分强调译文的流畅而不受原文意思的约束，添枝加叶，造成翻译上的自由主义。列如：

He wanted to learn , to know, to teach.

(1) 他渴望博学广闻，喜欢追根穷源，并且好为人师。

(2) 他想学习，增长知识，也愿意把知识教给别人。

Ⅲ. 理解与表达

翻译的过程主要包括理解与表达两个阶段。理解与表达不是截然分开的，而是相互联系，反复推敲的统一过程。在翻译实践中，往往要从英语到汉语，从汉语到英语仔细推敲，反复琢磨，直到译文符合原意。当译者揣摩原文含义时，实际也在思考着如何表达，而在他落笔表达的过程中又可进一步加深对原文的理解。

翻译的两个阶段，在通常情况下，理解是第一位的，表达是第二位的。正确地理解原作是翻译的基础，没有正确的理解就不可能有正确的翻译。当然，虽然理解了原文，但不能用确切的汉语表达出来，致使词不达意，文理不通，晦涩难懂，也无法达到忠实表达原文思想内容的目的。

1. 理解阶段

翻译的关键在于理解。就科技英语的翻译而论，关键在于透彻地理解和把握住原文的内容和实质。对于一个生长在汉语环境中而又运用汉语表达思想的人来说，理解英语比用汉语表达无疑要困难得多。英汉两种语言在词法、句法和逻辑思维等方面都存在很大差异，要彻底理解原文的每一个词，每一个短语,每一句，每一段，以至全文的精神实质并非易事。英语词汇浩如烟海，一词多义的现象比比皆是，习语和熟语更难掌握，至于原文所包罗的事物和背景，尤其是历史地理、风土人情和生活习俗等方面，绝不是一个外国人所能通晓的。至于科技知识，则涉及人类从古至今的一切科学领域，即使是一个翻译巨匠，不管科学知识多么渊博，也不可能什么都懂。因此，科技翻译的困难是可想而知的。因此，要提高理解原文的能力，最根本的是要有丰富的词汇和坚实的语法知识，有较高的英语水平。此外，还必须掌握广博的知识，熟悉英语国家的历史文化等。为了透彻理解原文，应该注意以下几点：

(1) 结合上下文，推敲词义

理解必须通过原文的上下文来进行。英语里一词一义的情况很少的，只有结合上下文才能理解单词在某一特定的语言环境中的确切意义，否则翻译时往往容易出错。例如：

Various speeds may be obtained by the use of large and small pulleys.

[误] 利用大小滑轮可以获得不同的转速。

[正] 利用大小皮带轮可以获得不同的转速。

Pulley 一般做“滑轮”、“辘轳”解，但影响机器转速的应为“皮带轮”而不是“滑轮”。

(2) 辨明语法，弄清关系

科技英语的特点之一是句子长，语法结构复杂，因此，根据原文的句子结构，弄清每句话里的语法关系对正确理解具有重要意义。例如：

There are no problems in the production of such domestic robot to which we do not have already the glimmering of a solution.

[误] 要生产这样的家用机器人已经毫无问题,我们对于一系列技术问题的解决现在已经不是只有一线希望了。

[正] 要生产这样的家用机器人存在着各种问题,然而这些问题的解决均已略显端倪。

这个句子误译的原因，可能主要是没有看清 no problems 与定语从句中 to which we do not have…构成双重否定，因而造成理解上的错误。to have a glimmering of solution 意为“模模糊糊地知道解决 (这些问题的) 办法”，即要解决这些问题现已略有眉目。

(3) 理解原文所涉及的事物

有些句子的翻译，不能单靠语法关系来理解，还必须从逻辑意义或专业内容上来判断，应该特别注意某些特有的事物，典故和专业术语所表达的概念。例如：

Do you know that the bee navigates by polarized light and the fly controls its flight by its back wings?

[误] 你知道蜜蜂借助极光飞行，而苍蝇用后翅控制飞行吗？

[正] 你知道蜜蜂借助偏振光飞行，而苍蝇用后翅控制飞行吗？

例句中的 polarized light 是偏 (振) 光，指不同方向显示不同特点的光线，误译为极光是由于不懂专业望文生义造成的。

2. 表达阶段

表达阶段的任务是把已经理解的原作的内容用汉语恰如其分地重述出来。是否能忠实流畅地表达原作首先取决于对原作的理解深度，同时也取决于汉语的修养程度。翻译时，很重要的一点是不受原文形式的束缚，而要放开思路，按照汉语的规律和习惯从容自如地遣词造

句。因此，译者必须十分重视汉语水平的提高。

表达涉及的问题很多，这里只介绍两种最基本的方法：直译和意译。

(1) 直译

翻译界长期以来对直译和意译有不少争论。作为两种翻译方法来看，直译是指译文采取原作的表现法，既忠于原文内容，又考虑原文形式，也就是说，在译文语言条件许可时，按照字面进行翻译。但直译不是死译或硬译。绝不能不分青红皂白地“对号入座”，逐字死译，把 bull's eye (靶心) 误译为牛眼睛，把 dog house (高频高压电源蔽罩) 误译为“狗室”。下面是一个直译的例子。

What sort of force does the sun exert on the planets which causes the plants to move according to the laws which Kepler has discovered?

太阳以什么力作用于行星，使之遵循开普勒发现的定律运行呢？

(2) 意译

意译 (free translation) 是指通过对原文深层意蕴的理解，将原文的表层结构转化为译文的表层结构，并且打破原文的语言形式，用译文的习惯表达形式把原文的意蕴再现出来。但形式的转换或再创造必须服从于原文的信息的传达。如果偏离原文的内容与风格而随意发挥，捕风捉影地进行编纂和杜撰，那就成了胡译、乱译。如：

In fact, it may be said that anything that is not an animal or vegetable is a mineral.

直译：事实上，可以说不是动物或植物的任何东西便是矿物。

意译：事实上，可以说任何东西只要既不是动物又不是植物便是矿物。

应当指出，在能确切地表达原作思想内容和不违背译文语言规范的前提下，直译法是有其可取之处的，如有助于保持原作风貌等。因此，能直译的就应该直译。但英汉两种语言差异甚大，翻译时往往需要改变原作的表达方式，即采用意译。在翻译实践中，应根据最能忠实、通顺地表达原文含义的原则，灵活机动地选用或交替使用这两种译法。

Ⅳ. 校对和修改

理解和表达都不是一次完成的，而是逐步深入，最后才能达到完全理解和准确表达原作反映的客观现实的目的。因此，表达阶段还包括校对和修改译文这一环节。校改译文是使译文符合翻译标准所必不可少的一步。校改译文时，不仅要对译文作进一步的推敲，使之符合汉语规范，而且要特别注意译文的准确性，科技文章尤其重要。因此，译文只有经过再三校改，直到符合原文时，才能最后定稿。

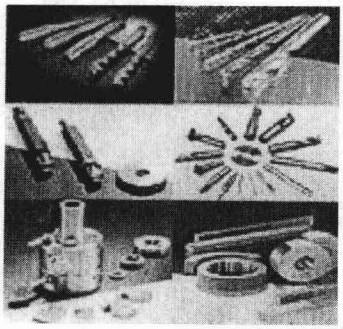
Unit 2

Cutting Tools

Tom: How do you do! My name is Tom.
Barter: How do you do!
Tom: Are there any vacancies in your factory?
Barter: Yes. We need some new workers. What was your major?
Tom: My major was mechanical manufacturing, and I think I am good at operating milling machine.
Barter: What kind of job do you like to do?
Tom: I would like to be milling worker. I think I can do my best to it.
Barter: Great! What time can you start to work?
Tom: Anytime.
Barter: Very nice. How much do you expect in salary?
Tom: RMB 900.
Barter: OK! Please fill in this form. If anything turns, I'll contact with you.
Tom: Thank you!
Barter: You're welcome.

Cutting Tools

Metal cutting tools must possess a variety of different properties in order to cut the different metals under varying conditions of severity[1]. To meet these demands, tools have been produced from a variety of materials.



The most important properties of cutting tools are hardness at high temperature, wear resistance, and impact strength.

As a tool cuts, high heat is developed as a result of compression and friction at the cutting edge of the tool. All metal cutting tools begin to lose hardness when heated to sufficiently high temperatures[2]. As the tool softens due to heat, it wears and breaks down at the cutting edge or face. Various cutting tool materials begin to lose their hardness at different

temperatures. Hence, the hardness of the tool and the degree to which it remains its hardness at high temperature are important in the selection of a cutting-tool material.

A cutting tool is the wear-resistant if it resists abrasion at the cutting edge and along the tool face. Wear resistance improves as cutting tool hardness increases.

Cutting tools must also have high strength in order to be vibration and impact-resistant. Strength in cutting-tool material is not always proportional to hardness. Some of the hardest tool materials lack strength because they are too brittle.

The various materials from which most metal cutting tools are made can be classified under the following principal headings:

1. Carbon tool steel
2. High-speed steel
3. Cast alloys
4. Cemented carbides
5. Ceramics
6. Diamonds

Tool life, or the number of parts produced by a cutting-tool edge before regrinding is required, is a very important cost factor in manufacturing a part or product[3]. Cutting tools must be reground at the first sign of dullness. If a tool is used beyond this point, it will break down rapidly.

In order to detect the time when a cutting tool should be changed, most modern machines are equipped with indicators that show the horsepower used during the machining operation. When a tool becomes dull, more horsepower is required for the operation which will show on the indicator. When it occurs, the tool should be reconditioned immediately.

Notes

[1] Metal cutting tools must possess a variety of different properties in order to cut the different metals under varying conditions of severity.
金属切削刀具必须具有许多不同性能才能在各种恶劣条件下切削不同的金属。
a variety of 多种的　in order to 为了……

[2] All metal cutting tools begin to lose hardness when heated to sufficiently high temperatures.
达到一定高温度时，所有的金属切削刀具便开始软化。

[3] Tool life, or the number of parts produced by a cutting-tool edge before regrinding is required, is a very important cost factor in manufacturing a part or product.
刀具寿命，即切削刀刃在需要重新打磨之前能加工的零件数，是生产某个零件或产品的重要成本因素。

New Words and Expressions

severity [si'veriti] *n.* 恶劣,严重
wear [wiə] *n.* 磨损，损坏
compression [kəm'preʃən] *n.* 压缩
friction ['frikʃən] *n.* 摩擦
soften ['sɔ(:)fn] *v.* 变柔软
hence [hens] *adv.* 因此