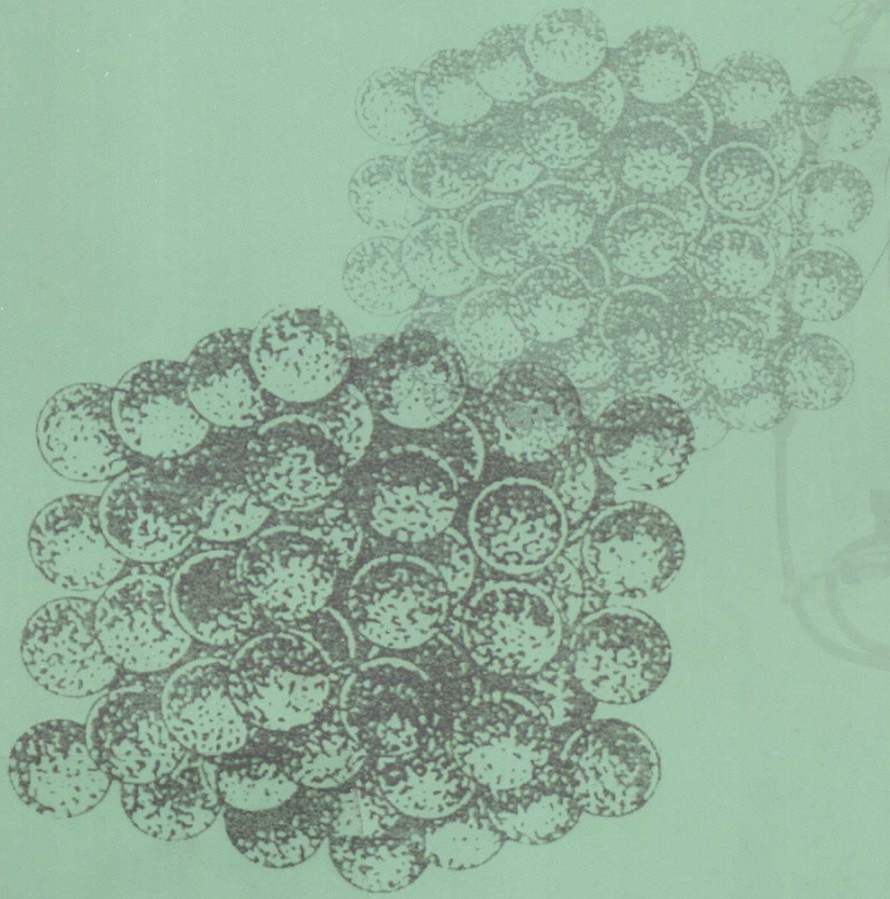
高职高专规划教材

English Course for Hot-Working of Metals

热加工专业英语

国家机械职业教育热加工类专业教学指导委员会　组编
王晓江　李学哲　主编



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本书课文和阅读材料均选自英、美等国专业教材和专业刊物中的原文，共 150 余篇。全书分 6 章，共 54 个单元。内容包括材料基础知识，金属热加工基础，铸造原理、工艺及设备，焊接原理、工艺及设备，热处理原理、工艺及设备，质量检测技术等。题材多样，内容全面，图文并茂，难度适中，融知识性和趣味性于一体，使读者在掌握热加工专业英语和科技英语语法与结构的同时进一步学习热加工专业的有关知识。为了便于学习，附录中还给出了科技英语阅读和翻译基础知识、有关的热加工专业名词术语和词组 500 余条、专业词汇缩写、科技英语单词的构成及词汇总表等。

本书是高职高专、中等职业院校机械类热加工各专业学生的专业英语教材，也可供机械类热加工各专业工程技术人员学习和参考。

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前　言

根据全国机械职业教育专业教学指导委员会关于“深化高等职业技术教育人才的改革，加强高职教材建设”的精神，结合市场需要，2002 年 8 月我们与机械工业出版社共同邀请了全国十几所开办焊接专业的高职院校，召开了这套教材的启动会。在会上大家就焊接专业的课程体系、教材的编写目的和要求、教材书目，以及编写人员的分工进行了研讨，最终达成共识。

高等职业技术教育是我国高等教育的重要组成部分，是培养适应生产、建设、管理、满足第一线需要的高等技术应用性专门人才的摇篮。高职学生应具有基础理论知识适度、技术应用能力强、知识面较宽、素质高等特点。我们应以“应用”为主旨和特征，构建课程和教学内容体系，突出应用性、实践性的原则，重组课程结构，更新教学内容。高职教学内容要突出基础理论知识的应用和实践能力的培养，基础理论教学要以应用为目的，以“必需、够用”为度；专业课教学要加强针对性和实用性。在此共识的基础上，我们组织广西机电职业技术学院、内蒙古工业大学、内蒙古机电职业技术学院、四川工程职业技术学院、包头职业技术学院、承德石油高等专科学校、沈阳职业技术学院、河北机电职业技术学院、陕西工业职业技术学院、渤海船舶职业技术学院、湖南张家界航空工业职业技术学院、新疆机电职业技术学院等十余所高职院校编写了这套高职高专焊接专业规划教材。此套教材首批包括：《金属学与热处理》、《焊接结构生产》、《焊接方法与设备》、《焊接生产管理与检测》、《金属熔焊原理》、《金属材料焊接》、《焊接技能实训》、《热加工专业英语》。

本套教材根据 2001 年国家机械职业教育热加工类专业教学指导委员会和 2002 年 4 月、8 月的高职高专焊接专业规划教材的专题会议精神，于 2002 年 4 月成立了教材编写委员会，2003 年年初由各教材的主编、主审统稿，并进行初审，同年 8 月聘请了西南交通大学、内蒙古工业大学、沈阳工业大学、四川工程职业技术学院等院校的专家教授对此套教材进行了全面审核、定稿。

本套教材的编写以突出应用性、实践性的原则重组课程结构，破除原有各种课程的学科化倾向，删除与岗位群职业能力关系不大的内容，增加与职业能力关系有关的新技术、新工艺、新设备、新材料。课程内容紧紧扣住培养学生现场工艺实施的职业能力来阐述，将必需的理论知识点溶于能力培养过程中，注重实践教学，注重操作技能培养。本套教材深度适宜，文字简洁、流畅，深入浅出，非常适合高职学生学习。为与国际接轨，体现教材的先进性，本套教材采用了最新国家标准和国家施行的国际单位制。

本套教材在编写和审稿过程中，得到了各参编、参审学校和许多兄弟院校领导及同仁的大力支持与热情帮助，在此一并表示衷心的感谢。

国家机械职业教育热加工类专业教学指导委员会

编 者 的 话

本教材是国家机械职业教育热加工类专业教学指导委员会规划教材，依据国家机械职业教育热加工类专业教学指导委员会最新审定的《热加工专业英语》教学大纲，在总结以前专业英语教材教学经验的基础上，组织部分高职高专院校长期从事专业和专业英语教学的教师编写而成。

本书课文和阅读材料均选自英、美等国专业教材和专业刊物中的原文，约 150 篇，全书分 6 章，共 54 个单元。每个单元由课文、问题、单词和词组、难句分析、阅读材料等组成。内容涉及材料基础知识，金属热加工专业基础，铸造原理、工艺及设备，焊接原理、工艺及设备，热处理原理、工艺及设备，质量检测技术，科技英语阅读和翻译基础知识等方面。各校在教学时，应以提高学生阅读、理解科技英语的能力为重点，可不受教材编排顺序的限制，也可根据本校及学生的具体情况进行适当的删选和调整。

本书可供高职高专材料成形与控制工程、铸造、焊接、金属材料与热处理、质量检测及热加工各专业的学生使用，亦可作为成人高校、中等职业教育院校的参考教材，同时还可供有关从事热加工各专业的工程技术人员和管理人员参考。

参加本书编写的有陕西工业职业技术学院王晓江、曹瑜强、李红莉、姚永红，沈阳职业技术学院李学哲，渤海船舶职业学院赵丽玲，河北机电职业技术学院李化芳，太原理工大学长治学院王丽宁。其中王晓江编写第 2 章和附录 B、C、D、E，李学哲编写第 1 章和附录 A，曹瑜强、李化芳合编第 3 章，赵丽玲、李学哲合编第 4 章，李红莉编写第 5 章 1~9 单元，王丽宁编写第 5 章第 10 单元，姚永红、王晓江合编第 6 章。全书由王晓江统稿，陕西工业职业技术学院王兆奇教授主审，新西兰籍教师 Gregory Reeves 对全书进行了审阅。

本书在编写过程中得到了许多院校和机械工业出版社的大力支持和热情帮助，在此表示诚挚的谢意。

由于编者水平所限，加之时间仓促，书中难免有错误和不足之处，恳请广大读者批评指正。

编 者

Contents

Chapter One Materials Science

Unit 1

Mechanical Engineering

Engineering is an applied science. The engineer has knowledge of the mathematical and natural sciences gained by study, experience, and practice which is applied to develop ways to utilize economically the materials and forces of nature for the benefit of mankind. The engineer is a problem solver, using knowledge and ability to device or improve the solution to technological problems. The engineer is concerned with learning why a system or concept operates and how it might be directed toward useful, beneficial products.

Perhaps the broadest of the engineering disciplines, mechanical engineering is concerned with the application of science and technology in the solution of the countless problems facing our increasingly complex world[1].

Mechanical engineers are innovators, developing devices and systems to perform useful services. They are involved in the conception, planning, design, analysis, testing, production, and utilization of facilities, systems, and machines. They are concerned with the production and use of energy, and with combustion processes, environmental control, industrial pollution, materials processing and handling, the design of transportation vehicles and propulsion systems, and the safety of products. The field of mechanical engineering may be divided into two major areas: thermosciences and design.

In the thermosciences area, the mechanical engineer is concerned with thermodynamics, fluid mechanics, and heat transfer—the behavior of solids, liquids, and gases — in engineering applications[2]. Emphasis is placed on energy conversion systems, energy analysis, the design and development of engines and propulsion systems, and the use of energy.

In the design area, mechanical engineers are concerned with the development of new and improved laborsaving devices and machines. They work toward the development of devices to transmit and control mechanical power for useful purposes. Emphasis is placed on machine design, mechanisms, kinematics, and automatic controls. Mechanical engineers, for example, have had a hand in the design of a great variety of commodities. They have also been instrumental in the development of machines to produce these commodities.

Questions

1. What knowledge does the engineer have?
2. What can the engineer do?
3. What is thermodynamics about?
4. What knowledge are the mechanical engineers involved in?
5. In the thermosciences area , what is emphasis put upon?

New Words

1. mathematical / ˌmæθi'mætikəl / *adj.* 数学的，精确的
2. economical / ˌi:kə'nɔmikəl / *adj.* 节约的，经济的
3. benefit / 'benifit / *n.* 利益，好处；*vt.* 有益于，有助于
   beneficial *adj.* 有益的
4. mankind / mæn'kaind / *n.* 人类
5. solver / 'sɔlvə / *n.* 解决者
6. devise / di'vaiz / *vt.* 设计，想出（办法）
7. solution / sə'lu:ʃən / *n.* 解答，解决办法
8. technological / ˌteknə'lɔdʒikl / *adj.* 技术的
9. concept / 'kɔnsept / *n.* 观念，概念
   conception *n.* 构想，想法
10. broad / brɔ:d / *adj.* 宽的，阔的
11. discipline / 'disiplin / *n.* 纪律，学科；*v.* 训练
12. countless /'kautlis / *adj.* 无数的，数不尽的
13. complex / 'kɔmpleks / *adj.* 复杂的，合成的
14. innovator /'inəuveitə(r) / *n.* 改革者，革新者
15. service / 'sə:vis / *n.* 服务；*vt.* 保养，维修
16. analysis / ə'næləsis / *n.*分析，分解；(*pl.* analyses)
17. utilization / ˌju:tilai'zeiʃən / *n.* 利用
18. facility / fə'siliti / *n.* 容易，设备
19. combustion / kəm'bʌstʃən / *n.* 燃烧
20. pollution / pə'lu:ʃən / *n.* 污染
21. propulsion / prə'pʌlʃən / *n.* 推进，推进力
22. thermoscience / 'θə:məu'saiəns / *n.* 热学
23. thermodynamics / 'θə:məudai'næmiks / *n.* 热力学
24. mechanics / mi'kæniks / *n.*（用作单数）机械学，力学；（用作复数）技巧，结构
25. transfer / træns'fə:/ *n.* 传递，转移；*v.* 转移
26. emphasis / 'emfəsis / *n.* 强调，重点
27. conversion / kən'və:ʃən / *n.* 变换，转化
28. mechanism / 'mekənizəm / *n.* 机械装置，机构
29. kinematics / ˌkaini'mætiks / *n.* 运动学
30. commodity / kə'mɔditi / *n.* 日用品，商品
31. instrumental / ˌinstru'mentl / *adj.*仪器的，器械的

Phrase and Expressions

1. applied science	应用科学
2. for the benefit of	为……的利益
3. direct … toward	以……为目标；把……转变为
4. be involved in	包含在……中；与……有关；专心于
5. transportation vehicle	运输车辆
6. heat transfer	传热
7. place emphasis on	强调，着重
8. work toward	努力达到

9. have a hand in 参与；与……有关

Notes

① Perhaps the broadest of the engineering disciplines, mechanical engineering is concerned with … .

机械工程学也许是工程学科中内容最广的一门学科，它涉及……。

句中 the broadest of the engineering disciplines 是 mechanical engineering 的同位语。

② In the thermosciences area, the mechanical engineer is concerned with thermodynamics, fluid mechanics, and heat transfer — the behavior of solids, liquids, and gases— in engineering applications.

在热学方面，机械工程师在工程应用中通常会接触到热力学、流体力学和传热学，即固体、液体和气体的性能。

句中 the behavior of solids、liquids、and gases 是 thermodynamics、fluid mechanics、and heat transfer 的同位语。

Reading Material

The Main *Tasks* of an Engineer

There are many types of industries active today. All industries ***require*** a great deal of engineering to keep new ideas and developments coming and to ***refine*** and improve ***manufacturing techniques.***

As we know, these are the main tasks of engineers: to explore new ways, ***invent*** new solutions to problems, and design new devices❶. In the research stage of a project, the engineer usually has found a new way of doing a job and is analyzing it (using mathematics and computer) to see how ***feasible*** the idea is and how well it will work. The development stage then follows. Here the idea is ***carried out*** in the ***laboratory.*** The processes ***vary*** among different project, but the basic point is the same: ***Turn*** the idea ***into*** a working ***reality***. The development stage lasts as long as it needs to❷, until the working device has been ***constructed*** and tested. Then the manufacturing stage begins, during which it may be necessary to change some plans***in the light of*** practical manufacturing condition❸.

Following the development of a new device or product, it must be manufactured, usually in large quantities. In the last few ***decades*** a whole field of ***automated*** manufacturing techniques has been developed, requiring new engineering skills to invent and improve machines that automatically construct other machines ***efficiently*** and ***reliably***.

During production and at the end of the ***assembly line,*** a product must be carefully tested to ***determine*** if it will perform its job properly and reliably. ***Frequently*** this testing ***procedure*** must be done automatically as well. Engineers are now developing procedures and machines to carry out what can be a very ***complicated sequence*** of tests. For example, consider the ***enormous*** problem of testing a large computer to see if it will perform all its tasks correctly.

In a ***large-scale*** production operation, be it many ***identical*** small items such as radios of

cars or a single ***item*** such as an oil ***refinery***[9], there are many problems for an engineer to ***deal with***. In an industrial ***environment*** the engineer's basic job is to plan the sequence of steps necessary for the successful ***completion*** of a task at ***minimum*** cost.

New Words

1. task *n.* 任务
2. require *n.* 要求
3. refine *v.* 精制
4. manufacture *v.* 制造
5. technique *n.* 技术
6. invent *v.* 发明
7. feasible *adj.* 可行的
8. carried out 实现，执行
9. laboratory *n.* 实验室
10. vary *v.* 变化
11. turn... into 把……转变成
12. reality *n.* 真实
13. construct *v.* 建造，构造
14. in the light of 按照
15. decade *n.* 十年
16. automate *v.* 使自动化
17. efficiently *adv.* 有效率地
18. reliably *adv.* 可靠地
19. assembly line 装配线
20. determine *n.* 确定
21. frequently *adv.* 常常
22. procedure *n.* 程序
23. complicated *adj.* 复杂的
24. sequence *n.* 次序，顺序
25. enormous *adj.* 巨大的
26. large-scale *adj.* 大规模的
27. identical *adj.* 同样的
28. item *n.* 项目
29. refinery *n.* 精炼厂
30. deal with 处理
31. environment *n.* 环境
32. completion *n.* 完成
33. minimum *adj.* 最小的

Notes

① As we know, these are the main tasks of engineers: to explore new ways, invent new solutions to problems, and design new devices.

正如我们所知，工程师的主要任务是：探索新的途径，找出新的解决问题的办法，并且设计新的装置。

句中 to explore new ways,（to）invent new solutions to problems, and (to) design new devices 是三个不定式短语，用作 these 的同位语。

② The development stage lasts as long as it needs to...

研制阶段需要持续多久就持续多久……。

在本句中，needs to 后省略了动词 last。

③ Then the manufacturing stage begins, during which it may be necessary to change some plans in the light of practical manufacturing condition

制造阶段开始，在这个阶段，按照实际的制造条件对某些计划做出改变是必需的。

句中 during which...之后引出的从句修饰 stage，这一部分较长而谓语部分较短，为使句子保持平衡，而移到谓语部分之后，从而与所修饰的词形成割裂现象。

④ ... be it many identical small items such as radios of cars or a single item such as an oil

refinery....

……不论它是许多同样的小产品，如汽车收音机；或是单个项目，如炼油厂……。

这是一个表示让步的从句，主语 it 和谓语动词 be 倒装。句中 be 是动词原形，表示虚拟语气。

Unit 2

Metals and Their Use

It is known that metals are very important in our life. Metals have the greatest importance for industry. All machines and other engineering constructions have metal parts. Some of them consist only of metal parts.

There are two large groups of metals:

1. Simple metals – more or less pure chemical elements.

2. Alloys – materials consisting of a simple metal combined with some other elements.

About two thirds of all elements found in the earth are metals, but not all metals may be used in industry. Those metals which are used in industry are called engineering metals. The most important engineering metal is iron (Fe) which, in the form of alloys with carbon (C) and other elements, finds greater use than any other metal❶. Metals consisting of iron combined with some other elements are known as ferrous metals; all the other metals are called nonferrous metals. The most important nonferrous metals are copper (Cu), aluminum (Al), lead (Pb), zinc (Zn), tin (Sn), but all these metals are used much less than ferrous metals, because the ferrous metals are much cheaper.

If we take all the metal produced by the world's metallurgical industry during one year for 100 percent, we shall see that the production of ferrous metals is about 94 percent, the production of copper is about 2 percent, zinc about 1.52 percent, aluminum about 0.6 percent, etc.

Engineering metals are used in industry in the form of alloys because the properties of alloys are better than the properties of pure metals. Only aluminum may be largely used in the form of a simple metal.

People begin to use metals after wood and stone, but now metals are more important for industry than these two old materials. Metals have such a great importance because of their useful properties. Metals are much stronger and harder than wood and that is why some engineering constructions and machines were impossible when people did not know how to produce and how to use metals. Metal is not so brittle as stone which was the first engineering material for people. Strength, hardness, and plasticity of metals are the properties which made metals so useful for industry. It is possible to find some very plastic wood, but it will be much softer than many metals; stone may be very hard, but it is not plastic at all. Only metals have a combination of these three most useful engineering properties.

But it is much more difficult to get the metals from the earth in which they are found than to find some stone or wood❷. That is why people began to use metals after stone and wood. The first metal which was produced by the people was copper. Iron was produced much later.

Different metals are produced in different ways, but almost all the metals are found in the form of metal ore (iron ore, copper ore, etc.).

The ore is a mineral consisting of a metal combined with some impurities. In order to produce a metal from some metal ore, we must separate these impurities from the metal; that is done by metallurgy.

Questions

1. Which metal is most important for industry?
2. What is an alloy?
3. Why are ferrous metals used more largely than nonferrous?
4. What properties of metals make them so useful in engineering?
5. Why cannot wood and stone be so largely used in industry as metals?

New Words

1. importance / im'pɔ:təns / *n.* 重要（性）
2. construction / kən'strʌkʃən/ *n.* 构造，工程
3. consist / kən'sist / *vi.* 由……组成，在于
4. combine / kəm'bain / *v.* （使）联合，（使）结合
5. chemical / 'kemikəl / *adj.* 化学的；*n.* 化学制品
6. element / 'elimənt / *n.* 要素，元素
7. ferrous / 'ferəs / *adj.* 铁的，含铁的
8. nonferrous / 'nɔn'ferəs / *adj.* 不含铁的，非铁的
9. iron / 'aiən / *n.* 铁
10. copper / 'kɔpə / *n.* 铜
11. lead / led / *n.* 铅
12. zinc / ziŋk / *n.* 锌
13. tin / tin / *n.* 锡
14. metallurgical / ˌmetə'lə:dʒikəl / *adj.* 冶金学的
15. property / 'prɔpəti / *n.* 性质，特性
16. alloy / 'ælɔi / *n.* 合金
17. brittle / 'britl / *adj.* 易碎的，脆的
18. strength / streŋθ / *n.* 强度
19. hardness / 'hɑ:dnis / *n.* 硬，硬度
20. plasticity / plæs'tisiti / *n.* 可塑性，塑性
21. ore /ɔ:(r)/ *n.* 矿石
22. mineral / 'minərəl / *n.* 矿物，矿石
23. impurity / im'pjuəriti / *n.* 杂质
24. separate / 'sepəreit / *adj.* 分开的，分离的
25. metallurgy / me'tælədʒi / *n.* 冶金，冶金术

Phrases and Expressions

1. consist of	由……构成
2. more or less	或多或少
3. two thirds	三分之二
4. be known as	被认为是……
5. ferrous metal	铁质金属
6. nonferrous metal	非铁金属
7. because of	由于
8. not at all	根本不
9. in order to	为了……
10. separate... from...	把……从……里分离出来

Notes

① The most important engineering metal is iron (Fe) which, in the form of alloys with carbon (C) and other elements, finds greater use than any other metal.

铁是最重要的工程金属，它和碳元素以及其他元素形成合金，但它比其他任何金属的用途都大。

在本句中，in the form of alloys with carbon (C) and other elements 是 which 引导的定语从句中的插入成分，in the form of 可以译为“以……的形式”。

② But it is much more difficult to get the metals from the earth in which they are found than to find some stone or wood.

从地壳中可以得到金属，但这要比得到木头或石头更困难。

本句中 in which 是介词+关系代词构成的定语从句，it 是形式主语，而 to get the metals from the earth in which they are found 和 to find some stone or wood 是两个相互比较的对象。

Reading Material

How We Use Metals

Metals are used for many ***purposes***. Ships and airplanes, pens and pencils, ***automobiles*** and bikes, all ***depend on*** metals in order to do their jobs. Every day we see, ***touch,*** and use hundreds of items in which metals ***play*** an important ***part***.

Metals usually occur in nature as minerals. At present, about 80 different metals are known to man. But with so many metals to choose from, the question ***arises*** which metal shall we use[1]? Is there any metal that is “best for everything”? Of course not. For example, iron is strong but it ***rust*** easily, while gold, one of the first metals to be found by man, doesn't rust at all. Should we use gold, therefore, to build ***fences***? ***Imagine*** the cost of a fence made of gold; it's important to consider the cost and the supply of a metal. Also, when we choose a metal for a certain job, we ***examine*** its physical properties. Is it strong enough to be used as a support for a bridge? Can it be used in a telephone to ***conduct*** electricity? Is it light enough to be used in an airplane ***wing***? Can it be drown out to make a fine wire? We also examine its chemical properties. Will it ***resist acid***? Is it too ***active*** to use? Is it easy to combine with other elements? Each use must be studied carefully. Then we can choose the right kind of metal, or combination of metals.

The metals used for construction building, cars, planes and ships must be strong and easy to form by casting, machining, and cutting. These metals are called ***structural metals***. The two most important structural metals are iron (steel) and aluminium. Aluminium, which is much lighter than iron, has made possible the modern ***aviation*** industry[2].

Very few of the metal things we use in industry and everyday life are made of a single pure metal. Most of them are combinations of metals called alloys. Alloys are formed when two or more metals are melted together and allowed to cool and harden. It has been known for a very long time that when some metals are combined in this way, the alloy ***takes on*** new physical properties. The use of alloys makes it possible to manufacture many ***articles*** which must have

special properties. Nowadays, if an ***inventor*** cannot find a metal that suits his purpose, he tries to have a new alloy made that will❸. The search for new alloys is going on all the time.

New Words

1. purpose *n.* 目的
2. automobile *n.* 汽车
3. depend on 依靠，取决于
4. touch *v.* 触摸
5. play...part 起……作用
6. be known to 为……所知
7. arise *vi.* 出现，发生
8. rust *n.* 铁锈；*vt.*（使）生锈
9. fence *n.* 栅栏
10. imagine *vt.* 想像，设想
11. examine *v.* 检测
12. conduct *v.* 导电
13. wing *n.* 翼
14. resist *vt.* 抗，忍得住
15. acid *n.* 酸
16. active *adj.* 活跃的
17. structural metals 结构金属
18. aviation *n.* 飞行，航空
19. take on 呈现，具有
20. article *n.* 工件
21. inventor *n.* 发明家

Notes

① But with so many metals to choose from, the question arises which metal shall we use?

由于有那么多的金属可供选择，于是也带来了一些问题，那就是我们应该选择哪种金属呢？

句中 with so many metals to choose from 是介词短语作原因状语。

② Aluminium, which is much lighter than iron, has made possible the modern aviation industry。

铝比铁轻得多，从而使现代航空工业成为可能。

句中 has made 的宾语是 the modern aviation industry，而 possible 为宾语补足语。因为宾语较长，所以放在补足语之后，以保持句子平衡。

③ Nowadays, if an inventor cannot find a metal that suits his purpose, he tries to have a new alloy made that will.

现在，如果一个发明家找不到满足他所要求的某一种金属时，他就得按此要求搞一种新合金。

句中过去分词 made 是宾语 a new alloy 的补足语。定语从句 that will 后面省略了 suits his purpose，用来说明 a new alloy。

Unit 3

Properties of Metals

Let us see why metals have come to play so large a part in man's activities. Wood and stone are both older in use, yet to a considerable extent they have been supplanted by the metals. The cause of the increasing use of metals is to be found in their characteristic properties, such as: strength, or ability to support weight without bending or breaking; toughness, or ability to bend rather than break under a sudden blow; resistance to atmospheric destruction; and malleability, or ability to be formed into desired shape. Malleability of a metal is also known as its ability to deform permanently under compression without rupture. It is the property which allows the hammering and rolling of metals into thin sheets.

Metals can be cast into varied and intricate shapes weighing from a few ounces to many tons. Their plasticity, or ability to deform without rupture, makes them safe to use in all types of structures, and also allows their formation into required shapes through forging and other operations. Metals also possess the important property of being weldable. Of all the engineering materials only metals are truly weldable and repairable❶. Other materials used in engineering constructions, including glass, stone, and wood, usually are destroyed when the structure is no longer usable. On the other hand, an unusable bridge, ship, or boiler made of metal usually is cut into easily handled sections, put in a furnace, remelted, cast, and finally worked in the making of a new ships, bridge, or boiler❷.

All of this represents a remarkable combination of properties, one possessed by no other class of materials. Some metals also possess additional, special properties. Two of which are power to conduct electric current and the ability to be magnetized. The selection of the proper metal or alloy for a given use is an important part of the practice of metallurgy. Because iron and steel are used in larger quantities than any of the other metals, it is common practice to divide metallurgical materials into ferrous, or iron-bearing, and nonferrous, or those containing no iron, or only small proportions of iron.

Questions

1. Why were wood and stone supplanted by metals?
2. What light weight metals do you know?
3. What is the property allowing forging and rolling metals?
4. Can wood and stone be used for conducting electric current?
5. Why is metal considered more repairable than stone and wood?

New Words

1. activity / æk'tiviti / *n.* 活跃，活动性
2. considerable / kən'sidərəbl / *adj.* 相当大的，值得考虑的
3. supplant / sə'plɑ:nt / *vt.* 排挤掉，代替