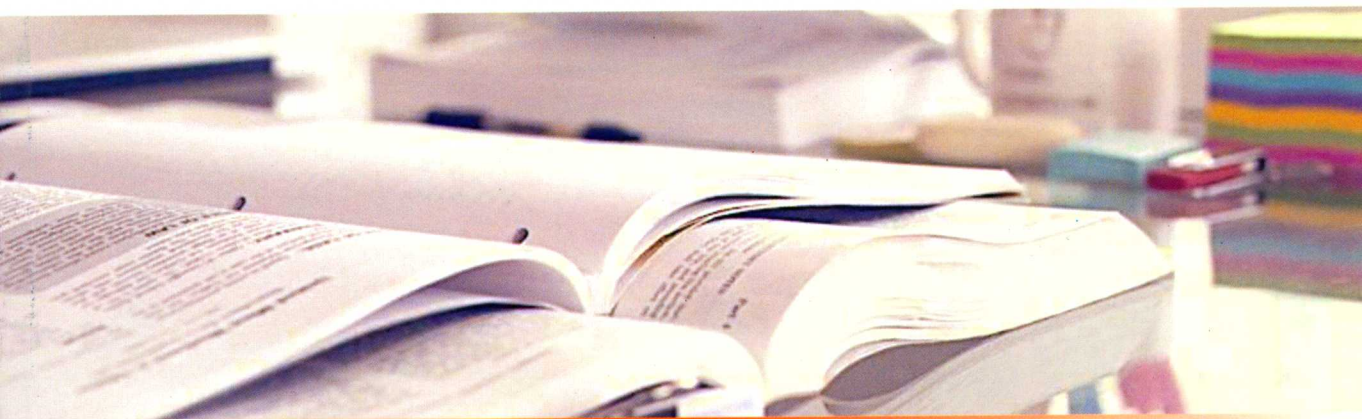
卓越科技学术交流英语系列丛书

科技英语阅读与翻译

总主编　李庆明　尹丕安

主　编　田晓蕾



EST Reading and Translation

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【内容简介】 本书以印刷包装、材料科学、土木工程、自动化工程、水利工程、通信工程、机械制造以及航空航天为主题设置了八个单元，每个单元分为学科总览、翻译技巧和接触前沿三个板块。本书集经典、技能、趣味、训练于一身，通过最新的、具有学科代表性的时代经典材料带领读者领略科技英语的趣味，同时提升自身的科技英语阅读及翻译能力。

图书在版编目（CIP）数据

科技英语阅读与翻译/田晓蕾主编．—西安：西北工业大学出版社，2015.8
（卓越科技学术交流英语系列丛书）
ISBN 978-7-5612-4515-6

Ⅰ.①科… Ⅱ.①田… Ⅲ.①科学技术—英语—阅读教学—教材 ②科学技术—英语—翻译—教材 Ⅳ.①H31

中国版本图书馆 CIP 数据核字（2015）第 189708 号

出版发行：西北工业大学出版社
通信地址：西安市友谊西路 127 号 邮编：710072
电　　话：(029)88493844　88491757
网　　址：www.nwpup.com
印 刷 者：陕西长盛彩印包装有限公司
开　　本：787 mm×960 mm　1/16
印　　张：15.125
字　　数：311 千字
版　　次：2015 年 9 月第 1 版　2015 年 9 月第 1 次印刷
定　　价：39.00 元

总序

2010年6月，教育部开始在部分高校实施“卓越计划”。该计划的目标是培养一大批创新能力强、适应经济社会发展需要的高质量各类型工程技术人才，为国家走新型工业化发展道路、建设创新型国家和人才强国战略服务。同时《国家中长期教育改革和发展规划纲要(2010－2020年)》也要求，高等学校要培养一批具有国际视野、通晓国际规则、参与国际竞争的复合性人才。

在此大背景下，作为常年在大学英语教学第一线奋战的教师们也在思考一个问题：大学英语到底应该怎么教？怎么学？学什么？毋庸置疑，当前的大学英语教学无论从教学内容、教学模式、教学理念方面，已经不适应时代发展和经济发展的要求。为适应国家经济发展和对外科技学术交流的要求，为了应对高等工程教育改革和经济全球化的挑战，培养一大批具有国际竞争力的工程人才，急需在总结经验的基础上不断修订，我们编写了这套系列丛书，以期培养学习者的国际视野意识，提高其科技学术交流能力。

本系列丛书包括《英语听说教程(上)》《英语听说教程(下)》《科技英语写作进阶》《科技英语阅读与翻译》《汉英科技翻译实务》《国际学术会议英语》。

根据“文理渗透，开发思维，提升学术交流能力”的编写理念，本系列丛书以拓宽学习者的国际学术视野为宗旨，期望最终达到提高学习者的国际学术交流英语的能力。本系列丛书以“科技学术交流”英语为主打方向，内容以水利水电、装备制造业和商务管理等学科的相关材料为主，在注重培养学习者的听、说、读、写、译的基础上，更加强调学习者如何运用英语来解决自身专业领域问题的能力。总之，本系列丛书有以下三个特点：

1. 通识英语和科技英语相互渗透。

本系列丛书在总结了近几年实践教学的基础上，将科技英语和通识英语相结合和渗透。所选材料以当今科技领域的传统行业和新兴行业为主，兼顾经济、管理和文化等相关领域，方便文、理、工科学生更好地掌握现代科技英语。

2. 一般语言应用能力和科技学术交流能力相互并重。

本系列丛书在编排体例和内容设计上，既注重培养学习者的一般语言应用能力，又注重提升其科技英语学术交流能力，使学习者更有效的利用英语进行专业学术交流，解决本专业的实际问题。

3. 趣味性和实用性相互结合。

趣味性和实用性始终贯穿于本系列丛书的编写中。编写内容力求多样化、实用性，以学习者为中心，既方便自主学习，又可以课堂使用。

本系列丛书在编写过程中，广大编者付出了辛勤的汗水，在此一并感谢。

李庆明

2015 年 5 月

前言

在如今这个电子产品无处不在、科技日新月异的时代里，每个人的生活与科技息息相关。因此，科技英语文献也前所未有地成为最广泛的阅读素材。我们一直有一种愿望：想将经典的科技英语文献与最富时代感的科技文章结合起来，汇编成经典与现代兼具的阅读教材；同时将所积淀和收集的有关科技英语翻译方面的素材与之结合，从而编写成一本经典与时代感结合、实用性强、针对性强，且便于操作的科技英语阅读与翻译方面的教科书。

本书共分为八个单元：第一单元以印刷包装为主题；第二单元以材料科学为主题；第三单元以土木工程为主题；第四单元以自动化工程为主题；第五单元以水利工程为主题；第六单元以通信工程为主题；第七单元以机械制造为主题；第八单元以航空航天为主题。每个单元由三个部分构成：第一部分是学科总览。该部分选取该学科概况类文章，对该学科进行系统、简练的介绍，并专门设计了多种阅读练习题，帮助学生提高科技经典类文章的阅读能力。第二部分是翻译技巧。该部分将翻译技巧按照从易到难、从部分到整体的编排顺序分布在八个单元。在翻译技巧的讲解过程中，引用了大量例子，覆盖宽广的专业领域，而且大多具有相当的深度。第三部分是接触前沿。该部分选取了最新的、具有学科代表性的时代经典材料，内容充满时代气息。同时第三部分也是对第二部分的延续。该部分根据该单元所学的翻译技巧设计了与篇章密切相关的翻译习题，从而使学生可以趁热打铁，有效地提高自身的科技英语翻译技能。

阅读是一种输入性的劳动，翻译是一种输出性的劳动，但这两种劳动都需要主动性与创造性。不同的人对同一素材有不同的理解与认识，因而译文也会因人而异，本书的目的在于帮助学生准确有效地阅读及翻译科技类文章。本书既可供

高等学校非英语专业学生使用，也可供大学英语专业高年级学生使用，同时对于广大喜欢科技英语和从事科技英语翻译的读者也不失为一本实用性强的参考书。

限于编者的水平，书中难免存在错误和不准确之处；有些语法和翻译上的问题，也可以从不同的角度上去理解和解释，热忱欢迎专家和读者批评指正。

编　者

2014 年 12 月

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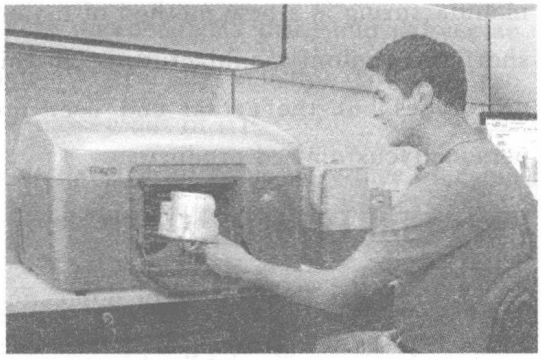
Unit 1

Printing and Packaging

What gunpowder did for war the printing press has done for the mind.

—Wendell Phillips

Section A 3D Printing



1. A faster and cheaper alternative to traditional methods of manufacturing is making its way into the mainstream market, and it looks to be changing the way people do business.

What Is 3D Printing?

2. The idea has been implemented since the late 80s by innovative companies Stratasys and 3D Systems. The original aim was to rapidly create prototypes for manufacturers using large machines, but the technology has been greatly improved over the years. It has also gotten cheaper to the point that there are now personal 3D printers available in the mainstream market.

3. Known in the industry as "additive manufacturing", 3D printing is unlike the usual method of "subtractive manufacturing", where raw materials arestripped, cut, smashed and broken down to create products. It works by adding layer upon layer of one material to fashion something new based on a design generated on a computer. 3D printers differ on the materials used (special resin, plastics, metals, etc.) and the exact technology (laser sintering, electron beam melting, etc.), but the fundamental concept remains the same.

Industrial Printing

4. In the last couple of years the term 3D printing has become more known and the

technology has reached a broader public. Still most people haven't even heard of the term, while the technology has been in use for decades. Especially manufacturers have long used these printers in their design process to create prototypes for traditional manufacturing and research purposes. Using 3D printers for these purposes is called rapid prototyping.

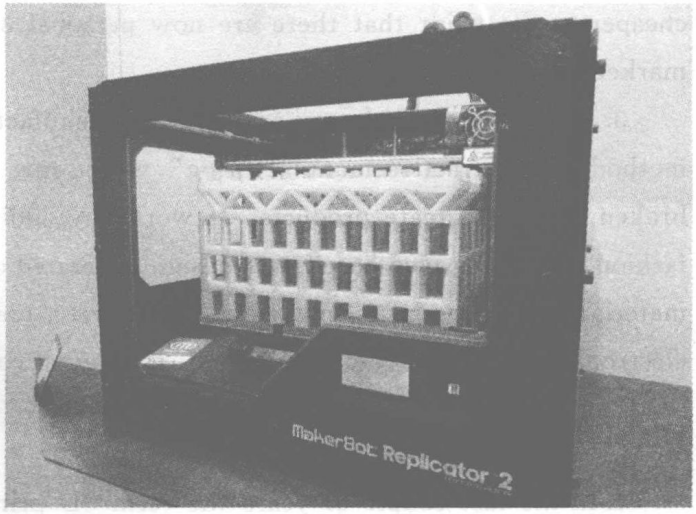
5. Why use 3D printers in this process you might ask yourself. Now, fast 3D printers can be had for tens of thousands of dollars and end up saving the companies many times that amount of money in the prototyping process. For example, Nike uses 3D printers to create multi-colored prototypes of shoes. They used to spend thousands of dollars on a prototype and wait weeks for it. Now, the cost is only in the hundreds of dollars, and changes can be made instantly on the computer and the prototype reprinted on the same day.

6. Besides rapid prototyping, 3D printing is also used for rapid manufacturing. Rapid manufacturing is a new method of manufacturing where companies are using 3D printers for short run custom manufacturing. In this way of manufacturing the printed objects are not prototypes but the actual end user product. Here you can expect more availability of personallycustomized products.

Personal Printing

7. Personal 3D printing or domestic 3D printing is mainly for hobbyists and enthusiasts and really started growing in 2011. Because of rapid development within this new market printers are getting cheaper and cheaper, with prices typically in the range of $250 - $2,500. This puts 3D printers into more and more hands.

8. The RepRap open source project really ignited this hobbyist market. For about a thousand dollars people have been able to buy the RepRap kit and put together their own personal 3D printer, complete with any customizations they were capable of making. What really speeds the development is the open source idea. Everybody working on the RepRap shares their knowledge



so other people can use it and improve it again.

9. This rapid development of open source 3D printers is gaining interest in both the developed as well as the developing world and it enables both hyper-customization and the use of designs in the public domain tofabricate open source appropriate technology through conduits such as Thingiverse. This technology can also assist unsustainable development as such technologies are easily and economically made from readily available resources by local communities to meet their needs.

Services

10. Not everybody can afford or is willing to buy their own 3D printer. Does this mean you cannot enjoy the possibilities of 3D printing? No, not to worry. There are 3D printing service bureaus likeShapeways and Ponoko that can very inexpensively print and deliver an object from a digital file that you simply upload to their user-friendly website. You can even sell your 3D designs on their website and make a little money out of it!

11. If you don't design your own 3D models, you can still print some very nice objects. There are model repositories such as Thingiverse, 3D Warehouse and 3D Parts Database that have model files you can download for free.

12. There are also companies who offer their services business-to-business. When, for instance, you have an architecture practice and you need to build model scales it is very time consuming doing this the old fashion way. There are services where you can send your digital model and they print the building on scale for you to use in client presentations. These kinds of services can already be found in a lot of different industries like dental, medical, entertainment and art.

3D Printing in Action

13. Teehan+Lax. The company used the technology in designing a milk jug that, once paired with a smartphone, alerts the user through an app if he/she is running out of milk. The user will then be able to check for any nearby stores that he/she can buy milk from. By producing an actual milk jug with a 3D printer, they managed to save money while also showing off the usefulness of their app.

14. Tech giant Google also employed this innovation in promoting their Google Search app's immense capabilities through theAdMob advertising campaign "Uncover Your

World". The company paired up with 3D printing company Z Corporation to create all the models of an entire neighborhood strip complete with a cinema, a bookstore, a museum and more, along with a faux smartphone and other things in a rich media ad.

15. People who click on the ad can then go through the somewhat cartoony yet physically real strip to understand how Google Search works. It even uses a cool stop-motion animation to bring it all to life. With the help of 3D printing, Google managed to keep its image of always being at the forefront of technology and creativity through great visuals, while managing to inform people in the process.

Benefits of 3D Printing

16. With the above examples, it should be apparent how 3D printing can be a very helpful tool. However, there are even more advantages toutilizing the technology as listed below:

It is cheaper

17. Although most production-grade 3D printers are very expensive (with some running up to fivefigures), there are companies that are now creating units at a more reasonable price that still deliver quality products. These can be perfect for ad agencies that don't need an entire production line to create proof of concepts and the eventual models for their clients and as promotional giveaways.

18. There is also no need for costly revamps of production designs since everything can be done on a computer. Whatever material has been left over from one project can be used again for another project.

It is easy to use

19. Another advantage of 3D printers is that they are also being designed for mass use. Before, experts in the technology are the only ones who can operate the old big and bulky machines. Nowadays, they have beenstreamlined so that the average person can run them.

20. Of course, there is still the issue of actually coming up with designs on a CAD software, but any competent ad agency would have graphic designers who know exactly how to use them.

It is more captivating

21. As seen in Google's "Uncover Your World" ad campaign, 3D printing can capture the imagination of people through fully realized materials that build a whole new world. Ad agencies will not be restricted to the same old campaigns, unleashing a unique creativity in its teams to hook cynical audiences tired of the usual ads.

22. Samsungcan learn from one of its biggest partners in Google to integrate 3D printing in their own advertising branch, Samsung AdHub. This can bridge the gap between marketers and their core customer base whether it's for their Samsung toner cartridges, LED TVs or Galaxy S line of smartphones.

Future

23. 3D printers capable of outputting in color and multiple materials already exist and will continue to improve to a point where functional products will be able to be output. With effects on energy use, waste reduction, customization, product availability, medicine, art, construction and sciences, 3D printing will change the manufacturing world as we know it.

New Words

Word	Meaning
innovative	*adj.* an innovative idea or way of doing something is new, different, and better than those that existed before 创新的，革新的
prototype	*n.* the first form that a new design of a car, machine etc has, or a model of it used to test the design before it is produced 原形，标准，模范
strip	*v.* to separate an engine or piece of equipment into pieces in order to clean or repair it 剥去，剥夺
smash	*v.* to break into pieces violently or noisily, or to make something do this by dropping, throwing, or hitting it 粉碎，打碎
customize	*v.* to change something to make it more suitable for you, or to make it look special or different from things of a similar type 定做，按客户具体要求制造
ignite	*v.* to start a dangerous situation, angry argument, etc. 点燃，使激动
fabricate	*v.* to make or produce goods or equipment 制造，装配