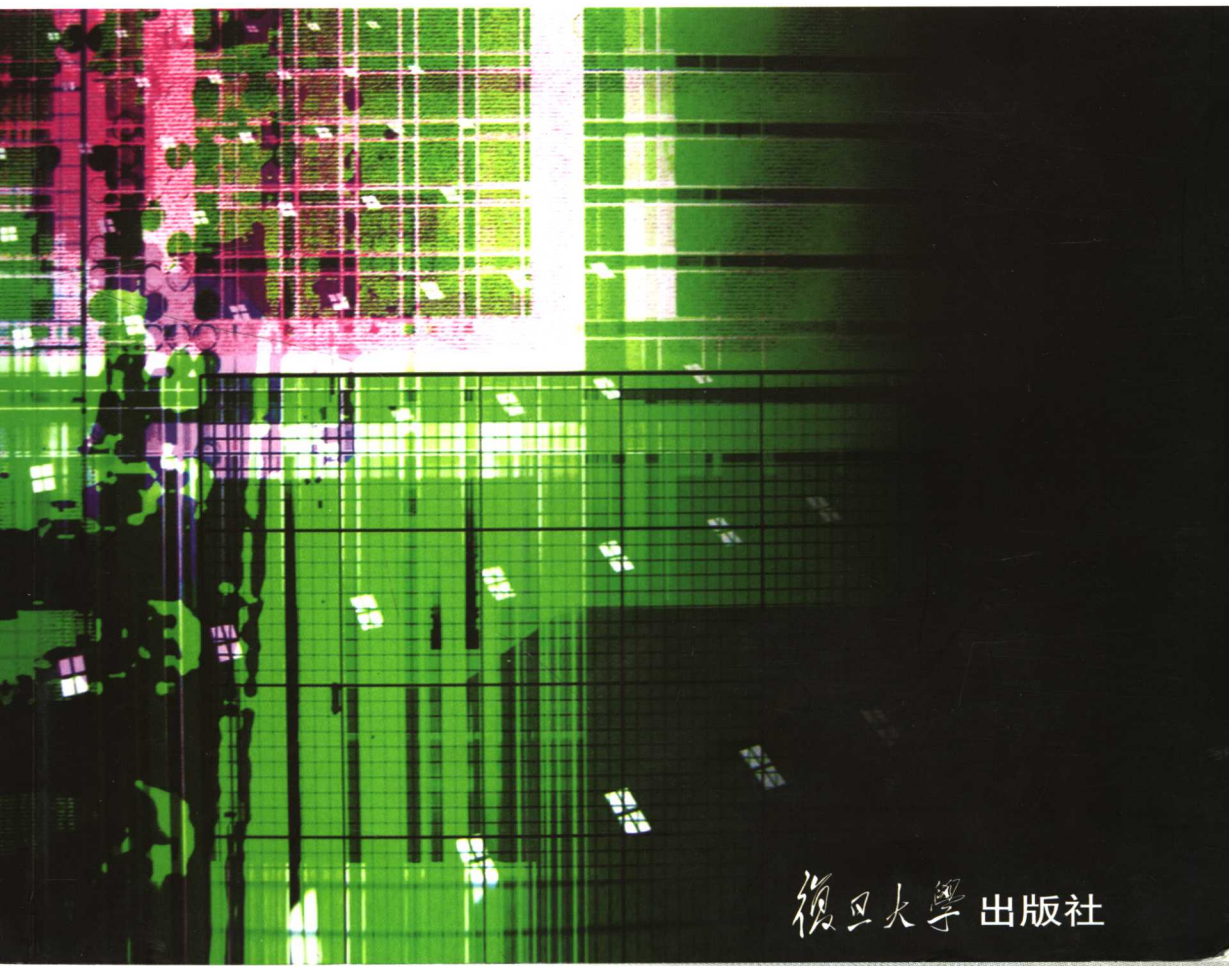
Readings for College English 大学用书

SELECTED PAPERS ON *Contemporary* SCIENCE & TECHNOLOGY I

英语现代科技文献精读本

华中一 陆 栋 卢义民 编著



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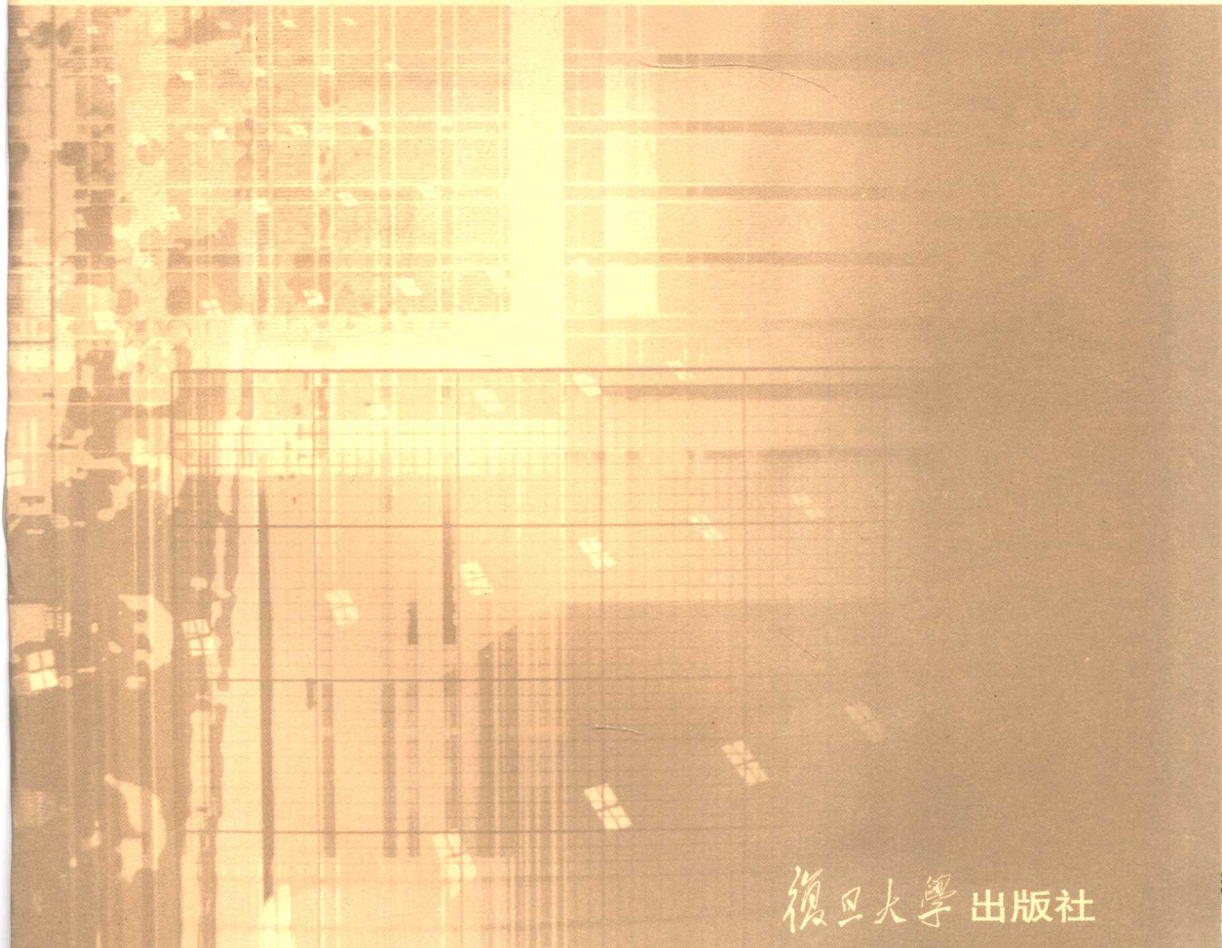

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前　言

随着信息社会的进展，作为一种世界性的语言，英语在国际化的科技、文化交流方面起着越来越大的作用。在科技教育领域加强英语学习，已经成为人们的普遍共识。但应当指出，如何有效地引导学生从大学英语学习顺利地过渡到科技文献的阅读，现在还存在着认识上的误区。有不少人认为有必要专门编写所谓的“科技英语”教材，以为“科技英语”非常特殊，与“普通英语”不一样，是一门专门的学科，——其实不然。实际上只有“用于科技方面的英语”，而没有与“普通英语”对立的“科技英语”；既没有特殊的英语规律，也没有可称为“科技语法”或“科技修辞学”之类东西。当然，各门学科都会有一些专门的用语，且同一个词汇在不同学科中可能有其特定的涵义和不同的侧重点；另外，也有一些在当前科技文献中常见的惯用法和特殊涵义的缩略语甚至新词汇。

正是因为在有没有特殊的“科技英语”和采用何种方法构建“大学英语”和“文献阅读”之间的联系上的模糊观念，迄今我们看到的这方面的教材，大都从专业书刊中选用某些文章片段或章节作为课文，编成所谓的《生物英语》、《管理英语》之类教材。粗看起来这对学生的专业阅读似乎能够起到速成的效果；但如回头再认真地审视一下，不难发现过早地囿于本专业阅读范围，很可能会忽视通过语言推敲达到深入理解的学习环节，无益于英语本身的继续提高，也不利于通过阅读产生创新的萌动，即难免有后劲不足之嫌。我们认为使学生实现从大学英语到文献阅读的跨越，最有效的方法是双管齐下，在运用英语基础知识的同时，仔细诵读当代各种专业的优秀科技文献，并充分理解其涵义，这样才能在求知中积累，在积累中创新，以至熟练后能随心地运用英语这个工具。

我们就是根据这样的要求，选择当代的优秀研究论文(research paper)、综述评论(review)和/或科普(popular science)文章，并就专业术语、理解难点作出注释和点评，使读者在学习英语的同时，能吸收文章中的新鲜知识。我们在这里选择了自然科学、技术科学、生命科学和管理科学等不同学科的内容，不仅是为了适应多种专业的需要，而且更重要的是当代科技的新起点往往始于交叉学科；补充更多方面的知识，可以开阔视野、体现创新思维、反映时代特色。

我们准备陆续推出几本教材。各本虽有相对侧重点，但各课单独成文，无规定的、按难易排列的次序，因此文中的少量注释会有重复。读者可以先从比较贴近自己专业的课文入手，再逐步拓宽选读范围。为了阅读方便，特地安排了左页正文、右页注释的排版形式，读者可在右页空白处补充自己的注释或写上阅读体会，以便日后复习巩固之用。

文后还附有少量练习，读者可循此找到文章主旨、研究现况、重要结论等等，以此加深对文章的理解，并逐步学会用英语写出简要答案。这样提高一定会更快。

最后我们对选本原文的作者们和原出版单位表示诚挚的感谢。这里也包含了他们对中国教育事业的贡献和国际友情。

华中一　陆　栋　卢义民

2006年5月27日

复旦大学建校101周年

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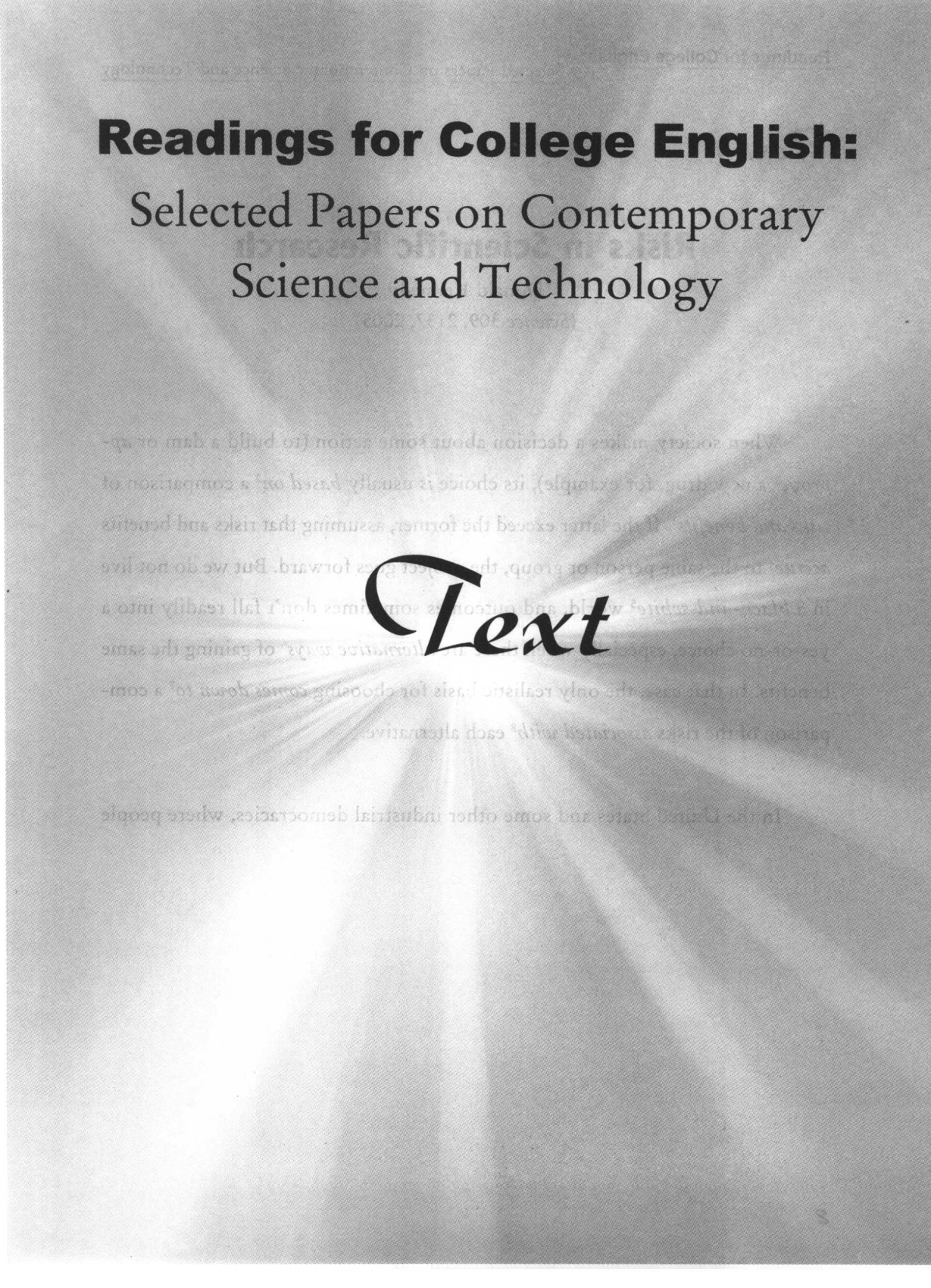

Text 1

Risks in Scientific Research

Donald Kennedy

(*Science* 309, 2137, 2005)

When society makes a decision about some action (to build a dam or *approve*[1] a new drug, for example), its choice *is* usually *based on*[2] a comparison of *risks and benefits*[3]. If the latter exceed the former, assuming that risks and benefits *accrue*[4] to the same person or group, the project goes forward. But we do not live in a *black-and-white*[5] world, and outcomes sometimes don't fall readily into a yes-or-no choice, especially when there are *alternative ways*[6] of gaining the same benefits. In that case, the only realistic basis for choosing *comes down to*[7] a comparison of the risks *associated with*[8] each alternative.

In the United States and some other industrial democracies, where people

科研中的风险

Notes

1. **approve** 批准
2. **is based on** 以……为基础，把……建立在

   base, basis, foundation 之间的细微区别：

   base 是指建筑物的实际基础；basis 是指学术事实的基础，多用于比喻意义；foundation 是指大建筑物、大的组织的基础。
3. **risks and benefits** 风险和利益
4. **accrue** 自然增长
5. **black-and-white** 黑白分明的
6. **alternative ways** 可供选择的办法

   alternative 两者任选其一的。例如：

   There are alternative answers to your question. 对你的问题有两个可供选择的答案。

   alternative 作定语时，还有一个意思为：候补的。例如：

   alternative member 候补委员
7. **come down to** 只剩下，只有
8. **is associated with** 把……联系在一起，与……有联系的；联想

   associate 作名词，意思是伙伴、同事；作定语时，意思是副的。例如：

   He is not a friend but a business associate. 他不是朋友，是生意上的伙伴。

   He is an associate professor. 他是副教授。

and their governments *tend to*[9] be *risk-averse*[10], *legislatures*[11], *courts*[12], and *administrative entities*[13] usually create a presumption *favoring*[14] more safety rather than less. The definitions of risk in law are often vague ("reasonable certainty of no harm" or "*adequate margin of safety*[15]") and are likely to encourage an unrealistic belief that risks can be minimized or even eliminated altogether. A frequent result is that legal choices for administrative agencies or individual decision-makers amount to *all-or-none options*[16], leaving little room for intermediates.

But on occasion, a zone opens for risk comparisons, as in the following examples. Suppose a municipality is treating its water supply with *chlorination*[17]. Chlorine sometimes combines with organic compounds in natural water supplies to form *chlorinated hydrocarbons*[18], some of which have *carcinogenic potential*[19]. The *Environmental Protection Agency (EPA)*[20] *is charged with*[21] regulating such substances, but it is also responsible for controlling *waterborne infections*[22]. In determining appropriate levels of chlorination, the EPA had to balance the risk of such infections against the risk of contamination with small amounts of a *potentially cancer-causing substance*[23]. In a lengthy negotiation, the EPA undertook a *risk-balancing*[24] exercise, resulting in a decision about the safe (least risky) level of chlorine addition.

Fig. 1.1

Or suppose you're taking a *prescription drug*[25] that relieves a *painful arthritic condition*[26]. Suddenly a study conducted by a large *health maintenance organization*[27] shows that at *doses*[28]

9. **tend to** 注意，倾向，趋向，有助于。例如：

The international tension tends to easing off. 国际紧张局势趋向缓和。

These measures tend to improving living conditions. 这些措施有助于改善居住条件。

10. **risk-averse** 不喜欢冒险的

11. **legislature** 立法机关

12. **court** 法院

13. **administrative entity** 行政实体

14. **favor** = favour，喜欢、支持、给予、有助于。例如：

in somebody's favour 得到某人的宠爱（欢喜）

15. **adequate margin of safety** 足够的安全幅度

adequate 足够的、适当的，margin 幅度、差额，用 margin 组成的常用短语有：by a wide (big, small) margin 大（小）幅度地。例如：

The company's profits increased by a wide (big) margin. 公司的利润有了大幅度的增长。

16. **all-or-none options** 要么全选，要么一个也不选

17. **chlorination** 氯化作用

18. **chlorinated hydrocarbon** 氯化的碳氢化合物

19. **carcinogenic potential** 致癌的潜在可能

20. **Environmental Protection Agency (EPA)** (美国)环境保护局

21. **is charged with** 被委以……使命、负责……

22. **waterborne infection** 饮水（引起的）传染

23. **potentially cancer-causing substance** 潜在致癌物

24. **risk-balancing** 权衡风险

25. **prescription drug** 处方药（必须由医生开药方才能买的药）

26. **painful arthritic condition** 关节痛的状态

27. **health maintenance organization** 保健组织

28. **dose** （药的）剂量；一剂药、一服药。例如：

Take a dose, three times a day. 一次服一剂，一日服三次。

higher than those used by patients seeking relief from *chronic joint pain*[29], there is a risk of *cardiac malfunction*[30]—*a risk twice as great as*[31] that of control subjects. You have to decide whether the risk of continuing to take the medicine is greater or less than the risk associated with your *mobility loss*[32] and pain. *Over-the-counter (OTC) anti-inflammatory drugs*[33] may cause some *digestive tract*[34] problems, so you prefer not *to switch to them*[35]. There's no history of *heart disease*[36] in your family, so you become more comfortable with the drug's *cardiac risk*[37]. In the end, after consultation with your *physician*[38], you decide to continue the drug regime despite the warning label.

There may be a lesson here for much larger-scale societal decisions. For a number of reasons, many *developed nations*[39] have concluded that the risks of *nuclear power generation*[40] are too great to engage in traditional *risk/benefit assessment*[41] of its use. But there is a growing scientific consensus that the *emission*[42] of carbon dioxide and other *greenhouse gases*[43], released *in the course of*[44] energy production and industrial combustion, is *related to*[45] *global warming*[46]. It is clear that business as usual will entail increasing *climate-associated risks*[47]. Nuclear power is an alternative that emits no greenhouse gases. On the other hand, it presents risks

29. **chronic joint pain** 慢性关节痛
30. **cardiac malfunction** 心脏功能失常
31. **a risk twice as great as** 两倍的风险

as…as 的三种用法：

(1) He is as kind as his sister (is). 他像他妹妹一样和蔼。

(2) He is as kind as (he is) honest. 他既诚实又和蔼。

(3) He is as kind as his sister is honest. 他妹妹诚实而他和蔼。

第一个 as 为副词，后面只能接形容词或副词；第二个 as 为连词，后面接从句。如果是否定时，第一个 as 改为 not so。例如：

He is not so kind as you are. 他不如你和蔼。

另外还有两个常用的短语：

as good as 跟……一样，几乎等于

as well as 不但……而且……，和……一样。例如：

She is as good as her words. 她遵守诺言，或她言行一致。

We study English as well as Chinese. 我们不但学习中文，而且还学英文。

32. **mobility loss** 活动力损失
33. **over-the-counter (OTC) anti-inflammatory drug** 非处方的抗炎药

over-the-counter (OTC) drug 为非处方药，即无需医生处方就可在药房购买的药。与 prescription drug（见注 25）相反。

34. **digestive tract** 消化系统
35. **to switch to them** 将它们撤下
36. **heart disease** 心脏病
37. **cardiac risk** 心脏病风险
38. **physician** 医生，内科医生
39. **developed nations** 发达国家
40. **nuclear power generation** 核发电
41. **risk/benefit assessment** 风险 / 利益评估（权衡）
42. **emission** 散发、发射
43. **green-house gases** 温室气体
44. **in the course of** 在……的过程中
45. **is related to** 与……有关系
46. **global warming** 全球变暖
47. **climate-associated risk** 与气候相关的风险

that include *nuclear accident*[48], *diversion and proliferation*[49] of *fissile material*[50], and uncertainty about the management of *high-level waste*[51].

These are substantial risks, all right. But so are those associated with global climate change: rising sea levels, increased frequency of extreme weather events, changes in *agricultural productivity*[52], and *weather-induced hazards*[53] to human health. Balancing these kinds of risks will require complex and difficult decisions, and the need to make them will be a challenge to our *societal appetite*[54] for no-risk solutions. Just as we compare risks as we seek to protect or improve our personal health, we will need to do so *on a larger scale*[55] as we seek to manage the environmental effects of our industrial economy. In the latter case, *it is pointless to*[56] take one option off the table without a serious comparison of risks. We may wish for safe solutions, but neither option *is free of*[57] risk, leaving us to make choices among imperfect alternatives. The real world is complex, but it's the one we have.

Exercises

1. How do you assess the risks and benefits in scientific research?
2. Is there any research work free of risk? Why?
3. What are your feelings about the last sentence: "The real world is complex, but it's the one we have"?

48. **nuclear accident** 核事故
49. **diversion and proliferation** 转移和扩散
50. **fissile material** 可裂变物质（核燃料）
51. **high-level waste** 高度放射性的核废料
52. **agricultural productivity** 农业生产率、农业生产能力
53. **weather-induced hazard** 由气候引起的灾害
54. **societal appetite** 社会的欲望

appetite 胃口、食欲；欲望、爱好。例如：

He had no appetite for hard work in study. 他没有刻苦学习的欲望。

He had a poor appetite for food. 他不想吃东西（他的胃口不好）。

55. **on a large scale** 大规模地

scale 的意思是：尺度、等级、规模。

on a large (small) scale 大（小）规模地

56. **it is pointless to do something** 做什么事都没有任何意义

pointless 的意思是：钝的、不尖的、没有意义的。

57. **is free of** 无……的、摆脱了……的、没有……的

类似的短语 is free from 没有……的、不受……影响的。例如：

As men are not sages, how can they be free of faults? 人非圣贤，孰能无过？

Human beings are not inanimate things, how can they be free from emotions? 人非草木，孰能无情？

Text 2

Glassmaking in Bronze-Age Egypt

Caroline M. Jackson

(*Science* 308, 1750, 2005)

Ever since *Sir Flinders Petrie*[1] discovered evidence for *Bronze-Age*[2] glass production in *Tell el-Amarna, Egypt*[3], in the late 19th century [1], *controversy*[4] has surrounded his findings. Does the evidence represent primary glass production (raw materials were mixed to produce glass) or secondary working (ready-made glass was imported and *reworked*[5] into *artifacts*[6])? The answer has important implications for understanding, trade and exchange in the *Mediterranean*[7] during the late second millennium B.C. On page 1756 of this issue, Rehren and Pusch [2], provide evidence *in favor of*[8] primary production in Egypt.

In the Late Bronze Age, glass was a *high-status commodity*[9]. Any group that controlled its production or consumption would have occupied a powerful position. *Archaeological*[10] evidence of a rise in trade and consumption indicates that this was a period of political change throughout the *Near and Middle East*[11] and the *Mediterranean area*[12]. This transformation may be explained by the rise of *elite groups*[13] who chose to express *allegiances*[14] through competitive gift exchange of *prestigious*[15] artifacts. Glass—being difficult to work, complicated to produce, and available in vivid, *symbolically significant colors*[16]—was favored for use in such artifacts. Understanding the evidence from Amarna will help to define the role of prestige goods and how elites used them to enhance their position.

The first *glass vessels*[17] found in Egypt were *stylistically indistinguishable*[18]