

テキスト詳細ページはこちらから→ [商品詳細ページ](#)



Hiroaki Tanaka

Hiroyuki Yamanishi

Bill Benfield

S SEIBIDO

はじめに

本書は身近な科学をテーマに、それに関連する最新の研究成果や未来の姿を予見させる技術革新について大学生に分かりやすいような英文で書き下ろしました。主なテーマはテクノロジー、環境、建築、生物、バイオサイエンス、都市計画、行動科学、人体、そして科学倫理と幅広く設定し、理系学部の学生だけでなく、文系学部の学生も興味を持てるような内容にしました。

本書は中上級総合英語教材として、各ユニットの英文の語数を 550 語から 650 語程度に設定してありますが、辞書に頼ることなく内容理解ができるようにしています。

本書の特徴は Reading と Writing を 2 つの柱とした構成です。Reading で内容を理解するだけでなく、パラグラフ構造も理解し、それをライティングスキルとして Writing 活動に応用する構成になっています。Reading で扱われた文章をいわばお手本として、それを活用、あるいは応用して自分の英語で書く演習ができます。もう 1 つの本書の特徴は Listening と Speaking に加えて、Active Learning も取り入れて総合的で能動的な学習教材になっている点です。Reading テーマをさらに深めた内容のダイアログを用いて、聞き取りや会話活動の演習をします。その後、テーマに関連した図表の読み取りをしたり、自分でリサーチした内容をプレゼンテーションしたり、あるいはリサーチを踏まえて自分の意見を述べたりする演習があります。これによって、理解した内容を書いたり、話したりすることで、能動的に理解を深められます。最後に、各 Unit のテーマに関連した最新の研究成果が本文や Active Learning で扱われている点も特徴です。中には *Nature* などのトップジャーナルも含まれていますが、大学生の皆さんに理解しやすいように平易に書き直したり、エッセンスのみを紹介したりしています。興味を持ったテーマがあれば、将来的にその原典を読むなどのチャレンジもしてもらいたいと思っています。

田中 博晃
山西 博之
Bill Benfield

CONTENTS



UNIT 1

p.01

No Car, Happy Life? Carless Cities in Spain

車のない街はパラダイスかもしれない

Reading 都市計画

Writing Paragraph Structure and Organization



UNIT 2

p.07

Science Fiction Is Not Fiction: Building Down and Building Underwater

SF が現実：地下都市や海中都市は実現可能か？

Reading 建築

Writing Introduction / Topic Sentence



UNIT 3

p.13

Save Summer Heat for Winter: Air Conditioning Past and Future

夏の暑さを保存して冬の暖房に：エアコンの過去と未来

Reading 環境

Writing Body / Supporting Sentences



UNIT 4

p.19

Are You Ready for Cultured Meat?

シャーレから生まれた培養肉の衝撃：家畜が消える未来

Reading バイオサイエンス

Writing Conclusion / Concluding Sentence



UNIT 5

p.25

Good News: Ozone Hole Is Recovering

オゾンホールは回復していた！？：国際協力の成果

Reading 環境

Writing Organization 1 (Time Order)



UNIT 6

p.31

Lost Wallet: Will You Ever Get it Back?

お金が入っているほど落とした財布は返ってくる？

Reading 行動科学

Writing Organization 2 (Comparison & Contrast)



UNIT 7

p.37

I Am a Cyborg: How Machines Are Meshing with Humans

人間と機械が融合する日

Reading 科学倫理

Writing Organization 3 (Cause & Effect)



UNIT 8

p.43

Wireless Power Revolution: Smart Pills and Wireless Power Transmission

ワイヤレス充電から電線不要の電柱まで：電力技術の革新

Reading テクノロジー

Writing Organization 4 (Problem & Solution part 1)



UNIT 9

p.49

The Simple, Free Solution to Myopia? Just Go Outside!

外で遊ぶだけで近視予防？

Reading 人体・健康

Writing Organization 5 (Problem & Solution part 2)



UNIT 10

p.55

Why Do Zebras Have Stripes?

シマウマはなぜ縞模様？

Reading 生 物

Writing Writing by Purpose 1(Classification)



UNIT 11

p.61

Placebo Effect Is Real: Fake Treatment Do Cure Patient

「病は気から」は本当だった：偽薬で治る人体の不思議

Reading 人体・健康

Writing Writing by Purpose 2 (Definition)



UNIT 12

p.67

How Smart Are Crows? They Even Enjoy Skiing!

カラスはスキーをして遊ぶ！：カラスの知性の謎

Reading 生 物

Writing Writing by Purpose 3
(Procedure & Process part 1)



UNIT 13

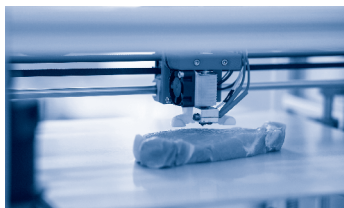
p.73

Fake Scientific Evidence: Can We Distinguish Science and Pseudoscience?

科学のウソ：ダークチョコレートダイエットの真相

Reading 科学倫理

Writing Writing by Purpose 4
(Procedure & Process part 2)



UNIT 14

p.79

Pizza, Milk and Nursing Food: All 3D-Printed

ピザ、ミルクや介護食を 3D プリンタで“出力”

Reading テクノロジー

Writing Writing in Action 1
(Writing a Summary part 1)



UNIT 15

p.85

Science of Lying: Start with Little Lies and then Get Bigger

要注意：うそをつくほど「うそつき」になることが判明

Reading 行動科学

Writing Writing in Action 2 (Writing a Summary part 2)

本書の使い方

Warm Up

各 Unit のテーマの導入となります。学生のみなさんにとっては身近なテーマもあれば、そうでもないものもあるかと思います。クラスメイトと情報交換したり、インターネットなどでテーマの背景知識を調べたりするなど、自宅で予習をしておくとう理解が深まります。本書は身近な話題に関する世界の最新の科学研究の成果を取り扱っています。各 Unit のテーマが、現在の科学技術でどのように進歩しているのか想像力を働かせてください。

Vocabulary

本文に使用される重要な語句を 10 語ずつ抽出しました。高校で既習の語とそうでない語の両方が含まれます。できるだけ辞書に頼らずに解答し、その後、辞書で意味と発音を確認してください。

Reading Comprehension

読解問題です。Comprehension Questions A は本文の内容との正誤を判定する TF 問題で、正確な読解力が要求されます。Comprehension Questions B は本文の全体像を理解する問題で、次の Writing 活動につながる設問です。パラグラフ構造を意識しながら解答してください。また辞書を使わずに読むことが理想ですが、自分の語彙力にあわせて適宜使用しても構いません。

Writing

パラグラフィティングの習得に焦点を当てています。ここでは各 Unit で取り上げるライティングスキルの解説と演習を取り扱います。各スキルは本文でも使われていますので、それを応用して自分の英語で表現する練習をします。また各スキルを応用する際に Unit によっては有用なシグナルワードのリストや演習があります。単に表現を覚えるだけでなく、その使い方も意識して学習してください。

Active Learning

Listening & Conversation ではモデルダイアログを使いリスニングとスピーキングの演習をします。各 Unit のテーマに関連あるいは発展した内容について大学生 2 名が議論しています。その音声を聞いて空欄を埋めるディクテーション活動の後、モデルダイアログで Speaking の練習をしてください。次の Discussion では各 Unit のテーマについて、図表を読み取ったり、自分の意見を述べたりする発展活動です。各 Unit で学習した語彙や表現、ライティングスキルなどを活用しながら解答してください。

I Am a Cyborg: How Machines Are Meshing with Humans

人間と機械が融合する日



I Warm up

Surprisingly, not a few people in the world have had machines or technological devices surgically implanted in their body. Can you imagine what they are? Share your ideas with your partner.

II Vocabulary

Match each word or phrase with its meaning.

- | | | |
|-------------------------|---------------------|----------------------|
| 1. artificial _____ | 2. status _____ | 3. replacement _____ |
| 4. perception _____ | 5. inevitable _____ | 6. substantial _____ |
| 7. modification _____ | 8. burdensome _____ | 9. negate _____ |
| 10. be willing to _____ | | |

- | | | | | | |
|----------------|--------|--------|---------|-------|--------|
| a. 避けられない | b. 面倒な | c. 改良 | d. 地位 | e. 知覚 | f. 人工の |
| g. ~することに抵抗がない | h. 代替品 | i. 相当な | j. 否定する | | |

Read the passage and answer the questions.

1 “I think that the biggest change this century will be that we will stop using technology as a tool and start using technology as part of the body.” These are the words of Neil Harbisson, the first person in the world to be officially recognized as a cyborg—in other words, a living being with both natural and artificial parts.

2 He owes his cyborg status to a wearable device that he calls an “eyeborg.” This is an antenna that is mounted to his head and attached to a chip implanted in the bone at the back of his skull. Born with a rare form of extreme colorblindness, Harbisson can perceive the world only in different shades of gray. Using the eyeborg, however, he is finally able to perceive color. It functions by analyzing the wavelengths of colors and turning them into sounds, which are then relayed through his bones to his inner ear. This may sound like a replacement for color perception, but in many ways, the eyeborg exceeds human perception. For example, the device is capable of distinguishing 360 different colors, and allows Harbisson to perceive the presence of ultraviolet, which is a non-visible wavelength of light. Given the rapid technological advances we are making, Harbisson believes that it is inevitable that more and more people will start using technology as part of their body.

3 One country where this trend is becoming more widespread is Sweden, where thousands of people have already had microchips inserted underneath their skin. The main purpose of these microchips—usually inserted between the thumb and the index finger—is to make daily life more convenient. For example, they can be used as contactless credit cards, key cards, and transportation passes. Several Swedish companies are offering microchip implants to their employees to help them quickly enter buildings, open security doors, operate printers, or pay for cafeteria food. Once the chip is embedded beneath your skin, there is no longer any need to worry about misplacing an ID card or carrying a heavy wallet.

4 Various reasons have been suggested to explain why Swedes in particular are more willing to use implanted technology than people in other countries. One is that Sweden is a country where people have a strong belief in the positive

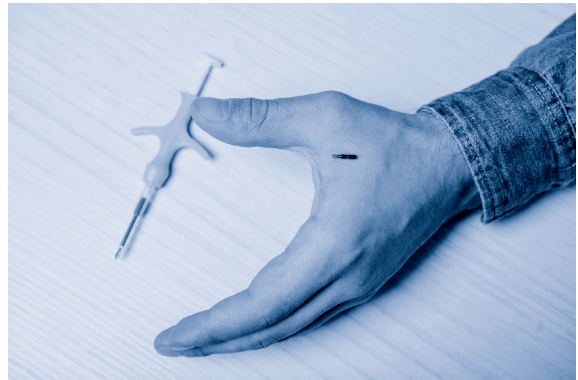


Figure. Microchip implant.

potential of digital technology. Since the government has made substantial investments in technological infrastructure, the Swedish economy is now largely based on digital exports, digital services, and digital tech innovations. As a result, it is one of the world's most successful creators and exporters of digital products and is home to globally successful companies in the digital realm, such as Skype and Spotify.

5 Perhaps a deeper reason is the popularity of the so-called transhumanist movement in Sweden. "Transhumanism" is a belief that we humans should try to escape our biological limitations and upgrade our bodies through incorporating technological devices into them. Winter Mraz, from the U.K., is one example of a growing number of transhumanists. She has microchips in both hands to open doors and send information, as well as LED lights in her arm and five magnets in her left-hand fingers. However, her first cyber-enhancements were not voluntary. She was in a serious car crash that fractured her back, both her ankles, and her knees. After surgery, one of her kneecaps was replaced with a 3D-printed one. If it were not for the cybernetic kneecap, she would not be able to walk. After that experience, she moved on to voluntary personal modifications.

6 It is clear that the idea of incorporating technology into the human body can be viewed in various ways. Swedes, for example, see it as a way to make daily life more convenient and less burdensome. People like Neil Harbisson and some transhumanists see it as a way to expand human perception and abilities. Others, however, may see our willingness to accept technological modification as something that negates our basic identity as human beings. At least, the addition of new abilities modifies our understanding of what it is to be human.

Comprehension Questions A

Choose *T* if the statement is true or *F* if it is false.

1. Neil Harbisson implanted eyeborgs in his eyes because he was born with a rare form of colorblindness.

T	F
---	---
2. Several companies in Sweden require their employees to implant microchips so that they can access their workplace and comply with security systems.

T	F
---	---
3. A belief in the positive potential of digital technology has strongly affected acceptance of implanted technology in Sweden.

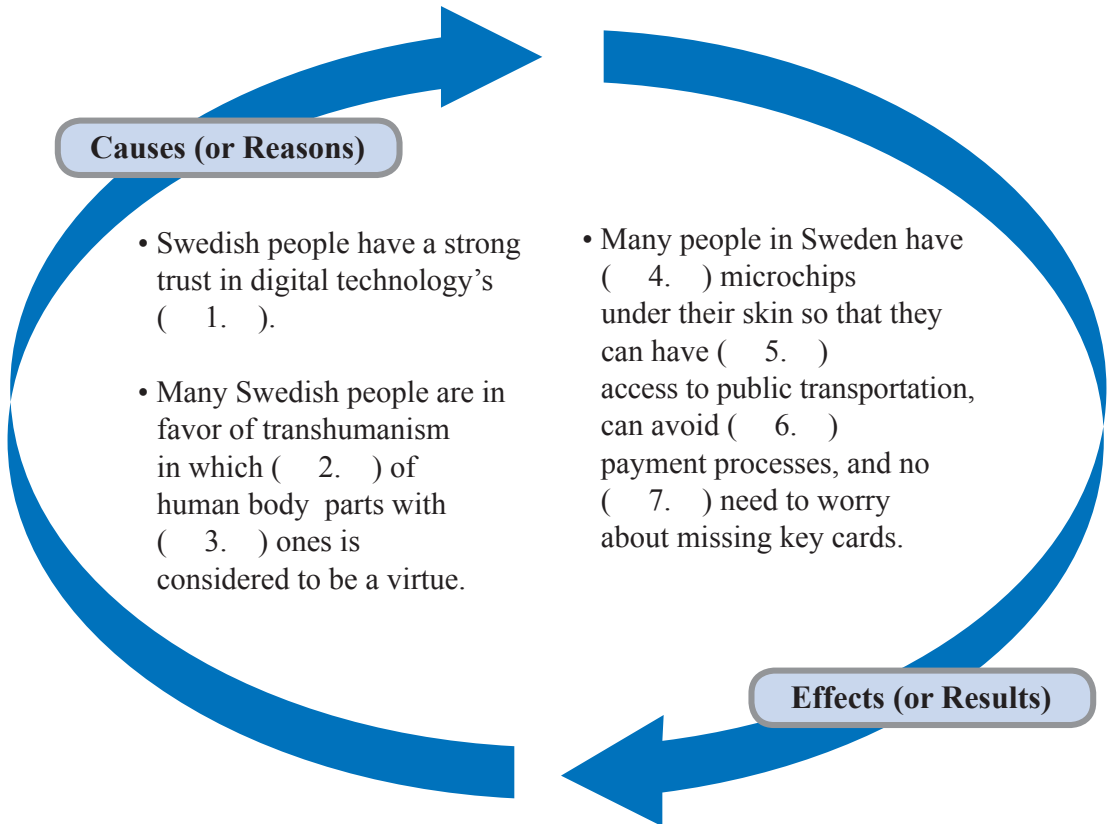
T	F
---	---
4. Transhumanism refers to the belief that humans can evolve beyond their natural capabilities, especially by means of science and technology.

T	F
---	---
5. Most of the devices in Winter Mraz's body are intended to be used for medical purposes.

T	F
---	---

Comprehension Questions B

The figure below shows the causes and effects related to the ideas Swedes have about implanted technology as described in the passage. Choose the best answer to fill in the blanks.



(1) _____ (2) _____ (3) _____ (4) _____
(5) _____ (6) _____ (7) _____

- a) longer b) replacement c) implanted d) replace e) burdensome
f) contactless g) artificial h) potential

IV Writing

Organization 3 (Cause & Effect)

「因果関係」(cause & effect) 型の文章構成は、物事の「原因」(cause または reason) とその「結果」(effect または result) を説明するためによく用いられます。また、同じ事象に対して、原因の側から結果を説明することも、逆に結果の側から原因を説明することもできるため、それぞれのシグナルワードを理解しておくことが大切です。

シグナルワード

原因 : the cause of, the reason is, because of, because/since/as, as a result of, as a consequence of, result in, due to

結果 : the first effect of, as a result, as a consequence, consequently, therefore, thus, result in, lead to, cause, have an effect on, affect

• Exercise

Put the words and phrases in right order.

- (1) 綿密な議論の結果、私たちはその新しい方法を採用することに決めた。
(discussion, result, as, a, of, the in-depth), we decided to adopt the new method.
-
- (2) 近隣地域の急激な人口増加は、慢性的な渋滞を引き起こした。
The rapid population growth in (neighborhood, to, chronic, has, congestion, our, led).
-

Rewrite paragraph 4 of the passage using cause-and-effect signal words from the list above. You can use the words and phrases you learned in the passage or comprehension questions but paraphrase them as necessary.

.....

.....

.....

.....

Active Learning

Listening & Conversation



1-50

Listen to the dialogue and fill in the blanks. Then, practice the dialogue with your partner.

A: I was really surprised to know that thousands of Swedes have implanted microchips just for their (^{1.}).

B: I have the same opinion. In Japan, most domestic dogs have microchips in their skin, but not humans.

A: Pet microchips provide (^{2.}) ID for pets, don't they?

B: That's right. But I think Neil Harbisson's eyeborg is socially acceptable, because he has congenital colorblindness.

A: But his device is not just a (^{3.}) but a kind of human enhancement.

B: Yes, you have a point.

A: The addition of new abilities is controversial, because it (^{4.}) our understanding of what is human.

B: We need some forms of (^{5.}) standards.

Discussion

Some people have implanted devices for medical purposes, and others have done it for the sake of convenience. How much tolerance should society have for artificially enhancing the body? Discuss your ideas with your partner.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....