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平成 28 年 度

英 語

問 題 冊 子

1 次の英文を読み、それに続く設問に答えなさい。

As the Hague Convention on the Civil Aspects of International Child Abduction enters into force in Japan and as parents of taken children around the world begin to submit Hague Article 21 applications for access to Japan-domiciled children, Cory recounts for the first time the details of those harrowing hours:

My daughter and I waited outside the elementary school for about 30 minutes until it became evident that the boys had already returned to the government-owned apartment where they were staying temporarily with their mother. The warmth of spring comforted the afternoon. Amid all that seasonal beauty, we hatched a rescue plan.

My daughter would return to the apartment, but she would not say anything to her brothers. The next morning, she would leave for school before them, as she had done over the past three days, but instead of heading in the opposite direction to the junior high, she would wait along the path the boys would typically walk to the elementary school. Accompanying them on their walk, she would announce just before their arrival that their father was there to pick them up.

Repeatedly that day, the words of the Chief Consul of American Citizen Services had resonated throughout my mind. I had spoken to him by phone that morning after he had reviewed the digital copy of the message my daughter had left on my answering machine the night before. Each person must make his own decisions in life. If you go over there though, you must be extremely careful. If you encounter your wife, walk away.

That morning, the family court had also been informed of my daughter's message, but the judge said that he did not want to take any action because "violence may result."

Stepping out the apartment door, my daughter turned left toward the junior high, and then circled back to the path the boys would be taking. A few minutes later, the boys arrived along the path and the 9-year-old immediately began complaining about his sister following them.

"They went in!" she hurriedly exclaimed, bouncing with anguish.

"Where are the boys?"

"They just ran inside."

Emotionally spent, she paused and began to cry. I looked down, deep in thought, as the sobs continued.

"I just want to go home," she softly wept. "I just want to go home."

The taxi arrived in front of the junior high. The chaos of a minute ago seemed so distant inside its warmth. I caressed her back and gazed out the window, irregular streams flowing

7. What was 'the words' (underline [2])? Explain the content in Japanese.
8. What was 'the message' (underline [3]) like? (Choose the best one.)
- A : She didn't want her whole family to live together.
 - B : She wanted her father to give up his purpose.
 - C : She wanted to live with her father in the U.S.
 - D : She wanted to keep living with her mother and brothers.
9. What do the words 'my next decision was going to tear a hole in my heart' (underline [5]) mean? Explain in Japanese.
10. What do the words "Let's go home" (underline [6]) mean? Explain in Japanese.

The conference room window overlooks a line of floor-to-ceiling, gleaming steel flasks. The steel feels chilly but not cold; the warehouse-like space they inhabit is unheated in the Arizona “winter”. But don’t lift the inner Styrofoam lid and stick your hand in: they are filled with liquid nitrogen, which boils at 77 degrees Kelvin (-196°C). From a nitrogen storage tank, a pipeline snakes along the ceiling sending a runner to each flask — more correctly, “dewar” — to top it up.

Most of the dewars are occupied. This is a little eerie. We are at Alcor, the cryonics organization. The dewars’ 79 occupants were — possibly will have been — people with a dream: that given enough time, medical science will advance enough to cure them of whatever killed them. To pay for their decades — centuries, possibly — at temperatures cold enough to prevent decomposition, they bought life insurance policies of between \$75,000 and \$100,000. Legally, they are dead. To Alcor’s staff, they are “patients”.

Cryonics is a small community. The two largest cryonics organizations, Alcor and Michigan-based Cryonics Institute, together poll about 1,600 members. Alcor has 79 patients and 33 pets in cryopreservation; CI has 85 patients and 50 pets.

Science was always going to be slow to fulfill a dream as grand as this. First, cryopreservation techniques need to improve so patients’ bodies — and especially their brains, the repositories of memory and personality — suffer minimal damage. Second, the medical techniques for revival, such as cures for Aids, cancer and heart disease, must be developed. Many cryonicists opt to preserve only their heads, hoping for revival technology good enough to give them new, younger bodies. However, there are not even animal experiments to bolster the idea. Nobody has yet frozen and revived any mammal.

But the dream no longer seems quite as lunatic as it did in 1962, when Robert Ettinger’s *The Prospect of Immortality* launched the modern cryonics movement. But because cryonics is so small, it has little funding for research.

The area of most immediate concern to cryonicists is improvements in preservation techniques: less damage at the beginning means an easier eventual repair job. The key technique, which came into use in 2001, is vitrification.

Ice cream that’s melted and refrozen develops ice crystals. So do human bodies, where crystals can tear through delicate tissues. As one cryonicist puts it: “We didn’t evolve to be frozen.” Vitrification avoids this by replacing the blood with a mixture of antifreeze-like chemicals known as cryoprotectants via a machine like the cardio-pulmonary bypass devices used in hospitals. The right mixture at the right temperature, between -90°C and -130°C ,

becomes a smooth solid, like glass — hence vitrification.

This process and the cryoprotectants used vary between Alcor and CI; Alcor's cryoprotectants were developed and published by 21CM, a media-shy Florida-based company whose website stresses vitrification's usefulness to organ banks. Published research has shown that vitrification preserves the brain's structure remarkably well.

The downside is that cryoprotectants are toxic. In addition, vitrified human flesh tends to fracture. These are, respectively, the key areas for ongoing research to Ben Best, CI's president, and Alcor. Tanya Jones, director of operations at Alcor, says the cause of the fractures isn't clear, but that at least a few large fractures are easier to repair than many small ones.

The other problem is that it's illegal to vitrify someone while they're medically alive. So the teams have to wait for someone to be declared dead before they can go to work with vitrification.

Meantime, medical research throws up a new and promising headline almost every day. Last year, scientists at the J Craig Venter Institute successfully transferred an entire genome from one bacterium to another. In Maryland recently, scientists built an entire microbial chromosome.

Or take, for example, the work being done by Lance Becker, director of the Penn Center for Resuscitative Medicine. Becker is not directly concerned with cryonics, but it's easy to see connections. Becker wants to extend today's five-minute window for successful resuscitation after the heart stops.

"Fundamentally," he says, "what we are focused on is bringing people back to life from death or near-death, and reinventing or revolutionising the way we approach that." Becker's key discovery is that cells don't die during that five-minute window. The real damage comes when the heart restarts and oxygen floods the tissues, a process known as reperfusion.

"It's pretty well accepted that at the point at which the usual human being gets pronounced dead, all their cells are alive. It's a very eerie question: if all their cells are alive, what is death?" says Becker. Besides, if all the patient's cells are alive, why can't the patient recover and walk out of the hospital? "With our current therapies we can't do it."

One option, says Becker, is cooling the patient — by a few degrees, not to cryonic extremes — to buy time, an idea he says has been around for thousands of years. In studies, dogs and mice cooled before reperfusion have recovered better. "We believe it prevents reperfusion injury."

Cooling, he adds, is much quicker if you cool the blood directly, either by injecting a slurry of micro-ice particles or by using a bypass machine. Imagine, he says, a soldier in the Iraq

war, bleeding to death while you watch. “If you could zap, perfuse him, put him on a plane, wing him to a major hospital and fix him all up — that’s not at all crazy.”

That idea is in fact close to Jones’s vision. “If we succeed in our mission,” she says, “cryonics will become a process carried out in hospitals by medical staff for much shorter times.”

That in itself is a change from the early days, when cryonicists more often aspired to immortality, not just more life. In addition, the demographics are changing. Formerly, most cryonicists were young, male and geeky. Now, Alcor gets whole families.

The important unknown is: Can a cryosuspended brain, warmed and revived, retain the memories and personality of its owner? Until this is proven — in a dog, if not a human — cryonicists don’t know if they’re mad or prescient. How long before we know?

Best says: “I think within 30 years we’ll see a successful revival in an animal experiment, but those revived then would be cryopreserved 30 years from now.” Last in, first out: the earliest patients to be cryopreserved suffered the worst damage. James Bedford, who in 1967 became the first person ever to be cryonically suspended and who is now at Alcor, was barely perfused at all. “For the people being cryopreserved now, under the best conditions, my guess is 50 to 100 years.” Given the current rate of medical progress and research into nanotechnology, says Jones: “If we haven’t done it in 100 years, it’s not going to work.”

The Guardian, February 14, 2008 (一部改変)

1. What is *cryonics*? (Choose the best one.)

- A : Experiments to freeze mammal bodies, including humans’, and then put them back to life.
- B : Techniques to slower the progression of now incurable diseases by cooling down the patients’ bodies.
- C : Techniques to lower vital activity to the minimal level by cooling down the bodies in order to buy time for difficult surgeries.
- D : Techniques to preserve dead bodies at the temperatures of preventing decomposition, and then revive the bodies after decades.

2. What is *dewar*?

- A : It is a container of a dead body and it is filled with liquid nitrogen.
- B : It is a container of a barely alive body and it is filled with nitrogen gas.
- C : It is a tank of liquid nitrogen which supplies nitrogen gas to each flask.
- D : It is a tall, large flask which contains many bodies preserved by nitrogen gas.

3. How do most dewars' occupants want to be when they are revived?
- A : To be a completely new, healthy person even without their past memories
 - B : To be a child who retains all the memories they had in their former life
 - C : To have a healthy body regardless of the memories at the time of their death
 - D : To have a stronger body of even another person with only the head of their own
4. In this article the word 'cryonicists' is used in the meaning(s) of _____.
- A : people who support cryonics technology
 - B : people who receive cryonics treatments
 - C : people who provide cryonics treatments
 - D : both people who receive and those who provide cryonics treatments
5. Choose three statements which are NOT applicable to *cryonics* and its procedures.
- A : Cryonics does not have much research fund.
 - B : Cryonics procedures do not involve any use of toxic materials.
 - C : This article names three organizations which deal with cryonics.
 - D : A successful human cryonics will not occur until at least 50 years from now.
 - E : Formerly, most cryonics applicants were males, but recently whole-family applications are increasing.
 - F : When cryonics technology is established, the last cryonicists will be the first ones to enjoy the technology.
 - G : The meaning of 'cryonics' has been changing from 'just more life' in early days to 'immortality' today.
 - H : There is an increasing interest in cryonics among rich people, so the research is virtually supported by private donations.
 - I : One of the greatest challenges to cryonics is to find the best method to cool down the bodies without giving major damage to the brains and bodies.

6. Choose three correct statements about *vitrification*.

- A : Vitrified human flesh is elastic, so it does not easily break.
- B : Vitrification technique began to be used for cryonics in the 20th century.
- C : Vitrification provides a promising method to preserve organs in organ banks.
- D : Cryonics organizations all use the same process and materials for vitrification.
- E : Vitrification is a kind of crystallization technique using cardio-pulmonary bypass devices.
- F : The materials which are currently most effective for vitrification were *not* developed by Alcor.
- G : It is illegal to start vitrification within five minutes after the announcement of medical death.
- H : Through vitrification treatment, the body becomes a smooth glass-like solid of about -100 degrees Celsius.
- I : Vitrification is a procedure of sterilizing the body to prevent decomposition and then contain it in glass-like material.

7. Choose three correct statements about *reperfusion*.

- A : Reperfusion is a promising measure when perfusion has failed.
- B : There has been no successful case of reperfusion even in experiments with animals.
- C : Reperfusion is likely to give damages to the body tissues which are coming back to life.
- D : Reperfusion can be very effective if it is started within five minutes after medical death is pronounced.
- E : Reperfusion is a procedure to replace all blood and body fluids with some fluids similar to the original ones.
- F : Reperfusion cannot be used for persons who have bled too much like soldiers severely injured in battle fields.
- G : Reperfusion is likely to be successful when applied to bodies which were once cooled down and then warmed up.
- H : Reperfusion is a process in which blood and oxygen flood the body tissues after the once-stopped heart begins to work again.
- I : Reperfusion is not free from the use of toxic drugs, so the development of a non-toxic drug is the key to success of the technique.

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次の日本語文の下線部(1), (2), (3)を英語で表現しなさい。

昨年の我が国の出生率が9年ぶりに低下した。人口の多い団塊ジュニア世代が40歳代にな
(1)り、出産年齢を過ぎつつあることが主な原因だ。(2)少子化克服に向け、官民を挙げて取り組まね
(3)ばならない。

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