

英 語

- 1 (A) 以下の英文を読み，その内容を70～80字の日本語で要約せよ。句読点も字数に含める。

Table manners are as old as human society itself, the reason being that no human society can exist without them. The active sharing of food — not consuming all the food we find on the spot, but carrying some back home and then giving it out systematically — is believed, even nowadays, to lie at the root of what makes us different from animals. Birds, dogs, and hyenas carry home food for their young until they are ready to find food for themselves, and chimpanzees may even demand and receive pieces of meat from other adults in their group. (Chimpanzees apparently exhibit this behaviour only on the occasions when they consume meat; their main, vegetable diet they almost invariably eat where they find it, without sharing.) Only people actively, regularly, and continuously work on the distribution of their food.

This activity is based on and probably helped give rise to many basic human characteristics, such as family and community (who belongs with whom; which people eat together), language (for discussing food past, present, and future, for planning the acquisition of food, and deciding how to divide it out while preventing fights), technology (how to kill, cut, keep, and carry), and morality (what is a fair portion?). The basic need of our stomachs for food continues to supply a good deal of the driving force behind all of human enterprise: we have to hunt for food, fight for it, find it, or sow it and wait for it to be ready; we then have to transport it, and distribute it before it goes rotten. It is in addition easier for us to consume food chopped, ground, cooked, or left to soften. Civilization itself cannot

begin until a food supply is assured. And where food is concerned we can never stop; appetite keeps us at it.

The active sharing out of what we are going to eat is only the beginning. We cannot help being choosy about our food: preference enters into every mouthful we consume. We play with food, show off with it, honour and despise it. The main rules about eating are simple: if you do not eat you die; and no matter how large your dinner, you will soon be hungry again. Precisely because we must both eat and keep on eating, human beings have poured enormous effort into making food more than itself, so that it bears multiple meanings beyond its primary purpose of physical nutrition.

(B) 以下の英文を読み, (ア), (イ)の問いに答えよ。

One evening Adam Mastroianni was reluctantly putting on his bow tie for yet another formal party at the University of Oxford that he had no interest in attending. Inevitably, Mastroianni, then a master's student in psychology at the university, knew that he would be stuck in some endless conversation that he did not want, with no way to politely excuse himself. Even worse, he suddenly realized, he might unknowingly be the one to set up unwanted conversation traps for others. "What if both people are thinking exactly the same thing, but we're both stuck because we can't move on when we're really done?" he wondered.

Mastroianni's idea may have been on the mark. A recent study reports on what researchers discovered when they climbed into the heads of speakers to gauge their feelings about how long a particular conversation should last.

(1) In fact, people are very poor judges of when their partner wishes to stop it. In some cases, however, people were dissatisfied not because the conversation went on for too long but because it was too short.

"Whatever you think the other person wants, you may well be wrong," says Mastroianni, who is now a psychology research student at Harvard University. "So you might as well leave at the first time it seems appropriate because it's better to be left wanting more than less."

Most past research about conversations has been conducted by linguists or sociologists. Psychologists who have studied conversations, on the other hand, have mostly used their research as a means of investigating other things, such as how people use words to persuade. A few studies have explored what phrases individuals say at the ends of conversations, but the focus has not been on when people choose to say them. "Psychology is just now waking up to the fact that this is a really interesting and fundamental social behavior," Mastroianni says.

He and his colleagues undertook two experiments to examine the dynamics of conversation. In the first, they quizzed 806 online participants about the duration of their most recent conversation. (2) The individuals involved reported whether there was a point in the conversation at which they wanted it to end and estimated when that was in relation to when the conversation actually ended.

In the second experiment, held in the lab, the researchers split 252 participants into pairs of strangers and instructed them to talk about whatever they liked for anywhere from one to 45 minutes. Afterward the team asked the subjects (↑) and to guess about their partner's answer to the same question.

Mastroianni and his colleagues found that only two percent of conversations ended at the time both parties desired, and only 30 percent of them finished when one of the pair wanted them to. In about half of the conversations, both people wanted to talk less, but the points they wanted it to end were usually different. (3) To the researchers' surprise, they also found that it was not always the case that people wanted to talk less: in 10 percent of conversations, both study participants wished their exchange had lasted longer. And in about 31 percent of the interactions between strangers, at least one of the two wanted to continue.

Most people also failed at guessing their partner's desires correctly. When participants guessed at when their partner had wanted to stop talking, they were off by about 64 percent of the total conversation length.

That people fail so completely in judging when a conversation partner wishes to end the conversation "is an astonishing and important finding," says Thalia Wheatley, a social psychologist at Dartmouth College, who was not involved in the research. Conversations are otherwise "such an elegant expression of mutual coordination," she says. "And yet it all falls apart at the end because we just can't figure out when to stop." This puzzle is

probably one reason why people like to have talks over coffee, drinks or a meal, Wheatley adds, because “the empty cup or plate gives us a way out — a critical conversation-ending cue.”

Nicholas Epley, a behavioral scientist at the University of Chicago, who was not on the research team, wonders what would happen if most conversations ended exactly when we wanted them to. “ (4) ” he asks.

While this cannot be determined in the countless exchanges of everyday life, scientists can design an experiment in which conversations either end at precisely the point when a participant first wants to stop or continue for some point beyond. “Do those whose conversations end just when they want them to actually end up with better conversations than those that last longer?” Epley asks. “I don’t know, but I’d love to see the results of that experiment.”

The findings also open up many other questions. Are the rules of conversation clearer in other cultures? Which cues, if any, do expert conversationalists pick up on? (5)

“The new science of conversation needs rigorous descriptive studies like this one, but we also need causal experiments to test strategies that might help us navigate the important and pervasive challenges of conversation,” says Alison Wood Brooks, a professor of business administration at Harvard Business School, who was not involved in the study. “I think it’s pretty wild, and yet we’re just beginning to rigorously understand how people talk to each other.”

注

linguist 言語学者

(ア) 空所(1)～(5)に入れるのに最も適切な文を以下の a)～f) より一つずつ選び、マークシートの(1)～(5)にその記号をマークせよ。ただし、同じ記号を複数回用いてはならない。

- a) How is it possible for anybody to correctly guess when their partner wants to start the conversation?
- b) How many new insights, novel perspectives or interesting facts of life have we missed because we avoided a longer or deeper conversation that we might have had with another person?
- c) Most of them had taken place with a family member or friend.
- d) Participants in both studies reported, on average, that the desired length of their conversation was about half of its actual length.
- e) The team found that conversations almost never end when both parties want them to.
- f) What about the dynamics of group chats?

(イ) 下に与えられた語を正しい順に並べ替え、空所(イ)を埋めるのに最も適切な表現を完成させ、記述解答用紙の1(B)に記入せよ。

been conversation have have liked
over the they to when would

- 2 (A) 「芸術は社会の役に立つべきだ」という主張について、あなたはどうか考えるか。理由を添えて、60～80語の英語で述べよ。

(B) 以下の下線部を英訳せよ。

旅人は遠い町にたどりつき、街路樹や家並み、ショーウインドウの中の商品や市場に並べられた野菜や美術館に飾られた絵画を眺めて歩き、驚き、感心し、時には不安を覚える。旅人は、その町に長年住んでいる人たちよりもずっとたくさんのものを意識的に見るだろう。しかし、いくら大量の情報を目で吸収しても旅人はあくまで「よそ者」、あるいは「お客様」のままだ。外部に立っているからこそ見えるものがあるのだから、それはそれでいいのだが、わたしなどは、もし自分が旅人ではなく現地人だったらこの町はどんな風に見えるのだろう、と考えることも多い。

(多和田葉子『溶ける街 透ける路』)

3 放送を聞いて問題(A), (B), (C)に答えよ。(A), (B), (C)のいずれも2回ずつ放送される。

- ・聞き取り問題は試験開始後 45 分経過した頃から約 30 分間放送される。
- ・放送を聞きながらメモを取ってもよい。
- ・放送が終わったあとも、この問題の解答を続けてかまわない。

(A) これから放送するのは、オウム貝の一種である crusty nautilus の生体を発見した記録である。これを聞き、(6)～(10)の問題に対して、最も適切な答えを一つ選び、マークシートの(6)～(10)にその記号をマークせよ。

注

crust 外殻 ecosystem 生態系
buoy ブイ(浮標) coral reef サンゴ礁

- (6) The speaker became interested in the crusty nautilus because
- a) as a marine biologist, she is interested in the life cycle of the creatures.
 - b) empty shells seen on the beach suggested that it may have died out.
 - c) from an interest in conservation, she wanted to know whether they still exist.
 - d) marine biologists have speculated that the crust on its shell only forms in certain areas.
 - e) the crust covering the creature is environmentally significant.
- (7) The speaker felt that the trip should be undertaken soon because
- a) deep-sea ecosystems may be under threat, and gathering information could help preserve them.
 - b) due to climate change, deep-sea environments are changing rapidly.
 - c) it was important to capture the creatures on video before they died out.
 - d) mining companies were moving to prevent environmental research in the area.
 - e) waste from mining on the land in Papua New Guinea was affecting the nearby sea.

- (8) After flying to Papua New Guinea from Brisbane, the team travelled to
- a) an island recently declared a protected area in order to meet local communities.
 - b) an island where the crusty nautilus was found alive in the 1980s.
 - c) greet a local community whose chief had declared the beach protected.
 - d) greet a small island community which had been trying to protect the crusty nautilus.
 - e) Manus Island, then to a smaller island to see some crusty nautiluses caught by locals.
- (9) From the island, after taking a banana boat out to sea, the team lowered
- a) a trap 300 metres deep, though this trap did not return anything.
 - b) traps overnight, but were disappointed to find the traps completely empty.
 - c) traps with buoys on the surface, but the buoys drifted away from the traps.
 - d) traps without realising that traps would not be useful in the fast currents.
 - e) two traps at the same depth, which both drifted during the night.
- (10) After the initial disappointment,
- a) based on advice from older fishermen, the team left the traps in the water longer.
 - b) rather than raising the traps, the speaker dived down to inspect them.
 - c) the team decided to use traps that the elder fishermen had successfully used in the past.
 - d) the team took the traps to where the creatures were last seen in 1984.
 - e) the traps were put in water not as deep as the first attempt.

(B) これから放送する講義を聞き、(11)～(15)の問題に対して、それぞれ最も適切な答えを一つ選び、マークシートの(11)～(15)にその記号をマークせよ。

(11) According to the speaker, the difficulty in investigating our own minds is that

- a) attempting to look at one's own mind necessarily modifies it.
- b) clarifying our own minds is not as simple as just turning on a light.
- c) in the same way that we cannot shine a light on a light itself, the mind cannot think of itself.
- d) it can be emotionally difficult to see the darkness in our thoughts.
- e) when we try to look at our own thoughts, it is unclear how to measure them.

(12) According to psychologist Russell Hurlburt,

- a) in daily life we think in words, but with a surprisingly limited vocabulary.
- b) in normal circumstances, people do not have as many thoughts as they suppose.
- c) people assume that they think in words, but this is often not true.
- d) the words we use in our thoughts are a lot more varied than previously assumed.
- e) we use words to think in various situations.

- (13) In the small study involving 16 college students,
- a) after reading short stories, college students were asked to record their opinions.
 - b) hardly any of the thoughts sampled involved inner speech and most were wordless.
 - c) only a third of the thoughts students had while reading involved words.
 - d) over 25 percent of thoughts sampled involved inner speech.
 - e) while listening to short stories, college students were asked to think freely.
- (14) In Famira Racy's research, the participants talked to themselves
- a) about a wide variety of topics.
 - b) especially when walking and getting in and out of bed.
 - c) in emotional situations.
 - d) in the same way as they talk to other people.
 - e) mainly about other people.
- (15) Jill Bolte Taylor's case is referred to as evidence that
- a) as we get older, inner speech becomes more important to our identity.
 - b) brain damage can be affected by inner speech.
 - c) inner speech is important to our sense of self.
 - d) the lack of inner speech can lead us to reflect on who we are.
 - e) without inner speech, short-term memory disappears.

(C) これから放送する講義を聞き, (16) ~ (20) の問題に対して, それぞれ最も適切な答えを一つ選び, マークシートの (16) ~ (20) にその記号をマークせよ。

- (16) According to the lecture, what is forensics?
- a) The analysis of the reliability of enhanced audio recordings.
 - b) The analysis of witness accounts.
 - c) The use of advanced technology in criminal courts.
 - d) The use of DNA evidence to convict a suspect.
 - e) The use of scientific methods to investigate a crime.
- (17) In this lecture, the instructor tells us that DNA evidence
- a) can be too easy to manipulate in some cases.
 - b) can give a false sense of confidence to the court.
 - c) is certainly available.
 - d) is most likely inaccurate.
 - e) is not always reliable.
- (18) According to the instructor, it is
- a) challenging to identify specific voices.
 - b) difficult to know whether a person is tired from a recording.
 - c) easy to match a voice with a recording.
 - d) important to record witness statements.
 - e) impossible to use a recording to convict a criminal.

(19) Which of the following statements about “enhanced audio recordings” is NOT correct?

- a) It can give the listeners a false impression.
- b) It is produced by manipulating the speech signal.
- c) It is sometimes presented to criminal courts.
- d) It makes the court more confident.
- e) It makes the recording easier to understand.

(20) According to the instructor, the transcript of the audio recording

- a) can be misleading.
- b) can never be used in court.
- c) is fairly reliable.
- d) is usually of very poor quality.
- e) must be presented to the court.

- 4 (A) 以下の英文の段落 (21) ~ (25) にはそれぞれ誤りがある。修正が必要な下線部を各段落から一つずつ選び、マークシートの (21) ~ (25) にその記号をマークせよ。

(21) I learnt several things from my conversations with Ian Stephens, (a) most profoundly why the suppression of public discussion can be disastrous for a population, even helping to bring about a famine. A government that generates a disaster like this may have (b) some chance of escaping public anger if the news of (c) it is to be effectively suppressed, so that it doesn't have to face criticism of its policy failure. That is what the British achieved, to some extent, (d) in the case of the Bengal famine. It was only after Stephens spoke up that the British Parliament had to discuss the famine and the British press demanded (e) that it be stopped immediately. It was only then that the colonial government had to take action.

(22) Public discussion clearly has (a) an important role in determining how a society performs. John Maynard Keynes's emphasis on persuasion (b) fits in very well with John Stuart Mill's advocacy of (c) public reasoning in good policy-making. Mill's characterization of democracy as 'government by discussion' (d) belongs to the same territory. Those, incidentally, are not Mill's exact words, but those of Walter Bagehot — though Mill (e) had made the most for the idea to be understood.

(23) Public reasoning in pursuit of better decision-making (a) has been used not just in the post-Enlightenment Western world, but (b) in other societies and at other time, too. While the Athenian origins of voting procedures are often remembered, it is important to note that the Athenians also engaged in discussion as a source of enlightenment. The idea (c) received a good deal of attention in India, too, particularly in Buddhist traditions. In the third century BC, Emperor Ashoka, the Buddhist emperor (d) who ruled over nearly all of the Indian subcontinent (and well into what is now Afghanistan), hosted the third — and largest — Buddhist Council in his capital city of Patna (then called Pataliputra) to settle disputes in the same

way. He emphasized the contribution that open discussions could make to a better understanding of what society needed. He tried to popularize the idea by carving easily readable words on stone pillars across the country and beyond, advocating peace and tolerance as well as ^(e)regular and orderly public discussion to resolve differences.

(24) Similarly, when ^(a)in early seventh-century Japan the Buddhist Prince Shotoku produced the so-called ‘constitution of seventeen articles’ in AD 604, ^(b)he argued for the need to be better informed through consultation: ‘Decisions on important matters should not be made by one person alone. They ^(c)should be discussed with many.’ The idea that democracy is ‘government by discussion’ — and not just about voting — ^(d)remains as extremely relevant today. Many of the large failures of democratic governments in recent years have arisen, I would argue, ^(e)precisely from inadequate public discussion, rather than from any obvious institutional barrier.

(25) ^(a)I was interested in this question since my schooldays when my grandfather Kshiti Mohan drew my attention to Emperor Ashoka’s rulings on public arguments, but Mill and Keynes offered me a new understanding about the role of public discussion in social choice. This was not an aspect of social choice that had particular prominence in Kenneth Arrow’s thinking about the subject, ^(b)which influenced me so much in other ways, but I was happy that it was ^(c)another of the many topics in social choice theory that Piero Sraffa and I could discuss during our afternoon walks. Despite ^(d)Piero’s reluctance to use the term ‘social choice theory’ (which he found too technical), ^(e)he was influential in teaching me that discussion and persuasion are just as much a part of social choice as voting.

注

post-Enlightenment 18世紀の啓蒙運動以降の

Athenian アテーナイ(アテネ)の

Buddhist 仏教(徒)の

(B) 以下の英文を読み、下線部(ア)、(イ)、(ウ)を和訳せよ。(ア)については“so”が指す内容を明らかにして訳すこと。

One year, as the school library supervisor, I was in an elementary school library that had begun circulating books on the first day of school. I was helping at the circulation desk. One fourth grader asked if he could have a specific book. “Of course!” I said. (ア)He didn’t think so, as his teacher had told him to check out a book with a yellow label. So, I took out my library supervisor’s business card, wrote a note to the teacher on the back of it, stuck the note in the book, and checked it out to the child.

I imagine this scenario — in which children must choose between books based on instructional priorities and those they want to read for pleasure — plays out frequently in school libraries or classrooms. (イ)There is a divide between the noble calling to teach children how to read and the equally noble calling to inspire a love of reading. We school librarians dance across this divide daily.

The motivation to read is largely self-determined, and choice is a powerful driver. People, including children, choose to do that which is fun, personally rewarding, or easy. This is where the dance begins! If learners develop and satisfy personal curiosity by reading widely and deeply in multiple formats, then we must surround our learners with opportunity and help them make connections between the school library’s resources and their interests. Finding and borrowing books (or using other kinds of texts) should be fun, accessible, and free of barriers. We need to consider how our policies, procedures, and routines inspire children and encourage their engagement with text, as well as how they guarantee all learners’ rights to intellectual freedom. (ウ)Reducing choice, whether through labeling, age-related rules, or restrictive policies, is not a strategy that makes children fall in love with books and reading. If our goal is to help learners self-identify as readers, then we must help them make connections with text through practices that celebrate the reading life.

5 以下の英文を読み, (A) ~ (D) の問いに答えよ。

I am eight years old, sitting in my childhood kitchen, ready to watch one of the home videos my father has made. The videotape still exists somewhere, so somewhere she still is, that girl on the screen: hair that tangles, freckles across her nose that in time will spread across one side of her forehead. A body that can throw a baseball the way her father has shown her. A body in which bones and hormones lie in wait, ready to bloom into the wide hips her mother has given her. A body that has scars: the scars over her lungs and heart from the scalpel that saved her when she was a baby, the invisible scars left by a man who touched her when she was young. A body is a record or a body is freedom or a body is a battleground. Already, at eight, she knows it to be all three.

But somebody has slipped. The school is putting on the musical *South Pacific*, and there are not enough roles for the girls, and she is as tall as or taller than the boys, and so they have done ^(A)what is unthinkable in this typical 1980s American town, in this place where the men do the driving and the women make their mouths into perfect Os to apply lipstick in the rearview mirror. For the musical, they have made her a boy.

No, she thinks. They have *allowed* her to be a boy.

What I remember is feeling my face ア(26) as my father loads the tape into the player. Usually I ア(27) watching videos of myself. Usually there is this stranger on the screen, this girl with her pastel-colored clothing, and I am supposed to pretend that she is me. And she is, I know she is, but also she isn't. In the third grade I'll be asked to draw a self-portrait in art class, and for years into the future, when I try to understand when this feeling began — this feeling of not having words to explain what my body is, to explain who I am — I'll remember my ア(28) as I placed my drawing next to my classmates'. They'd drawn stick figures with round heads and blond curls or crew cuts; they'd drawn their families and their

dogs and the bright yellow spikes of a sun. One had drawn long hair and the triangle shape of a dress, and another short hair and jeans. (B)_____ so easily?

I had drawn a swirl.

Now, in the kitchen, what I notice is that my brothers and sisters are feeling embarrassed in their seats, asking if they can leave—and that I, somehow, am not. I am sitting perfectly still. Is it possible that I want to see this video? The feeling is peculiar. I have not yet known the ア(29) of taking something intimately mine and watching the world respond. Someday, I will be a writer. Someday, I will ア(30) this feeling. But at eight years old, my private world both pains and sustains me, and sharing it is new.

My mother makes my brothers and sisters quiet and passes popcorn around the table. My father takes his spot at the head. Onscreen, the auditorium of an elementary school appears. At the corner of the stage, there are painted palm trees on the board.

Then the curtains part, and there I am. My hair brushed back, my ponytail pinned away, a white sailor's cap perched on my head. Without the hair, my face looks different: angular, fine-boned. I am wearing a plain white T-shirt tucked into blue jeans, all the frill and fluff of my normal clothing stripped away—and with it, somehow, so much else. All my life, I have felt awkward—wrong-sized and wrong-shaped.

But look. On the screen. (C) There is only ease.

I don't know whether the silence I remember spread through the kitchen or only through me. My mother is the first to speak. "You make a good-looking boy!" she says.

I feel the words I'm not brave enough to say. *I know.*

Soon after, I began to ignore the long hair that marked me so firmly as a girl, leaving it in the same ponytail for days on end, until it knotted into a solid, dark mass. All my friends were boys, and my dearest hours were spent playing Teenage Mutant Ninja Turtles on the lawn with my twin

brother and the neighbor boy. My room was blue, and my teddy bear was blue, and the turtle I wanted to be was Leonardo, not only because he was smart but because his color was blue. When my twin brother got something I didn't — to go to the baseball game, though we were all fans; to camp with the Boy Scouts while my sisters and I were taken to the イ; to keep the adult magazines I discovered in his bedroom — and the reason given was that he was a boy, ア(31) choked me with tears. That was grief, I think now, the grief of being misunderstood.

One afternoon, when my brother yet again went shirtless for a game of catch and I wasn't allowed to, I announced to my father that I didn't want to be a girl, not if being a girl meant I had to wear a shirt. My father went to get my mother. They whispered together, then my mother explained that I should be happy to be a girl — there were so many good things about it. I knew there were; that wasn't the problem. The problem was that people kept calling me one. I remember realizing I couldn't explain this to her.

Back then, in 1985, the word *genderqueer* — how I now identify, the language that would eventually help me see myself — hadn't yet been invented.

注

freckles そばかす

scalpel (外科手術用の)メス

rearview mirror 車のバックミラー

stick figure 手足を線で描くなど, 簡略化された人物画

crew cut 毛を短く刈る髪型

swirl 渦巻き

auditorium 講堂

angular 骨ばった, やせこけた

frill and fluff フリルや飾り

Teenage Mutant Ninja Turtles 1980年代から米国で人気のある同名のコミックやアニメ, 映画に登場するスーパーヒーローの集団

(A) 下線部 (A) が指している内容を示したうえで、それがなぜ “unthinkable” なのかを説明せよ。

(B) 下に与えられた語を正しい順に並べ替え、下線部 (B) を埋めるのに最も適切な表現を完成させよ。本文では大文字で始まる語も小文字にしている。

had how known like looked they they what

(C) 下線部 (C) について、誰がどのように感じたかを、その理由も含めて説明せよ。

(D) 以下の問いに解答し、その答えとなる記号をマークシートにマークせよ。

(ア) 空所アの (26) ~ (31) には単語が一語ずつ入る。それぞれに文脈上最も適切な語を次のうちから一つずつ選び、マークシートの (26) ~ (31) にその記号をマークせよ。ただし、同じ記号を複数回用いてはならない。

- a) flush b) hate c) love d) pleasure
e) rage f) shock

(イ) 空所 に入れるのに最も適切な語を次のうちから一つ選び、マークシートの (32) にその記号をマークせよ。

- a) ballet b) football game
c) hospital d) shopping

(ウ) 本文の内容と合致するものはどれか。最も適切なものを一つ選び、マークシートの (33) にその記号をマークせよ。なお、以下の選択肢において they および their は三人称単数を示す代名詞である。

- a) The author did not like their body.
b) The author had to play with boys because there were only boys in their family and neighborhood.
c) The author played a male role in the musical in elementary school.
d) The author thought there was nothing good about being a girl.
e) The author was happy to be a girl when they were in elementary school.

問題 A

The empty shells of the “Crusty Nautilus” wash up on the shore in Papua New Guinea from time to time, but no one has seen the animals alive since the 1980s. The deep-water creature gets its name because of a crust that forms on its shell. As a marine biologist working in the Pacific for environmental preservation, I have wondered for years if this species is even still living here.

Early one morning in July 2015, I set out to find the answer, embarking on a journey to the waters of Papua New Guinea in search of this rare species. My partners on this scientific expedition hope that we will be the first to get video footage of the species.

Our journey has taken on a sense of urgency because Papua New Guinea has moved rapidly in recent years to expand deep-sea mining. Documenting what exists in some of these deep-water ecosystems before they are altered by industry may be the key to their protection.

From Brisbane, we fly to Port Moresby, the capital of Papua New Guinea, then on to an island called Manus. We sail several hours south to a smaller island where a live crusty nautilus was last seen in 1984. As we arrive on the beach, we are greeted by the island’s chief, and the director of a network of tribal communities that has recently declared their sea a protected area.

Eager to get started that night, we climb onto an engine-powered banana boat, steer out to deep water and lower two traps. Buoys mark the traps’ locations at the water’s surface.

The next morning we head back to sea. The first trap had drifted in strong currents during the night, and is now in water well over 300 metres deep. Members of our team pull it up, but the cage is empty. We move quickly to the second trap. It too is empty. Our entire team is visibly disappointed.

We gather together after lunch and plan a new approach: A few elder fishermen who remember the 1984 expedition recall that their team found specimens in slightly shallower waters. We decide to take their advice. We go out once again, lower the traps in shallower waters and wait out the night back at the Island.

The following morning, the team slowly raises the first trap. When the cage comes into view, I am unable to wait any longer and dive down to inspect it. I can hardly control my excitement when I count three crusty nautilus inside.

I swim up to the surface as fast as I can and shout the news to everyone waiting on the boat. We put

on our diving equipment, I grab my camera, and soon we are filming crusty nautilus underwater around a coral reef. Later that day we attach tiny tags to the shells of the nautilus so that we can track their movements and learn more about the depth and temperature ranges that they prefer.

We had done it. Our team of scientists, conservationists, fisheries staff and community members had found and filmed a crusty nautilus for the first time, and we were now learning previously unknown information about this rare marine species.

問題B

What were you thinking about a second ago? Or, rather, how were you thinking about it? It's a surprisingly tricky question to answer.

Investigating what's going on inside our own minds doesn't seem to be a difficult task. But by trying to shine a light on those thoughts, we're disturbing the very thing we want to measure in the first place. It's like turning a light on quickly to see how the darkness looks.

Psychologist Russell Hurlburt at the University of Nevada, Las Vegas, has spent the last few decades training people to see inside their own minds more clearly in an attempt to learn something about our inner experiences. What he's found suggests that the thoughts running through our heads are a lot more varied than we might suppose.

For one thing, words don't seem to be as important in our day-to-day thoughts as many of us think they are. "Most people think that they think in words, but many people are mistaken about that," he says.

In one small study, for example, 16 college students were given short stories to read. While reading, they were asked at random times what they were thinking. Only a quarter of their sampled thoughts included words at all, and just 3% involved inner speech.

But for psychologists like Hurlburt, researching inner speech is not an easy task. Simply asking people what they're thinking about won't necessarily prompt an accurate answer, says Hurlburt. That is partly because we're not used to paying close attention to our wandering minds.

Famira Racy, who is the co-ordinator of the Inner Speech Lab at Mount Royal University in Canada and her colleagues, recently used a method called thought listing – which, unsurprisingly, involves getting participants to list their thoughts at certain times – to take a broader look at why and when people use inner speech, as well as what they say to themselves. They found that the participants in the study were talking to themselves about everything from school to their emotions, other people,

and themselves, while they were doing everyday tasks like walking and getting in and out of bed.

According to Racy, research shows that inner speech plays an important role in self-regulation behaviour, problem solving, critical and logical thinking and future thinking.

There's also growing evidence that inner speech is important for self-reflection. After scientist Jill Bolte Taylor recovered from a stroke she suffered when she was 37, she wrote about what it was like to experience a "silent mind" without inner speech for several weeks. It was such an overwhelming task, she wrote, to simply sit there in the centre of a silent mind, trying to remember who she was and what she was doing.

But even though current research can't yet shine a light on those bigger truths about the inner workings of our minds, learning how to pay attention to your thoughts could help you on an individual level.

問題C

Hi, my name is Jane Kentala, the instructor for this introductory course in Forensic Science.

First, what's forensic science, or forensics? In order to convict a criminal, we need evidence that the suspect has committed the crime. Forensics is about how to apply scientific methods to investigate a crime. I'm sure you've all seen movies in which they used DNA to convict the criminal. In real life, however, while some suspects have been found guilty based on DNA evidence, some of them were judged innocent many years later based on a more reliable DNA technique. So, we must keep in mind that, even today, DNA evidence is still not 100% reliable *and*, very importantly, not always available. So what other types of evidence can be used instead of or in addition to DNA?

The testimony of a witness? Can we trust the witness' recall of the events, is it really reliable? Can their memory be influenced by their expectations or affected by trauma? What if a witness has only *heard* voices? Can a person reliably distinguish a voice from another? We will discuss all of these issues later. But for today let's talk about audio recordings made at the crime scene or over the phone.

In many movies, the audio recordings are clear enough to understand most of the words recorded, and it is just a question of matching the recording with the voice of the suspect. The investigators usually do this with fantastic technology that can produce a match within a few seconds. I'm afraid that in reality, however, this amazing technology doesn't exist. At least, not yet. Why?

To assess the possible match between a person's voice and the recording of a voice, the speech can be analyzed with computer software. Although speech scientists can analyze various features of speech, it is not yet clear which features can be used to distinguish one voice from another. That is because speech does not only vary *between* individuals, it also varies *within* the same person.

Obviously, the voice of a person may be affected by sickness, tiredness and let's not forget alcohol, but it may also vary according to whom that person is speaking to, the social context, environmental conditions, and so on.

An additional problem lies in the quality of the recording, which is more often than not, very poor. And I mean, really, really poor. Since the recording has been done most likely in secret or by accident, it is usually done with a low quality microphone, possibly hidden in a suitcase, sometimes far from the center of the crime and with considerable background noises. This lack of quality interferes further with the ability to analyze the speech in the recording properly. Not only can it be difficult to identify who is speaking, but it may be difficult to even figure out what has been said or done.

In an attempt to solve this problem, a recording is sometimes "enhanced" before being presented in a court of law. This is usually done through manipulation of the speech signal, which gives the *impression* that we can understand the recording better. And I say "*impression*", because forensic researchers have demonstrated that it does NOT make the recording easier to understand. Instead, it provides a false sense of confidence in what people "*think*" they heard. To make matters worse, a transcript of the recording is sometimes presented to the court of law, which further increases this false sense of confidence, while the reliability of the transcript remains questionable.