

I 次の文章を読んで、問1～3に答えなさい。(配点35点)

Small mammals — mice, beavers, and their relatives — have long hidden in the wild shadows of large beasts. But recently, the world’s little creatures stepped quietly into the biology spotlight. They were called onto the stage by biologist Jessica Blois and her team, who reported a new discovery in the journal *Nature*, connecting the loss of small mammals to a past period of climatic warming.

Given the current global warming trend, the new research likely provides
 (1) insight into the future of small mammals and that of all the creatures with which they coexist, including humans. The study definitively shows that drop-offs in species diversity among small mammals in North America coincided with the warming shift from the icy Last Glacial Maximum* (LGM) some 21,500 years ago to the comparatively toasty interglacial period of the Holocene*, which began about 11,700 years ago.

The work, led by Blois, focused on small mammal fossils excavated from the Samwell Cave Popcorn Dome in northern California. The Samwell Cave area has a high degree of species diversity and shares climatic features with each of the different surrounding ecosystems. Hence, as Blois put it, “We figured that this
 (2) region should be particularly good for recording climatic and wildlife change through time.”

In comparing fossils from different depths in the Samwell Cave area, the researchers found that populations of certain small-mammal species decreased, whereas others increased. Among the species that experienced declines were the Mazama pocket gopher* and the mountain beaver, both of which migrated to cooler areas as soon as temperatures began heating up following the LGM. Populations of ground squirrels and various chipmunks also decreased. But while these species declined, generalists such as deer mice*, which are relatively nonspecific in their habitat requirements, expanded.

Minor shifts in populations of small mammals, such as the moving out of the Mazama pocket gopher, can cause significant changes in ecosystems. “Small mammals are crucial members of local food webs, and they play many important roles within ecosystems,” Blois explained. “For example, they mix up the soil and recycle nutrients, and disperse seeds, and they are also an important food source for larger animals, like hawks, owls, foxes, and wolves.”

The team’s work now enables biologists to study questions about the (3) response of small mammals to recent climate change in the context of past climate events. Since it is known that ecosystems can be destabilized following the loss of species, scientists already have some useful hypotheses to work with. “The small mammal community serves as a useful, measurable indicator — if these changes are happening in the small mammals, comparable changes are likely happening in many other communities as well,” Blois said.

Losses in small mammal diversity can also potentially impact the so-called ecosystem services*, such as nutrient cycling and biomass production, that benefit human communities. Regardless of the unknowns concerning the individual contributions of small mammals to ecosystem services, it can be said that altered species distribution and the ensuing shifts in ecological function could change how human societies interact with their local environments.

注 Last Glacial Maximum 最終氷期最盛期；

Holocene 完新世；

Mazama pocket gopher マザマホリネズミ；

deer mouse シロアシネズミ；

ecosystem services 生態系の公益的機能(生物・生態系に由来し，人類の利益になる機能)

問 1 シロアシネズミが減少しなかった理由を第4段落からまとめ、「シロアシネズミは」に続けて、15字以内の日本語で説明しなさい。ただし、句読点も1字に数えます。

問 2 次の(a)~(h)のうち、本文の内容と合致しないものを二つ選び、記号で答えなさい。

- (a) A decrease in the number of small-mammal species may well indicate a comparable change in other animals.
- (b) A decrease in small-mammal diversity can influence biomass production.
- (c) A decrease in the number of small mammals affects the food chain.
- (d) Small mammals decrease plant diversity by eating plant seeds.
- (e) Small mammals improve the quality of the soil in their habitats.
- (f) The LGM occurred prior to the Holocene.
- (g) The LGM saw the least diversity in small mammals in North America.
- (h) The LGM was colder than the Holocene.

問 3 下線部(1)~(3)を日本語に訳しなさい。

Ⅱ 次の文章を読んで、問1～3に答えなさい。(配点35点)

(1) Since parents control who sleeps where, it is their everyday beliefs that decide sleeping arrangements. In those cultures in which the prime parental goal is to integrate children into the family, the household, and society, babies are held close at hand, even during the night. It is primarily in those societies (mostly in the industrialized West, especially in the United States) where a premium is placed on independence and self-reliance that babies and children sleep alone. Underlying this unconscious societal goal is an even more fundamental assumption made by Americans and some other groups — how we treat children from day one has a major effect on how they turn out as adults. This philosophy is not shared by all cultures. The Mayans*, for example, see mother and infant as one unit that cannot be separated, and believe offspring are not ready for guidance until they can speak and reason, when they are older children. Newborns in their culture are not capable of being trained, and, they feel, should just be cared for.

Sleep, in other words, can take on a moral nuance. And the basis for that morality is, of course, culturally constructed. American parents believe it is morally “correct” for infants to sleep alone and thus learn (A). They view child-parent co-sleeping as strange, psychologically unhealthy, and even sinful. Those in co-sleeping cultures see the Western practice of placing an infant alone as wrong and a form of child neglect or parental irresponsibility. Parents in both kinds of cultures are convinced that their moral structure is “correct”.

The difference in attitude also reflects the way different cultures view sleep in general. Mayans treat sleep as a social activity and think sleeping alone is a hardship, whereas Americans treat sleep as a time of (B); sharing a bed is considered a sacrifice. Americans make a clear distinction between daytime and nighttime and the kinds of activities that can take place during each time of day, while the San* think nothing of waking up in the middle of the night and

spending a few hours around the campfire talking. There is no insomnia* in their culture because no one is expected to sleep through the night. In fact, cross-cultural sleep research has shown that night waking is actually much less frequent in Western cultures than in others. And yet Western parents view those comparatively few periods of (C) during the night as much more problematic than parents in societies where babies' sleep is much lighter.

But it is not just (D), or modernity, that has fostered nights of uninterrupted solitary sleep. Japanese children sleep with their parents until they are teens. Even when other rooms and other beds are available, Japanese babies and young children are placed on futons in the parents' room. The Japanese see the child as a separate biological organism that needs to be drawn into an interdependent relationship with parents and society, especially with the mother. Japanese prefer not to sleep alone; they do not expect, and probably cannot imagine being interested in, sleeping alone. For the Japanese the concept of family includes sharing the night, and the model of the family tends to orient toward mother and children, with the father on the outside, rather than the American version of the ideal nuclear family with mother and father first and foremost as partners, and children subordinate to that primary relationship.

注 Mayan マヤ人(中央アメリカに住む民族)；

San サン人(アフリカ南部のカラハリ砂漠に住む狩猟採集民族)；

insomnia 不眠症

問 1 本文によると、以下の(a)~(f)の考え方はどの人たちのものですか。

American, Japanese, Mayan, San の中からそれぞれ一つ選び、答えを英語で書きなさい。なお、同じ選択肢が2回以上使われることもあります。

- (a) A mother and her baby are so close that it is as if they were one.
- (b) Babies are individuals but they need to be shown how to live in relationships with others.
- (c) Babies should be taught to be independent as early as possible.
- (d) The notion of “family” emphasizes the relationship between a mother and her child more than that between a wife and her husband.
- (e) There is no point training a child until he or she has sufficient ability to talk and think.
- (f) Waking in the middle of the night is not considered a problem at all.

問 2 空所(A)~(D)に入る最も適切な語を下から選び、答えを英語で書きなさい。ただし、それぞれの語は一度しか使えません。

alertness independence industrialization privacy

問 3 下線部(1), (2)を日本語に訳しなさい。

Ⅲ 次の文章を読んで、問1～4に答えなさい。(配点30点)

“I keep worrying about Martha,” my mother said as we sat in the hospital corridor, waiting for my father to be examined by the doctor. “We left her playing in the yard and didn’t tell her where we were going. I hope she’s not sitting somewhere crying.”

I wiped away tears that were streaming down my cheeks. “But I’m Martha. I’m right here with you,” I tried to reassure her.

“No, not you,” my mother answered. “My little Martha.”

Fears of abandonment, past and present, enveloped us as we tried to adjust to my father’s sudden incapacity.

(1)

The call had come the night before. My father had fallen and broken his hip. An operation to replace the hip joint was scheduled for the next morning. A friend was staying with my mother for the night. “I’ll come as soon as I can — on the early morning plane,” I promised.

My mother and father, married for fifty-eight years, had never had a serious emergency before, although my mother had become increasingly confused in the last several months. “And is your mother still alive?” she had asked me on my last visit, with a sociable interest in the young woman she had never seen before. Now, with the daily routine disrupted and the nearly constant companionship of my father removed, her disorientation was more severe.

“But I’m worried about Martha,” my mother said again when we had returned home and sat down for lunch. “I’m going out to look for her.”

(2)

“But I’m Martha,” I tried again. “Little Martha grew up and turned into me.”

“That’s ridiculous,” my mother said. She opened the front door, went out to the street, and stood tensely, looking up and down for the little girl she was sure she had seen just that morning. No one in sight. Then to the back of the house and through the back lot to the other street. “I’m going to ask those people over there if they’ve seen her.” My mother, becoming increasingly frantic, was ready

(3)

to plunge into traffic and cross the busy street. “Let’s go home,” I pleaded.

On the way back to the house, my mother said, “It’s not like Martha to go away like that without telling me. If only she had left a note.”

A note! Seeing a way to relieve my mother’s worry, I scribbled a note as soon as we were in the house, and left it where it could be discovered a minute later. “Mama,” it said, “I have gone to stay with Mary Ann for a few days. Please don’t worry. I’m okay. Martha.”

“Look,” I said, “here’s a note. What does it say?” My mother read it aloud slowly and immediately began to calm down.

“Thank goodness,” she said. “She’s all right. She’s with Mary Ann.” With the tension gone, we sat down to finish lunch and spend a peaceful afternoon at home.

That evening in the hospital, my mother told my father that Martha had gone to stay with Mary Ann for a few days but that she was still worried about her. My father said, “Don’t go looking for another Martha. We already have one, and that’s enough.”

The next day, Martha’s absence was still very much on my mother’s mind. “What can she be doing?” she wondered. “She never goes off like that without arranging it with me. Besides, I want her to go to the hospital to see Daddy.”

I assured my mother that her daughter would come home soon. “Besides,” I said, “Martha is a clever little girl. She can take care of herself.”

“She needs a clean dress for church on Sunday,” my mother said.

“It’s only Thursday,” I replied. “Plenty of time.”

“Where did you learn to take over a kitchen like this?” my mother asked as I fixed dinner that night. “It’s nice of you to come and stay with me. Do you have a family?” Having been accepted as a companion, if not a daughter, I settled into a friendly routine with my mother.

It wasn’t until my brother came on Saturday that I was recognized as part of the family. “Bob will take this bed, and you can sleep in your old room,” my mother said that night. It felt good to be legitimate again.

“You see,” my father said the next day, “Martha is here. She has been here all the time. There was no need to worry.”

“But there was a note!” my mother shouted.

“I wrote the note,” I explained. “I wrote it to calm you when you were so anxious,” and comprehension flickered for a moment in my mother’s gradually dimming eyes.

問 1 下線部(1)の内容を具体的に表す文を本文の中から探し、解答欄に英語で書きなさい。

問 2 下線部(6)と同じ内容を表す文を本文の中から探し、解答欄に英語で書きなさい。

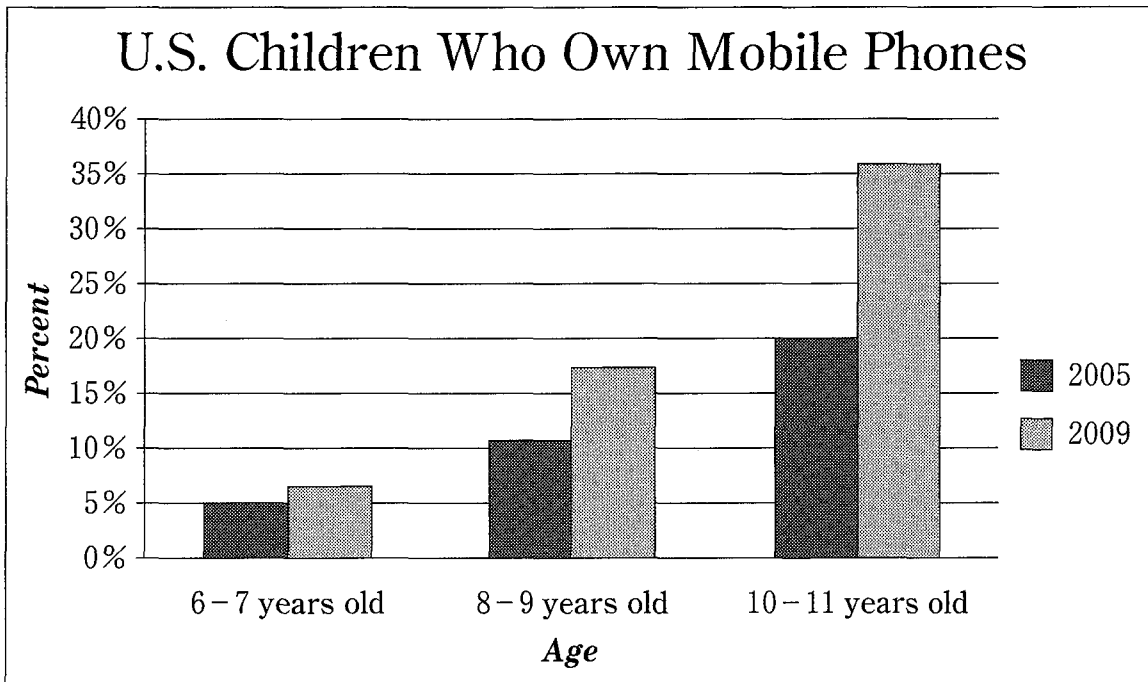
問 3 下線部(2), (3), (4), (5), (7)が指す人物を、下の(a)~(d)からそれぞれ一つ選び、記号で答えなさい。同じ記号を2回以上使ってもかまいません。

- (a) Martha as a child
- (b) Martha as an adult
- (c) Martha’s friend
- (d) Martha’s mother

問 4 次の(ア)~(カ)のうち、本文の内容に合致するものには○、合致しないものには×を解答欄に記入しなさい。

- (ア) Both of Martha’s parents were hospitalized.
- (イ) It wasn’t until Sunday that Martha revealed who wrote the note.
- (ウ) Martha tricked her mother by writing a note.
- (エ) Martha went to stay with Mary Ann while her father was in hospital.
- (オ) Mother finally recognized Martha on Saturday.
- (カ) While Mother was waiting in the hospital corridor, Martha was in the yard playing.

IV 次のグラフを見て、問1、2に英語で答えなさい。(配点25点)



問1 What does this graph tell us? Write a paragraph of around 60 words. Include one brief introductory sentence that outlines the general trend, and two sentences that discuss some specific details from the graph.

問2 At what age do you think people should get their first mobile phone? Write another paragraph of around 60 words giving your opinion. Include reasons to support your opinion.