

I 次の文章を読んで以下の問い(問1～問7)に答えなさい。下線部の番号は問いの番号と同じです。解答はすべて日本語で書きなさい。なお本文中に*で表示されている語彙については本文の後ろに注があります。(配点 80点)

The climb was over.

Kelly Perkins stood on the summit of Mount Fuji, a freezing wind whipping through her short blonde hair, a mix of tears and rain streaming down her cheeks. In her hand she held the photo of a person⁽¹⁾ she had never met, never spoken to, never seen. She knew only a few things about this woman.

She knew that the woman was about 40 years old when she was thrown from a horse and that she had died somewhere in southern California two and a half years previously. Kelly knew these things because she now carries that woman's heart in her chest. And as she stood on the rim of Mount Fuji's volcanic crater, she also carried the ashes of this woman, whose death saved her life.

In November 1995, Kelly Perkins was at the UCLA Medical Center dying of viral cardiomyopathy*. Three years earlier, a virus had somehow infected her heart, done its damage and vanished.

She first noticed the problem one night when her heart began to race. Her family doctor found nothing wrong. He suspected stress. Kelly knew that wasn't it.

"I knew something was up," she said. "And I knew it wasn't in my⁽²⁾ head."

Before going on a backpacking trip, she had herself checked again. This time, tests showed her heart was running amok*. She was taken to a nearby hospital for a more advanced test, which showed the left ventricle* was scarred and swollen to about four times normal size. A

device was implanted in her side to shock her heart into the proper rhythm.

For two years, she learned to live with the problem and a very unpleasant side-effect*; the device tended to shock her when she laughed. So she learned not to.

⁽³⁾ But a change in medication* put an end to even that modicum* of stability she had found in life. To switch, she had to stay off her old medication for a full day. Without it, however, she was unable to function. Her heart ran wild, and she collapsed. She was admitted to the medical center at UCLA and put at the top of their list for a heart transplant.

Somewhere, not too far away, a 40-year-old woman was thrown from her horse.

Kelly got her new heart in November 1995 and recovered so well that within a few months she was able to return to a favorite hobby — hiking in the mountains.

She and her husband, Craig, real estate appraisers* both aged 36, started out on the gentler slopes near their home in Laguna Niguel, California. Soon they were making more serious climbs. Just ten months after her transplant, Kelly climbed Yosemite's Half Dome*. The 27-kilometer hike to the 1,250-meter summit took her eleven and a half hours.

Next came Mount Whitney. At 4,418 meters, Whitney is the highest U.S. peak outside Alaska. Kelly had done it before, with her old heart.

"I wanted to prove that I could do it with my new heart," she said, "to prove that to myself."

With Craig and a four-person support team, she made the three-day, 35-kilometer round-trip last September. It put her in the national spotlight.

Kelly was the first heart transplant recipient known to have climbed Whitney. She was sought out for interviews. She appeared on "Good Morning America," a popular morning television show broadcast nationwide in the United States.

Among the millions of people who read Kelly's story, one was particularly touched.

"The donor's daughter read an Associated Press* story about Kelly and put two and two together," Craig said. "She found our number through information and called our home."

"It was totally unexpected, I was totally taken aback," he said of the message recorded on his answering machine.

While Kelly was making her Whitney climb, a debate over transplants raged in Japan. For years, the Japanese medical community had urged the recognition of brain death, the condition that makes heart, lung and liver transplants possible.

But opposition was intense. Critics claimed doctors shouldn't be trusted to make such a judgment, that transplant advocates would rush to harvest organs instead of struggling to save a dying patient. Others simply felt uncomfortable with the idea, for reasons of religion or superstition.⁽⁴⁾

Now, after being repeatedly shot down in the Diet, a bill recognizing brain death was about to become law. Even so, Japan had virtually no infrastructure for actually carrying out transplants. Legal obstacles threatened to make harvesting organs extremely difficult and potential donors were few. For many Japanese in need of a transplant, going abroad remained the only real option.

"I had seen little Japanese kids at UCLA waiting for a transplant," Kelly said. "It's heartbreaking."

So, after Whitney, she decided to climb Mount Fuji. Maybe,

she thought, her climb could change the way some people in Japan felt⁽⁵⁾
about transplants.

The ascent was split into two legs. It began at station 5, a little base camp 2,515 meters up, complete with restaurants, lodges and a post office. From there Kelly, who is 1.60 meters and weighs 43 kilograms, hiked for four hours with her husband and a personal trainer to station 8. There they rested and acclimatized for several hours.

Mount Fuji, Japan's highest peak at 3,776 meters, is an almost perfect cone. The volcano is a symbol of beauty in Japan and has been worshipped for centuries. Seeing the sunrise from the summit is considered by many to be a sacred experience.

The 4-hour final trek began just after midnight under full moon. The climb is not technically challenging. Pilgrims need no mountain-climbing skills. But Fuji's slopes are covered with a muscle-grinding mixture of ash and loose stone. That was a problem for Kelly.

Because its nerves were severed for her transplant, Kelly's heart does not "know" immediately when to start beating faster to match the exertion of her body. Adrenaline* kicks in* after a few minutes, but until then she must endure an oppressive feeling of fatigue. And, unlike her previous climbs, the trail up Fuji offers virtually no level ground.

"I'd heard people climbed it in sandals," she said. "But it's a hard climb."

After the call from the daughter, Craig had kept most of his dealings with the donor's family to himself. Kelly had spoken to her donor's daughter on the phone, but it was a rather brief conversation, and they had never met. Fear was part of the reason.

"I had mixed feelings. When you need a transplant, you think of it
⁽⁶⁾ sort of like a pill. It's the medicine that will make you well," Kelly

said. "It's not until everything is OK for you that you can start grieving for the donor. It's hard."

"It isn't just a pill that saved her life anymore," he added.

"When you have a family associated with it," he said, "it becomes more than a medication, it becomes a gift. It's a real gift."

Before coming to Japan, Craig told the donor's daughter about the trip. She asked if he and Kelly would take her mother's ashes and picture to the summit. He agreed. But he didn't tell his wife until they had reached their goal.

Just after sunrise, crouching on Fuji's rugged rim, they opened the small leather pouch.

Clutching the photo and weeping, Kelly watched the gray remains of the woman who gave her heart swirl from the pouch and disperse over Japan's sacred volcano, vanishing into the alpine storm.

"It's almost like seeing an angel," she said. "She has been a kind of mysterious figure in my life for so long. But now it's real."

(7)

(注)

adrenaline アドレナリン(ホルモン的一种)

Associated Press AP通信社(通信社の名前)

kick in 放出される

medication 治療, 薬

modicum わずかな量

real estate appraiser 不動産鑑定士

run amok 心拍数が異常に上がる

side-effect (薬の)副作用

ventricle (心臓の)心室

viral cardiomyopathy ウイルス性心筋症

Yosemite's Half Dome カリフォルニア州・ヨセミテ大峡谷にある山の名前

問 1 下線部(1)の人物と Kelly Perkins はどういう関係ですか。

問 2 下線部(2)はどういうことですか。具体的に説明しなさい。

問 3 下線部(3)はどういう意味ですか。具体的に説明しなさい。

問 4 下線部(4)はどういう内容ですか。具体的に説明しなさい。

問 5 下線部(5)の具体例を2つ挙げなさい。

問 6 下線部(6)における“mixed feelings”を具体的に説明しなさい。

問 7 下線部(7)はどういう意味ですか。具体的に説明しなさい。

II 次の文章を読んで下の問い(問1～問4)に答えなさい。下線部の番号は問いの番号と同じです。解答はすべて日本語で書きなさい。なお、本文中に*で表示されている語彙については本文の後ろに注があります。(配点 70点)

One of the few predictable things about evolution is its unpredictability. Which dinosaur* could have guessed that descendants of the small creatures playing at its feet would soon replace it? And how could it have been predicted only 30,000 years ago that one moderately common primate would be among the most abundant of mammals while its genetically almost indistinguishable relative was near extinction?

The opportunistic nature of evolution — its ability to cope with the unexpected — means that, just as in politics, it is almost impossible to guess what is going to happen next.

There have, of course, been many attempts to do so. Many predictions by authors of greater or less literary merit about the future of humanity involve a Lamarckian* view of evolution. Heavily used organs get larger; those no longer needed disappear.

Less pretentious utopias have our descendants with X-ray vision or computers as brains. However, if we can be sure about anything it is that humanity will not become superhuman. We will, as always, build ⁽¹⁾ on our present weaknesses rather than making a new evolutionary start. The mechanisms of change that shape the future will certainly be those that led to modern humans.

Biologists who try to predict the future always run the dreadful risk of being taken seriously, either by themselves or — even worse — by politicians who cannot believe the depth of our biological ignorance. The early days of human genetics* were marred by statements of great (and quite unjustified) confidence about the fate awaiting us unless genetically defective individuals were prevented from reproducing.

Ideas derived from the eugenics* movement led to the horrors of the Nazi* experiment; and, although this is less widely known, to the American immigration laws that prevented Eastern Europeans from escaping it. Since then most geneticists have been more careful about discussing the social implications of their subject and less confident about their ability to do so. There have, nonetheless, been changes in the genetics of human populations that are certain to affect our evolutionary future. We can at least speculate about what that might be.

Evolution involves variation, a struggle for existence, and natural selection. ⁽²⁾ Random events also play an important part, particularly in small populations. What will happen to these processes over the next 1,000 years?

The amount of variation may well go up: migration, the melting pot, means that the genes* of the peoples of the world will mix together into a rich genetic soup and there will be no shortage of the raw material of evolution. In the West at least (an important proviso), most babies born now survive until they themselves have babies, so that existence is less of a struggle than it was. Natural selection involves inherited differences in the chance of surviving that struggle, and as most of us do survive nowadays until we have passed on our genes, the strength of selection has decreased.

Evolution takes place quickly in small and isolated populations, as there is then a chance for random accidents to change the fate of a gene very quickly. Such populations are now very rare and most people no longer marry the girl or boy next door — the evolution of the bicycle made a big difference to our future.

Optimists have often claimed that medical advances and improvements in our environment will greatly increase our length of life; men may become immortal. Without genetic variation, there can be no evolutionary progress.

Depressingly enough, it seems that we may already have reached the end of the road of increasing human longevity*, in Western societies at least. The great killer of past centuries was infectious disease. However, improvements in public health have had a dramatic effect on life expectancy*. In the United States, mean life expectancy at birth has risen during the present century from 47 to 75 years.

Infectious disease has been largely controlled, and cancer and heart disease are now among the main causes of mortality. These are, of course, influenced by external agents such as smoking or diet.

However, recent attempts to control these have had little effect on length of life; and adult life expectancy has scarcely increased in the last decade. For example, women of 65 had a life expectancy of 18.6 years in 1989 — exactly the same as in 1979.

It seems that far more of us now reach the age limit set by genetically programmed and intrinsic* decay of our body processes; and as selection works much less effectively on those who have already reproduced or who are unable to contribute to the upkeep of their relatives, it is unlikely that our life expectancy can continue to increase.

It may even be that we are near the end of our evolutionary road, that we have got as close to utopia as we ever will. But remember the dinosaurs.

(注)

dinosaur 恐竜

eugenics 優生学

gene 遺伝子

genetics 遺伝学

intrinsic 必然的な, 内在的な

Lamarckian ラマルク(フランスの博物学者・進化論者)の

life expectancy 余命

longevity 寿命

Nazi ナチスの

問 1 下線部(1)の予測はどのような根拠にもとづいていますか。

問 2 筆者は、下線部(2)で挙げられている「変異」「生存競争」「自然淘汰」の3つのプロセスについて、今後どうなると予測していますか。

問 3 下線部(3)はどのような根拠にもとづく判断ですか。具体的な例を挙げて説明しなさい。

問 4 下線部(4)の「上に述べた恐竜のことを忘れないように」ということばで、筆者は人類の未来についてどんなことを暗示していますか。

Ⅲ

次の文章を英語に訳しなさい。(配点 50点)

以前は動物たちの社会というと、弱肉強食の社会といわれたものだった。それも最近ではあまり聞かれなくなった。動物たちの暮らしぶりが研究されてくるにつれて、彼らが想像以上に平和主義者であり、調和と共存をモットーとしてきたことがわかってきたからである。(内山 節『自然と労働』より)