

# 奈良県立医科大学 後期

平成 30 年 度

試 験 問 題

英 語

## 【注 意】

1. 試験開始の合図があるまで、この問題冊子の中を見てはならない。
2. 監督者の指示に従って、すべての解答用紙の受験番号欄に受験番号を記入せよ。
3. 問題冊子は表紙のほか 8 ページ、解答用紙は 4 枚である。
4. 問題冊子の印刷不鮮明、ページの落丁・乱丁及び解答用紙の汚れ等に気付いた場合には、手を挙げて監督者に知らせよ。
5. 解答はすべて解答用紙の対応する場所に記入せよ。
6. 解答用紙は切り離してはならない。
7. 解答用紙は持ち帰ってはならない。問題冊子は持ち帰ってよい。

1. 次の英文を読んで、設問に答えよ。( \*印の語には注がある。 )(70点)

After sunset, the forests of the Caribbean island of Puerto Rico are filled with the cry of the native coqui frog. 'Ko-kee', the male frogs call long into the night. This is where their name comes from. Researchers believe the first half of the call threatens other males, while the second half attracts females. However, after a few drinks, the local islanders reply: 'Soy de aqui como el coqui' (I'm as Puerto Rican as a coqui). The common coqui is the symbol of the island. It turns up in folklore and pop songs, on T-shirts and coffee mugs. About 20 years ago, as the island's natural forests were replaced by sugar and coffee plantations, naturalists\* regarded the native inch-long tree frog as being at serious risk. Now the frog is back. But it no longer calls in the few surviving small areas of native forest, where it has died from a fungal\* disease. Most of its song comes instead from new woodlands dominated by foreign trees, like the African tulip.

The coqui seems happy there, in what ecologists\* are starting to term novel\* ecosystems — composed of new combinations of native species and species introduced by humans, but where the system itself does not depend on humans to keep it going. Is this sacrilege\*, or (1)is this the future? Is it an ecological horror doomed to self-destruct, or a model for protecting species and reviving nature in the modern world?

Puerto Rico has a unique history. When Europeans arrived at the end of the 15th century, it was thinly populated by a native seafaring people\* called the Taino, and still almost entirely forested. Spanish colonists\* changed (2)that, farming sugar in the lowlands and coffee and tobacco in the mountains. The plantations spread further after the US took control of the island during the Spanish-American War of 1898. Sugar production peaked in the 1940s, by which time only 6 per cent of the native forests remained. The island's environment was damaged. With the trees gone, it suffered massive loss of soil which blocked its rivers.

But another future awaited. Export markets for sugar and other products disappeared. Small farmers also struggled as rural people moved to towns to work in

American factories. The island experienced an economic boom, but an agricultural collapse. The forests began to grow back into abandoned fields. Between 1959 and 1974, land devoted to agriculture dropped by half while forest cover rose from six per cent to 60 per cent. By comparison, it was “the largest event of forest recovery anywhere in the world during the second half of the twentieth century”, says Thomas Rudel, who studies land use at Rutgers University.

But it wasn't the native Caribbean trees that raced to plant their roots in the former sugar fields. Native species didn't return to the poor and sun-baked soils on damaged hillsides that the farmers left behind. Instead, the trees that colonized\* the former farms were mostly from the island's stock of introduced species. There were more than a hundred of them, the majority imported by Europeans for forestry and agriculture, or as garden plants. Suddenly the abandoned fields were full of mangoes and grapefruit, avocados, rose apple and, most prominent of all, the African tulip tree. It now spread its orange and purple flowers across the new wild lands.

One man recorded change: Ariel Lugo, a local forester\* and the long-time director of the US Department of Agriculture's International Institute of Tropical Forestry in Puerto Rico. In his 60s now and with a white beard, he has seen the island change hugely. It was, he says, extraordinary, apparently unique and definitely not in the textbooks of either foresters or ecologists. (3)Conservationists were shocked, as their hopes of a natural reforestation were broken. Instead, they saw a large increase in an alien\* species. There was, says Lugo, talk of eliminating the aliens and starting again. But he stood up for them. His research showed that (4)they were not keeping out the natives, but actually paving the way for their return. The alien trees repaired soils and restored biodiversity\*. Some provided homes for birds, both native and alien, that subsequently spread the seeds of native plants. With time, many of the more slower growing native trees joined the alien trees in the new forests, often now germinated\* by non-native insects and birds.

The African tulip tree proved to be powerful at taking over abandoned floodplains\* in particular. It is now the most common tree on the island. But it is a friendly giant. It is

home to the coqui tree frog. It allows light to reach the forest floor. Native species, including reptiles\* and birds, make up 80 per cent of animal life in the tulip-dominated forests. Seven out of the 60 native bird species were lost during the period of extensive deforestation, but the new forests should prevent (5)further disappearances.

注

naturalists\* 動植物研究家

fungal\* 真菌類の, カビの

ecologists\* 生態学者

novel\* 新奇な

sacrilege\* 冒瀆 (ぼうとく)

seafaring people\* 海洋民族

colonists\* 入植者

colonized\* (生物が) 新しい生育場所に移住した

forester\* 森林管理官

alien\* 外来の, 外国から移入された

biodiversity\* 生物の多様性

germinated\* 種を植え付けられて, 芽を出した

floodplains\* [地理] 氾濫原

reptiles\* 爬(は)虫類

## 設問

1. 下線部 (1) の指す内容を具体的に日本語で記せ. (20 点)
2. 下線部 (2) の指す内容を本文の言葉を利用して, 英語で記せ. (15 点)
3. 下線部 (3) について, プエルトリコの現状を踏まえて, “Conservationists” (環境保護主義者) の考えを日本語で記せ. (15 点)
4. 下線部 (4) の指す内容を日本語で記せ. (10 点)
5. 下線部 (5) は何を指すのか, 日本語で記せ. (10 点)

II. 次の英文を読んで、設問に答えよ。( \*印の語には注がある。 )(65点)

Another application of evolutionary\* medicine is to recognize that many symptoms are actually adaptations\*, thus helping doctors and patients rethink the way we treat some illnesses and injuries. How often do you take an over-the-counter\* medication at the first sign of fever, nausea\*, diarrhea\*, or just aches and pains? (1)These discomforts are widely regarded as symptoms to get rid of, but evolutionary perspectives indicate that they can be adaptations we should learn from and use. Fevers help your body fight infections, joint and muscle pains can be signals to cause you to cease doing something harmful like running incorrectly; and nausea and diarrhea assist you in getting rid of harmful microorganisms\* and poisons. Moreover, adaptation is a tricky concept. The human body's adaptations evolved long ago solely because they increased the number of surviving children our ancestors had. Consequently, we sometimes get sick because (2)natural selection generally favors fertility\* over health, meaning we didn't necessarily evolve to be healthy. For example, because Paleolithic\* hunter-gatherers sometimes faced shortages of food and they had to be very physically active, they were selected to desire energy-rich foods and rest whenever possible, helping them to store fat and devote more energy to having children. An evolutionary perspective predicts that most diets and fitness programs will fail, as they do, because we still don't know how to fight once-adaptive basic instincts to eat donuts and take the elevator. Further, because the body is a complex mix of adaptations, all of which have costs and benefits, and some of which conflict with one another, there is no such thing as a perfect diet or fitness program. Our bodies are full of compromises.

Finally, considering and knowing about evolution in general, and human evolution in particular, is needed for preventing and treating a class of diseases and other problems known as evolutionary mismatches. The idea behind the mismatch theory is extremely simple. Over time, natural selection adapts (matches) organisms to particular environmental conditions. A zebra, for example, is adapted to walk and run on the African savanna, to eat grass, to run from lions, to resist certain diseases, and to cope

with a hot, dry climate. If you were to transport a zebra to where I live, New England, it would no longer have to worry about lions, but it would suffer from a variety of other problems as it struggled to find enough grass to eat, to stay warm in the winter, and to resist a new set of diseases. Without help, the transplanted zebra would almost certainly get sick and die because it is so poorly adapted (mismatched) to the New England environment.

The emerging and important new field of evolutionary medicine proposes that, despite much progress since the Paleolithic era, we have become like that zebra in some respects. As new technologies have become available faster and faster, especially since farming began, we have devised or adopted a growing list of novel cultural practices that have had conflicting effects on our bodies. On the one hand, (3) 比較的新しい時代に獲得した進歩は有益である。すなわち、農業を営むことは食糧生産の増加につながり、現代の衛生設備と科学に基づく医学は乳幼児死亡率の低下と寿命の延長に寄与している。 On the other hand, numerous cultural changes have altered interactions between our genes and our environments in ways that contribute to a wide range of health problems. These illnesses are mismatch diseases, defined as diseases that result from our Paleolithic bodies being poorly or inadequately adapted to certain modern behaviors and conditions.

I don't think it is possible to overemphasize just how important mismatch diseases are. You are most likely going to die from a mismatch disease. You are most likely to suffer from disabilities caused by mismatch diseases. (4) Mismatch diseases contribute to most of health-care spending throughout the world. What are these diseases? How do we get them? Why don't we do more to prevent them? And how might an evolutionary approach to health and medicine — including a serious consideration of the human body's evolutionary history — help reduce and treat mismatch diseases?

注

evolutionary\* 進化に関する

adaptations\* 順応, 適応

over-the-counter\* (医師の処方が必要とせずに) 店頭売買される

nausea\* 吐き気

diarrhea\* 下痢

microorganisms\* 微生物

fertility\* 繁殖力, 多産

Paleolithic\* 旧石器時代の

設問

1. 下線部 (1) を和訳せよ。(15 点)
2. 下線部 (2) の指す内容をわかりやすく日本語で説明せよ。(15 点)
3. 下線部 (3) を英訳せよ。ただし、「衛生設備」については“sanitation”を使用せよ。(20 点)
4. 下線部 (4) の意味を, “Mismatch diseases” の説明を含めて, 日本語で記せ。(15 点)



III. Write approximately 120 words in English about what changes you think should be made in modern Japanese life to reduce “mismatch diseases”. This task will be marked on both content and English language. (別紙解答用紙IIの様式にしたがって論述せよ。) (60点)

IV. Write about a mistake you have made in approximately 80 words in English. This task will be marked on both content and English language. (30点)