

# 名古屋市立大学

平成 27 年度・入学試験問題

## 英 語 (前)

### 注 意 事 項

1. 試験開始の合図があるまで、この問題冊子を開いてはいけません。
2. この冊子は 14 ページあります。
3. 試験開始後、落丁・乱丁・印刷不鮮明の箇所があれば申し出なさい。
4. 解答はすべて解答用紙に、それぞれの問題の指示にしたがって記入しなさい。
5. 解答は特に指示のない限り日本語で書きなさい。
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平成27年度個別学力検査 前期日程

医・経済・人文社会・芸術工・看護 学部

英 語 問 題

名古屋市立大学 入試広報課 052-853-8020

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# 問題 I

次の文章を読み、下の問いに答えなさい。

DNA taken from the tooth of a European hunter-gatherer has given scientists a new look at modern humans before the rise of farming. The Mesolithic\* man, who lived in Spain around 7,000 years ago, had an unusual mix of blue eyes, black or brown hair, and dark skin, according to analyses of his genetic make-up.

He was probably lactose\* intolerant and had more difficulty digesting starchy\* foods than the farmers who transformed diets and lifestyles when they took up tools in the first agricultural revolution.

The invention of farming brought humans and animals into much closer contact, and humans likely evolved stronger immune systems to protect against infections that the animals passed on. But scientists may have over-estimated the impact farming had in shaping the human immune system, because tests on the hunter-gatherer's DNA found that he already carried mutations\* that boost the immune system to tackle various nasty bugs. Some live on in modern Europeans today.

“Before we started this work, I had some ideas of what we were going to find,” said Carles Lalueza-Fox, who led the study at the Institute of Evolutionary Biology in Barcelona. “① out / ② completely / ③ of / ④ turned / ⑤ to / ⑥ ideas / ⑦ most / ⑧ those / ⑨ be / ⑩ wrong.”<sup>(1)</sup>

The Spanish team started their work after a group of cavers stumbled <sup>(A)</sup> upon two skeletons in a deep and complex cave system high up in the Cantabrian Mountains of northwest Spain in 2006. The human remains, which <sup>(B)</sup> belonged to two men in their early 30s, had been extremely well preserved by the cool environment of the cave.

Carbon dating\* put the remains at around 7,000 years old, before farming had swept into Europe from the Middle East. The timing fitted with ancient artefacts\* found at the site, including reindeer teeth that were strung and hung from the people's clothing.

The scientists focused their efforts on the better preserved of the two skeletons. After several failed attempts, they managed to reconstruct the man's entire genome\* from DNA found in the root of a third tooth. It is the first time researchers have obtained the complete genome of a modern European who lived before the Neolithic\* revolution.

The DNA threw up a series of surprises. When Lalueza-Fox looked at the genome, he found that rather than having light skin, the man had gene variants that tend to produce much darker skin. "This guy had to be darker than any modern European, but we don't know how dark," the scientist said.

Another surprise finding was that the man had blue eyes. That was unexpected, said Lalueza-Fox, because the mutation for blue eyes was thought to have arisen more recently than the mutations that cause lighter skin colour. The results suggest that blue eye colour came first in Europe, with the change to lighter skin ongoing through Mesolithic times.

On top of the scientific impact, artists might have to rethink their drawings of the people. "You see a lot of reconstructions of these people hunting and gathering and they look like modern Europeans with light skin. You never see a reconstruction of a mesolithic hunter-gatherer with dark skin and blue eye colour," Lalueza-Fox said. Details of the study are published in the journal, Nature.

The Spanish team went ( a ) to compare the genome ( b ) the  
(2)  
hunter-gatherer ( c ) those of modern Europeans from different regions to  
see how they might be related. They found that the ancient DNA most closely matched the genetic makeup of people living in northern Europe, in particular Sweden and Finland.

The discovery of mutations that strengthened the immune system against bacteria and viruses suggests that the shift to a farming culture in Neolithic times did not drive all of the changes in immunity genes that Europeans carry today. At least some of those genetic changes have a history that stretches

further back. “One thing we don’t know is what sort of pathogens\* were affecting these people,” said Lalueza-Fox.

Martin Jones, professor of archaeological science at Cambridge University, said the immunity genes were the most striking result. “Many people believe <sup>(3)</sup>that the move from a hunter-gatherer lifestyle to settled farming was initially bad for our health. A number of factors contributed, particularly living closely together with other humans and animals, shrinking the food web, and crowding-out water supplies. The authors are drawing attention to the role of pathogens in pre-agricultural lives, and that is interesting.”

出典 Ian Sample, The Guardian, 26 January 2014 より一部修正

\*注

Mesolithic：中石器時代の

lactose：乳糖

starchy：でんぶんの

mutations：遺伝情報の変化

carbon dating：放射性炭素年代測定法

artefacts：人工物

genome：ゲノム(すべての遺伝情報)

Neolithic：新石器時代の

pathogens：病原体

問 1 下線部(1)を文意に合うように記号で並べなさい。

問 2 下線部(A)の意味している内容と最も類似の意味をもつ単語を選んで記号で答えなさい。

- a) dug
- b) made
- c) discovered
- d) obtained
- e) caught

問 3 下線部(B)と同じ意味の単語 1 語を文中から抜き出して答えなさい。

問 4 下線部(2)の a, b, c の( )に入る最も適切な言葉を以下から 1 回ずつ選んで入れ、文章を完成させなさい。

|   |
|---|
| under      of      over      to      on |
|---|

問 5 下線部(3)を 65 字以内の日本語に訳しなさい。

問 6 DNA を調べた結果から、その人物にはどのような外見上の特徴があったと述べられているか、すべての特徴を日本語で答えなさい。

問 7 Choose 2 statements from the list below which are true according to the article.

- (A) The Mesolithic man had a lighter skin colour than expected.
- (B) Lalueza-Fox was surprised by his results.
- (C) The Mesolithic man liked eating starchy food.
- (D) Before the agricultural revolution, people had diets similar to today.
- (E) The DNA for the genome reconstruction was taken from a human hair.
- (F) The results of this study have not yet been published.
- (G) Spanish researchers have collaborated with people living in Sweden and Finland.
- (H) Some of the changes in immunity were due to factors other than the shift of agriculture.

## 問題Ⅱ

次の文章を読み、以下の問いに答えなさい。

Leonardo da Vinci dreamed of flying. He wrote that developing a machine capable of reaching the skies would be the one invention to gain him “glory <sup>(1)</sup>eternal.” During the first years of the sixteenth century, Leonardo made careful observations of larks and other species common to the Italian countryside, writing down his ideas in a private notebook that came to be called *Codex on the Flight of Birds*\*. Leonardo’s designs for flying machines included a now-famous illustration of a primitive helicopter, as well as a flapping Icarus\*-style flier. The most important pictures in the book may be a series of small birds sketched casually in the margins. They look like pigeons in flight, showing a variety of postures and illustrating the birds with lines of air passing under and over each wing. Combined with his text on the “thickness” and “thinness” of air, these pictures <sup>(2)</sup> clearly show that Leonardo had begun to understand the importance and function of airfoils\*.

When air meets the front of a bird wing, it has a choice: take the low road, or take the high road. Both paths reach the other side, but they travel by different routes, at different rates, and through surprisingly different conditions, and the angle and speed of the wing determine how much air is pushed downward, creating lift by increasing air pressure below the wing while reducing it above. It’s Newton’s third law at work: every action has an equal and opposite reaction. This effect is familiar to anyone who has held their arm out a car window and felt the wind force their hand up as they tilt it to cup the air. <sup>(3)</sup>Shape matters, too. Seen in cross-section, a bird’s wing has a curved top, a thick leading edge, and a long, tapering tail, like a comma tipped on its side and stretched thin. Airflow hugs that curved upper surface and exits behind the wing as downwash, further reducing the air pressure above and adding additional lift. This is also easy to test. Place a piece of paper in front of your lips and blow across the curved top surface—you will see the paper rise from below, pushed upward as your wind reduces the air pressure above the page.

Leonardo was particularly well-suited to understanding aerodynamics, having already studied the way water moved in streams, around obstacles, and through tubes of various widths. He was the first person to understand that air and water moved by the same principles. He is considered the father of the combined field of fluid dynamics\*. Though no one thinks of Leonardo as the father of ornithology\*, Rick Prum\* once made a study of his ornithological observations and noted how close he had been to the modern understanding of bird flight. If he knew what we know now, he would have cursed himself for not figuring it out!<sup>(4)</sup>

出典 Feathers: The Evolution of a Natural Miracle. Thor Hanson 2011 より  
一部修正

\*注

*Codex on the Flight of Birds* : 鳥の飛翔に関する手稿

Icarus : ギリシア神話に登場する人物, 鳥の羽根を固めて翼を作り空を飛んだ

airfoils : 翼

dynamics : 力学

ornithology : 鳥類学

Rick Prum : 鳥類学者の名前



問 1 下線部(1)は具体的には何を指すか、最も適切な答えを次の選択肢から選びなさい。

- ① To complete Codex on the Flight of Birds
- ② To become the father of ornithology
- ③ To understand the principle of aerodynamics
- ④ To develop flying machines
- ⑤ To figure out what we know now about flying

問 2 下線部(2)の内容を 35 字以内の日本語で具体的に書きなさい。

問 3 下線部(3)の内容を 25 字以内の日本語で具体的に説明しなさい。

問 4 筆者は、ニュートンの第 3 法則を用い、飛ぶ力を得る様子を具体的に説明している。この部分を 25 字以内の日本語で書きなさい。

問 5 下線部(4)を 65 字以内の日本語に訳しなさい。

問 6 本文の内容とあっているものを 1 つ選びなさい。

- A—Leonardo shared his notebook on birds with others to read.
- B—Leonardo's pictures of helicopters and fliers were more important than his drawings of birds.
- C—It was clear from his drawings that Leonardo understood the importance of airfoils.
- D—Newton's third law is not necessarily that important in understanding how fluid dynamics works.
- E—Leonardo had a solid understanding of what is now considered modern flight.

### 問題Ⅲ

次の文章を読み、下の問いに答えなさい。

What would you do to earn money if all you had was five dollars and two hours? This is the homework I gave students in one of my classes at Stanford University. Each of fourteen teams received an envelope with five dollars and was told they could spend as much time as they wanted planning. However, once they cracked open the envelope, they had two hours to make as much money as possible. I gave them from Wednesday afternoon until Sunday evening to complete the homework. Then, on Sunday evening, each team had to send me one slide describing what they had done, and on Monday afternoon each team had three minutes to present their project to the class. They were encouraged to be entrepreneurial\* by identifying opportunities, challenging assumptions, taking advantage of the limited resources they had, and by being creative.

What would you do if you were given this challenge? When I ask this question to most groups, someone usually shouts out, “Go to Las Vegas,” or “Buy a lottery ticket.” This gets a big laugh. These folks would take a significant risk in return for a small chance at earning a big reward. The next most common suggestion is to set up a car wash or lemonade stand, using the five dollars to purchase the starting materials. This is a fine option for those interested in earning a few extra dollars of spending money in two hours. But most of my students eventually found a way to move far beyond the standard responses. They took seriously the challenge to question traditional assumptions — exposing a wealth of possibilities — in order to create as much value as possible.

How did they do this? Here’s a clue: the teams that made the most money didn’t use the five dollars at all. They realized that focusing on the money actually framed the problem far too tightly. They understood that five dollars is essentially nothing and decided to reinterpret the problem more broadly: What can we do to make money if we start with absolutely nothing?

They increased their observation skills, tapped into their talents, and unlocked their creativity to identify problems in their midst — problems they experienced or noticed others experiencing — problems they might have seen before but had never thought to solve. <sup>(4)</sup> These problems were irritating but not necessarily at the forefront of anyone's mind. By finding these problems and then working to solve them, the winning teams brought in over \$600, and the average return on the five dollar investment was 4,000 percent! If you take into account that many of the teams didn't use the funds at all, then their financial returns were infinite.

So what did they do? All of the teams were remarkably inventive. One group identified a problem common in a lot of college towns — the frustratingly long lines at popular restaurants on Saturday night. The team decided to help those people who didn't want to wait in line. They paired off and booked reservations at several restaurants. As the times for their reservation approached, they sold each reservation for up to twenty dollars to customers who were happy to avoid a long wait.

As the evening got later, they made several interesting observations. First, they realized that the female students were better at selling the reservations than the male students, probably because customers were more comfortable being approached by the young women. They adjusted their plan so that the male students ran around town making reservations at different restaurants while the female students sold those places in line. They also learned that the entire operation worked best at restaurants that use vibrating pagers\* to alert customers when their table is ready. Physically swapping pagers made customers feel as though they were receiving something real for their money. They were more comfortable handing over their money and pager in exchange for the new pager. This had an additional bonus — teams could then sell the newly acquired pager as the later reservation time grew nearer.

Another team took an even simpler approach. They set up a stand in front

of the student union where they offered to measure bicycle tire pressure for free. If the tires needed filling, they added air for one dollar. At first they thought they were taking advantage of their fellow students, who could easily go to a nearby gas station to have their tires filled. But after their first few customers, the students realized that the bicyclists were incredibly grateful. Even though the cyclists could get their tires filled for free nearby, and the task was easy for the students to perform, they soon realized that they were providing a convenient and valuable service. In fact, halfway through the two-hour period, the team stopped asking for a specific payment and requested donations instead. Their income soared. They made much more when their customers were reciprocating for a free service than when asked to pay a fixed price. For this team, as well as for the team making restaurant reservations, experimenting along the way paid off. The repeated process, where small changes are made in response to customer feedback<sup>(5)</sup>, allowed them to optimize their strategy during the project they were performing.

出典 Seelig, T. (2009). *What I Wish I Knew When I Was 20*. New York: Harper Collins. より一部修正

\*注

entrepreneurial : 目的のために危険を冒したり, 工夫したりする

pager : 呼び出しベル

- 問 1 下線部(1)の内容を日本語で 35 字以内で具体的に書きなさい。
- 問 2 下線部(2)の具体例を本文の中から 1 つ選び 10 字以内の日本語で書きなさい。
- 問 3 下線部(3)の理由を端的に示す箇所を、本文から抜き出し、10 語以内の英語で書きなさい。
- 問 4 下線部(4)の “problems” として、学生たちが実際にみつけたことの具体例を 2 つ、それぞれ 35 字以内の日本語で書きなさい。
- 問 5 下線部(5)の具体例を端的に示す一文を同じ段落から抜き出し、最初と最後の 2 語ずつを英語で書きなさい。
- 問 6 本文の内容と合致する文章を以下から 1 つ選んで記号で答えなさい。
- (a) The teams could plan as long as they wanted before opening the envelope.
  - (b) Many of the student teams used the original five dollars given by the professor.
  - (c) One team got money by offering to measure bicycle tire pressure.
  - (d) The male students were better at selling the reservations.
  - (e) The teacher felt that true value is measured in financial rewards.

**問題IV**

What opinion would you contribute after reading the following article in a newspaper?

It is said, "Many people in developed countries eat food from convenience stores and fast food restaurants every day." While a large number of people enjoy eating these foods, there are some people who fear that traditional foods will be completely replaced in the future by food that is convenient.

In 120 to 150 words, clearly state your own opinion about this issue in English.