

平成30年度入学試験問題(後期)

英 語

注 意

1. 合図があるまで表紙をあけないこと。
2. 受験票は机に出しておくこと。

I 以下の英文を読み、設問に答えよ。

IMAGINE you are a zookeeper and it's your job to design an enclosure for humans. What single feature would best ensure the health and well-being of the animals in your care? Appropriate access to food and water? Shelter?

The thought experiment has only one answer, according to John Cacioppo, a social neuroscientist of the University of Chicago, who proposed it. The enclosure, above all else, must take into account our need for connection with other humans. We are an “obligatorily gregarious*¹ species”, in Cacioppo’s words. Yet if so, this is not how many of us live today. We are often far from our families, in homes where we are the sole occupant, socialising, working and shopping online.

This can have a serious downside: a gnawing feeling of loneliness to which most of us can be prone, regardless of age or stage of life. We’re just beginning to understand what serious consequences that can have. Loneliness changes the brain, taking hold of our thoughts and behaviours in ways that are likely to make us feel even more isolated.⁽¹⁾ But its effects are not just psychological; they are also physical. Left unchecked, loneliness can have a physiological impact as harmful to longevity as smoking or obesity. “I had always thought of loneliness as a nuisance, not one of the most toxic environmental conditions we can possibly encounter,” says Steve Cole at the University of California, Los Angeles, who studies the effect of the environment on our genes. If that sounds gloomy, the new insights also offer perspectives on how to tackle this notoriously intractable*² social phenomenon — and make each of us less lonely, too.

Loneliness is often assumed to be a problem of social isolation, one that predominantly affects the elderly, or vulnerable people with no friends and family who rarely leave home. Yet loneliness may have very little to do with being on our own, or having few friends, even if this is how it is often defined.⁽²⁾ “It’s not social isolation; it’s feeling socially isolated,” says Cacioppo. Loneliness arises from a mismatch between expectations of our social interactions and the reality. A lonely person will not feel less so simply by being surrounded by other individuals, while a socially enfranchised*³ person won’t feel lonely just because they have spent sometime alone.

We have known for a while that being physically alone is bad for our health. Only now, though, it is becoming clear that just feeling isolated can be equally damaging. Lonely people are at increased risk of “just about every major chronic illness — heart attacks, neurodegenerative diseases, cancer,” says Cole. “Just a completely crazy range of bad disease risks seem to all come together around loneliness.”

But perhaps the biggest effect may be on the genes that control the immune system. In their first study together, Cacioppo and Cole compared gene expression in the white blood cells of two groups. In one group were six persistently lonely middle-aged adults and in the other were eight who ranked as consistently socially enfranchised. In the lonelier people, the activity of genes responsible for inflammation was ramped right up. “The signal was screaming loud — it could not have been more clear,” says Cole.

Inflammation is the body’s first line of defence against injury and bacterial infection, but too much inflammation has been linked to cancer, depression, Alzheimer’s disease and obesity. The lonely people in the study also had less activity in genes that regulate the immune response to viral infections, “just the way you really wouldn’t like for our long-term well-being,” says Cole. Such findings lend weight to Cacioppo’s thought experiment: failing to allow the human inhabitants of the zoo the chance to form social bonds could have serious consequences for their health.⁽³⁾

But if loneliness is so bad for us, why have we evolved to feel this way? That’s possibly not such a mystery. A short pang of loneliness probably helped us to survive in our evolutionary past. Social primates like us live in groups as a means of protection. Loneliness is part of a biological warning machinery, just like hunger, thirst and pain, says Cacioppo. So we need to listen to that painful, empty feeling of disconnection that we call loneliness and change our behaviour, seeking out safety in numbers.

(出典：New Scientist, 19 July 2017. 一部変更あり)

*¹gregarious: fond of living in groups rather than alone

*²intractable: hard to control or deal with

*³socially enfranchised: socially independent, autonomous

(1) 下線部(1)~(3)を和訳せよ。(ただし、固有名詞のカタカナ表記については正確さを求めない。)

(2) 下線部(4)の意味するところを、本文に即して50字以内の日本語(句読点を含む)で説明せよ。

II 以下の英文を読み、下線部(1)~(3)を和訳せよ。(ただし、固有名詞のカタカナ表記については正確さを求めない。)

To a mathematician, a proof is a logical demonstration that a conclusion necessarily follows from axioms that are assumed. Pythagoras^{*1} Theorem is necessarily true, provided only that we assume Euclidean^{*2} axioms, such as the axiom that parallel straight lines never meet. You are wasting your time measuring thousands of right-angled triangles, trying to find one that falsifies Pythagoras' Theorem. ⁽¹⁾ The Pythagoreans proved it, anybody can work through the proof, it's just true and that's that. Mathematicians use the idea of proof to make a distinction between a 'conjecture' and a 'theorem'. A conjecture is a proposition that looks true but has never been proved. It will become a theorem when it has been proved. A famous example is the Goldbach^{*3} Conjecture, which states that any even integer can be expressed as the sum of two primes^{*4}. Mathematicians have failed to disprove it for all even numbers up to 300 thousand million million million, and common sense would happily call it Goldbach's Fact. Nevertheless it has never been proved, despite huge prizes being offered for the achievement, and mathematicians rightly refuse to give it the status of theorem. If anybody ever finds a proof, it will be promoted from Goldbach's Conjecture to Goldbach's Theorem, or maybe X's Theorem where X is the clever mathematician who finds the proof.

Fermat's^{*5} Last Theorem, like the Goldbach Conjecture, is a proposition about numbers to which nobody has found an exception. Proving it has been a kind of ultimate goal for mathematicians ever since 1637, when Pierre de Fermat wrote in the margin of an old mathematics book, 'I have a truly marvellous proof ... which this margin is too narrow to contain.' It was finally proved by the English mathematician Andrew Wiles in 1995. Before that, some mathematicians think it should have been called a conjecture. Given the length and complication of Wiles's successful proof, and his reliance on advanced twentieth-century methods and knowledge, most mathematicians think Fermat was mistaken in his claim to have proved it. ⁽²⁾ I tell the story only to illustrate the difference between a conjecture and a theorem.

I am going to borrow the mathematicians' term 'theorem', but I'm spelling it 'theorem' to differentiate it from a mathematical theorem. A scientific theorem such as evolution or heliocentrism^{*6} is a theory that conforms to *Oxford English Dictionary's* first definition of 'theory':

[It] has been confirmed or established by observation or experiment, and is propounded^{*7} or accepted as accounting for the known facts; [it is] a statement of what are held to be the general laws, principles, or causes of something known or observed.

A scientific theorem has not been — cannot be — proved in the way a mathematical theorem is proved. But common sense treats it as a fact in the same sense as the 'theory' that the Earth is round and not flat is a fact, and the theory that green plants obtain energy from the sun is a fact. All are scientific theorems: massive accumulation of evidence supports them so strongly that to deny them the status of 'fact' seems ridiculous to all but the obstinate. ⁽³⁾ As with all facts, however, it is undeniably possible that our measuring instruments, and the sense organs with which we read them, are the victims of a massive confidence trick. As Bertrand Russell, a British philosopher, said, 'We may all have come into existence five minutes ago, provided with ready-made memories, with holes in our socks and hair that needed cutting.' Given the evidence now available, for evolution to be anything other than a fact would require a similar confidence trick by the creator, something that few theists^{*8} would wish to credit.

(出典: Richard Dawkins, *The Greatest Show on Earth: The Evidence for Evolution*. Free Press. 2009. 一部変更あり)

*1 Pythagoras: an ancient Greek philosopher and mathematician

*2 Euclid: an ancient Greek mathematician

*3 Christian Goldbach: a German mathematician (1690-1764)

*4 prime: a positive integer divisible only by itself and 1 (e.g. 2, 3, 5, 7)

*5 Pierre de Fermat: a French mathematician (1607-65)

*6 heliocentrism: an astronomical view that the earth and the planets revolve around the sun at the center of the solar system

*7 propound: propose for consideration by others

*8 theist: a person who believes in the existence of a god or gods

III 英訳せよ。

どれほど人間が利己的であると思われようと、人間の本性には、他人の幸不幸に関心を向ける何らかの打ち消しがたい傾向が
⁽¹⁾ある。他人の悲しみに同情することは我々にとってあまりに身近な経験なので、わざわざ例を挙げてそれを説明する必要は
⁽²⁾ない。このような感情は高潔な人間に限られたものでなく、冷徹に見える人間にもまた、しばしば見いだされるのである。
⁽³⁾