受験番号

一般　前期

平成25年度

入学試験問題

英　語

注意：答えはすべて解答用紙に記入しなさい。

藤田保健衛生大学医学部

第１問　次の英文を読んで、後の問いに答えなさい。

Reports of dolphins interacting with dead members of their pod are raising questions about whether cetaceans understand the concept of death. Bottlenose dolphins in western Greece have been seen reacting to death differently depending on whether a pod member has died suddenly or after a longer period of illness.

Interpreting animal behaviour after the death of a companion is fraught with difficulty. Death is rarely observed in the wild, and it is easy to erroneously attribute human emotions to animals. Nevertheless, several species of intelligent, social animals, such as gorillas, chimps and elephants can display particular behaviours when an animal dies — behaviours which some have interpreted as akin to mourning. [　あ　] together with a growing number of reports of cetaceans interacting with dead animals and the discovery that they have specialised neurons linked to empathy and intuition, the Greek study suggests dolphins may have a complex — and even sophisticated — reaction to death.

Joan Gonzalvo of the Tethys Research Institute based in Milan, Italy, has been observing the bottlenose dolphin population in the Amvrakikos gulf since 2006. In July 2007, he and his team of Earthwatch Institute volunteers saw a mother interact with her dead newborn calf. She lifted the corpse above the surface, 《A》in an apparent attempt to get it to breathe. "This was repeated over and over again, sometimes frantically, during two days of observation," says Gonzalvo. "The mother never separated from her calf."

The newborn had a large bruise on its lower jaw, suggesting it may have been killed by another dolphin. "Infanticide has been reported in this species," says Gonzalvo. Aware of 《B》the dangers of investing animal behaviour with human emotions, he nonetheless suggests the mother may have been mourning the sudden death: "She seemed unable to accept the death."

One year later, Gonzalvo came across a pod surrounding a 2 to 3-month-old dolphin that was having difficulty swimming. It bore bleach marks, possibly from exposure to pesticide or heavy-metal pollution. "The group appeared stressed, swimming erratically," he says. "Adults were trying to help the dying animal stay afloat, but it kept sinking." It died about an hour later.

From his previous observation, Gonzalvo expected the mother to stay with the corpse. [　い　], it was allowed to sink and the group immediately left the area. "My hypothesis is that the sick animal was kept company and given support, and when it died the group had done their job. In this case they had already assumed death would eventually come — 《C》they were prepared." Gonzalvo accepts that his interpretation is speculative and based on limited data. He is gathering examples from other researchers before publishing his observations.

Ingrid Visser of the Orca Research Trust in Tutukaka, New Zealand, has seen bottlenose dolphins and orcas carrying dead infants in what she too interprets as grief. She acknowledges that the activity may simply be misdirected behaviour, and that the animals do not know that the calf is

dead. "But we do know that cetaceans have von Economo neurons, which have been associated with grief in humans." [う], she speculates that the behaviours are a form of grief.

Visser has seen similar things at pilot whale strandings. "When one died the others would stop when passing by, [え]. If we tried to get them to move past without stopping, they would fight to go back to the dead animal. I do not know if they understand death but they do certainly appear to grieve — based on their behaviours."

Karen McComb of the University of Sussex, UK, who has studied how elephants act when they find elephant bones, says Gonzalvo's observations bring to mind other intelligent, social mammals, but it is impossible to know what is going on in an animal's mind.

"《D》It is fascinating but out of our reach as scientists," she says, adding that any inferences are necessarily speculative. "It's great to accumulate examples though — as more are gathered a clearer picture emerges."

(Rowan Hooper, "Do dolphins have a concept of death?", *NewScientist*, 3 September 2011)

注 pod：群れ　cetacean：クジラ目の動物　bottlenose dolphin：バンドウイルカ
fraught with：～を伴った　akin to：～と同種の　empathy：共感　corpse：死体
frantically：半狂乱で　infanticide：子殺し　pesticide：農薬　erratically：不規則に
orca：シャチ　pilot whale：ゴンドウクジラ　stranding：座礁

問 1. 空所 [あ] に入れるのに最も適当なものを 1 つ選び、その番号を答えなさい。

(1) Taking　(2) Taken　(3) To take　(4) To be taken　(5) Having Taken

問 2. 下線部《A》の意味を日本語で表しなさい。

問 3. 下線部《B》の 'the dangers of investing animal behaviour with human emotions' と最も近い意味になるものを 1 つ選び、その番号を答えなさい。

(1) the dangers of criticising animal behaviour in the light of human emotions
(2) the dangers of disturbing animal behaviour in the light of human emotions
(3) the dangers of praising animal behaviour in the light of human emotions
(4) the dangers of understanding animal behaviour in the light of human emotions

問 4. 空所 [い] に入れるのに最も適当なものを 1 つ選び、その番号を答えなさい。

(1) For instance　(2) Indeed　(3) In short　(4) Instead　(5) Moreover

問 5. 下線部《C》の意味として最も適当なものを 1 つ選び、その番号を答えなさい。

(1) 仲間に安らかに死を迎えさせる準備ができていた
(2) 仲間の命を少しでも長らえさせる準備ができていた
(3) 仲間の死を受け入れる心の準備ができていた
(4) 仲間の死を弔う行動をする準備ができていた

問 6. 空所［　う　］に入れるのに最も適当なものを 1 つ選び、その番号を答えなさい。

(1) As a result　(2) Curiously enough　(3) Fortunately
(4) On the contrary　(5) On the other hand

問 7. 空所［　え　］には、次の語句をある順序に並べ替えた表現が入る。2 番目と 4 番目に入る語句の番号を答えなさい。

(1) acknowledge or confirm　(2) as if　(3) it was dead
(4) that　(5) to

問 8. 下線部《D》の意味として最も適当なものを 1 つ選び、その番号を答えなさい。

(1) 動物の心の中を知るための観察を積み重ねることは興味深いことだけれども、科学者でないわれわれには無理なことだ。
(2) 動物の心の中を知るための観察を積み重ねることは興味深いことだけれども、われわれ科学者には不可能なことだ。
(3) 動物の心の中を知るというのは興味深いことだけれども、科学者でないわれわれには無理なことだ。
(4) 動物の心の中を知るというのは興味深いことだけれども、われわれ科学者には不可能なことだ。

問 9. 仲間の死に対するイルカの反応の違いを述べた次の文の空所（　ア　）、（　イ　）に、それぞれ 10 文字以内の日本語を補いなさい。

仲間の死が突然の死である場合には死体のそばを（　　ア　　）が、
長い病気の末の死である場合には死体のそばを（　　イ　　）。

空白ページ

第２問　次の英文を読んで、後の問いに答えなさい。

"The invalid assumption that correlation implies cause is probably among the two or three most serious and common errors of human reasoning." Evolutionary biologist Stephen Jay Gould was referring to purported links between genetics and an individual's intelligence when he made this familiar complaint in his 1981 book *The Mismeasure of Man.*

Fast-forward three decades, and leading geneticists and anthropologists are 《A》levelling a similar charge at economics researchers who claim that a country's genetic diversity can predict the success of its economy. To critics, the economists' paper seems to suggest that a country's poverty could be the result of its citizens' genetic make-up, and the paper is attracting charges of genetic determinism, and even racism. But the economists say that they have been misunderstood, and are merely using genetics as a proxy for other factors that can drive an economy, such as history and culture. The debate holds cautionary lessons for a nascent field that blends genetics with economics, sometimes called genoeconomics. The work could have real-world pay-offs, such as helping policy-makers to "reduce barriers to the flows of ideas and innovations across populations", says Enrico Spolaore, an economist at Tufts University, who has also used global genetic-diversity data in his research.

But the economists at the forefront of this field clearly need to be prepared for harsh scrutiny of their techniques and conclusions. At the centre of the storm is a 107-page paper by Oded Galor of Brown University, and Quamrul Ashraf of Williams College.

The paper argues that there are strong links between estimates of genetic diversity for 145 countries and per-capita incomes, even after accounting for myriad factors such as economic-based migration. [　あ　] genetic diversity in a country's population is linked with greater [　い　], the paper says, because diverse populations have a greater range of cognitive abilities and styles. By contrast, [　う　] genetic diversity tends to produce societies with greater [　え　], because there are fewer differences between populations. Countries with intermediate levels of diversity, such as the United States, balance these factors and have the most productive economies as a result, the economists conclude.

[　お　], prominent scientists, including geneticist David Reich of Harvard Medical School, and Harvard University palaeoanthropologist Daniel Lieberman, say that the economists made blunders such as treating the genetic diversity of different countries as independent data, when they are intrinsically linked by human migration and shared history. "It's a misuse of data," says Reich, which undermines the paper's main conclusions. The populations of East Asian countries share a common genetic history, and cultural practices — but the former is not necessarily responsible for the latter. "Such haphazard methods and erroneous assumptions of statistical independence could equally find a genetic cause for the use of chopsticks," the critics wrote.

They have missed the point, responds Galor, a prominent economist whose work examines the ancient origins of contemporary economic factors. "The entire criticism is based on a gross misinterpretation of our work and, in some respects, a superficial understanding of the empirical techniques employed," he says. Galor and Ashraf told *Nature* that, [か], they are using it as a proxy for immeasurable cultural, historical and biological factors that influence economies. "Our study is not about a nature or nurture debate," says Ashraf.

Galor and Ashraf are not the first economists to use genetic-diversity data. Spolaore has also found that the differences in genetic diversity between countries can predict discrepancies in their level of economic development. But he is clear that this is not necessarily a causal relationship: "In my view it's not genetic diversity itself that is [き] this correlation," he says. "A lot of this could be culture."

Some say that the field needs a dose of rigour. Many studies linking genetic variation to economic traits make basic methodological errors, says Daniel Benjamin, a behavioural economist at Cornell University. He is part of the Social Science Genetics Association Consortium, a group that brings together social scientists, epidemiologists and geneticists to improve such studies. Problems that medical geneticists have known about for years — such as those stemming from small sample sizes — crop up all too often when economists start to work with the data, he says.

For instance, while searching for genetic associations with factors such as happiness and income in a study of 2,349 Icelanders, Benjamin and his colleagues found a statistically significant association between educational attainment and a variant in a gene involved in breaking down a neurotransmitter molecule. But the researchers could not replicate this association in three other population samples — a test for false positives that is standard practice in medical genetics — and 《B》the team now has reservations about the association. If the field is to develop fruitfully, "I think it's essential for us to have geneticists involved", says Benjamin. "We couldn't do it without their help and insight."

(Ewen Callaway, "Economics and genetics meet in uneasy union",
Nature 490, 11 October 2012)

注 proxy：代用となるもの　nascent：新しい　per-capita：一人当たりの　myriad：無数の
palaeoanthropologist：古人類学者　intrinsically：本質的に　haphazard：でたらめな
nature or nurture：生まれか育ちか　discrepancy：相違　epidemiologist：疫学者
neurotransmitter：神経伝達物質　replicate：再現する　false positive：偽陽性

問 1. 下線部《A》の'levelling'とほぼ同じ意味で用いられているものを 1 つ選び、その番号を答えなさい。

(1) Constructors started levelling the ground for the new station.
(2) The party attempted to level the various classes in the nation.
(3) Accusations were levelled at other countries' leaders.
(4) He levelled his opponent with one blow to the chin at the arena.

問 2. 本文の内容に合うように（ ア ）～（ エ ）にそれぞれ漢字 2 文字を書き入れなさい。

経済学者は遺伝的多様性から経済発展を（ ア ）することができると主張しているが、遺伝学者や人類学者は前者は後者の（ イ ）ではなく、（ ウ ）関係は（ エ ）関係を必ずしも含まないと批判している。

問 3. 空所［ あ ］～［ え ］に入れる語句の組み合わせとして最も適当なものを 1 つ選び、その番号を答えなさい。

(1)	あ: High	い: interpersonal trust	う: low	え: innovation
(2)	あ: High	い: innovation	う: low	え: interpersonal trust
(3)	あ: Low	い: interpersonal trust	う: high	え: innovation
(4)	あ: Low	い: innovation	う: high	え: interpersonal trust

問 4. 空所［ お ］に入れるのに最も適当なものを 1 つ選び、その番号を答えなさい。

(1) Indeed (2) For instance (3) In addition (4) On the other hand

問 5. 空所［ か ］には、次の語句をある順序に並べ替えた表現が入る。2 番目と 5 番目に入る語句の番号を答えなさい。

(1) economic development (2) directly influences (3) far from
(4) genetic diversity (5) claiming that

問 6. 空所［ き ］に入れるのに最も適当なものを 1 つ選び、その番号を答えなさい。

(1) correlative with (2) independent of (3) responsible for (4) caused by

問 7. 下線部《B》の意味を日本語で表しなさい。

問 8. 本文の内容に合致するものを 2 つ選び、その番号を答えなさい。

(1) The economists conclude that the United States has the most productive economy because of its population having a greater range of cognitive abilities and its society having greater interpersonal trust than any other country.

(2) The critics say that the economists misused data, because the genetic diversity of different countries was regarded as dependent data when they are linked by human migration and shared history.

(3) Galor and Ashraf answered that they substitute genetic diversity for immeasurable cultural, historical and biological factors that exercise an effect on economic development.

(4) Spolaore says that the differences not only in genetic diversity but also in culture between countries cause their discrepancies in the level of economic development.

(5) Benjamin says that in order to avoid problems that economists tend to have when they link genetic variation to economic traits, they should ask geneticists for help and insight.

第３問　次の英文を読んで、後の問いに答えなさい。

When the pain returned, Lisa rested at home with her foot elevated. Over the next few weeks, she tried icing the area and was fitted with new orthotics. But the pain didn't get any better. She returned to the surgeon.

"I'm not surprised," he said when Lisa told him about her condition. "You need surgery, I told you that before."

Lisa and her daughter had scheduled a trip to Europe in a few weeks' time. The trip had been planned for a long while, and she told the doctor that she didn't want an operation to interfere with it.

"You have pain from the bone spur, the ganglion cyst, and lots of arthritis in that joint," the doctor reiterated. "That's going to interfere with your trip. I can fix all of that, and in two weeks you'll be fine to travel."

"I'd rather have another cortisone shot," Lisa replied.

The doctor paused and then spoke deliberately, emphasizing each word. It sounded to Lisa as though he were speaking to a badly behaved child. "I will give you the shot. But this is not a cure. Let's get you on the schedule for surgery." Lisa agreed.

The trip to Europe was everything that Lisa and her daughter had hoped for. They both loved art, and they spent days lingering in the museums in Paris. Despite the many hours Lisa spent on her feet, she didn't feel any discomfort — the shot again had worked. But her surgery was already scheduled. So when she returned, she went to the hospital for her preoperative evaluation.

In the examination room, Lisa almost dozed off waiting to meet with the nurse who would clear her for surgery. Her jet lag still hadn't worn off. The nurse greeted Lisa with a warm smile and went over a checklist, reviewing Lisa's past medical history, asking about any allergies or reactions to medication. She noted the normal recent electrocardiogram and chest X-ray, which showed that Lisa was healthy enough to undergo surgery.

"You know," Lisa said, "my foot feels fine now. I wonder if I really have to have such an extensive surgery?"

The nurse glanced up from the paperwork and gave Lisa a quizzical look. "You really should discuss that with your doctor," she said. "But in any event, since you're here, let's get your pre-op blood tests done." The nurse handed Lisa a sheet with a series of tests marked off and told her how to find the phlebotomist who would draw her blood.

When we spoke with Lisa, she reflected back on this conversation. "I guess I was afraid to confront the surgeon one-on-one," she said. She still wasn't sure exactly why she hadn't told him her foot felt better. "I guess I just didn't want to deal directly with him. He had such a frosty and assertive way about him. And I also really wanted to believe that he knew best."

Lisa underwent the operation. The surgeon removed the bone spur and the ganglion cyst and then fused the arthritic joint, inserting two small titanium screws so that there would be no motion that could cause pain. The day after the procedure, the surgeon called Lisa and said that the postoperative X-ray was "not satisfactory." It looked as if the screws weren't correctly aligned, so Lisa underwent a second operation.

We spoke with Lisa some four months later. "I have pain in my foot all the time," she said. "It has thrown off my gait. So now I also have pain in my hip." Lisa Norton was frustrated, bitter, and consumed with regret.

(J. Groopman and P. Hartzband, *Your Medical Mind*, 2011)

注 orthotics：機能回復訓練　bone spur ：骨棘　ganglion cyst：ガングリオン嚢胞
arthritis：関節炎　reiterate：繰返して言う　cortisone shot：コルチゾン注射
linger：長居する　preoperative：手術前の(pre-op)　doze off：居眠りする
jet lag：時差ぼけ　medication：薬物　electrocardiogram：心電図
quizzical：いぶかしげな　phlebotomist：採血士　align：調整する　gait：歩行

以下の 問1～問4について、それぞれ本文の内容と合致するものを2つ選び、その番号を答えなさい。

問1.

(1) Lisaの旅行はずっと以前から計画していたものであった。
(2) Lisaは、手術で痛みがなくなってから娘と一緒に旅行に出かけた。
(3) Lisaは、娘との旅行の間、まったく痛みを感じることなく過ごすことができた。
(4) Lisaは、予定していた旅行の期間を短くした。
(5) Lisaは、予定していた旅行の出発日を遅らせた。

問2.

(1) 医師は、手術は旅行の後でも大丈夫だと言って、まず旅行に行くことを勧めた。
(2) 医師は、旅行の前に痛み止めの注射を打っておくことを勧めた。
(3) Lisaは、手術のことは旅行から帰ってから考えることにして、旅行に出かけた。
(4) Lisaは、これまでにも痛み止めの注射を打ってもらっていた。
(5) Lisaは、注射を打ってもらって痛みが消え、手術はもう必要ないのではないかと思った。

問3.

(1) Lisaが受けた手術は、小さなねじを入れて伸びたままの関節を曲がるようにするものであった
(2) Lisaは、医師に勧められて、十分な話し合いと納得のないまま手術を受けてしまった。
(3) Lisaは、医師に勧められて手術を受けることに同意したが、手術は失敗で、再手術を受ける結果になった。
(4) Lisaは、痛みは良くなっていると手術の前に医師に話したが、手術は予定通り行われた。
(5) 手術を勧めた医師はていねいに説明してくれたので、Lisaは医師を信頼して手術を受けた。

問 4.

(1) Lisa は、痛みを何とか自分で抑えようとやってみたがよくならないので、また医師のところへ来たのであった。

(2) Lisa は、いったん痛みがなくなったので手術はしなくても済むかと思ったが、また痛み出したのでやはり手術を受けることにした。

(3) Lisa は、時差ぼけのせいで手術前の血液検査を受け忘れたので、また検査に来なければならなかった。

(4) Lisa は、手術前の検査の際に看護師に手術についての疑問を話したが、取り合ってもらえなかった。

(5) 医師は、痛みを治療するいくつかの方法について説明したうえで、Lisa に手術を選択するよう勧めた。