平成31年度　個別学力試験問題

外　国　語　(英　語)

(120分)

人文・文化学群　(人文学類，比較文化学類，日本語・日本文化学類)
社会・国際学群　(社会学類，国際総合学類)
人　間　学　群　(教育学類，心理学類，障害科学類)
生命環境学群　(生物学類，生物資源学類，地球学類)
理　工　学　群　(数学類，物理学類，化学類，応用理工学類，
　　工学システム学類，社会工学類)
情　報　学　群　(情報科学類，情報メディア創成学類，
　　知識情報・図書館学類)
医　　学　　群　(医学類，看護学類，医療科学類)

注　　意

1. 問題冊子は1ページから9ページまでである。
2. 解答は解答用紙の定められた欄に記入すること。

I　次の英文を読んで，下の問いに答えなさい。
（星印（＊）のついた語には本文の後に注があります。）

In Plymouth, under the gray gloom of an English autumn, Richard Thompson waited in a yellow raincoat outside Plymouth University's Coxside Marine Station, at the edge of the harbor. A lean man of 54, Thompson was headed for an ordinary career as a marine ecologist in 1993 — he was studying marine creatures that grow on coastal rocks — when he participated in his first beach cleanup, on the Isle of Man. While other volunteers zoomed in on the plastic bottles and bags and nets, Thompson focused on the small stuff, the tiny particles that lay underfoot, ignored, at the high tide line. At first he wasn't even sure they were plastic. He had to consult forensic chemists to confirm it.

There was a real mystery (1) to be solved back then, at least in academic circles: Scientists wondered why they weren't finding even more plastic in the sea. World production has increased drastically — from 2.3 million tons in 1950, it grew to 162 million in 1993 and to 448 million by 2015 — but the amount of plastic drifting on the ocean and washing up on beaches, alarming as it was, didn't seem to be rising as fast. "That begs the question: Where is it?" Thompson said. "We can't establish harm to the environment unless we know where it is."

In the years since his first beach cleanup, Thompson has helped provide the beginnings of an answer: The （　ア　） plastic is getting broken into pieces so small they're hard to see. In a 2004 paper, Thompson coined the term "microplastics" for these small bits, predicting — accurately, （　イ　） it turned out — that they had "potential for large-scale accumulation" in the ocean.

When I met Thompson in Plymouth last fall, he and two of his students had just completed a study that indicated it's not just waves and sunlight that break down plastic. In lab tests (2), they'd watched tiny shrimplike sea creatures that are common in European coastal waters devour pieces of plastic bags and

determined they could break down a single bag into 1.75 million microscopic fragments. The little creatures chewed through plastic especially fast, Thompson's team found, when it was coated with the bacterial slime that is their normal food. They eventually eliminated the plastic bits from their bodies.

Microplastics have been found everywhere in the ocean that people have searched, from sediments* on the deepest seafloor to ice floating in the Arctic — which, (イ) it melts over the next decade, could release more than a trillion bits of plastic into the water, according to one estimate. On some beaches on the Big Island of Hawaii, as much as 15 percent of the sand is actually grains of microplastic. Kamilo Point Beach catches plastic from the North Pacific gyre*, the dirtiest of five spinning current systems that (ウ) garbage around the ocean basins and (エ) it into large-scale accumulations. (3) At Kamilo Point the beach is piled with laundry baskets, bottles, and containers with labels in Chinese, Japanese, Korean, English, and occasionally, Russian. On Henderson Island, an uninhabited coral island in the South Pacific, researchers have found an astonishing volume of plastic from South America, Asia, New Zealand, Russia, and as far away as Scotland.

(イ) Thompson and I talked about all this, a day boat called the *Dolphin* was carrying us through a bay, off Plymouth. Thompson threw out a fine-mesh net called a manta trawl, usually used for studying plankton. We were close to the spot where, a few years earlier, other researchers had collected 504 fish of 10 species and given them to Thompson. Dissecting the fish, he was surprised to find microplastics in the stomach of more than one-third of them. The finding made international headlines.

After we'd steamed along for a while, Thompson pulled the manta trawl back in. There was a small amount of colored plastic pieces at the bottom. Thompson himself doesn't worry much about microplastics in his fish and chips — there's little evidence yet that they pass from the gut of a fish into the flesh we actually eat. He worries (オ) can see — the chemicals added to

plastics to give them desirable properties, and the even tinier nanoplastics that microplastics presumably degrade into. These might pass into the tissues of fish and humans.

"We do know the concentrations of chemicals at the time of manufacture in some cases are very high," Thompson said. "We don't know how much additive is left in the plastic by the time it becomes bite-size to a fish."

"Nobody has found nanoparticles in the environment — they're below the level of detection for analytical equipment. People think they are out there. They have the potential to be stored in tissue, and that could be a game changer."(4)

Thompson is careful not to get ahead of the science on his subject. He's far from an alarmist — but he's also convinced that plastic trash in the ocean is far more than an aesthetic problem. "I don't think we should be waiting for a key finding of whether or not fish are hazardous to eat," he said. "We have enough evidence to act."

出典：Laura Parker (2018) "Planet or Plastic?" *National Geographic Magazine, June Issue,* 49–50. より抜粋，一部改変

(注)

sediment: a soft substance that consists of very small pieces of a solid material that have fallen to the bottom of a liquid

gyre: circular pattern of ocean flow of water

(注意) 解答する際，アルファベットの小文字と数字は1マスに2文字，大文字，引用符，句読点は1マスに1文字記入すること。

1. 下線部(1)について，なぜ mystery とされているのかわかるように，50字程度の日本語で説明しなさい。

2. 空所(ア)に入る最も適切な語を次の中から1つ選び，記号で答えなさい。

(A) harmful (B) large (C) missing (D) precious (E) recycled

3. 3カ所の空所(イ)に共通して入る最も適切な一語を，本文中から抜き出して書きなさい。ただし，文頭であっても解答は小文字ではじめなさい。

4. 下線部(2)の lab tests でわかったことは何か。最も適切なものを一つ選び，記号で答えなさい。

(A) Tiny shrimplike sea creatures clean up the ocean because they eat up plastic bags.

(B) Tiny shrimplike sea creatures are commonly found in European coastal waters.

(C) Tiny shrimplike sea creatures could break down into very small fragments.

(D) Tiny shrimplike sea creatures are normal food for the plastic-eating bacterial slime.

(E) Tiny shrimplike sea creatures can consume and expel pieces of plastic.

5. 下線部(3)の文について，文脈に合うように(ウ)と(エ)に入る最も適切な語の組み合わせを次の中から1つ選び，記号で答えなさい。

(A) collect/decrease (B) navigate/extend

(C) purchase/recycle (D) transport/concentrate

6. 空所(オ)に次の語を最も適切な順に並べ替えて入れると，2番目と4番目にくる語はそれぞれ何になるか。その語の記号で答えなさい。

(A) none (B) more (C) us

(D) about (E) of (F) the things that

7. 下線部(4)について，"game changer" の意味するところを明らかにしながら，40字程度の日本語で説明しなさい。

Ⅱ　次の英文を読んで，下の問いに答えなさい。
（星印（＊）のついた語には本文の後に注があります。）

Anthropologists at the Smithsonian's National Museum of Natural History and an international team of collaborators have discovered that early humans in East Africa had — by about 320,000 years ago — begun trading with distant groups, using color pigments* and manufacturing more sophisticated* tools than those of the Early Stone Age. These newly discovered activities approximately（　ア　）to the oldest known fossil record of *Homo sapiens* and occurred tens of thousands of years earlier than previous evidence has shown in eastern Africa. These behaviors, which are characteristic of humans who lived during the Middle Stone Age, replaced technologies and ways of life that had been in place for hundreds of thousands of years.

Evidence of these significant events in humans' development comes from the Olorgesailie Basin in southern Kenya, which holds an archeological* record of early human life spanning more than a million years. The new discoveries, reported in three studies published March 15 in the journal *Science*, indicate that (1) these behaviors emerged during a period of tremendous environmental variability in the region. As earthquakes remodeled the landscape and the climate changed between wet and dry conditions, technological innovation, social exchange networks and early symbolic communication would have helped early humans survive and obtain the resources they needed despite uncertain conditions, the scientists say.

"This change to a very sophisticated set of behaviors that involved greater mental abilities and more complex social lives may have been the leading edge that distinguished our direct ancestors from other early humans," said Rick Potts, director of the National Museum of Natural History's Human Origins Program. He is the lead author of one of the three *Science* publications that describe the challenges of adaptation that early humans faced during this phase

of evolution. Alison Brooks, a professor of anthropology at George Washington University is the lead author of the paper that focuses on the evidence of early resource exchange and use of coloring materials in the Olorgesailie Basin. A third paper, by Alan Deino at the Berkeley Geochronology Center and colleagues, details the timeline of the Middle Stone Age discoveries.

The first evidence of human life in the Olorgesailie Basin comes from about 1.2 million years ago. For hundreds of thousands of years, people living there made and used large stone-cutting tools called handaxes. Beginning in 2002, Potts, Brooks and their team discovered a variety of smaller, more carefully shaped tools in the Olorgesailie Basin. The tools were surprisingly old — made between 320,000 and 305,000 years ago. These tools were carefully crafted and more specialized than the large, all-purpose handaxes. Many were points designed to be attached to a handle and used as weapons, while others were shaped as scrapers.

While the handaxes of the earlier era were manufactured using local stones, the Smithsonian team found small stone points made of non-local obsidian* at their Middle Stone Age sites. The team also found larger, unshaped pieces of the sharp-edged volcanic stone at Olorgesailie, which has no obsidian source of its own. The diverse chemical composition of the artifacts* matches that of a wide range of obsidian sources in multiple directions 15 to 55 miles away, suggesting exchange networks were (イ) to move the valuable stone across the ancient landscape.

The team also discovered black and red rocks (2) at the sites, along with evidence that the rocks had been processed for use as coloring material. "We don't know what the coloring was used on, but coloring is often taken by archeologists as the root of complex symbolic communication," Potts said. "Just as color is used today in clothing or flags to express identity, these pigments may have helped people communicate membership in alliances and maintain ties with distant groups."

Hoping to understand what might have driven such fundamental changes in human behavior, the research team integrated data from a variety of sources to assess and reconstruct the ancient environment in which the users of these artifacts lived. Their findings suggest that the period when these behaviors emerged was one of changing landscapes and climate, in which the availability of resources would have been insufficient. Geological evidence indicates that an extended period of climate instability affected the region beginning around 360,000 years ago; at the same time earthquakes were continually altering the landscape. Although some researchers have proposed that early humans evolved gradually in response to a dry environment, Potts says his team's findings support an alternative idea. Environmental variability would have presented significant challenges to inhabitants of the Olorgesailie Basin, prompting changes in technology and social structures that improved the likelihood of securing resources during times of shortage.
(3)

出典：Newsdesk (2018) "Scientists Discover Evidence of Early Human Innovation, Pushing Back Evolutionary Timeline." (https://newsdesk.si.edu/releases/scientists-discover-early-human-innovation-pushing-back-evolutionary-timeline より抜粋，一部改変)

(注)

pigment: a substance used for coloring
sophisticated: more complex or refined
archeology: the study of societies and peoples of the past
obsidian: a hard, dark, glass-like volcanic rock
artifact: an object made by humans

(注意) 解答する際，アルファベットの小文字と数字は1マスに2文字，大文字，引用符，句読点は1マスに1文字記入すること。

1. 空所(ア)に入る最も適切な1語を次の中から1つ選び，記号で答えなさい。

(A) date (B) due (C) estimate (D) originate (E) prove

2. 下線部(1)の these behaviors は何を指すか，50字程度の日本語で述べなさい。

3. 空所(イ)に入る最も適切な2語を次の中から1つ選び記号で答えなさい。

(A) at stake (B) in charge (C) in place

(D) on purpose (E) on time

4. 下線部(2)の black and red rocks は具体的にどのような目的で使用されたと推測されているか，40字程度の日本語で説明しなさい。

5. 下線部(3)と同じ意味になるように書きかえるとき，以下の空所に入る最も適切な表現を，同じ段落内から抜き出して書きなさい。

times when ( )

6. 次のそれぞれの記述について，本文の内容に合っているものには○を，そうでないものには×を記入しなさい。すべて○あるいは×を記入した場合は採点の対象としません。

(A) Archeologists revealed that color pigments found at ancient sites had been used to dye flags and clothing materials.

(B) The Smithsonian team discovered that artifacts at the Middle Stone Age sites contained materials originating from various regions.

(C) The oldest fossil found in East Africa shows evidence that early humans had more advanced technologies than previously believed.

(D) Recent advances in archeological techniques for analyzing fossils have overturned our common understanding of early human behaviors.

Ⅲ　次の英文を読んで，あなた自身の経験に基づいた具体的な理由を2つ以上明示しながら，下線部の問いに対する考えを100語程度の英語で述べなさい。ただし，句読点は語数に含めません。

Students need to adapt to different learning techniques to succeed throughout their academic life. While in school, they learn new concepts in a variety of subjects taught by different teachers. Because the curriculum and learning style for every subject is different, students must adapt to various study techniques. For example, there is classroom learning in schools, where students receive proper instruction by teachers. On the other hand, there is self-study, where students learn by themselves without their teacher's direct supervision. Some students find classroom learning with teachers more efficient, while others consider self-study more effective for better understanding.

What is your opinion?

出典：Anjum Kahn (2018) "Self Studies vs. Classroom Studies: Which One is Better Way to Learn?"
(https://www.jagranjosh.com/articles/self-studies-vs-classroom-studies-which-one-is-better-way-to-learn-1521034058-1?ref＝list_art に基づき作成)