

英語 I (選択) (656 words)

次の文章に関して、空欄補充問題と読解問題の二つがあります。まず、[31]から[40]の空所を埋めるのに、文脈的に最も適切な語を 1 から 3 の中から選び、その番号を解答欄(31)から(40)にマークしなさい。次に、内容に関する[41]から[45]の設問には、1 から 4 の選択肢が付されています。そのうち、文章の内容からみて最も適切なものを選び、その番号を解答欄(41)から(45)にマークしなさい。

- 1 "We shall escape the absurdity of growing a whole chicken in order to eat the breast or wing, by growing these parts separately under a suitable medium," predicted famed British politician Winston Churchill in a 1932 essay titled *Fifty Years Hence*. Although off by a few decades, Churchill's prophecy may finally be coming to eerie fruition.
- 2 The process of growing meat in a lab, while nascent and sure to encounter obstacles and complications, is nonetheless [31][1. burdened 2. rife 3. discharged] with potential to profoundly change the way humans produce and consume protein. Cultured meat (also known as synthetic meat, in vitro meat, or clean meat) has recently become possible because of advances in stem cell research and tissue engineering. The process of growing tissue outside the body in a lab involves self-replicating cells, food, hormones, and other factors that allow original cells to grow and [32][1. deteriorate 2. evaporate 3. proliferate], eventually creating strips of synthetic animal muscle that are [33][1. essentially 2. scarcely 3. accidentally] meat.
- 3 Although the thought of this may bring a knee-jerk stank-face to many, the potential benefits that cultured meat may provide may be worth getting over any negative reactions. [34][1. For one 2. In contrast 3. At last], the world population is already dealing with a major protein crisis that only figures to get worse. According to a 2012 United Nations report, the world's population is expected to [35][1. suppress 2. surpass 3. supersede] nine billion by the year 2050, which means meat production (if our current consumption remains the same) would need to almost double. Producing this much meat using conventional methods could severely harm or even destroy the planet. The report states that current meat and dairy production [36][1. rely on 2.

account for 3. result from] 19 percent of global greenhouse gas emissions, 38 percent of global land use, and 70 percent of global water use. And although cultured meat production would surely leave some sort of carbon footprint as well, the thought is that if it is done correctly and efficiently, it has the potential to be much less harmful to the environment.

4 Cultured meat could also [37][1. curb 2. pacify 3. sustain] or even completely end what many consider to be the barbaric practices involved in the raising and slaughtering of live animals for food. Would vegetarians eat it? From a health perspective, cultured meat also has the potential to be [38][1. neglected 2. improvised 3. engineered] to be more nutritious, as well as cleaner and more free of disease than conventional meat.

5 In 2013, the world's first lab-grown burger was produced from living cow stem cells by scientists, led by Professor Mark Post. He is now involved in a cultured meat startup company called Mosa Meat. There is also a San Francisco-based startup called Memphis Meats that recently released its versions of lab-grown fried chicken, beef meatballs, and duck a l'orange. Other startups are working on developing similar products — even Tyson Foods, America's largest meat company, launched a venture capital fund intended on investing in innovative approaches for protein production. There are also several research institutes [39][1. navigating 2. advocating 3. mitigating] for and working on the development of cultured meat, and even government regulatory organizations are getting involved and working to establish guidelines.

6 Outside the lab, one obstacle is mass public acceptance. [40][1. Portability 2. Profitability 3. Palatability] will go a long way toward potentially changing this negative ingrained mindset. Tasters of cultured meat products have generally said that the flavor and texture are similar to that of the real thing, although not exactly the same. Companies would need to work on creating close enough facsimiles that would hold their own in blind taste tests. This may be especially difficult for products like hamburgers and steaks that have significant fat content, which contribute to their natural taste and texture. Producing lab-grown fat would involve a separate and similarly complicated biogenic process.

7 Another major hurdle is reducing the production cost of cultured meat to bring it up to par with conventional prices. Although this may take a while, history has shown us that when a technology's time has come, it is only a matter of time before costs come down to a point where it goes mainstream.

—Based on Steingrube, A. (2017). "Cultured Meat Is Here, And That Might Be a Good Thing," *Good Times*.

[41] What does the author suggest about Churchill's prediction?

1. It was ahead of its time and is now beginning to be realized.
2. It was exaggerated and people were repulsed by the idea of fake meat.
3. It was imaginative but has remained unrealized despite later progress.
4. It was unrealistic then and is still unlikely to succeed.

[42] What does the author imply about the environmental benefits of cultured meat in paragraph 3?

1. They would be negligible compared to ongoing traditional systems.
2. They would be on an equal footing with conventional meat.
3. They would depend on how effectively production is carried out.
4. They would depend on the UN's report on world population.

[43] What does the mention of companies like Tyson Foods mainly illustrate?

1. Traditional meat companies are threatened by lab-grown meat producers.
2. Established meat producers are beginning to invest in new technologies.
3. The cultured meat industry is controlled entirely by large corporations.
4. Government funding is no longer needed for cultured meat research.

[44] Which research priority is most consistent with the author's analysis to improve the natural taste and texture of products in paragraph 6?

1. Focus on ground products and ignore fat replication to cut costs.
2. Abandon whole-cut analogs and pivot to plant-based substitutes.
3. Replace fat with non-caloric additives to simplify production.
4. Develop a parallel technology to cultivate human-made fat tissue.

[45] The author's overall tone toward cultured meat is best described as

1. unreservedly positive.
2. cautiously optimistic.
3. conservative and skeptical.
4. detached and indifferent.

英語Ⅱ (574 words)

次の文章に関して、空欄補充問題と読解問題の二つがあります。まず、[46]から[55]の空所を埋めるのに、文脈的に最も適切な語を 1 から 3 の中から選び、その番号を解答欄(46)から(55)にマークしなさい。次に、内容に関する[56]から[60]の設問には、1 から 4 の選択肢が付されています。そのうち、文章の内容からみて最も適切なものを選び、その番号を解答欄(56)から(60)にマークしなさい。

- 1 The public is ignoring the seemingly slow warming of the world, but it doesn't have to be that way. For a long time, many climate scientists and advocates held onto an optimistic belief: when the impacts of global warming became undeniable, people and governments would finally act decisively. Perhaps a devastating hurricane, heatwave or flood — or even a cascade of disasters — would make the severity of the problem impossible to ignore, [46] (1. negating 2. precluding 3. spurring) large-scale action. Yet, even as disasters mount, climate change remains low on voters' priority lists and policy responses are [47] (1. tepid 2. salacious 3. zealous).
- 2 This widespread inaction is often blamed on political or structural forces. But decades of psychological research suggest something deeper is at play: the human brain tends to [48] (1. overlook 2. personalise 3. underscore) slow, creeping change. While many regions are facing severe climate extremes, for most of the world, climate change appears as a slow, gradual shift in

daily weather.

3 This [49] (1. scarcity 2. singularity 3. subtlety) is a problem. People judge the issue largely via personal experience: we are more worried on an unusually hot day, and less so when the weather feels normal. But as things gradually worsen, our sense of "normal" quietly shifts. This is known as the boiling frog effect — where subtle, incremental changes fail to trigger alarm, resulting in [50] (1. apathy 2. antipathy 3. empathy) despite worsening conditions: like a frog in a pan of slowly warming water. In 2020, we were researching climate impacts in Princeton, New Jersey. The area doesn't face wildfires or droughts, but we realised it had lost something: winter ice skating. For decades, you could skate on Lake Carnegie every year. Now, it rarely freezes over.

4 Through conversations with long-term residents and digging into local newspaper archives, we discovered there had been a stark decline in ice skating on the lake over the past century, and a sense of loss over it. This interruption to a winter tradition suddenly made climate change in Princeton feel real and [51] (1. esoteric 2. exuberant 3. tangible). That led us to ask: could binary climate data — yes-or-no indicators such as "lake froze" vs "no freeze"— make people sit [52] (1. back 2. out 3. up) and take notice better than graphs showing gradual temperature rise?

5 We tested this idea in a series of experiments. Participants were shown one of two graphs: one displayed a fictional town's rising winter temperatures; the other showed whether its lake froze each year. Importantly, both graphs captured the same [53] (1. mirroring 2. paralysing 3. underlying) climate trend. But people's responses were very different. People who saw the binary "froze or not" graphs consistently perceived climate change as having a greater impact than those who saw the temperature graphs. In follow-up studies with data from lakes in North America and Europe, we saw the same result. When climate impacts were presented in these kinds of black-and-white terms, people took them more seriously.

6 Why? We found that binary data creates an [54] (1. illumination 2. illusion 3. illustration) of sudden shifts. When people saw a series of winters when the lake froze, followed by years when it didn't, they perceived a clear "before" and "after", even though the change was

gradual. Climate change isn't just a physical crisis. It is also a psychological problem. And unless we communicate it in ways that feel real, we risk [55] (1. figuring 2. sorting 3. tuning) out the warning signs until it is too late.

7 We hope these results ignite policy-makers, journalists and educators to take action. Highlight the concrete losses people can relate to: winters without ice skating, harvests damaged by drought, summers filled with wildfire smoke. Use visuals that contrast "what we had" with "what we've lost".

— Based on Liu, G. & Dubey R. (2025). "Why climate change fades into the background — and how to change that" New Scientist.

[56] What is the optimistic belief outlined in the opening paragraph?

1. People will be gradually educated about and conscious of the devastating global disasters.
2. People will be convinced that the solar temperature cycle will self-heal global warming.
3. People will eventually tackle the problem when it becomes obvious.
4. People will finally notice that natural disasters are exaggerated.

[57] Which statement best matches the authors' observations about global warming?

1. When presented with objective, scientific data, people become inquisitive about the changes in 1 surrounding climate.
2. Since policy-makers are unreliable, ordinary citizens should take action to prevent further dim; changes.
3. Whenever people suffer from a devastating natural disaster, they tend to be forced into a response
4. A build-up of small changes makes people less aware of the importance of big changes.

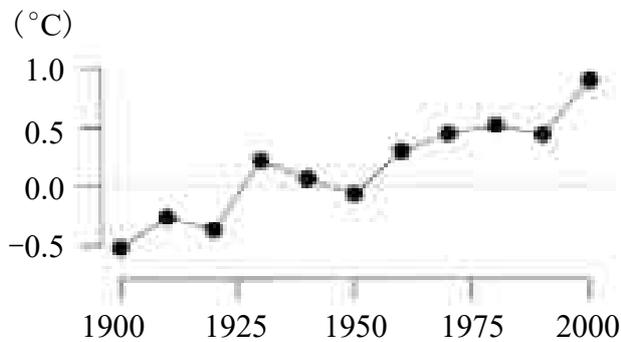
[58] What is a good example of the metaphor mentioned in paragraph 3?

1. "I swore I'd never overeat again, but the moment cake is offered, I just can't resist."

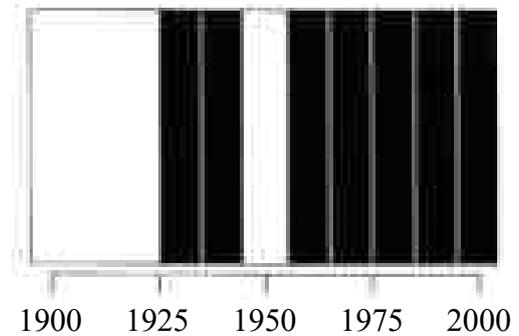
2. "The fire alarm went off, but I thought it was just a drill, so I didn't evacuate."
3. "Work increased day by day, and before I knew it, I was regularly working overtime."
4. "Even if I have complaints, I can't bring myself to quit my job."

[59] Which of the following statements are the authors most likely to support regarding the graphs created from the same data as shown below?

1. A line graph presents chronological tendency more vividly as a time-series data set.
2. The use of anecdotes is more persuasive than the use of graphical representation.
3. The color selected for the graphs is important to convey accurate information.
4. Different figures based on identical information can give different impressions.



Graph A (winter temperature over time)



Graph B (Black: "not frozen, white frozen")

[60] Which of the following statements best reflects the main message of this article?

1. People tend to think and react in black and white terms when confronted with change.
2. Progress on climate issues requires insights from multiple academic disciplines.
3. Lawmakers should take responsibility for failing to implement effective policies.
4. Data may fail to persuade unless it is presented in a way that people can identify with.

英語Ⅲ (1237 words)

次の文章に関して、空欄補充問題と読解問題の二つがあります。まず、[61]から[80]の空所を埋めるのに、文脈的に最も適切な語を 1 から 3 の中から選び、その番号を解答欄(61)から(80)にマークしなさい。次に、内容に関する[81]から[90]の設問には、1 から 4 の選択肢が付されています。そのうち、文章の内容からみて最も適切なものを選び、その番号を解答欄(81)から(90)にマークしなさい。

- 1 The term 'ecology' was coined in the mid-nineteenth century by the German naturalist Ernst Haeckel in his book *General Morphology of Organisms*. 'By ecology,' wrote Haeckel, 'we mean the whole science of the relations of the organism to the environment including, in the broad sense, all the conditions of existence.' The term derives from the Greek *ekos*, meaning house or environment; in a footnote Haeckel also referenced the Greek *hora*, meaning 'dwelling place'. Ecology is not merely the study of where we find ourselves, but of everything which surrounds us and allows us to live.
- 2 Haeckel was an early [61] (1. skeptic 2. plagiariser 3. proponent) of the work of Charles Darwin. In particular, he supported Darwin's belief that the full import of his theories was to be found not in the way in which individual species developed, but in the relationships between species. In the famous final paragraph of *On the Origin of Species*, Darwin provided a proto-description of ecology, describing an '**entangled bank**', wherein plants of many kinds, birds, insects and other 'elaborately constructed forms, so different from one another' were produced by the complex forces of evolution, yet depended utterly on one another.
- 3 Perhaps the briefest but most [62] (1. resonant 2. monotonous 3. flimsy) description of ecological thought is that given in 1911 by John Muir, the Scottish-American naturalist, outdoorsman, and father of the US National Park system. Reflecting on the [63] (1. banality 2. isolation 3. abundance) of complex life he encountered while writing his book *My First Summer in the Sierra*, he wrote simply: 'When we try to pick out anything by itself, we find it hitched to everything else in the Universe.' Ecology is the study of these interrelationships: those unbreakable [64] (1. cords 2. ledgers 3. oaths) which tie everything to everything else. Crucially, those

relationships extend to things as well as beings', ecology is just as interested in how the availability of nesting materials affects bird populations, or how urban planning shapes the spread of diseases, as it is in how honeybees pollinate marigolds and cleaner wrasses delouse surgeonfish. And that's just biological ecology. Ecology is fundamentally different to the other sciences in that it [65] (1. describes 2. mentions 3. clarifies) a scope and an attitude of study, rather than a field. There is an ecology — and ecologists — of mathematics, behaviour, economics, physics, history, art, linguistics, psychology, warfare, and almost any other discipline that you can think of.

4 There is also ecological politics, which has the potential not merely to explain worlds, but to change them. It was as an ecologist that the marine biologist Rachel Carson approached the environment, [66] (1. deflecting 2. culminating 3. faltering) in her immensely influential *Silent Spring* of 1962, her ecological understanding enabling her to link pesticides in the rivers and oceans to devastating effects on animal and human health. Her work led directly to bans on toxins such as DDT, and the birth of the global environmental movement. Since then, ecological thought has hitched itself to politics and law, in order to shift public awareness and social practice towards less damaging forms of relationships with the natural world.

5 Ecological thought, once unleashed, [67] (1. permeates 2. fragments 3. nullifies) everything. It is as much movement as science, with all the motive, restless energy that word connotes. Every discipline discovers its own ecology in time, as it shifts inexorably from the **walled gardens of specialized research** towards a greater engagement with the wider world. As we expand our field of view, we come to realize that everything impacts everything else — and we find meaning in these interrelationships.

6 Technology is the last field of study to discover its ecology. Ecology is the study of the place we find ourselves in, and the relationships between its inhabitants, while technology is the study of what we do there: techne, or craft. Putting it that way makes them sound like natural bedfellows, but the history of technology is largely one of willful blindness to the context and consequences of its enactment. What counts as technology is also much debated. I like the definition given by the science fiction writer Ursula Le Guin, in a [68] (1. nod 2. rebuff 3.

surrender) to critics who accused her of not including enough of it in her work. 'Technology', she wrote, 'is the active human interface with the material world.' Its definition, for Le Guin, wasn't limited to 'high' technology, like computers and jet bombers; rather, it referred to anything that was produced by human [69] (1. infatuation 2. ingenuity 3. inferiority). That included fire, clothing, wheels, knives, clocks, combine harvesters — and paperclips.

7 Technology, understood as our interface with the material world, is that human practice which most closely ties us to our context and our environment. It [70] (1. exemplifies 2. curtails 3. purifies) and performs the most central characteristics of ecology: complexity, interrelatedness, interdependence, distribution of control and agency, even a closeness to the earth and the sky; on, under and out of which we [71] (1. accessorise 2. fashion 3. display) our tools.

8 An ecology of technology, then, is concerned with the interrelationships between technology and the world, its meaning and materiality, its impact and uses, beyond the everyday, deterministic fact of its own existence. We will start to construct such an ecology by examining many of the assumptions and biases that are built into our ways of thinking, and which are subsequently [72] (1. embedded 2. allocated 3. harvested) in the tools we use every day so deeply that we rarely think to question them. The most powerful of these is the idea that human intelligence is unique, and uniquely significant, in the world. Yet there are in fact many ways of doing intelligence, because intelligence is an active process, not just a mental capacity. By rethinking intelligence, and the forms in which it appears in other beings, we will begin to [73] (1. build up 2. phase in 3. break down) some of the barriers and false hierarchies that separate us from other species and the world. In doing so, we will be in a position to [74] (1. mediate 2. forge 3. reinforce) new relationships based on mutual recognition and respect.

9 Language, that most [75] (1. tentative 2. evocative 3. abrasive) of human faculties, emerged from our direct experience of the world. As we heard and saw and felt the world — the [76] (1. blubbering 2. babbling 3. boiling) of the brook, the flight of the bird, the rumbling of the storm — we shaped language to reflect these experiences, in order to better reflect it to itself, and thus to embody and come [77] (1. across 2. through 3. into) communion with it. In the

millennia since we first spoke to and of the world we have lost much of this sense of connection to it: technological progress is all too often accompanied by spiritual attenuation. But I argue that our contemporary, networked, computational technologies might yet be our fullest attempt since the development of language to draw ourselves closer to nature, however carelessly and unconsciously.

10 Changing our relationship with the world requires us to acknowledge this, and to [78] (1. undercut 2. undermine 3. undertake) the task more carefully and consciously. This task is [79] (1. paramount 2. inconsequential 3. verifiable) if we are to reconcile the vast scope, god-like power and material demands of our technology with our present situation. We are poisoning the soil and air, warming the atmosphere, acidifying the oceans, burning the forests, and murdering with unthinkable efficiency the numberless beings who share our planet, not to mention generations of humans alive and yet to come. The devastation we are visiting upon the earth has every likelihood of forcing our species back into the [80] (1. limelight 2. caves 3. metaverse)—as does an unthinking critique of technological progress. If we do not wish to go there, and do not wish to render ourselves alone and abject on the face of the earth, we must rethink every aspect of our technological society and the ideas it is founded on, and we must do it fast.

— Based on Bridle, J. (2022). "Ways of Being: Animals, Plants, Machines: The Search for a Planetary Intelligence," Picador.

[81] What did Ernst Haeckel emphasize in his definition of ecology?

1. The various ways humans interact with and alter natural systems
2. The processes by which animals respond to environmental conditions
3. The full range of interactions between living things and their environment
4. The gradual development of species in isolated ecosystems over time

[82] Why does the author refer to Darwin's "entangled bank"?

1. To show how Darwin predicted modern ecological science
2. To give a critique of Darwin's focus on species classification

3. To illustrate a contradiction between Darwin's and Haeckel's ideas
4. To provide an explanation of the rise of botanical research in the 1800s

[83] What can be inferred from Muir's quote in paragraph 3?

1. He believed nature should be left untouched by human activity.
2. He thought strong connections were fostered by living organisms.
3. He recognized the connectivity of all components of nature.
4. He held a view based on spiritual belief rather than scientific reasoning.

[84] Which of the following statements is not mentioned-in paragraph 4?

1. Ecological thinking has engaged with politics and law to promote change.
2. Political action is starting to outweigh scientific research on environmental issues.
3. Carson's approach helped her to connect pollutants in waterways with health impacts.
4. Carson's research contributed to the rise of worldwide environmental activism.

[85] What does the author mean by the phrase, "*walled gardens of specialized research*"?

1. Research areas that are closed off from other fields
2. Natural environments that are preserved for scientific study
3. Academic fields that have no practical applications
4. Scientific work that is conducted in outdoor settings

[86] If an ancient community designed a wind-powered mill using stone and wood, Ursula Le Guin would most likely classify this as

1. technology, because it is a human-made way of working with the physical world.
2. ecology, because it applies environmental forces to support humans in a specific setting.
3. both technology and ecology, because it enables humans to overcome the environment.
4. neither technology nor ecology, because it appeared before industrial development.

[87] Which of the following situations is most consistent with the author's point about pre-conceived ideas in paragraph 8?

1. A smartphone app automatically switches to the local language when the user travels, ensuring it can be used anywhere in the world without confusion.
2. A school principal installs solar panels on the roof to cut costs as a result of a study on renewable energy.
3. A national road system is built with wide lanes based on the designer's conviction that most vehicles are large.
4. A luxury watch brand uses waterproof materials so the product can be worn while swimming, but this adds significantly to the production cost.

[88] Why does the author discuss the early development of spoken language in paragraph 9?

1. To show that early communication once reflected a close link with nature
2. To claim that language was invented to inform each other of human achievements
3. To argue that speech evolved without influence from the environment
4. To suggest that early language reduced the need for ecological understanding

[89] In paragraph 10, the author is stating that

1. technology will fix environmental problems without the need for action.
2. action is needed to redesign technology within ecological boundaries.
3. environmental action should be delayed until technology advances further.
4. earlier technologies could be encouraged to promote stronger environmental action.

[90] Which of the following statements best reflects the author's central argument?

1. Ecology and technology can be connected, but their relationship has often been undervalued.
2. Applying ecological thinking can help guide the way technology is developed and applied.
3. Most technological change happens independently of environmental or social influence.
4. Ecological action helps us recognize the deep connection of all beings as interdependent networks.

解答・全文訳

I [解答] [31] 2, [32] 3, [33] 1, [34] 1, [35] 2, [36] 2, [37] 1, [38] 3, [39] 2, [40] 3, [41] 1, [42] 3, [43] 2, [44] 4, [45] 2

[全文訳] 1 「胸肉や手羽先を食べるために鶏全体を育てるという不条理から、適切な培地でこれらの部位を個別に培養することで脱却するだろう」と、英国の著名な政治家ウィンストン・チャーチルは 1932 年のエッセイ『50 年後の世界』で予言した。数十年は外れたものの、チャーチルの予言はついに不気味なまでに現実のものとなりつつある。

2 実験室での肉培養技術は、まだ初期段階にあり障害や複雑な問題に直面することは確実だが、それでも人類がタンパク質を生産・消費する方法に根本的な変革をもたらす可能性に**満ちている**。培養肉（合成肉、インビトロ肉、クリーンミートとも呼ばれる）は、幹細胞研究と組織工学の進歩により、近年実現可能となった。体外で組織を培養するプロセスには、自己複製する細胞、栄養分、ホルモン、その他の因子が関与し、元の細胞が成長・**増殖して**、最終的に**本質的に**肉である合成動物筋肉の帯状構造を形成する。

3 この考えに多くの人が反射的に嫌悪感を示すかもしれないが、培養肉がもたらす可能性のある恩恵は、そうした否定的な反応を乗り越える価値があるかもしれない。**第一に**、世界人口はすでに深刻なタンパク質危機に直面しており、この状況はさらに悪化する一方だ。2012 年の国連報告書によると、2050 年までに世界人口は 90 億人を**突破する**と予測されており、これは（現在の消費量が維持される場合）肉生産量をほぼ倍増させる必要があることを意味する。従来の方法でこれほどの肉を生産することは、地球に深刻な損害を与え、あるいは破壊さえも招きかねない。報告書は、現在の肉・乳製品生産が世界の温室効果ガス排出量の 19 %、土地利用の 38 %、水利用の 70 %を**占めている**と指摘している。培養肉生産も確かに何らかの炭素フットプリントを残すだろうが、適切かつ効率的に行われれば、環境への悪影響を大幅に軽減できる可能性があると考えられている。

4 培養肉は、食用のために生きた動物を飼育・屠殺する過程で生じる、多くの人が野蛮と考える慣行を**抑制し**、あるいは完全に終わらせる可能性もある。菜食主義者はこれを食べるだろうか？健康の観点から見ると、培養肉は従来肉よりも栄養価が高く、清潔で、病気のリスクが少ないように**設計**される可能性も秘めている。

5 2013年、マーク・ポスト教授率いる科学者チームが、生きた牛の幹細胞から世界初の培養肉バーガーを製造した。ポスト教授は現在、培養肉スタートアップ企業「モサミート」に関わっている。サンフランシスコに拠点を置くスタートアップ「メンフィスミーツ」も、培養肉を使ったフライドチキン、ビーフミートボール、鴨のオレンジソース煮を最近発表した。他のスタートアップも同様の製品開発に取り組んでおり、アメリカ最大の食肉企業タイソン・フーズでさえ、タンパク質生産の革新的手法への投資を目的としたベンチャーキャピタルファンドを立ち上げた。培養肉の開発を**推進**・研究する複数の研究機関も存在し、政府規制機関までもが関与しガイドライン策定に取り組んでいる。

6 実験室外では、大衆の受容が障壁となる。**美味しさ**が、この根強い否定的な固定観念を変える大きな鍵となるであろう。培養肉製品を試食した人々は概して、味と食感が本物に似ていると述べているが、完全に同一ではない。企業はブラインドテストで通用するほど精巧な模倣品の開発に取り組む必要がある。特にハンバーガーやステーキのような脂肪分が多く、それが自然な味と食感に寄与している製品では困難が予想される。実験室で脂肪を生産するには、別途同様の複雑な生合成プロセスが必要となるであろう。

7 もう一つの大きな課題は、培養肉の生産コストを削減し、従来の価格水準に近づけることである。これには時間がかかるかもしれないが、歴史が示すように、技術の時代が到来すれば、コストが主流となる水準まで下がるのは時間の問題に過ぎない。

II [解答] [46] 3, [47] 1, [48] 1, [49] 3, [50] 1, [51] 3, [52] 3, [53] 3, [54] 2, [55] 3, [56] 3, [57] 4, [58] 3, [59] 4, [60] 4

[全文訳] 1 人々は地球温暖化がゆっくりと進んでいるように見える現状を無視しているが、必ずしもそれに甘んずる必要はない。長年、多くの気候科学者や気候擁護者は楽観的な考えを抱いていた。地球温暖化の影響が否定できないほど強まれば、人々も政府もついに断固たる行動を起こすだろう、と。壊滅的なハリケーン、熱波、洪水、あるいは災害の連鎖さえも、問題の深刻さを無視できなくなり、大規模な行動を**促す**だろう、と。しかし、災害が増加する一方で、気候変動は有権者の優先事項の下位にとどまり、政策対応も**生ぬるい**。

2 こうした広範な不作為は、しばしば政治的あるいは構造的な要因のせいとされる。しかし、数十年にわたる心理学的研究は、より深い何か作用していることを示唆している。人間の脳は、ゆっくりと

忍び寄る変化を**見落とし**がちだ。多くの地域が深刻な異常気象に直面している一方で、世界のほとんどの地域では、気候変動は日々の天候におけるゆっくりとした緩やかな変化として現れている。

3 この**微妙さ**こそが問題なのである。人々は主に個人的な経験に基づいて問題を判断する。異常に暑い日には不安が増し、普段通りの天気にはそれほど不安を感じない。しかし、事態が徐々に悪化するにつれて、「普通」という感覚は静かに変化していく。これは「茹でガエル効果」として知られている。つまり、微妙で段階的な変化は警戒心を起こさず、悪化する状況にもかかわらず**無関心**に陥るということである。まるで鍋の中のゆっくりと温まる水の中のカエルのようなものである。2020年、私達はニュージャージー州プリンストンで気候変動の影響を調査していた。この地域は山火事や干ばつに見舞われていないが、何かが失われていることに気づいた。冬のアイススケートである。何十年もの間、カーネギー湖では毎年スケートを楽しむことができた。今では、湖が凍ることはほとんどない。

4 長年の住民との会話や地元新聞のアーカイブ調査を通じて、過去1世紀の間に湖でのアイススケートが著しく減少し、人々がそれに対する喪失感を抱いていることが分かった。冬の伝統が途絶えたことで、プリンストンにおける気候変動が突如として現実的で**明らか**になったのである。そのことは私達に、「湖が凍った」か「凍らなかった」といった二者択一の指標を示す気候データの方が、気温の緩やかな上昇を示すグラフよりも、より効果的に人々を起き上がらせ、注意を向けさせることが出来るのではないだろうか?と考えさせるに至った。

5 私達はこの考えを一連の実験で検証した。参加者には2つのグラフのうち1つを見せた。1つは架空の町の冬の気温上昇を示すグラフ、もう1つは毎年その町の湖が凍るかどうを示すグラフである。重要なのは、どちらのグラフも同じ**根本的な**気候傾向を捉えていたことである。しかし、人々の反応は大きく異なった。「凍ったか凍らないか」という二者択一のグラフを見た人は、気温のグラフを見た人よりも、一貫して気候変動の影響が大きいと認識した。北米とヨーロッパの湖のデータを用いた追跡調査でも、同じ結果が得られた。気候の影響がこのような白黒はっきりした言葉で提示されたとき、人々はそれをより真剣に受け止めたのである。

6 なぜであろうか?二者択一のデータは、突然の変化という**錯覚**を生み出すことが分かった。湖が凍る冬と凍らない冬が続くのを目にした人々は、変化が緩やかであったにもかかわらず、明確な「前」と「後」を感じた。気候変動は単なる物理的な危機ではない。心理的な問題でもある。そして、私達がそれを現実的に感じられる方法で伝えなければ、手遅れになるまで警告の兆候を**無視してしまう**危険性がある。

7 私達は、これらの結果が政策立案者、ジャーナリスト、教育者に行動を起こすきっかけとなることを願っている。人々が共感できる具体的な損失、例えばアイススケートができない冬、干ばつによる

被害を受けた作物、山火事の煙で満たされた夏などを強調するべきである。「私達が持っていたもの」と「失ったもの」を対比させる視覚教材を用いるべきである。

Ⅲ [解答]

[61] 3, [62] 1, [63] 3, [64] 1, [65] 1, [66] 2, [67] 1, [68] 2, [69] 2, [70] 1, [71] 2, [72] 1, [73] 3, [74] 2, [75] 2, [76] 2, [77] 3, [78] 3, [79] 1, [80] 2, [81] 3, [82] 1, [83] 3, [84] 2, [85] 1, [86] 1, [87] 3, [88] 1, [89] 2, [90] 2

[全文訳] 1 「生態学 (エコロジー)」という用語は、19 世紀中頃、ドイツの博物学者エルンスト・ヘッケルによって彼の著書『生物の一般形態学』の中で造り出された。ヘッケルは、「生態学とは、生物と環境の関係に関する科学全般を指し、広い意味では、生存のあらゆる条件を含む」と述べた。この用語はギリシャ語の「エコス」(家または環境)に由来し、ヘッケルはギリシャ語の「ホラ」(居住場所)にも脚注で言及した。生態学は、単に私達がどこに存在しているのかに関するだけでなく、私達を取り囲み、私達の生存を可能にするあらゆるものに関する学問である。

2 ヘッケルはチャールズ・ダーウィンの研究に対する早くからの**支持者**であった。特に、彼は、理論の重要性が個々の種の発達の仕方ではなく、種間の関係に見出されるべきであるというダーウィンの信念を支持した。ダーウィンは『種の起源』の有名な最終段落で、生態学の原型的な記述を行った。それは「絡み合った土手」であり、多種多様な植物、鳥、昆虫、そして「互いに非常に異なる精巧に構築された形態」が、進化の複雑な力によって生み出されながらも、完全に相互に依存し合っているというものであった。

3 生態学的思想の最も簡潔かつ印象深い記述は、おそらく 1911 年にスコットランド系アメリカ人の博物学者、アウトドア愛好家、そして米国国立公園制度の父であるジョン・ミューアによって行われた記述であろう。『シエラでの最初の夏』の執筆中に出会った複雑な生命の**豊かさ**を振り返り、彼は簡潔にこう記述した。「何かを単独で取り上げようとすると、それが宇宙の他の全ての物と結び付いていることに気付く。」生態学とは、こうした相互関係、つまり全ての物を他の全ての物と結び付ける、切れない**紐**を研究する学問である。重要なのは、こうした関係性が生物だけでなく物にも及ぶということである。生態学は、巣材の入手可能性が鳥類の個体数にどう影響するか、都市計画が病気の蔓延にどう影響するかといったことに、ミツバチがマリーゴールドを受粉し、ベラがクロハギのシラミを駆除する仕組みと同じくらい関心を持つ。しかし、それは生物生態学に過ぎない。生態学は他の科学とは根本的に

異なり、分野ではなく研究の範囲と姿勢を規定する。数学、行動学、経済学、物理学、歴史学、芸術、言語学、心理学、戦争学、そして思い付く限りのほぼあらゆる学問分野には、生態学、そして生態学者が存在する。

4 また、生態学的政治学も存在するが、これは、世界を説明するだけでなく、世界を変える可能性も持っている。海洋生物学者レイチェル・カーソンは生態学者として環境に取り組み、1962年に出版された非常に影響力のある著書『沈黙の春』で**頂点に達した**。彼女の生態学的理解は、河川や海洋における農薬が動物と人間の健康に壊滅的な影響を与えることを示した。彼女の研究は、DDTなどの有害物質の禁止と、世界的な環境運動の誕生に直接つながったのである。それ以来、生態学的思想は政治や法律と結びつき、人々の意識と社会实践を、自然界とのより害の少ない関係へと向かわせて来た。

5 生態学的思想は、一度解き放たれると、あらゆるものに**浸透する**。それは科学と同じくらい大きな動きであり、その言葉が暗示するあらゆる動機と絶え間ないエネルギーを伴う。あらゆる分野は、専門研究という壁に囲まれた庭園から、より広い世界とのより深い関わりへと、容赦なく移行して行く中で、やがて独自の生態学を発見して行く。視野を広げるにつれて、私達はあらゆるものが互いに影響を与えていることに気付き、こうした相互関係の中に意味を見出す。

6 テクノロジーは、その生態学を解明する最後の学問分野である。生態学とは、私達が暮らす場所とそこに住む人々との関係性を研究する学問であり、テクノロジーは、そこで私達が行う行為、つまりテクネ（工芸）を研究する学問である。このように表現すると、両者は自然な流れのように聞こえるが、テクノロジーの歴史は、その成立の文脈と結果に対する故意の無視の歴史と言えるであろう。テクノロジーとは何かについても、多くの議論が交わされている。SF作家のアーシュラ・ル＝グウィンが、作品にテクノロジーが十分に盛り込まれていないと批判した批評家達への**反論**として示した定義は、私にとって興味深いものである。彼女は「テクノロジーとは、人間と物質世界との能動的なインターフェースである」と記している。ル＝グウィンにとって、テクノロジーの定義は、コンピューターやジェット爆撃機のような「ハイ」テクノロジーに限定されず、むしろ人間の**創意工夫**によって生み出されるあらゆるものを指していた。火、衣服、車輪、ナイフ、時計、コンバイン、そしてペーパークリップも、テクノロジーに含まれていたのである。

7 テクノロジーは、物質世界とのインターフェースとして理解され、私達を文脈や環境に最も密接に結び付ける人間の営みである。テクノロジーは、生態学の最も中心的な特徴、すなわち複雑性、相互関連性、相互依存、制御と行為主体性の分散、そして大地と空との親密さを**体現し**、実践する。私達は、その上、下、そしてそこから道具を**創り出している**のである。

8 したがって、テクノロジーの生態学とは、テクノロジーと世界、その意味と物質性、その影響と用

途との相互関係性、そしてテクノロジー自体の存在という日常的で決定論的な事実を超えたところに関心を寄せるものである。私達は、こうした生態学の構築にあたり、私達の思考様式に組み込まれ、ひいては日々使用する道具に深く**根付いている**ため、ほとんど疑問視することのない多くの前提や偏見を検証することから始める。その中で最も強力なのは、人間の知性は世界において唯一無二であり、かつ他に類を見ないほど重要なものであるという考えである。しかし、実際には知性を発揮する方法は数多く存在する。なぜなら、知性は単なる精神的能力ではなく、能動的なプロセスだからである。知性、そしてそれが他の存在に現れる形態を再考することで、私達を他の種や世界から隔てる障壁や誤った階層構造の一部を**打ち破り**始めることが出来る。そうすることで、私達は相互認識と尊重に基づく新たな関係を**創り出す**ことが出来る立場になることになろう。

9 人間の能力を最も強く**喚起する**言語は、世界を直接体験することから生まれた。私達は、小川の**せせらぎ**、鳥の飛翔、嵐の轟きなど、世界を聞き、見て、感じながら、これらの経験を反映するように言語を形作って来た。それは、世界をよりよく反映し、ひいては世界を体現し、世界**と**交わりを持つためであった。私達が初めて世界に語り、世界について語り始めてから数千年の間に、私達は世界との繋がりを感じをほとんど失ってしまったのである。技術の進歩は、あまりにもしばしば精神的な衰退を伴う。しかし私は、現代のネットワーク化された計算技術こそが、たとえそれがいかに不注意で無意識的であろうとも、言語の発達以来、私達が自然に近づくための最も完全な試みであるかもしれないと主張する。

10 世界との関係を変えるには、このことを認識し、より注意深く意識的にその課題に**取り組む**必要がある。テクノロジーの広大な範囲、神のような力、そして物質的な要求を、私達の現状と調和させるためには、この課題は極めて**重要**である。私達は土壌と空気を汚染し、大気を温暖化し、海洋を酸性化し、森林を焼き尽くし、地球を共有する無数の生物、そして今生きている人類とこれから生まれてくる人類の世代を、想像を絶する効率で殺戮している。私達が地球にもたらす荒廃は、人類を**洞窟**へと逆戻りさせる可能性を孕んでいる。技術進歩に対する無思慮な批判も同様です。もし私達が洞窟に逆戻りしたくないのであれば、そして地球上で孤独でみすぼらしい存在になりたくないのであれば、私達は技術社会のあらゆる側面と、その基盤となる理念を再考しなければならない。そして、それを速やかに実行しなければならないのである。