

前期日程試験

平成 25 年度医学科入学試験問題

英 語

〔注意事項〕

- 1 監督者の指示があるまで，この冊子を開いてはいけない。
- 2 解答用紙に受験番号と氏名を必ず記入すること。
- 3 この問題冊子の本文は，14 ページからなっている。落丁，乱丁及び印刷不鮮明な箇所等があれば，手をあげて監督者に知らせなさい。
- 4 この問題冊子の白紙と余白は，適宜下書きに使用してもよい。
- 5 解答は，すべて別紙「解答用紙」の指定された場所に記入すること。
- 6 この問題冊子は持ち帰ること。

I Read the passage below and answer the questions which follow.

Our first topic is a debate between Gottfried Leibniz (1646–1716) and Isaac Newton (1642–1727), two of the outstanding scientific intellects of the 17th century, concerning the nature of space and time. We shall focus primarily on space, but the issues about time are closely parallel. In his famous *Principles of Natural Philosophy*, Newton defended what is called an ‘absolutist’ conception of space. According to this view, space has an ‘absolute’ existence over and above the spatial relations between objects. Newton thought of space as a three-dimensional container into which God had placed the material universe at creation. This implies that space existed before there were any material objects, just as a container like a cereal box exists *before* any pieces of cereal are put inside. The only difference between space and ordinary containers like cereal boxes, according to Newton, is that the latter obviously have finite dimensions, whereas space extends infinitely in every direction.

Leibniz strongly disagreed with the absolutist view of space, and with much else in Newton’s philosophy. He argued that space consists simply of the totality of spatial relations between material objects. Examples of spatial relations are ‘above’, ‘below’, ‘to the left of’, and ‘to the right of’ — they are relations that material objects bear to each other. This ‘relationist’ conception of space implies that before there were any material objects, space did not exist. Leibniz argued that space came into existence *when* God created the material universe; it did not exist beforehand, waiting to be filled up with material objects. So space is not usefully thought of as a container, nor indeed as an entity of any sort. Leibniz’s view can be understood in terms of an ⁽⁴⁾analogy. A legal contract consists of a relationship between two parties — the buyer and seller of a house, for example. If one of the parties dies, then the contract ceases to exist. So it would be crazy to say that the contract has an existence independently of the relationship between buyer and seller — the

contract just *is* that relationship. Similarly, space is nothing over and above the spatial relations between objects.

Newton's main reason for introducing the concept of absolute space was to distinguish between absolute and relative motion.⁽⁵⁾ Relative motion is the motion of one object with respect to another. So far as relative motion is concerned, it makes no sense to ask whether an object is 'really' moving or not — we can only ask whether it is moving with respect to some other object. To illustrate, imagine two joggers running in tandem along a straight road. Relative to a bystander standing on the roadside, both are obviously in motion: they are getting further away by the moment. But relative to each other, the joggers are not in motion: their relative positions remain exactly the same, so long as they keep jogging in the same direction at the same speed. So an object may be in relative motion with respect to one thing but be stationary with respect to another.

Newton believed that as well as relative motion, there is also absolute motion. Common sense supports this view. For intuitively, it *does* make sense to ask whether an object is 'really' moving or not. Imagine two objects in relative motion — say a hang-glider and an observer on the earth. Now relative motion is symmetric:⁽⁶⁾ just as the hang-glider is in motion relative to the observer on the earth, so the observer is in motion relative to the hang-glider. But surely it makes sense to ask whether the observer or the hang-glider is 'really' moving, or both? If that is so, then we need the concept of absolute motion.⁽⁷⁾

But what exactly *is* absolute motion? According to Newton, it is the motion of an object *with respect to absolute space itself*. Newton thought that at any time, every object has a particular location in absolute space. If an object changes its location in absolute space from one time to another then it is in absolute motion; otherwise, it is at absolute rest. So we need to think of space as an absolute entity, over and above the relations between material objects, in order to distinguish relative from absolute motion. Notice that Newton's

reasoning rests on an important assumption. He assumes without question that all motion has got to be relative to something. Relative motion is motion relative to other material objects; absolute motion is motion relative to absolute space itself. So in a sense, even absolute motion is 'relative' for Newton. In effect, Newton is assuming that being in motion, whether absolute or relative, cannot be a 'brute fact' about an object; it can only be a fact about the object's relations to something else. That something else can either be another material object, or it can be absolute space.

Leibniz accepted that there was a difference between relative and absolute motion, but he denied that the latter should be explained as motion with respect to absolute space. For he regarded the concept of absolute space as incoherent. He had a number of arguments for this view, many of which were theological in nature. From a philosophical point of view, Leibniz's most interesting argument was that absolute space conflicts with what he called the principle of the identity of indiscernibles (PII). Since Leibniz regarded this principle as unquestionably true, he rejected the concept of absolute space.

PII says that if two objects are indiscernible, then they are identical, i.e., they are really one and the same object. What does it mean to call two objects indiscernible? It means that no difference at all can be found between them — they have exactly the same attributes. So if PII is true, then any two genuinely distinct objects must differ in at least one of their attributes — otherwise, they would be one, not two. PII is intuitively quite convincing. It certainly is not easy to find an example of two distinct objects that share *all* their attributes. Even two mass-produced factory goods will normally differ in innumerable ways, even if the differences cannot be detected with the human eye. Whether PII is true in general is a complex question that philosophers still debate; the answer depends in part on exactly what counts as an 'attribute', and in part on difficult issues in quantum physics.

(Cited from *Philosophy of Science: A Very Short Introduction* (pp. 95–98), by Samir Okasha, 2002, Oxford University Press)

QUESTIONS

1. Underlined (1)— Explain the meaning of this sentence in Japanese, especially by clarifying what the word “parallel” in this sentence means.
2. Underlined (2)— Explain the meaning of this sentence in Japanese, especially by clarifying what the words “the latter” in this sentence refer to.
3. Underlined (3)— Complete the sentence below by writing one appropriate English word in each space in order to clarify the meaning of this part.
Leibniz () against () other () of Newton’s theory.
4. Underlined (4)— Choose the most appropriate answer to match the meaning of this phrase.
ア. An issue of time/space relations.
イ. The material universe outside of objects.
ウ. A contractual relationship between God and human beings.
エ. A physically definable object.
オ. An existential dilemma among the ‘absolutist’ view.
5. Underlined (5)— According to the author, what is “relative motion” here? Explain the details of the meaning of this phrase clearly in Japanese, especially by using an example from the passage.
6. Underlined (6)— According to the author, why is it possible to say that “relative motion is symmetric”? Explain the details of the meaning of this sentence clearly in Japanese, especially by using an example from the passage.

7. Underlined (7)—According to the author, why do we need “the concept of absolute motion” here? Explain the reason(s) clearly in Japanese.

8. Underlined (8)—According to the author, why is it possible to say that “absolute motion is ‘relative’ for Newton” here? Explain the reason(s) clearly in Japanese.

II Read the passage below and answer the questions which follow.

One of the nursery windows faced south-west across the Nile — over fields of sugar-cane stretching to the line of desert hills upon which, an enormous triangle, stood the Great Pyramid of Khufu. Two other pyramids, barely visible, but known to be there, were located behind it. Standing there twelve miles away, half in shade, half-shining in the morning sun, as one struggled into one's undershirt or fed the silkworms on their breakfast of mulberry leaves, ^(a) it gave, if anyone in the nursery had thought on those lines, a sense of continuity to human endeavour. Do very small children have thoughts? What remains in the memory is feeling. Passionate surges of delight, anger, grief, affection, terror, and surprise imprint on the memory a series of small, highly-coloured photographs with blurred edges; brief incidental exposures without before or after. The Great Pyramid was always there, part of the backcloth of the photographs, an impressive solidity that was for ever in the tail of one's eye.

No one told me that the Pyramids had been one of the Seven Wonders of the Ancient World, but they were certainly ^(b) the primal wonder of mine. From early on they exercised an oddly persistent fascination. They could not, it seemed, be taken for granted, like hills and trees and houses. Approached ^(c) along the pyramid road they got larger and larger until they filled up one half of the sky. It took a long while to ride round the Great Pyramid on a wildly swaying camel, and from no angle could their immense size be ignored. They were made of square yellow blocks, exactly like sugar lumps, but higher than I was. Even after the ride, swimming naked in the clear green water of the Mena House Hotel swimming pool, they seemed, excitingly, to dominate the scene. And back at home, hours later, there they still were, black against the sunset, which was as usual turning the whole western sky to a bright orange.

“What are they for, Nanny?”

“Tombs, dear. Where’s your other sock?”

“Who put them there?”

“The Pharaohs did.”

The Pharaohs. Some sort of boy fairies, perhaps? Better not say so and provoke that scornful adult laughter once again.

“Pharaohs?”

“The Pharaohs, dear. The old kings of Egypt, as you’d know if you’d listened while your father was telling your brother on the picnic.”

“But what are they *for*, Nanny?” This was a formal question, but I did not really expect an answer. The Pyramids had been put there, of course, expressly for my amusement and education.

(d) “I’ve told you before, for the Pharaohs when they died to be buried in. Your other sock is in the doll’s bed, and that it got there by itself I do not believe for one minute.”

People were too often, in the kindest manner, scaling one down to size, and laughter was the easiest way to do so. The sound of it intruded, very slightly, into the ruthlessly egocentric world in which, as a two- and three-year-old, one lives. I was, of course, the most important thing that had ever happened. My dignity and independence, my whole separate being and essence, could hardly have mattered more enormously. Other people were shadows, were laps for my sitting on, were arms to pick me up when I was tired, were shoulders for me to rub my bumped head upon. But when they laughed one had an unpleasant impression that people had moments of not sharing this view. I wanted with all my heart to be taken very seriously indeed, and there were times when there seemed to be no one who did so.

(f)
(Cited from *A Late Beginner* (pp. 15–17), by Priscilla Napier, 2009, Slightly Foxed Ltd.)

QUESTIONS

1. Complete the following sentence by writing one English word in the space.
The author is writing of her memories of being a child in ().
2. Complete the following sentence by writing one English word in the space.
In shape the Great Pyramid of Khufu was not spherical but ().
3. Underlined (a)—What does “it” refer to here? Write your answer in English.
4. Underlined (b)—“... the primal wonder of mine.” What does “mine” refer to? Write your answer in English.
5. Complete the following sentence by writing one English word in the space.
The author compares her childish memories to ().
6. Underlined (c)—“Approached along the pyramid road they got larger and larger until they filled up one half of the sky.” Why did the Pyramids become “larger and larger”? Answer in your own words in English.
7. Complete this sentence by using words taken from the passage.
The author compares the blocks of stone of which the Great Pyramid was built to ().
8. Underlined (d)—What does “expressly” mean here? Write the letter of your answer.
A — creatively
B — largely
C — solely
D — very quickly

9. Underlined (e)—When adults “laughed one had an unpleasant impression that people had moments of not sharing this view.” Exactly what view is not being shared? Answer by quoting from the text.
10. Underlined (f)—“... there were times when there seemed to be no one who did so.” Exactly what does “who did so” mean here? Answer by placing one English word in each space.
- “... there seemed to be no one who () () very ().”

III Read the following passage and answer the questions which follow.

The Crooked Carrot is Also Food

If we are failing to feed the world's seven billion people now, how will we be able to feed nine billion people in 2050? The problem of producing enough food first arose in the very late 18th century (1798) when Thomas Malthus noted that though population growth occurred geometrically (in a ratio of 1-2-4-8-16-32...), food production increased much more slowly, in arithmetical progression (in a ratio of 1-2-3-4-5...) insuring that there would be more mouths than food. One consequence was the beginning of advocacy for population control: artificially limiting the rapid growth of population by limiting the size of families, so as to balance food production and consumption.

As it turned out, the development of higher-yielding species of grain (often climate- and pest-resistant hybrid grains) and the artificial cultivation of livestock (early factory farming and fish production) vastly increased the food supply. Lengthy periods of famine almost disappeared in Europe—except during times of warfare—and by the mid-twentieth century many countries were paying farmers *not to grow food*, so great had food surpluses become. For example, Japan can neither export nor consume all the rice grown there, nor can America consume all the corn it produces, because both rice and corn are two products whose yields per hectare have been vastly increased since Malthus' time.

Today, the problem of too much food in large parts of the world necessarily means that much of it is wasted. The Londoner who walks home with three bags of groceries will never eat the contents of one of them, because one-third of all the food purchased in the UK is thrown away. In America, rotting food that has been discarded from tables is the largest single component of landfills for the disposal of garbage. Hence, it costs the United States one billion dollars a year to dispose of food waste, much more than the

cost for the disposal of used clothing, which retains what economists now call “scarcity value.” Rotten food has almost no recycled value; once it is wasted, it is gone forever.

The countries of South and Southeast Asia produce less food per capita than the industrialized economies of the West, but they waste about the same proportion, 30–35%. Although tiny Singapore traditionally imports 90% of all the food the nation consumes, in 2008 it threw out 570 million kilos, or one-fifth of the total. So great has the waste become at lavish wedding banquets in the city-state that the government has now proposed a surplus consumption tax on uneaten food to cover the cost of disposal. In this case, a surplus tax is being used to limit a surplus of food on offer!

In the industrialized world, much of the loss hence occurs at the consumer level, after the food has reached supermarkets. This is partly because food expense as a percentage of income has come down substantially in comparison with the costs of transportation, housing, and children’s education. In the developing world, the issue is different, for most waste occurs before the food ever reaches the supermarket shelf. India, the world’s second largest producer of fruits and vegetables, loses 30–35% of its food production annually because of waste and spoilage at harvest or poor transportation networks that delay the timely distribution of perishable produce. Thus, markets for export beyond India are underdeveloped because fresh produce cannot be reliably transported to foreign markets.

These local problems are compounded by international economic trends. As we shift away from fossil fuels, farmers in the United States and the EU now receive government payments to grow corn, sugarcane, and certain oil seeds not suitable for human consumption, but for ethanol and biofuels for industry and autos. This diversion from human to industrial consumption is expected to increase the price of vegetable oils and coarse grains, like corn, by up to 35% by 2050. The danger is not too little food, but food that is more expensive throughout the world.

In the industrialized world, reducing food waste will require raising human awareness and changing attitudes about how we consume. For example, on farms that cultivate carrots, photographic sensors now scan all harvested carrots and mark those that are imperfect — crooked or of inappropriate size — for disposal as waste. 25–30% of all carrots produced in America are thrown away or used as animal feed, although they have the same nutritional value as regularly-shaped carrots. Additionally, when sliced, the aesthetic advantages enjoyed by beautiful carrots are minimized. Why are they thrown away?

In the developing world, the problem is obviously vastly different. More investment must be made in highways, ports, refrigeration plants, and airports to make them more efficient links in the chain of distribution from producer to consumer at the table so that less food is wasted in transit. Large supermarkets must instruct producers in quality control and international standards of sanitation, including the regulation of chemical additives. Only then will new consumers for exotic, fresh agricultural produce from the developing world be tempted to buy, creating entirely new markets in the industrialized world while simultaneously reducing agricultural poverty.

The problem of hunger cannot be solved if we continue to seek solutions based only on boosting food production and increasing crop yields. When one-third of the food produced is never consumed, limiting waste must become the first priority. This burden will increasingly fall upon the consumer who must decide whether or not it is in his or her (and the world's) interest to reduce the quantity of wasted food and the cost of this waste.

(Adapted from the *Global Edition* of *The New York Times*, October 14th, 2011)

QUESTIONS

Based on the content of the passage, write T for True, F for False or N for Not mentioned in the text for each statement. Answer the questions with “N” only if the statement is either not present in the text or cannot be inferred from the information in the text.

1. In the very late 18th century in England, Malthus’ idea of an ever-increasing imbalance over time between food production and population growth suggested that there would not be enough food for an increasing population.
2. Food production has improved so much since Malthus’ era that governments in many parts of the world are now paying farmers not to grow food.
3. “Scarcity value” is the cost to governments or taxpayers of disposing of food that is wasted in both the industrialized and developed worlds.
4. Because many traditional foods for human consumption have been shifted to other uses in the developed world, like fuel, the prices of certain food products might be lowered by 2050.
5. Because food is wasted in similar ways in both the industrial and developing world, the problems of excess waste can be solved in similar ways.
6. Food waste in the developing world is often the result of a lack of efficiency in getting the food to markets as well as a limited ability to sell their product in new markets because of their failure to meet international standards.
7. A reduction in the quantity of wasted food will result in healthier diets and hence higher living standards in the developing world.

IV Answer the following question in about 150 English words.

The University of Tokyo announced last year that they would change the start of the academic year from April to September. Since then, there have been heated discussions around the country, which means that there are both positive and negative responses to the new system. What do you think of this? First of all, state if you are “*For*” or “*Against*” this change, and then explain logically your opinion about this change in the university calendar. Support your view with two or three specific examples.