

1. 次の英文を読み、設問に答えなさい。

Four Myths of Smell

Because our grasp of smell is so poor, a number of myths and misunderstandings have ① accumulated around this sense. Clearing them up will help you on your journey to the centre of scent.

Myth 1: [A]

Although we can indeed smell by ② inhaling through our nostrils, we detect odours using neurons that are directly connected to the brain, which dangle down through the base of the skull, at about eye level. Really, you are smelling with your brain.

Myth 2: [B]

The molecules we smell are carried on the air, but we do not directly detect airborne odours. If your (7) olfactory neurons were in contact with the air they would ③ shriveled and die; instead, these neurons, which are found in a thin layer of skin called the olfactory epithelium, are protected by a layer of (4) mucus. A similar thing happens with insects — their olfactory neurons bathe in liquid housed in their sensory hairs. For obvious reasons, aquatic organisms can only sense odours in water. (Yes, fish, crabs, lobsters, and so on all smell, too.) Any airborne molecule you want to smell has to get through that protective liquid barrier. For this to happen, there are special molecules called (9) odorant binding proteins (OBPs) that are found in that mucus — effectively on the outside of your body. Their role seems to be to transport smell molecules through the mucus and deliver them to the receptors on the olfactory neurons.

Myth 3: [C]

While it is generally the case that your sense of smell might ④ be diminished if you are aged, or if you smoke, and you will generally be better at smelling if you are female (overall, women have a more acute sense of smell than men), in reality we all have an atomic nose. Your sense of smell can distinguish between molecules that differ in size by a single atom of carbon — people describe heptanol (an alcohol made of seven carbon atoms) as smelling 'violet, sweet, woody', while (x) octanol (just one carbon atom more) smells 'sweet, orange, rose'. Caraway — one of the components of curry — smells different from spearmint; the two smells have exactly the same atomic composition, but their structure is different. The molecules are mirror images of each other, like two gloves. The difference in our perception of those two odours is due to the way our olfactory neurons respond to the different (8) molecular orientations.

So fine is our sense of smell that the number of odours we can distinguish may be near-infinite. For decades, researchers repeated that the average human could distinguish about 10,000 odours, but this figure had no scientific basis. In 2014 researchers in the laboratory of Leslie Vosshall at Rockefeller University tried to estimate how many smells we might be able to tell apart, based on mixtures of molecules. They came up with the astonishing figure of over a trillion. Although this mathematical model has been challenged, it seems probable that there is no real limit to the number of odours we can detect. The same will apply to many animals.

Myth 4: [D]

Your sense of smell and your sense of taste are ⑤ intimately connected. If you try eating something tasty while pinching your nose, making sure your mouth is shut, you will find that there is little flavour; but when you take your fingers away, you should get a sudden rush of sensation as volatile compounds from the food you are chewing whoosh up your nasal cavity and flow over your olfactory neurons, high in your head. This is called retronasal olfaction and is one of the two ways you can detect odours; the other way is called (6) orthonasal olfaction or, more simply, sniffing. Our sense of taste is relatively ⑥ rudimentary, divided into a small number of classes (the traditional salt, sour, bitter, and sweet, together with the more recently identified umami (meaty), fatty, hot/spicy, metallic,

and the taste of carbon dioxide), while our perception of flavour is a mixture of the simple world of taste and the rich, multiple dimensions of smell. In many languages, flavour is colloquially called 'taste' even though smell may be the dominant sense giving flavour its subtlety.

(Adapted from Matthew Cobb, *Smell: A Very Short Introduction*, 2020)

[1] 下線部①～⑥の意味に最も近いものを選択肢1～5の中から選び、マークシートの解答欄(1)から(6)にマークしなさい。

- | | | | | | |
|---|------------------|--------------------|-------------------|-------------------|----------------------|
| ① | 1. built down | 2. built in | 3. built out | 4. built over | 5. built up |
| ② | 1. breathing in | 2. breathing on | 3. breathing out | 4. breathing over | 5. breathing through |
| ③ | 1. wrinkle down | 2. wrinkle in | 3. wrinkle out | 4. wrinkle over | 5. wrinkle up |
| ④ | 1. become keener | 2. become stronger | 3. become thicker | 4. become thinner | 5. become weaker |
| ⑤ | 1. closely | 2. hardly | 3. periodically | 4. tentatively | 5. ultimately |
| ⑥ | 1. advanced | 2. basic | 3. offensive | 4. physiological | 5. sophisticated |

[2] 下線部(ア)～(カ)の意味として最も適切なものを選択肢1～9の中から選び、マークシートの解答欄(7)～(12)にマークしなさい。

(ア) (7) (イ) (8) (ウ) (9) (エ) (10) (オ) (11) (カ) (12)

1. an alcohol made of eight carbon atoms
2. an alcohol made of seven carbon atoms
3. a protective liquid barrier
4. molecules that transport odour molecules through mucus to smell receptors
5. smelling through the nostrils (e.g., sniffing a flower)
6. specialized neurons for detecting smells
7. the introduction of a pair of molecules for smelling
8. the perception of odours that reach the nose internally from the mouth and throat
9. the spatial arrangement or direction of molecules

[3] 本文中の[A]～[D]には、嗅覚をめぐるmythが小見出しとして1つずつ入る。本文の意味に合う最も適切な小見出しを以下の選択肢1～6の中から選び、マークシートの解答欄(13)～(16)に順番にマークしなさい。

[A] (13) [B] (14) [C] (15) [D] (16)

1. We can detect more smells than other animals.
2. We do not use smell much.
3. We have a poor sense of smell.
4. You smell molecules in the air.
5. You smell with your nose.
6. Your sense of smell is superior to that of taste.

[4] 本文の内容に最も一致するものを選択肢1～8の中から3つを選び、マークシートの解答欄(17)～(19)にマークしなさい。ただし、解答の順序は問いません。

1. Fish can smell.
2. One of many ways by which we detect odours is by sniffing.
3. Researchers have continued to identify new tastes over time.
4. Spearmint and caraway have the same atomic structure.
5. Technically speaking, flavour is not just about taste.
6. The number of recognized tastes has not changed.
7. Vosshall's team estimated that we can tell the difference between over 100,000,000,000,000 smells.
8. Young men who smoke do not face a risk of losing their sense of smell.

2. 次の英文を読み、設問に答えなさい。

Idleness is a complex phenomenon whose meaning varies, sometimes quite radically, across contexts. The notion of idleness I want to explore ① encapsulates a form of experience that places us outside the norms or conventions of societies like ours. It is not only a state of not working, (1) that is a key marker. It involves a departure from a range of values that make us the kinds of people we are supposed to be in order to live well. The very idea of being a “self” of the appropriate kind is thereby placed in question. The features of the phenomenon of idleness — in the sense that is in focus here — can be roughly grouped. First, there are what we may label its *phenomenological features*, its distinctive feel. Idleness is experienced activity that operates (2) no guiding purpose. That absence of purpose explains its restful and pleasurable qualities. Idleness is a feeling of non-compulsion and drift [A]. We often become idle by slipping into it, either in the middle of tasks or for extended periods. The structure of our individual lives ② permits idleness in varying degrees, depending on the level of our commitments and the seriousness with which we take them. In principle, it is possible to imagine a life that is largely idle — a life (X) from work. Philosophers appear to express no worry about momentary or ③ intermittent idleness, but a life of idleness is often seen by them as representative of humanity in a debased form [B].

A second dimension of idleness is its *effective* content. The activities that fill an idle period are not geared (3) productivity. (4) an interesting thought, of value to ongoing or future projects, arise during idleness, it is a ④ serendipitous outcome. A further distinctive feature of idle behavior is its *structure*. It simply does not happen as a process involving disciplined self-monitoring [C]. There is no sense of an inner power struggle in which something in us needs to be overcome or improved. Hence idleness is perceived by its modern critics as an ⑤ obstacle to some grand idea of self-realization. However, idleness is not mindless [D]. As we idle we know what we are doing, even if we have no idea of an overall end or purpose in what we do. Idleness need not therefore be interpreted as essentially irrational. To construe it in that way is nothing more than to express the prejudice that rationality belongs to self-mastering, rule-guided actions only. Idleness, (5), may offer a glimpse of an alternative way of living, one that looks wholly reasonable — makes sense — to those who experience it. It does, after all, seem to place us in a liberating possession of ourselves, free of pressure, and evidently content [E]. From these characteristics it is obvious that idleness stands (6) much of what is taken to be right and normal: it has nothing to do with performance, with work, with social standing, with gaining in prestige.

(Adapted from Brian O'Connor, *Idleness: A Philosophical Essay*, 2018)

[1] 下線部 ① ～ ⑤ の意味に最も近いものを選択肢 1 ～ 5 の中から選び、マークシートの解答欄 から にマークしなさい。

- | | | | | |
|------------------|-----------------|-----------------|---------------|---------------|
| ① 1. educates | 2. encompasses | 3. estranges | 4. evades | 5. excludes |
| ② 1. abuses | 2. adjusts | 3. allows | 4. appeals | 5. attributes |
| ③ 1. accidental | 2. eternal | 3. internal | 4. occasional | 5. terminal |
| ④ 1. anticipated | 2. coincidental | 3. fruitful | 4. happy | 5. valuable |
| ⑤ 1. access | 2. barrier | 3. contribution | 4. disrespect | 5. entrance |

[2] 空所(1)～(6)に入る最も適切な語または語句を選択肢1～5の中から選び、マークシートの解答欄(25)から(30)にマークしなさい。

- | | | | | |
|---------------------|--------------------|---------------------|---------------------|---------------------|
| (1) 1. also | 2. however | 3. if | 4. still | 5. though |
| (2) 1. according to | 2. against | 3. ahead of | 4. apart from | 5. as for |
| (3) 1. along | 2. off | 3. on | 4. toward | 5. up |
| (4) 1. However | 2. Should | 3. Upon | 4. What | 5. Whenever |
| (5) 1. by no means | 2. in the same way | 3. in vain | 4. on the contrary | 5. to our regret |
| (6) 1. in front of | 2. in line with | 3. in opposition to | 4. in sympathy with | 5. in the middle of |

[3] 次の語句を最も適切な順に並びかえて本文中の(X)を完成させたとき、4番目にくる語の番号を解答欄(31)に、6番目にくる語の番号を解答欄(32)にマークしなさい。

- | | | | |
|--------------|-------------|------------|----------|
| 1. a | 2. idleness | 3. in | 4. is |
| 5. momentary | 6. not | 7. release | 8. which |

[4] 下記の【 】内の一節が入る本文中の位置として最も適切なものを選択肢1～5の中から選び、マークシートの解答欄(33)にマークしなさい。

【: no less than non-idle behavior, it contains conceptual components and judgments】

- | | | | | |
|----------|----------|----------|----------|----------|
| 1. [A] | 2. [B] | 3. [C] | 4. [D] | 5. [E] |
|----------|----------|----------|----------|----------|

[5] 次の英文は、本文の著者へのインタビューの一部です。空所(ア)～(エ)に入る表現として、本文の内容も踏まえ最も適切なものを選択肢1～4の中から選び、マークシートの解答欄(34)から(37)にマークしなさい。

Interviewer: Bertrand Russell famously wrote in praise of idleness. But he was also an aristocrat and idleness has often been seen as a kind of aristocratic luxury that is not really open to those who have to make ends meet. Do you think idleness will always remain an elitist phenomenon?

Brian O'Connor: I think it's true that there is something relevant in Russell's aristocratic background but this does not entail that idleness is therefore something only for aristocrats; rather his aristocratic background arguably gives him the confidence to withstand the pressure that others would feel to (ア) the imperatives to be successful in terms of the 20th century's version of the commercial world. Russell has the confidence to call this out. His version of idleness is not an aristocratic one that relies on social (イ) and privilege, and this is what makes it so appealing. The kind of idleness that interests me always has this (ウ) character. It stands very firmly against many of the ideals by which we measure success in the modern world, not least (エ) and social esteem.

(Adapted from "Idleness and Society": A Conversation with Brian O'Connor, *The Philosopher*, 2019)

- | | | | |
|---------------------|----------------|-------------------|----------------|
| (ア) 1. come up with | 2. fit in with | 3. keep away from | 4. set aside |
| (イ) 1. equity | 2. housing | 3. inequality | 4. mobility |
| (ウ) 1. abusive | 2. lucrative | 3. regressive | 4. subversive |
| (エ) 1. creativity | 2. flexibility | 3. productivity | 4. sensibility |

3. Read the following dialogue and answer the questions which follow.

Mr. Hiyoshi: Congratulations! You passed everything ① with flying colors! Now ② the world is your oyster!

Ms. Yagami: Thanks! (*laughing*) I did hit it out of the park, didn't I! I can't believe I'm graduating tomorrow.

Mr. Hiyoshi: Speaking of graduating, I was wondering if I might be able to graduate soon, too — from bachelorhood. (*dropping to his knee and pulling out a ring*) Ms. Yagami, will you marry me?

Ms. Yagami: Yes!

Mr. Hiyoshi: Really? I think you might need to pinch me to make sure I'm not dreaming.

Ms. Yagami: (*with a cheeky grin*) And do you think our "old friend" Stanford will be your best man?

Mr. Hiyoshi: (*laughing*) Hey, I thought we agreed not to mention that guy! You know he ③ rubs me the wrong way.

Ms. Yagami: I'm just giving you a hard time. You're the one who's ④ seen me through thick and thin. I can't think of anyone else I'd rather spend the rest of my life with.

[1] Choose the phrase with the most similar meaning for each of the underlined expressions

① through ④ in the dialogue. Mark your answers on the mark sheet in through .

- | | |
|---|--------------------------------|
| ① 1. with brightness | 2. with courage |
| 3. with distinction | 4. with hard work |
| ② 1. the true value lies inside | 2. the world is a hard place |
| 3. you can do anything you want in life | 4. you can finally relax |
| ③ 1. annoys me | 2. controls me |
| 3. inspires me | 4. intimidates me |
| ④ 1. always supported me | 2. inspired me to change |
| 3. looked at the true me | 4. not judged me by how I look |

[2] Read the following text message from Stanford to Mr. Hiyoshi and answer the questions below.

Hey, Mr. Hiyoshi. I hear congratulations are in (A). You really are a lucky (B). Ms. Yagami is a very special person. To be honest, I tried to win her (C) several times, but she only ever had (D) for you. I guess the best man (E). Sorry if I caused you any stress along the (F). You can't (G) a man for trying. At any rate, I wish you all the (H) in the world.

Choose the best options below for letters (A) through (D). Mark your answer on the mark sheet in through . You may not choose the same answer more than once.

- | | | | | |
|-----------|----------|---------|----------|---------|
| 1. around | 2. charm | 3. ears | 4. eyes | 5. face |
| 6. man | 7. order | 8. over | 9. shape | |

Choose the best options below for letters (E) through (H). Mark your answer on the mark sheet in through . You may not choose the same answer more than once.

- | | | | | |
|---------|----------|----------|--------------|--------------|
| 1. beat | 2. blame | 3. curse | 4. gratitude | 5. happiness |
| 6. path | 7. way | 8. well | 9. won | |

4. (A)～(E)の各文の空所に入る最も適切な語または語句を選択肢1～6の中から選び、マークシートの解答欄 (50) から (54) にマークしなさい。

(A) According to Copernicus, the simplest way to account for the () motions of the Sun, Moon, and planets through the sky is to assume that Earth and other planets revolve around the Sun.

1. believed 2. computed 3. dreamed 4. observed
5. simulated 6. tested

(B) In certain materials at sufficiently low temperatures, electrical () disappears and the electrons flow without losing energy — such materials are called superconductors.

1. acceleration 2. generation 3. information 4. maintenance
5. performance 6. resistance

(C) Mathematical () is a means of proving a theorem by showing that if it is true of any particular case, it is true of the next case in a series.

1. belief 2. construction 3. dimension 4. exercise
5. induction 6. protection

(D) Water is a useful cooling () in the cooling systems of automobiles and other engines, for it has a much higher capacity for storing energy, due to its hydrogen bonds, than all but a few uncommon materials.

1. agent 2. business 3. means 4. method
5. production 6. work

(E) Rainwater is naturally acidic due to the fact that carbon dioxide in the atmosphere can () water.

1. change into 2. collide with 3. condense into 4. dissolve in
5. give rise to 6. lead to

5. 下線部の謎かけを、答えが「人間」となるように、1つの英文で表現したい。以下の空所(1)～(6)に、それぞれ最も適切な1語を入れて英文を完成させなさい。ただし、下記の英文中で既に使われている単語を使用してはいけません。なお、大文字・小文字の別は問いません。解答は解答用紙(記述式)に記入しなさい。

英雄カドモスによって創られた古代ギリシャの国テーバイは、ラブダコス王家が代々治めてきた由緒ある国である。異国コリントスの王子だったオイディプスは、この地へ旅をし、「朝は四本足、昼は二本足、夜は三本足。これは何か」という謎をかけてテーバイの住民を苦しめていた怪物スフィンクス(乙女の顔と獅子の体を持つ)の謎を解いてテーバイを解放した。

(ソポクレス、『オイディプス王』、河合祥一郎訳、2017年より一部改変)

(1) do you (2) a thing that (3) on all (4) in the morning, walks on two legs in the (5), and strolls on three legs in the (6) ?