

- [I] Thomas Midgley, Jr. (1889~1944) について述べている下の英文を読んで、問いに答えなさい。また、* のついた語 (句) は本文の後ろに注としてまとめてあります。(38点)

Lead

A regrettable Ohio inventor named Thomas Midgley, Jr. was an engineer by training and the world would no doubt have been a safer place if he had stayed so. Instead, he developed an interest in the industrial applications of chemistry. In 1921, while working for the General Motors Research Corporation in Dayton, Ohio, he investigated a compound called *tetraethyl lead (also known, confusingly, as lead tetraethyl), and discovered that it significantly reduced the *juddering condition known as engine knock.

Even though lead was widely known to be dangerous, by the early years of the twentieth century it could be found in all manner of consumer products. Food came in cans sealed with lead [1]. Water was often stored in lead-lined tanks. *Lead arsenate was sprayed onto fruit as a pesticide. Lead even came as part of the [2] of toothpaste tubes. Hardly a product existed that didn't bring a little lead into consumers' lives. However, nothing gave it a greater and more lasting intimacy than its addition to motor fuel.

Lead is a [3]. Get too much of it and you can irreparably damage the brain and central nervous system. Among the many symptoms associated with over-exposure are blindness, [4], kidney failure, hearing loss, cancer, *palsies and convulsions. In its most acute form it produces abrupt and terrifying *hallucinations, disturbing to victims and onlookers alike, which generally then give [5] to coma and death. You really don't want to get too much lead into your system.

On the other hand, lead was easy to extract and work, and almost embarrassingly profitable to produce industrially—and tetraethyl lead did indubitably stop engines from knocking. So in 1923 three of America's largest corporations, General Motors, Du Pont and Standard Oil of New Jersey, formed a joint enterprise called the Ethyl Gasoline Corporation (later shortened to simply Ethyl Corporation) with a view to making as much tetraethyl lead as the world was willing to buy, and that proved to be a very great deal. They [A] toxic than 'lead', and introduced it for public consumption (in more ways than most people realized) on 1 February 1923.

Almost at once production workers began to exhibit the staggered gait and confused faculties that mark the recently poisoned. Also almost at once, the Ethyl Corporation embarked on a policy of calm but unyielding denial that would serve it well for decades. As Sharon Bertsch McGrayne notes in her absorbing history of industrial chemistry,

**Prometheans in the Lab*, when employees at one plant developed irreversible delusions, a spokesman blandly informed reporters: 'These men probably went insane because they worked too hard.' Altogether, at least fifteen workers died in the early days of production of leaded gasoline, and untold numbers of others became ill, often violently so; the exact numbers are unknown because the company nearly always managed to hush up news of embarrassing leakages, spills and poisonings. At times, however, suppressing the news became impossible—most notably in 1924 when, in a matter of days, five production workers died and thirty-five more were turned into permanent staggering wrecks at a single ill-ventilated facility.

As rumours circulated about the dangers of the new product, ethyl's ebullient inventor, Thomas Midgley, decided to hold a demonstration for reporters to allay their concerns. As he chatted away about the company's commitment to safety, he poured tetraethyl lead over his hands, then held a beaker of it to his nose for sixty seconds, claiming all the while that he could repeat the procedure daily without harm. ¹⁾ In fact, Midgley knew only too well the perils of lead poisoning: he had himself been made seriously ill from over-exposure a few months earlier and now, except when reassuring journalists, never went near the stuff if he could help it.

***Chlorofluorocarbons**

Buoyed by the success of leaded petrol, Midgley now turned to another technological problem of the age. Refrigerators in the 1920s were often appallingly risky because they used insidious and dangerous gases that sometimes seeped out. One leak from a refrigerator at a hospital in Cleveland, Ohio, in 1929 killed more than a hundred people. Midgley set out to create a gas that was stable, non-flammable, non-corrosive and safe to breathe. With an instinct for the regrettable that was almost uncanny, he invented chlorofluorocarbons, or CFCs.

Seldom [B] embraced. CFCs went into production in the early 1930s and found a thousand applications in everything from car air-conditioners to deodorant sprays before it was noticed, half a century later, that they were devouring the ozone in the stratosphere. As you will be aware, this was not a good thing.

Ozone is a form of oxygen in which each molecule bears three atoms of oxygen instead of the normal two. It is a bit of a chemical oddity [C] at ground level it is a pollutant, while way up in the stratosphere it is beneficial since it soaks up dangerous ultraviolet radiation. Beneficial ozone is not terribly abundant, however. If it were distributed evenly throughout the stratosphere, it would form a layer just 2 millimetres or so thick. That is why it is so easily disturbed.

Chlorofluorocarbons are also not very abundant—they constitute only about one part per billion of the atmosphere as a whole—but they are extravagantly destructive. A single kilogram of CFCs can capture and annihilate 70,000 kilograms of atmospheric ozone. CFCs also hang around for a long time—about a century on average—wrecking havoc all the while. And they are great heat sponges. A single CFC molecule is about ten thousand times more efficient at exacerbating greenhouse effects than a molecule of carbon dioxide—and carbon dioxide is of course no slouch itself as a greenhouse gas. In short, chlorofluorocarbons may ultimately prove to be just about the worst invention of the twentieth century.

Midgley never knew this because he died long before anyone realized how destructive CFCs were. His death was itself memorably unusual. After becoming crippled with polio, Midgley invented a contraption involving a series of motorized pulleys that automatically raised or turned him in bed. In 1944, he became entangled in the cords as the machine went into action and was strangled.

注 *tetraethyl lead : 四エチル鉛

*judder : 異常に振動する

*lead arsenate : ヒ酸鉛

*palsy : 麻痺

*hallucination : 幻覚

**Prometheans in the Lab* : 2001年刊行。正式な書名は, *Prometheans in the Lab: Chemistry and the Making of the Modern World*

*chlorofluorocarbon : 炭化水素の水素原子すべてをフッ素または塩素原子で置換した化合物の総称

(1) 文中の〔 1 〕～〔 5 〕に入れるべき適当な語を下から選び, 番号をマークシートに記入しなさい。ただし, 同じものを二度使わないこと。

1. composition 2. hormone 3. insomnia 4. neurotoxin 5. nutrient
6. off 7. solder 8. tranquilizer 9. way

(2) 文中の〔 A 〕と〔 B 〕を, 文脈に沿ったものとして完成するために, 1. ～ 9. を並べ替えなさい。〔 A 〕は, 3 番目, 4 番目, 7 番目に入る番号を, 〔 B 〕は, 1 番目, 5 番目, 7 番目に入る番号を, それぞれマークシートに記入しなさい。

- 〔 A 〕 1. additive 2. and 3. because it 4. called 5. 'ethyl'
6. friendlier 7. less 8. sounded 9. their

- 〔 B 〕 1. an 2. been 3. has 4. industrial 5. more 6. or
7. product 8. swiftly 9. unfortunately

(3) 文中の下線部 ¹⁾ In fact, Midgley knew only too well the perils of lead poisoning とほぼ同じ意味になる文を下から選び、番号をマークシートに記入しなさい。

1. In fact, Midgley comprehended the perils of lead poisoning as well
2. In fact, Midgley denied the perils of lead poisoning based on his findings
3. In fact, Midgley had a limited knowledge about the perils of lead poisoning
4. In fact, Midgley knew nothing but the perils of lead poisoning
5. In fact, Midgley understood very well the perils of lead poisoning

(4) 文中の [C] に入れるべき適当な句を下から選び、番号をマークシートに記入しなさい。

1. in spite of the fact that 2. in that 3. in the assumption that
4. in the exceptional case that 5. in which

(5) 下の英文の中で本文の内容と一致するものを3つ選び、その番号をマークシートの一行に記入しなさい。

1. According to the author, if Midgley had converted his interest to applied chemistry, the earth would be less dangerous.
2. Carbon dioxide is hardly to blame for the greenhouse effect because it is not a toxic gas itself.
3. Chlorofluorocarbons are not so abundant but men may well be nervous about them.
4. Chlorofluorocarbons remain destructive over a time period of about one hundred years on average.
5. In 1944 Midgley's death was an accidental, commonplace, and tragic one.
6. In the early days of producing leaded petrol, factory workers contracted various diseases.
7. Midgley, not haunted by his failure, started to invent a new type of gas for refrigerators.
8. Ozone, even if existing in the stratosphere as a thin layer, is valuable because it sponges ultra-violet radiation and heat.
9. While Midgley was alive, no one sounded the alarm that chlorofluorocarbons and leaded gasoline could be perilous.

- 〔Ⅱ〕 UNICEF (United Nations Children's Fund) のホームページに掲載された下の記事を読んで、問いに答えなさい。また、* のついた語 (句) は本文の後ろに注としてまとめてあります。
(32点)

ALTAR, Mexico, 24 May 2007—For countless *Latinos, the road to the American Dream has a short-cut through a tiny farming community about an hour-and-a-half south of the U.S.-Mexico border. Word has traveled throughout Latin America that if you're looking for a guide to help you illegally navigate the desert into the United States, you'll find him in Altar.

A never-ending stream of buses delivers migrants to the front of the town square, where they will wait for a smuggler, known as a 'coyote', to offer his services to elude U.S. soldiers, immigration agents and armed citizen militias patrolling the border. A line of dusty vans sits, like taxis at an airport, along the far side of the square, waiting to ferry migrants to the border, where they will begin their dangerous three-day hike across the scorching desert.

18-year-old Enrique (not his real name) was approached by a coyote who offered to deliver him to a major U.S. city for \$2,500. A relative is lending Enrique the money, which will be paid to the coyote upon delivery.

There are no guarantees. Each year, hundreds of people die making this journey. Many of them are women and children who run out of water in the middle of the desert. Some migrants are caught by the authorities multiple times before they get across. Others are [A].

Like many migrants, Enrique has grown tired of living on less than \$3 a day. His dream is to own a house, and he says the only way to make that dream a reality is to get a job in the United States. Is Enrique afraid of what he might find in the desert?

"Yes, I am afraid because I have been told that many people die in the desert," he says quietly. "But to try to be in the United States, I will do my very best to get there."

Enrique's mother pleaded with him to stay in Mexico. But the lure of economic prosperity proved too strong.

"My mother told me it is too risky," he says. "But I'm going anyway."

If Enrique succeeds, it will be years before he sees his mother again.

With growing security on the border, migrants [B], sometimes carrying only two gallons of water. That might seem like a lot, until you realize that temperatures often climb above *100 degrees Fahrenheit.

Hundreds of thousands of migrants are caught by the [1] every year. Most of the

adults are simply dropped off back on the Mexican side of the border, free to try again. The children are sent to repatriation centers, where they wait to be picked up by a relative. UNICEF partner Colegio de la Frontera Norte works with the Mexican government to ensure that the children are safe, and given access to health and legal services. They also discourage the children from attempting another [2].

“There are important dangers that children need to know about,” says Humberto Valdez, a director for DIF, a Mexican public institution of social assistance. “It is possible for them to become the victims of thieves, rapists, sex traffickers. And in some cases, people who want to sell their organs.”

On the night before Enrique climbed into a van and sped off to the desert with a coyote, a journalist passed along his cell phone number with instructions to call him with news of the journey. One week passed without a call. On the evening of the eighth day, the phone rang. Enrique was on a pay phone on the [3] of a large U.S. city.

“We made it!” he said. “I am calling from a gas station. I can only talk for a few minutes.” He said that he and nine others traveled three days across the desert. They were robbed along the way, and nearly suffered [4] at night, but they made it out alive.

Still others will not be as lucky as Enrique, and will attempt the same journey. Children will continue to face the dangers of the desert with the lure of their dreams [C].

注 *Latino : ラテンアメリカ (系) の住民

*100 degrees Fahrenheit : 約 37.8℃ にあたる

- (1) 文中の [A] と [B] を、文脈に沿ったものとして完成するために、それぞれ、
1. ~ 8. と 1. ~ 9. を並べ替えなさい。[A] は、2 番目、4 番目、6 番目に入る番号を、
[B] は、3 番目、6 番目、8 番目に入る番号を、それぞれマークシートに記入しなさい。
[A] 1. along 2. bare 3. by bandits 4. hiding 5. of 6. stripped
7. the worn desert trails 8. their belongings
[B] 1. are 2. areas of the desert 3. Enrique 4. in 5. increasingly
6. like 7. now trying 8. remote 9. to cross

- (2) 文中の [1] ~ [4] に入れるべき適当な語を下から選び、番号をマークシートに
記入しなさい。ただし、同じものを二度使わないこと。
1. authorities 2. crossing 3. flight 4. hyperthermia 5. hypothermia
6. minorities 7. outskirts 8. sickbed

(3) 文中の〔 C 〕に入れるべき適当な句を下から選び、番号をマークシートに記入しなさい。

1. in their native places 2. in the south of border 3. of becoming political exiles
4. on the other side 5. which were childlike ones

(4) 下の英文の中で本文の内容と一致するものを3つ選び、マークシートの一行に記入しなさい。

1. A coyote is a refugee smuggling racketeer using all lawful means available.
2. An illegal entrant is usually demanded to pay in advance by a coyote when crossing the U.S.-Mexico border.
3. Enrique is a fictitious name because the author failed to confirm his real name carelessly.
4. It is hardly said that Americans patrolling the border exclude ordinary people who arm themselves.
5. It is quite indifferent to Enrique's mother whether her son made an attempt to cross the border or not.
6. Latino people cannot expect assistance from 'coyotes' gratis.
7. Some traffickers tell the children beforehand that they may sell their organs as a price of ferrying.
8. The main reason for crossing the border to the U.S. is a financial one for many Latinos.

〔Ⅲ〕 出口調査について書かれた下の英文を読んで、問いに答えなさい。また、* のついた句は本文の後ろに注としてあげてあります。(20点)

An exit poll is a poll of voters taken immediately after they have exited the polling stations. Unlike an opinion poll, which asks who the voter plans to vote for or some similar [A], an exit poll asks who the voter actually voted for. ¹⁾ Pollsters—usually private companies working for newspapers or broadcasters—conduct exit polls to gain an early indication as to how an election has turned out, as in many elections the actual [B] may take hours or even days to count.

Exit polls are also used to collect ²⁾ demographic data about voters and to find out why they voted as they did. Since actual votes are cast anonymously, [C] is the only way of collecting this information.

Exit polls have historically and throughout the world been used as a check against and rough indicator of the degree of election [D]. Some examples of this include the Venezuelan ³⁾ recall referendum, 2004, the Ukrainian presidential election, 2004, and the 2004 U.S. presidential election controversy.

However, like all opinion polls, exit polls by nature do include a [E] of error. A famous example of exit poll error occurred in the 1992 ⁴⁾ UK General Election, when two exit polls predicted a *hung parliament. The actual vote revealed that Conservative Party Government under John Major held their position, though with a ⁵⁾ significantly reduced majority.

注 *hung parliament : どの党も過半数を制していない議会

(1) 文中の [A] ~ [E] に入れるべき適当な語を下から選び、その番号をマークシートに記入しなさい。ただし、同じものを二度使わないこと。

1. candidacy 2. formulation 3. fraud 4. lot 5. margin 6. polling
7. result

(2) 下線部 ¹⁾ Pollsters, ²⁾ demographic, ³⁾ recall, ⁴⁾ UK, ⁵⁾ significantly の意味が下に記してあります。正しいものを2つ選び、番号をマークシートの一行に記入しなさい。

- ¹⁾ Pollsters: persons or organizations who ask all the people questions to find out their opinions on particular subjects

- 2) demographic: of or relating to demography, which is the statistical study of human populations especially with reference to size and density, distribution, and vital statistics
- 3) recall: a company's asking the shops or people who have bought its product to return it because there is something wrong with it
- 4) UK: an abbreviation of United Kingdom
- 5) significantly: in a way that has a special meaning that only some people understand

〔IV〕 日本について述べている下の英文中の〔 A 〕～〔 E 〕に入れるべき適当な語を語群から選び、その番号をマークシートに記入しなさい。ただし、語群の中の語は、頭文字をどれも小文字にしてあります。(10点)

1. Various regions in Japan are separated by mountains, so communities, unable to come and go easily, developed their own respective〔 A 〕.
2. The〔 B 〕was originally a special award. But now most businesses and government and public agencies provide it at the established times of summer and yearend.
3. The〔 C 〕consists of two chambers, the House of Representatives and the House of Councilors, and is the highest organ of state and the only legislative one.
4. The high〔 D 〕rate supported investment capital and even became a causal factor of the high economic growth.
5. The〔 E 〕following the collapse of the "Bubble Economy" unintentionally and effectively promoted the reduction in working hours.

語群

1. bonus 2. boom 3. congress 4. dialects 5. diet 6. fatality
7. pension 8. recession 9. saving