

## 生命科学専攻 英語

## 英語 第1問

以下の英文を読んで問いに答えよ。

A few billion years after the initial event of creation, our own galaxy, the Milky Way, was formed. However, the earth was not formed until much later, about 4.5 billion years ago. (1)It is not known with certainty how soon after it was formed the planet became hospitable for life. Perhaps only a few hundred million years were required for this, since it is becoming quite clear that events leading to the beginning of life happened relatively rapidly thereafter. Paleobiologists have found possible remnants of early life that are 3.5-3.8 billion years old. (2)Considering the complexity required for a living organism, the development of life on earth seems to have occurred quite abruptly. Again, one must ponder over the veritable eruption of highly ordered living things out of a chaotic environment. Calculations based on information theory suggest that the appearance of life could not have been simply a random process, an inevitable consequence of chemical evolution. (3)Even a simple, small protein could not have been formed by a random process, over the span of time during which life developed. Indeed, much of evolutionary history, with a flow to greater states of complexity against an apparent countercurrent of entropy, has a non-random character.

注：planet, 惑星；thereafter, その後；Paleobiologist, 古生物学者；remnant, 残存物；ponder, 熟考する；veritable, 文字通りの；countercurrent, 逆流

問1 下線部(1)を和訳せよ。

問2 下線部(1)の最後の thereafter とは何の後を指しているか？

問3 下線部(2)を和訳せよ。

問4 下線部(3)を和訳せよ。

## 生命科学専攻 英語

## 英語 第2問

以下の英文を読んで問いに答えよ。

Of the three states of matter, the solid and liquid states were recognized already in ancient times. A concept of the third state of matter -- the gaseous state -- emerged slowly during the Middle Ages and was formalized only early in the 17th century by the Flemish chemist Jan Baptista von Helmont (1577-1644). von Helmont collected several gases and was the first to employ the term gas. Then, in 1654, the Prussian Otto von Guericke (1602-1686) demonstrated that air possesses weight and that a vacuum could be produced with an air pump he had invented. Shortly thereafter, in 1661 Robert Boyle (1627-1691), a British physicist, developed his law of gases ( $PV = k$  at constant temperature). Boyle commented in 1673 that generally "men are so accustomed to judge of things by their senses that because air is invisible they ascribe but little to it, and think of it as but one remove from nothing." Boyle is perhaps the founder of the science of chemistry, since he introduced important ideas concerning chemical reactions and analysis and, in particular, advocated a rigorous experimental method for the testing of theories and for the establishment of the reliability of facts. Boyle also for the first time distinguished among elements, compounds, and mixtures.

Priestley's experiments on oxygen began by heating the red powder mercuric oxide with sunlight focused by a large lens. On August 1, 1774, after collecting the gas that was expelled, Priestley noted, "... what surprised me more than I can well express, was, that a candle burned in this air with a remarkably vigorous flame." This gas also permitted a mouse to live longer than when placed into an equal volume of air.

注：Flemish, フラマン人の；Prussian, プロシヤ人の；advocate, 主唱する；element, 元素；mercury, 水銀；expel, 追い出す

問1 下記の人物が行った業績を上の方から分かる範囲内で出来るだけ詳しく記せ。

von Helmont, von Guericke, Robert Boyle, Priestley

問2 下線部を和訳せよ。

## 生命科学専攻 英語

## 英語 第3問

以下の英文を読んで問に答えよ。

When scientists hear about scientific fraud, they quickly denounce the culprits as not being 'true' scientists. ① The true scientist, they argue, is only interested in unveiling step by step the countless enigmas of nature. He or she labors long hours and weekends at a desk or in the laboratory to find the truth, not to invent it. ② When describing her attitude to science, Nobel Prize-winner Barbara McClintock once said, "I was so interested in what I was doing I could hardly wait to get up early in the morning and get at it." "One of my friends said I was a child, because only children can't wait to get up in the morning to get at what they want to do".

③ It is probably the scientist's greatest motivation and satisfaction to understand or observe what has never been understood or described before. But is the ensuing 'eureka' experience really the greatest award for all that hard work? Is this the only reason for doing science? Or is this too idealistic and naïve a view of scientists, one that ignores the fact that our profession may be driven by other ambitions, such as glory, recognition or even money? Are scientists really as honest as the public tends to believe? ④ Let us first take a look at a few famous cases of puzzling behavior in the history of science. In the second century AD, Claudius Ptolemy of Alexandria, one of the greatest geographers and astronomers of antiquity, stole astronomical data from Hipparch of Rhodes, who in turn published data from Babylonian sources as his own observations. Ptolemy recalculated and adapted Hipparch's figures without reference to the source, a clear case of plagiarism. Many centuries later, Galileo Galilei developed the law of gravity, but his famous experiments involving weights dropped from the tower of Pisa were most probably never carried out. The great Isaac Newton used what biographer Richard Westfall called a "fudge factor"—he arranged his equations in such a way that the result came out as he required. The data reported by Gregor Mendel on his famous pea experiments seem to be too good to be true. However, commentators differ on whether Mendel in fact manipulated his data or whether there is an innocent explanation for why his results perfectly adhered to a mathematical formula.

問1 下線①を和訳せよ。

問2 下線②を和訳せよ。

問3 下線③を和訳せよ。

問4 ④以降、本文後半では Scientist の不適切な行為（あるいはそのような可能性のある事実）についていくつかの実例が挙げられている。そのうち3つについて、誰のどういう行為か人名を挙げて、その内容を説明せよ。

## 英語 第4問

以下の英文を読んで問に答えよ。

When the Wright brothers set out to invent a flying machine at the end of the nineteenth century, they knew they were facing ① quite a challenge. Not only was it a daunting task to accomplish powered flight but also to overcome the ideology, morality and sensibility of their time, when most people believed that human flight was neither possible nor natural. Science fiction author Arthur C. Clarke once commented on such major advances in science technology that "Any sufficiently advanced technology is indistinguishable from magic." Even after they accomplished their first flight, lasting 59 seconds on 17 December 1903, the Wrights still found it hard to convince their fellow countrymen and everyone else around the world of their breakthrough achievement.

But the Wright brothers' success is not only notable for what was achieved—the first powered flight—but it should also be remembered for how it was achieved. First, ② the Wrights did background research and gathered all available information about flying machines. As they owned a newspaper—*The Evening Item*—they had already seen photographs of German flight pioneer Otto Lilienthal flying a glider in 1895. They also came across photos taken by Alexander Graham Bell of Samuel Pierpoint Langley, the third secretary of the Smithsonian Institution, launching an unmanned flying machine over the Potomac River near Washington, DC, USA, in 1896.

Furthermore, and unlike most of their peers, ③ the Wrights believed that the problem of flight could be solved through proper balance and experience—just as learning how to ride a bicycle. These problems, they assumed, could ultimately be solved only through experimentation and drawing on the experiences of others.

問1 Wright brothers は、いつ何を達成したか説明せよ。

問2 下線①の内容を説明せよ。

問3 下線②を和訳せよ。

問4 下線③を和訳せよ。