

Ⅲ期（一般）

令和3年度

武蔵野大学大学院 工学研究科 建築デザイン専攻 入学試験問題（3月7日）

[英語]

ニュース系ウェブサイトに掲載された記事「Could humans live on Mars? Why the architecture of polar bases holds the key」を読み、下線部分(1)～(16)を日本語に訳しなさい。

(1) The revived appetite for space exploration is as much of a challenge for architects as it is for engineers as they draw up plans for how we might colonise the solar system, writes Jonathan Morrison

February 21 2021, The Times

“Touchdown confirmed,” announced Swati Mohan, head of the guidance, navigation and control operations team. (2) “Perseverance is safely on the surface of Mars, ready to begin seeking the signs of past life.”

To much global excitement, Nasa’s \$2.7 billion rover mission successfully landed on Mars last week after its seven-month, 290 million mile journey from Earth. (3) This incredible engineering feat may have left many wondering: can we colonise the red planet?

Answering the question of whether humans could live on Mars will be an architectural as well as an engineering challenge. (4) Intriguingly it is the development of manned bases in extreme environments such as the polar regions that provide a useful reference point for the investigations of national space agencies and super-wealthy buccaneers.

Coming in from the cold

In the Arctic and Antarctica there are severe restrictions analogous to the hostility of space: there are limitations on logistics and assembly, maintenance and repairs, labour and safety, the volume of internal areas, not to mention crew comfort and training. (5) The physiological and psychological problems of keeping humans sane and safe in space and on ice can be very similar and there are lessons to be learnt.

If they were initially utilitarian — such as Captain Scott's (6) prefabricated hut on Ross Island, built in 1911 and notably (7) lacking in insulation — the most recent examples of manned stations feature impressive engineering.

Think the retractable giant skis that enable the British Antarctic Survey's Halley VI to be relocated or the aerodynamic shell of New Zealand's Scott Base that will allow it to cope with winds gusting at 110mph.

Both were designed by the British architect Hugh Broughton and offer far more than the ability to cope with a moving ice shelf and (8) temperatures that can drop to minus 57C.

Rather, they are welcoming (9) habitations where pine-scented furnishings and plush leisure facilities are as important as laboratories and hangars; places where scientists can live in a state of once unimaginable comfort.

At the Scott Base, due to be completed in 2027, up to 100 residents might while away the hours in a cafeteria and even a Kiwi-themed pub, while Halley VI — which opened in 2013 — boasts a gym, library, large canteen, bar and mini cinema. The best show of all, however, can be found by looking straight up at the night sky through a central oculus.

“(10) Nasa has certainly kept a firm eye on Antarctica as it looks, not for engineering solutions so much, but at how architecture can respond to the human condition,” Mr Broughton said.

“It's in areas like wellbeing and psychology that they're looking to learn: (11) how you deal with isolation, how you create a sense of community while giving people personal space, how you support people in the darkness.”

“(12) When you're designing for extreme environments you're not going to find a quick solution in an old manual: you need to look at everything you can to find the answer.”

“Old hands may say [Halley VI] has become too comfortable. But by making it more comfortable, you can attract a more diverse group of scientists and it also becomes more efficient operationally, especially when computers are involved.”

Even the most dedicated scientist or astronaut needs to relax and blow off steam occasionally. So if you can put a pub in Antarctica, there's no reason not to put one on Mars or the ship that takes you there. As Mr Broughton says: “(13) It wouldn't have to take up that much room, because people can just sit on the ceiling.”

There are other bases in the pipeline that may provide further (14) clues as to how mankind's colonisation of space might take shape: not least a dramatic underwater laboratory called Proteus that is being constructed 18m down off the coast of Curacao in the Caribbean.

The brainchild of Fabien Cousteau, grandson of Jaques, and the Swiss designer Yves Behar, (15) it is designed to accommodate 12 scientists for days at a time, allowing them to conduct research on the seabed without the constant need to decompress between dives.

Cousteau hopes his £100 million project will not only lead to (16) important scientific breakthroughs — not least new drugs derived from as-yet-undiscovered species of flora and fauna — but also become “the ocean's equivalent of the International Space Station” and “help us learn how to live in places like the dark side of the Moon”.