NEWS IN FOCUS

LIU SHIPING/XINHUA/ALAMY LIVE NEWS

Members of the Chinese Antarctic expedition saw their research season cut short after their transport, the icebreaker *Xuelong*, was damaged by an iceberg.

GEOLOGY

Chinese crew extracts rock from East Antarctica

Team faced race against time to retrieve the first rock sample from the region in 60 years.

BY ALEXANDRA WITZE

A collision with a rogue iceberg earlier this year jeopardized several experiments dependent on China's most recent Antarctic voyage — including an effort to drill through almost 200 metres of ice to collect a sample of the underlying bedrock. The work was an early test of an ambitious plan to extract rock from an enormous mountain range that is buried beneath a kilometre or more of ice. The project yielded the first rock core collected from beneath East Antarctica in more than 60 years.

The polar scientists behind the experiment, who were drilling near the Chinese research station of Zhongshan in East Antarctica, were among many who were forced to cut short their field season last month. Their ride home, the icebreaker *Xuelong*, had been damaged when it hit an iceberg off West Antarctica, and needed to depart early.

"We all worried whether time was enough to reach bedrock," says project leader Pavel Talalay, a drilling engineer at Jilin University in Changchun, northeast China.

Racing against the clock, the drillers reached their target on 10 February, pulling up a 7-centimetre-long rock core, which they hope to study for a rare glimpse of the region's geology. The last sample taken from beneath East Antarctica's ice was collected by Russian scientists in 1957. Talalay's team then scrambled to pack up camp the following day, and by 13 February was on-board the *Xuelong*.

The iceberg collision also disrupted other Chinese Antarctic projects. In January, a ▶

South Korean research ship had to rescue Chinese workers — whom the *Xuelong* was supposed to pick up — stranded on an island in Terra Nova Bay, where they had been building the country's fifth Antarctic research station.

Other members of the Chinese Antarctic expedition squeezed in as much science as possible before departing on the *Xuelong*. One group installed a meteorological station about 100 kilometres from Zhongshan to collect data that will improve Antarctic weather forecasts. And the Xue Ying aircraft, China's only polar-research aeroplane, gathered geophysical observations of the ice sheet.

China is expanding its scientific activities in Antarctica, an ambition outlined in the country's five-year plan that began in 2016. This season, workers finished a second stage of construction at a research station that opened in 2014 about 500 kilometres from Zhongshan. China has also announced plans to build an airstrip on the ice near Zhongshan.

WHAT LIES BENEATH

Next year, if Talalay and his colleagues can secure funding, they plan to take their drill to the site of this future runway. They want to drill through the ice to help better monitor how ice flows in the area and where crevasses are likely to form, Talalay says. Working at the site would also allow them to take their drill to the next level of testing, because the ice there is 600–800 metres thick — substantially more than they drilled through this year.

The team hopes to eventually use the drill to penetrate more than 1 kilometre of ice to extract a rock core from one of Antarctica's biggest geological mysteries: the Gamburtsev Mountains, a range that is similar to the Alps but about which little is known because it lies so deep beneath the ice. Like ice cores, which tell the story of changing environmental conditions as the ice formed, rock cores reveal the story of a region's geology.

Antarctica's vast ice sheet covers almost the entire continent. The Gamburtsev Mountains are known to exist because they appear in radar images, but are a geological puzzle because they occur in the middle of the continent, where researchers think there has been little tectonic activity for more than half a billion years. Drilling directly into the Gamburtsevs would allow geologists to begin testing ideas of how the mysterious range formed.

"I'm sure they're rightfully excited to have core in hand."

Drilling in Antarctica is hard because of the cold temperatures and the logistical difficulties of transporting large amounts of equipment (J. Wang *et al. Polar Sci.* **9**, 208–220; 2015). So far, scientists have recovered only a handful of rock cores from beneath the Antarctic ice sheet. These include an 8-metre-long core from the Pirrit Hills area of West Antarctica, collected by US researchers in the 2016–17 season (O. Spector *et al. Cryosphere* **12**, 2741–2757; 2018).

Last month, a team from the University of Glasgow, UK, was hoping to collect a small sample of bedrock from the bottom of a hole drilled in West Antarctica by the British Antarctic Survey. But technical problems, including misbehaving motors, scuttled the plan, says team leader Patrick Harkness, an ice-drilling engineer at the University of Glasgow.

To retrieve their rock core, Talalay's team, led in the field by drilling engineer Zhang Nan of Jilin University, set up its drill about 12 kilometres south of Zhongshan during December and January. The group used ice-penetrating radar to locate the top of a hill buried beneath the ice, and aimed for that subglacial peak.

After drilling through the ice, the researchers lowered a rock-drilling tool into the hole and retrieved the short rock core. The dark, blocky cylinder appears to comprise a roughly fifty–fifty mix of ice and a metamorphic rock called gneiss, Talalay says.

The team's success is "a significant accomplishment", says John Goodge, a geologist at the University of Minnesota in Duluth who is helping to develop a US drill meant to quickly bore through the Antarctic ice and reach the bedrock below. "I'm sure they are rightfully excited to have core in hand," he says.

Drilling into the Gamburtsev Mountains is a long-standing goal of the Chinese and US Antarctic research programmes, Goodge notes. Such rock samples could help to reveal how long the Antarctic ice sheet has existed above them, and whether there are any buried lakes or basins that could preserve evidence of life beneath the ice.

But getting through more than a kilometre of ice — while working in extreme cold, at high elevation, and far from an established major research base — is extremely difficult. So the Gamburtsevs may have to wait a while. "Can it be done?" Goodge asks. "I think so. But because of the many technical challenges it isn't going to happen soon." ■

WORKPLACE

Harassment rife in Australian science

The first national survey of science workplaces reveals that sexual harassment is widespread and infrequently reported.

BY BIANCA NOGRADY

Nearly half of the female scientists who responded to an Australian survey on sexual misconduct at work have experienced sexual harassment. In a report released on 1 March, 10% of male scientists also said they had been sexually harassed at work.

The poll (see go.nature.com/2uh7oys) represents the first investigation into the prevalence of sexual harassment among Australian scientists and technologists working in industry, the public sector or non-profit organizations, as well as academia. Almost 300 science professionals answered the questions in an online poll conducted by Science & Technology Australia (STA), an organization based in Canberra that lobbies for the interests of scientists.

Previous surveys of students in Australia, the United States and the United Kingdom have found widespread harassment at universities. The latest results show that harassment is rife across all types of scientific workplace.

The survey found that around two-thirds of respondents who had been harassed had not reported the incident to their employer. Nearly one-third of respondents also said their workplace's policies on preventing sexual harassment were ineffective. And 33% thought procedures for addressing reported incidences of sexual misconduct were inadequate (see 'Sexual harassment in science').

Policies on how to prevent sexual harassment and bullying, and how to handle incidents after they occur, have been available for several years, says Wafa El-Adhami, executive director of the Science in Australia Gender Equity (SAGE) initiative in Canberra. But the results suggest that there is poor awareness of these policies, or they aren't being implemented effectively, El-Adhami says. She advocates greater accountability for organizations, to ensure that policies work. "You lift the awareness as you make managers and senior leaders accountable," she says.

The survey was carried out over two weeks in late January and early February by the STA, which represents about 70,000 scientists. Nearly 60% of respondents worked in academia; the rest worked in the government (25%), the private sector (12%) or non-profit