Bagging basalt

After dodging icebergs and flying fish, Jeff Standish and colleagues collected a suite of basalts from the Southwest Indian Ridge, to try and determine the mechanisms of mid-ocean-ridge formation.

What was the objective of the work?

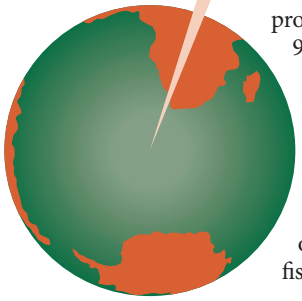
The work that Ken Sims and I report is part of a much larger project, aimed at examining the effect of spreading rate and geometry on the morphology and geochemistry of mid-ocean ridges. However, the objective of this project was to determine how the Southwest Indian Ridge was built, and whether this process was similar to other ridges. This part of the mid-ocean-ridge system joins the African and Antarctic plates in the Southern Ocean, and is termed an ultraslow-spreading ridge, owing to the slow pace at which these plates are moving apart.

Why did you choose this location for the fieldwork?

This section of the Southwest Indian Ridge is a unique and relatively unexplored region of the mid-ocean-ridge system. What makes it special is that two very long, consecutive portions of the ridge have quite different spreading geometries that are not separated by, and do not contain, a transform fault. Hence, a natural experiment exists. However, its location south of the 'roaring forties' — the region between 40° S and 50° S where strong westerly winds circle the globe unobstructed by land — has prevented many sane (and sea-sick-prone) scientists from sailing to this section of the storm-riddled Southern Ocean in recent years.

What sorts of samples were you after?

We wanted to determine the age and composition of the erupted basalt, so we dragged a large steel basket across the sea floor at over 100 different locations, and collected over 9,000 kg of rock. Although this project only needed a small fraction of the basalts collected — the youngest-looking ones — the amount of time and effort required to prepare the rocks and separate the necessary elements made it feel as though I had processed the entire 9,000 kg.



Did you have encounters with dangerous animals?

Only the occasional flying fish that launched itself over the ship's gunnel at the odd unsuspecting scientist. There were, however, numerous large icebergs in the southern reaches of the study area, so the captain and crew had to remain vigilant at all times.

JARED JEFFREY STANDISH

Scientists and crew onboard the RV *Knorr* enjoying a calm day in the Southern Ocean.

Were there any other memorable events?

During the initial 2001 expedition aboard the RV *Knorr*, all of us, crew and scientists, experienced a very unfortunate event and one that we will not soon forget. While on station at the Southwest Indian Ridge (four to five days sailing from Cape Town, South Africa), one of the ship's sailors became very ill. The serious nature of the event suspended science, and the ship sped back to Cape Town. When we were within reaching distance of helicopter transport, the sailor was airlifted off the ship and flown directly to the nearest hospital. Unfortunately, he passed away shortly after arrival.

What was the most moving part of the expedition?

What I will remember most about the expedition is the event described above. However, what I choose to focus on when recalling the event is not the terrible loss of life that this sailor's family, friends and colleagues had to endure, but the unbelievable effort, altruism and inner fortitude that the crew of the RV *Knorr* showed trying to save his life. For nearly five days, around the clock, the crew members and scientists attended to the sailor in exhausting 20-minute shifts. In the end we learnt that nothing could have prevented the final outcome. Shortly after returning from the expedition, the principal investigator, Henry Dick, and I agreed that in memory of our fallen shipmate, and in recognition of the tremendous humanitarian effort shown by the entire crew of the RV *Knorr*, the newly found giant submarine volcano within our study area would officially be named Joseph Mayes seamount.

Did the trip give you any ideas for future research projects?

The study area remains a very active research site. Just to the north of the rift valley we mapped a portion of the sea floor that is pock-marked and appears to contain lots of small volcanic cones. We have yet to return to this area, but we have plans to do some additional high-resolution mapping and sampling of this unique seafloor morphology. There are also plans to return to more fully explore both the hydrothermal activity and the rift-valley tectonics in this unique ultraslow-spreading environment.

This is the Backstory to the work by Jared Jeffrey Standish and Kenneth Sims, published on page 286 of this issue.