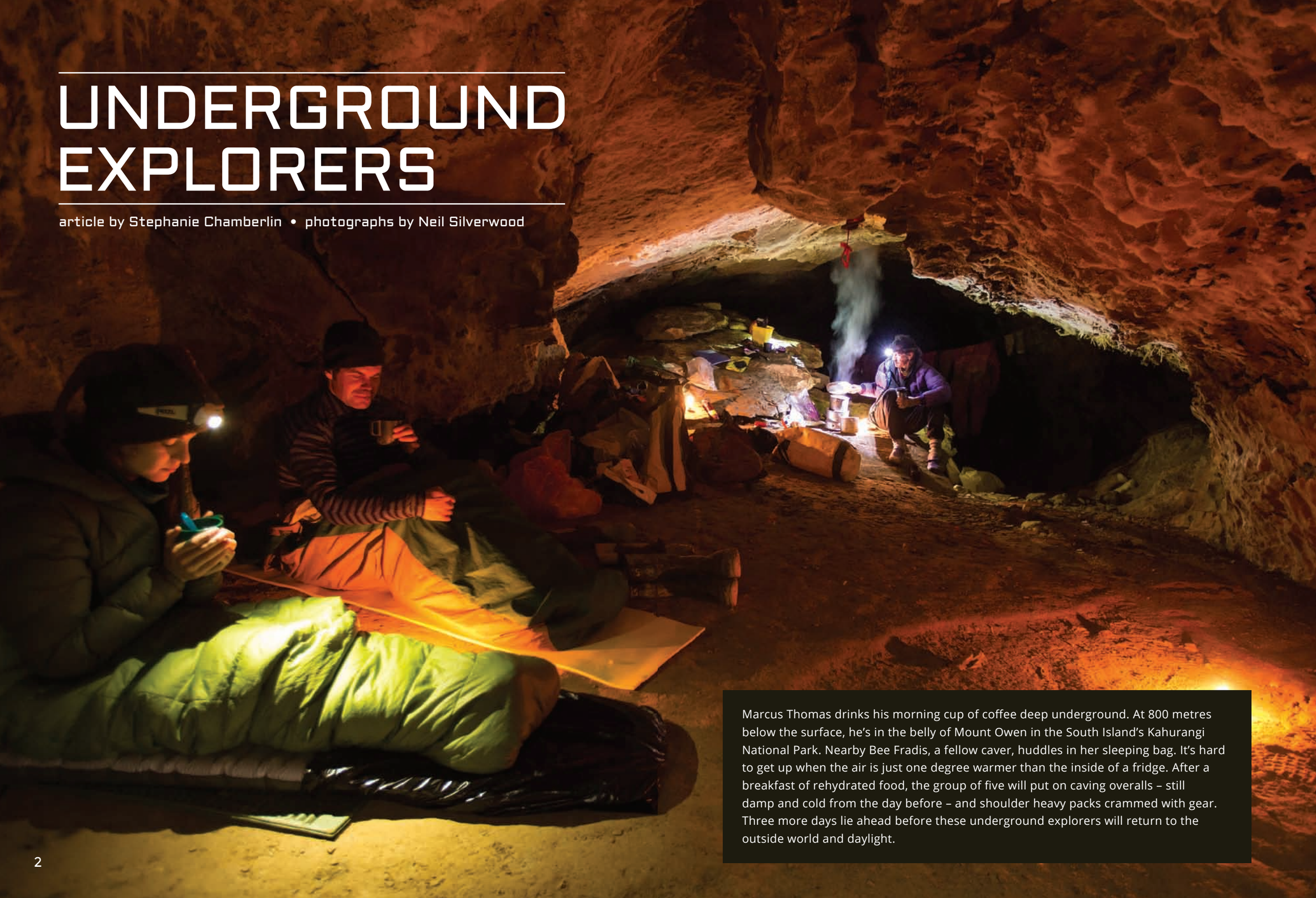
UNDERGROUND EXPLORERS

article by Stephanie Chamberlin • photographs by Neil Silverwood



Marcus Thomas drinks his morning cup of coffee deep underground. At 800 metres below the surface, he's in the belly of Mount Owen in the South Island's Kahurangi National Park. Nearby Bee Fradis, a fellow caver, huddles in her sleeping bag. It's hard to get up when the air is just one degree warmer than the inside of a fridge. After a breakfast of rehydrated food, the group of five will put on caving overalls – still damp and cold from the day before – and shoulder heavy packs crammed with gear. Three more days lie ahead before these underground explorers will return to the outside world and daylight.

An Underground Connection?

TO MOST OF US, the caving trips of Marcus Thomas sound like crazy endurance tests. But for extreme cavers like Marcus, this latest one is a dream come true. He and his team-mates are hoping to prove that the Bulmer cave system is much larger than previously thought – and today might be the day. If they pull it off, the team will make history. It all depends on the journey of a small trickle of green dye.

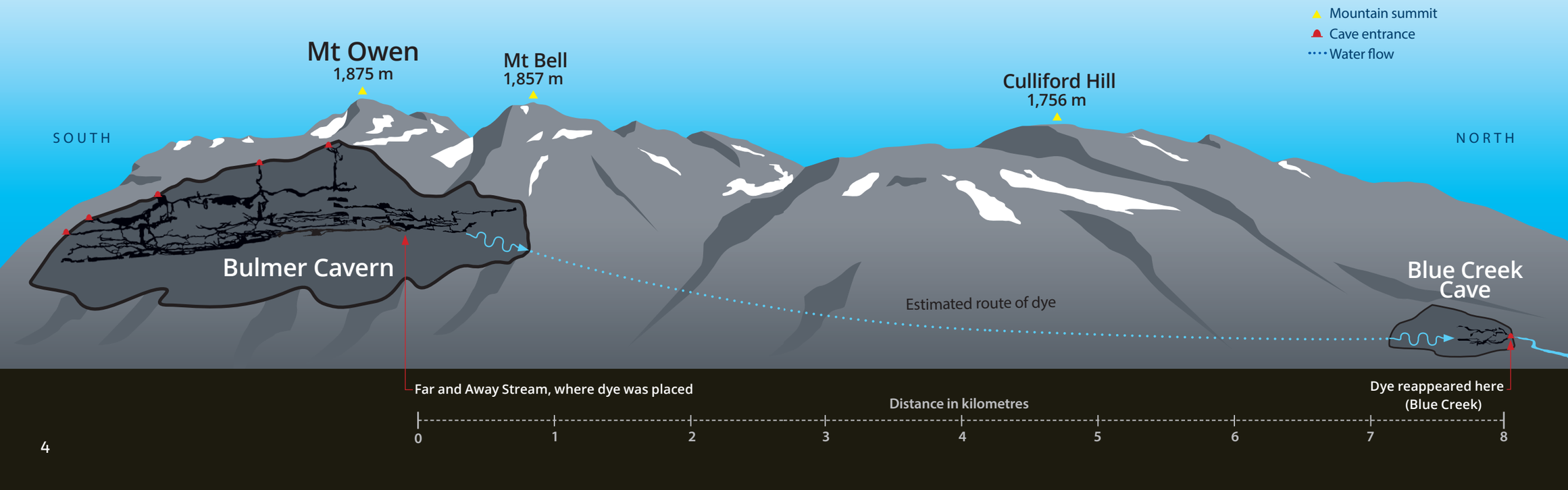
Five years ago, one of Marcus's team-mates, Neil Silverwood, made this same trip. Neil climbed Mount Owen, the highest peak in Kahurangi National Park, and caved as far as possible into the mountain's south-facing Bulmer Cavern. Neil had a theory the stream at the back of the cavern fed right through the mountain to Blue Creek on the north side. If this were true, it would mean there was an underground connection between the south and north sides of the mountain. This connection would open up a whole new world for cavers. "If water can make the journey," Marcus explains, "maybe we can too."

For cavers, this idea of an underground connection is mind-boggling. "As the crow flies, there are 8 kilometres between the end of Bulmer Cavern and Blue Creek," Marcus says. "This means there could be many more kilometres of caving passages underground. Bulmer Cavern already has 72 kilometres of passages. So the potential cave could be over twice as long again!" When almost everything on the planet has been mapped for centuries, it's exciting stuff.

Last time, to test his theory, Neil placed a cupful of water-tracing dye into the cavern's Far and Away Stream. Then he made his way back to the surface and waited to see if the dye would reappear in Blue Creek. It showed up ten days later. A positive result – but the concentration of dye was weak, and people still had nagging doubts that a connection could exist. Neil understood that his claim was highly unusual, and he was keen to have the discovery confirmed by other cavers. To prove this underground connection beyond doubt, Neil knew that his experiment would need to be repeated.

A profile map of Bulmer Cavern

Kahurangi National Park, north-west Nelson



Expect the Unexpected

On mountains that contain caves, water usually trickles down through cracks and shafts. Underground streams flow in a direction that roughly mirrors the slope on the surface. For water to travel from Bulmer Cavern in the south to Blue Creek in the north, it would have to cross the drainage divide. It would then have to intersect an entirely different cave system altogether (Blue Creek) for the water to flow northward – an unusual, and thrilling, possibility. Water rarely changes course in this way, but as Marcus points out, "This is limestone country, and these mountains are at the mercy of rainwater, which dissolves limestone. Mount Owen is ever-changing – and this means you should expect the unexpected."

This time around, nothing is being left to chance. Bags of charcoal that can detect even the tiniest trace of dye have been placed in rivers around Mount Owen. These will be tested at a laboratory and used as evidence. A sixth member of the team, Jon, waits at Blue Creek, ready to photograph the dye if it appears and to collect the charcoal bag.

Big Spaces

The team leave their campsite and travel via a series of abseils, then inch along rock faces that drop steeply away. Swinging on ropes, the cavers negotiate seemingly bottomless pits. Finally, they navigate a maze of 4-metre-wide tube passages by following wind draughts. As Marcus explains, "Passages that go nowhere usually have no draught. But passages that have both an entrance and exit have a strong draught funnelling through. People don't expect it to be windy underground, but in the tighter passages, the wind roars so loudly it's like a jet taking off."

Not surprisingly, people also expect caves to be dark. "They imagine black pits and mine-like passages – but it's rarely like that," Marcus says. In Bulmer Cavern, a white mineral called gypsum coats the cave walls. This makes the passages shine and sparkle in the cavers' lights. Their LED headlamps are so powerful the large galleries and tunnels are often filled with bright light. "When I think about caving in Bulmer," Marcus says, "I think about big spaces and amazing formations, not darkness."

> *"When I think about caving in Bulmer … I think about big spaces and amazing formations, not darkness."*

Alpine caving requires incredible skill. If anything goes wrong, there's no cellphone coverage. Help can be many days away. Here, Kieran Mckay helps Marcus cross a deep void. The bottom is too far away to be visible.

As well as gypsum, many of the walls in Bulmer Cavern are coated with moonmilk – a lumpy, creamy-white substance. Other walls bristle with crystals that have formed delicate shapes like flowers, stars, and snowflakes. "We call these 'pretties'," Marcus explains. The Bulmer Cavern is also known for its impressive helictites. "These form when water is pushed under pressure through a limestone wall. A mineral called calcite is deposited on the other side, and it grows in random angles, twisting and turning into curls and spirals."

By one o'clock, the team have reached their ultimate destination: the Far and Away Stream. The others look on while another Neil in the team – Neil Warrington – carefully pours the fluorescent-green dye into the stream. With some emotion, the cavers watch the colour gently balloon in the water as it starts its journey. They've done what they can; now they wait.

Instead of heading immediately back to the surface and to Blue Creek, the cavers have allowed two more days underground. They slowly make their way to a passage named Black the Ripper, the northern limit of the cave and the last place the stream can be seen before it disappears in the direction of Blue Creek. They hope to be able to dig their way through to a large passage on the other side but have no luck. The team turn in for the night, thinking about the green dye winding its way through the mountain.

Top: Marcus admires a helictite.

Bottom: Neil Warrington pours the green tracing dye into the Far and Away Stream.

Taking Only Photos

The next morning, Marcus and Neil Silverwood want to do some photography in Avalanche Alley. This is a very beautiful section of Bulmer Cavern, named for its big piles of white gypsum. The passage looks as though it's filled with great banks of snow. Cavers take great care in places like this. Although Bulmer Cavern is seldom visited, caves are vulnerable to damage from people and their gear. Paths are taped off so that cavers follow the same route, and if a cave is particularly pristine, visitors will avoid walking through it – or at least take off their boots to leave the lightest possible footprint. "Even one bit of mud could stick around for many lifetimes to come," says Marcus. "The cavers' code is to take only photos and leave only footprints. Sometimes, though, even footprints are too much."

Taking the photos is very cold work. The wind in the cave seems stronger today. It's also blowing in the opposite direction from yesterday, now from the south – a sign of bad weather on the surface. "Because of its high altitude and length, Bulmer Cavern is one of the coldest caves in New Zealand," Marcus says. It's time to take a break and warm up.

> *"The cavers' code is to take only photos and leave only footprints."*

Another of Bulmer's secret delights: a crystal pool. The water is so clear it's difficult to see the surface.

Bulmer Cavern was discovered in 1984. Over the last three decades, few people have explored this incredibly complex network. Much of it still remains a mystery. “Bulmer Cavern isn’t linear,” says Marcus. “It’s more like a honeycomb, with a lot of interconnected passages.” Marcus has been exploring Bulmer for twenty-five years. On each visit, he’s collected data using a compass, an inclinometer, and a tape measure. People use this data to create detailed maps. “These help us to visualise and navigate the cave. Maps tell us where we’ve been, what we’ve found, and what equipment we need.” But perhaps most importantly, Marcus believes a well-drawn map is a source of inspiration for the unknown. “Maps show us what we don’t know; a blank space might be a new passage waiting to be discovered.”

An Incredible Forty-eight Hours!

After another chilly night in the mountain, the team is due to tramp out. The journey is carefully planned. It's a long, slow slog – with lots of crawling and the passing of heavy packs – to get to the entrance.
As the dim glow of the world outside grows stronger, it becomes apparent something's up. Hundreds of icicles hang from the ceiling, and there are piles of snow. While the team's been exploring, there has been a major storm. "Seeing the outside world and daylight after five days underground is always a special moment," Marcus says.

"The colours everywhere and the details in rocks and plants ... your brain struggles to cope with so much information. This fresh perspective brings a new appreciation for things you wouldn't normally give a moment's thought to."

It's getting late, and the sun goes behind dark clouds. On the horizon, more bad weather is approaching. Already the snow is falling. The team decide to camp at the cave entrance for the night rather than brave the deep snow. Getting off the mountain can be tricky. There's no need to rush and take risks.

By morning, it's stopped snowing. The cavers make it back to the carpark without incident. They dump heavy packs, pull off gumboots, and drift one by one back into their own worlds, cellphones in hand. Marcus is responsible for finishing the tracing project, which means heading to Blue Creek to find Jon. Unfortunately, access is cut off by high water. Marcus flags down a passing ute – and Jon is in the back! Nervously, Marcus asks his burning question.

"We got a positive all right!" Jon replies. "The dye flowed out in less than forty-eight hours! Want to see the photos?"

A positive trace in under two days is an incredible result. It suggests the waterway in the mystery cave is steep and fast flowing – and possibly very large. It's a significant moment in the history of the cave. A whole new network of passages awaits exploration. "Bulmer Cavern has the potential to become one of the longest caves in the world," Marcus says.

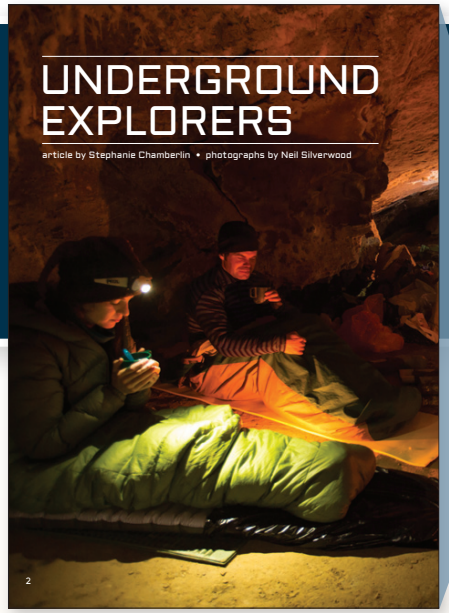
Neil is just as excited when he hears the news. "One day, maybe it will be possible to travel right through the mountain, from one side to the other," he says. "Perhaps it will be one of the greatest cave journeys in the world. One thing's for sure – we're all really looking forward to getting back in there to find out."

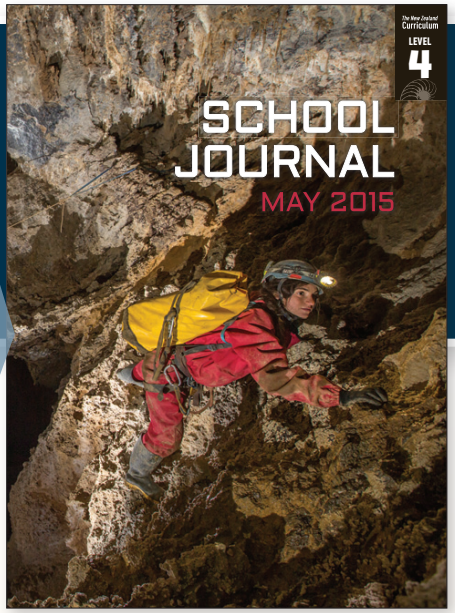
> *"Perhaps it will be one of the greatest cave journeys in the world."*

Marcus and Bee at Blue Creek

Underground Explorers

by Stephanie Chamberlin
photographs by Neil Silverwood





SCHOOL JOURNAL LEVEL 4, MAY 2015

Curriculum learning area	English Social Sciences
Reading year level	Year 8
Keywords	alpine caving, Bulmer Cavern, caving, conservation, environment, explorers, geology, Kahurangi National Park, limestone, Mount Owen, personal challenge, underground rivers, waterways

Published 2015 by the Ministry of Education
PO Box 1666, Wellington 6140, New Zealand.
www.education.govt.nz

ISBN 978 0 478 44672 2 (online)

Publishing services: Lift Education E tū
Series Editor: Susan Paris
Designer: Liz Tui Morris
Literacy Consultant: Melanie Winthrop
Consulting Editors: Hōne Apanui and Emeli Sione

MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

New Zealand Government