

Stalagmites down under

Mike Gagan, Michael Griffiths and colleagues negotiated knee-deep mud while up to their neck in water in an Indonesian cave, all to reconstruct Australasian monsoon rainfall over the past 12,000 years.

■ What was the objective of the work?

Our primary aim was to understand the role of the tropics in global climate change. Our Australian–Indonesian team uses geochemical tracers in speleothems from Indonesia to reconstruct the late Quaternary history of rainfall extremes and abrupt climate shifts in the southern half of the Australasian monsoon domain. Here, we used geochemical tracers in stalagmites in the Liang Luar cave, Indonesia, to reconstruct monsoon rainfall in Australasia over the past 12,000 years. The discovery of what may be a new human species — *Homo floresiensis*, also known as ‘the Hobbit’ — in Indonesia in 2003 made our objective even more pertinent: what caused the surprisingly recent extinction of the Hobbit is an intriguing question.

■ Why did you choose this location?

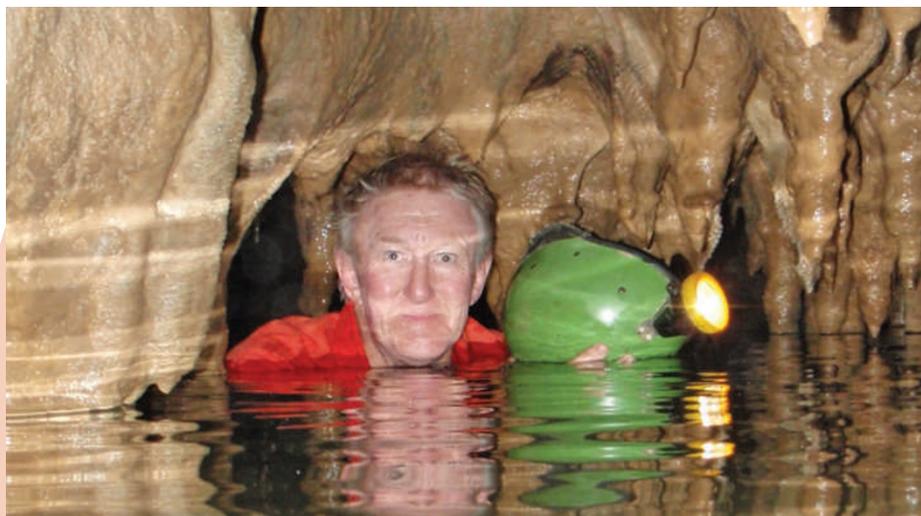
Liang Luar cave is strategically located on the climatically sensitive, seasonally dry island of Flores in southeast Indonesia, and lies in close proximity to Liang Bua, where the Hobbit skeleton was discovered. The deep cave-chambers of Liang Luar are cut off from the outside world; thus the stalagmite isotopic record is largely undisturbed by outside changes in temperature.

■ Did you have any encounters with dangerous animals?

During our cave reconnaissance work in 2006, several of us were attacked by vicious hornets; this could have been a deadly encounter had we not found a quick escape through the dense scrub. The attack resulted in several of us receiving large stings, which in some cases took days to recede.

■ Did you encounter any difficulties?

Our caving expeditions felt like commando operations. Near the cave entrance, we had to scale a six-metre-high boulder surrounded by two boggy mud pools, which we had to wade through to get to the cave interior. Even during the dry season, air space above the



Neil Anderson wades through water, with little room to breathe, in the Liang Luar cave, Indonesia.

poools is often reduced to claustrophobic head-sized gaps (see photo). Worse still, knee-deep gooey brown mud blankets the cave. We had to lug heavy and awkward equipment hundreds of metres through this slippery obstacle course. Our tools were sealed away in mud-proof containers and dry-bags, but we were anything but. And eating anything other than dark chocolate was out of the question. One of our toughest team-members, and a veteran of many field seasons in Antarctica and Papua New Guinea, to name a few, surmised soberly, “This is the hardest fieldwork I’ve ever done”.

■ Any low points?

We toiled for two days collecting the 1.7-metre-tall stalagmite that is described in our paper. We lowered this ~90 kg specimen by rope down a treacherous rock-slope, packed it in foam rubber, cased it with PVC drain-pipe and then lugged it ~800 m to the cave exit. In places we were crawling on hands and knees through mud in decimetre increments (shouting in unison “one, two, three, heave!”). The low point came when, after this Herculean effort, the truck transporting us back to base hit a big bump, and we heard a loud ‘crack’. We had done so much to keep this 11,000-year-old stalagmite intact, only to have it snap in the truck!

■ What was the highlight of the expedition?

The highlight was the thrill of exploring the full length of Liang Luar, which stretches back 1.8 km. In 2006, after several days exploring dead-end caves around Liang Bua, we faced what appeared to be — at least to my inexperienced eye — an insurmountable rock approximately 100 m from the cave entrance of Liang Luar. But whereas the rest of us waited defeated, our two professional cavers effortlessly free-climbed the rock and squeezed through uncharted passageways to discover huge, well-decorated chambers full of stalagmites and stalactites, which have proven invaluable for our study.

■ Did you learn anything new about yourself or your team members?

None of us had ever worked in such a harsh environment, or collected such large stalagmites. The inherent risks and accomplishments of the expedition produced a remarkably motivated and resilient team. We are deeply thankful for the unwavering “anything is possible” logistical and caving support provided by Bambang Suwargadi, Neil Anderson (pictured) and Garry Smith.

This is the Backstory to the work by Michael Griffiths and colleagues, published on page 636 of this issue.

