

Serendipity in Sichuan

Research opportunities can present themselves at the most unexpected times. When Ingrid Ukstins Peate and Scott Bryan went on a conference field trip in China, they didn't expect to steer previous geological interpretations in a new direction.

What is special about the location for your fieldwork?

Geological observations from the Emeishan Large Igneous Province in China have been cited as the best (and until now, the only) well-documented example of rapid large-scale uplift thought to result from a plume rising from deep within the Earth's mantle. We were therefore very interested in visiting this province. We got our chance in 2006, during a meeting on continental volcanism, where 11 international geologists were able to participate in a 10-day post-conference field trip led by Yigang Xu and Bin He.

What was the main objective of your work?

We wanted to test whether the environment in which the oldest volcanic rocks from the Emeishan province erupted was similar to that predicted by mantle plume models. To do this we needed to document the physical characteristics of the volcanic and associated sedimentary rocks in detail. Rock textures can reveal the environment of their formation. For example, the presence of pillow lavas indicates volcanic eruption in water, and the presence of specific types of fossils indicates a marine environment.

What data or samples were you after?

We documented rock components and textures, as well as the thicknesses of different units, by making detailed geological logs. We also collected samples of important rock types. These were cut into ultrathin slices and investigated under the microscope. Bin He graciously lent us some thin sections from this locality and other areas he had worked in previously. The several hundred field photographs that we took also formed an important part of our dataset.

Was it straightforward to get samples back to the lab?

We were in China for a holiday afterwards so didn't want to lug rocks around



Curious rocks. Some of the field-trip participants discuss an interesting outcrop at the Daqiao locality in the Emeishan province.

for the rest of our trip. We wrapped them in newspaper, put them in cardboard boxes and duct-taped the heck out of them. Yigang and Bin were invaluable in explaining to the local postal workers that, indeed, the crazy scientists wanted to send boxes of Chinese rocks back to the US. The postal employees enthusiastically added another layer of official-looking tape, and off they went. When the boxes were delivered several weeks later, they had moulded themselves to the shape of the rocks, arriving as brown lumps held together solely by the multiple layers of tape!

What was the highlight of the expedition?

As soon as we saw the first outcrops at Daqiao in the Emeishan province, we knew the rocks were spectacular, and important — they had formed through the interaction of magma with water. This was really interesting because they had previously been interpreted as alluvial sediments shed from a rapidly uplifting domical region. We found clear evidence that the outcrop formed at or near sea level, which was confirmed by additional work on the thin sections. The group had a fabulous afternoon walking along the stream running through the Daqiao section, discussing

rock textures and interpretations. We were very lucky to be in the right place at the right time, with the skill sets to recognize the unique and significant nature of the outcrops. We saw some spectacular scenery in the Yunnan and Sichuan provinces and experienced the culture of China. We were also fortunate to have gregarious and good-natured field-trip leaders who were so passionate in showing us their geological backyard.

Did you encounter any dangerous animals?

Not living ones, but local markets offered some interesting food that we opted not to experience, including scorpions on a stick!

Did the trip give you ideas for future research projects?

We hope to undertake a more detailed study of the volcanic deposits from the Emeishan province to shed additional light on surface processes and responses during the formation of large igneous provinces. Any interested PhD students? You have our contact details!

This is the Backstory to work by Ingrid Ukstins Peate and Scott Bryan, published on page 625 of this issue.

