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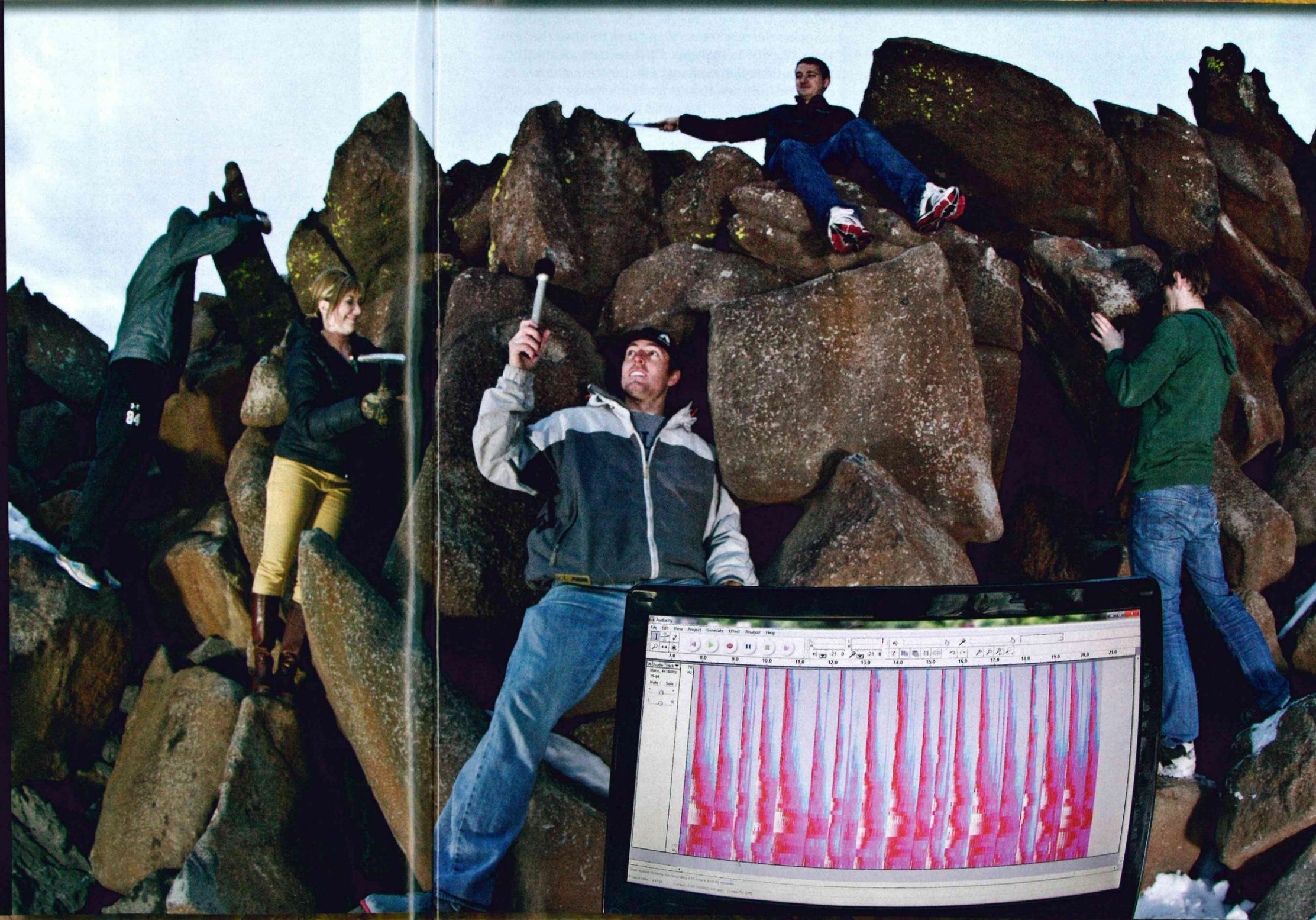
Montana's geographic wonders have long inspired musicians and songwriters, but an ancient anomaly allows even the least musically inclined among us to be a rock star. The only instrument you need is a hammer.

The Ringing Rocks, located roughly 20 miles east of Butte is a symphonic wonder that has been millions of years in the making. Having lived in Butte for almost 20 years, we'd heard about the rocks for many years but not until recently did we bundle up our young son for an afternoon of outdoor adventure. After all, what could be more fun for a four-year-old than your parents encouraging you to play with rocks? ▶

# Rock of Ages

Scientists are still pondering the mystery of Butte's Ringing Rocks

Story by Claudia Rapkoch  
Photos by Kenton Rowe



UM-Montana Tech geophysics students Mathew Bray, Mike Beecher, Taylor Stipe and Leif Knatterud bang on the Ringing Rocks while Brad Rutherford records the sounds on a computer. The white and red areas on the spectrograph show ringing sounds while the shapes show different pitches.

As we drove up the rocky road to the small parking area at the base of the formation, we were a little underwhelmed at first. It appears to be an immense rusty pile of rocks unceremoniously dumped by a prehistoric front-end loader with people climbing around with hammers and mallets. But the second I opened our truck's passenger side door, I immediately understood the fascination. Instead of hearing the expected chink of hammer on rock, we were greeted with the sound of chimes resonating from the towering batholithic cathedral.

On this particular cloudless cool afternoon, the formation was crawling with geology students from the University of Montana who were visiting one of the only known locations of ringing rocks in North America. Professor Julie Baldwin's students teemed around the large rust-colored boulders that look strangely out of place even in an area known for unusual rock formations. "The angular formation is really interesting," she says while loading her tools of the trade into her vehicle. "Why would this have formed in the manner that it did? It's a really cool mystery."

I love a good mystery, so I decided to dig a little deeper (pun intended) into formation. It turns out I'm not the only one who's baffled. "This has been kind of puzzling to people for a long time," says Kaleb Scarberry, a geologist with the Montana Bureau of Mines and Geology in Butte. Scarberry says that, although certainly not common,

there are other similar formations located around the world. Despite their best efforts, members of the scientific community who've studied these formations aren't exactly certain why they ring.

"What makes the most sense to me is to think of the bell analogy," Scarberry explains. "The striking (of a bell) generates a sound which is energy moving through the cavity of the bell and reverberating off the walls of the bell. If a bell is sitting on the ground it won't ring, so that tells us it has to be free standing, and we also know that if we broke off a piece of the bell it wouldn't ring."

The last two points are relevant to the Ringing Rocks. Each rock has its own pitch and tone that varies depending on where or how you hit it. Strike a smaller, free standing rock on the pile with a hammer and it sounds, well, a lot like a hammer hitting a rock. But strike a boulder wedged within the pile and you're rewarded with a clear musical note that would impress even the most expert bell ringer.

Upon closer examination of the boulders, it's easy to see where amateur and professional scientists have chipped away samples over the years either to better understand the rocks' crystalline structure or just because they may have hit one a little too hard. If the rocks remain with the band, they're able to perform, however, just as in Scarberry's analogy, the rocks don't ring if they're removed from the formation.

While the bell analogy makes sense, it still doesn't answer the question about why this particular pile of rocks rings and others, even nearby, don't. Scarberry says geology provides at least a partial answer.

The formation itself is comprised of igneous monzonite crystals, which Scarberry describes as similar to granite but with less quartz, that were deposited there about 80 million years ago during the Cretaceous Period. While dinosaurs roamed Montana, the rock slowly cooled and subsequent weather eroded the land to reveal what is now call the Ringing Rocks Stock, a circular formation about a half mile wide in diameter.

"It's a very small component of a much larger igneous intrusive system (the Boulder Batholith) that we see all over this region," adds Scarberry. He adds that this particular formation was likely exposed to another volcanic event, which contributed to its unique interlocking structure and above average density. This could also help explain why its mineral composition is somewhat different than the surrounding rock formations that comprise the Boulder Batholith.

It's hard to fathom the cataclysmic events that formed the Ringing Rocks while we climb amongst the rocks gently tapping our way



around the formation. In fact, the incongruity of it all is rather addicting as the variation of notes mixes with the occasional percussive gusts of wind to form an entirely unique musical experience.

It's likely that people over the millennia have happened upon the Ringing Rocks, but the first mention of them in any formal record came in 1966 when a geologist for the USGS named Harold J. Prostka wrote about it in a survey bulletin. Since then it's become one of Montana's most offbeat and unique outdoor experiences.

The formation, located on the southwestern side of Dry Mountain, is located within the Deerlodge National Forest and is under the jurisdiction of the Bureau of Land Management. The gravel road leading up to the site is open year-round, weather permitting, but it is narrow in spots and rather rocky so a high clearance vehicle is recommended. Visitors can also hike or mountain bike to the formation, just remember to bring a hammer or mallet with you.

You don't have to climb up the rock pile in order to make music if you don't want to—so it's a fun adventure for little kids too. Once our son realized that he really wasn't going to get in trouble for wielding the hammer, he was hooked. So, it's a fun way for children and adults to learn about scientific concepts including geology, sound and even music. Sturdy shoes, preferably hiking boots, are a must.

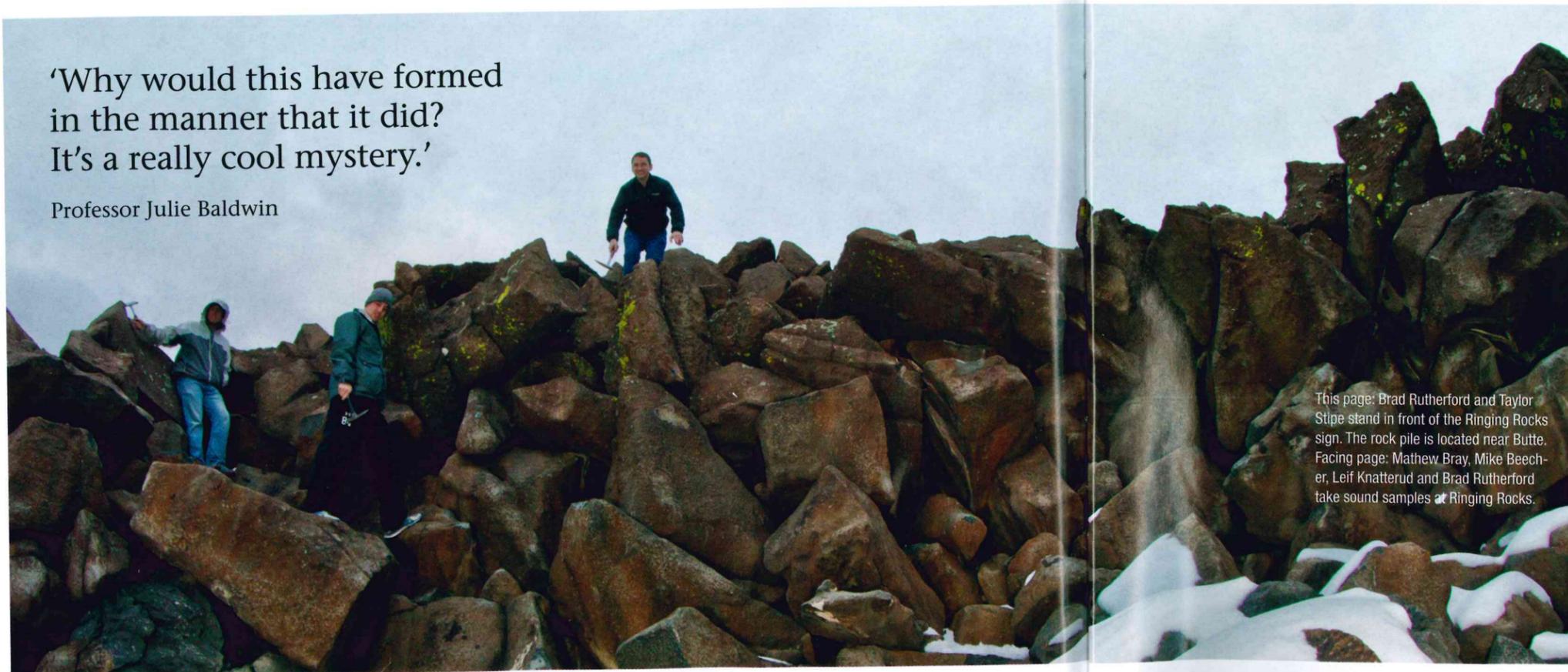
As the geology students worked their way back down the pile of rocks, a few of them stopped to marvel at the natural wonder as they waited for classmates still tapping away above. They compared notes and observations while they looked at rock fragments with hand lenses. "It's just so neat to have something like (the Ringing Rocks) in our own backyard," says Ellie Fitzpatrick, from Helena, "it's a great experience."

We couldn't agree more. The mystery of the Ringing Rocks just adds to the thrill and we're already looking forward to our next rock concert. **M**

Claudia Rapkoch is a freelance writer from Butte.

'Why would this have formed in the manner that it did? It's a really cool mystery.'

Professor Julie Baldwin



This page: Brad Rutherford and Taylor Stipe stand in front of the Ringing Rocks sign. The rock pile is located near Butte. Facing page: Mathew Bray, Mike Beecher, Leif Knatterud and Brad Rutherford take sound samples at Ringing Rocks.