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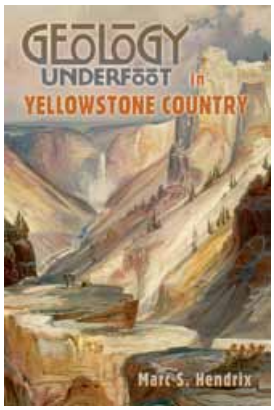

Geology Underfoot in Yellowstone Country, Marc S. Hendrix, 2011, Mountain Press Publishing Company, Missoula, 312 p., softcover USD24.00, ISBN: 978-0-87842-576-1.

Among my earliest memories are family vacations in the West, complete with rock hammers and fishing rods. Badlands, Black Hills, Devil's Tower, Glacier National Park, and Yellowstone evoke not only pleasant reminiscences but also fragrances: parched clay, dry grass, pine needles, and steamy rotten eggs (hydrogen sulfide). In *Geology Underfoot in Yellowstone Country*, Hendrix conjures up some of those ghostly aromas and wafts them gracefully into 20 geologic vignettes, which makes for a remarkably entertaining and educational read for geologists and interested nongeologists alike.

This volume is the most recent addition to Mountain Press's *Geology Underfoot* series. I have to admit, I was expecting a "first national park, geyser, hot spring, and waterfall tour-de-force" when I opened the book, but Hendrix writes about Yellowstone Country, not just the national park, and thereby places these unique features into a much broader context. Geographically, the book ranges from the Madison River to the Beartooth Mountains, and it naturally covers the touristy middle ground of the park. In scope, this volume addresses topics on geological processes from mantle circulation to mass wasting, paleodendrochronology, glaciology, and climate change in moderate detail. Hendrix doesn't shy away from the more controversial aspects of our science, like plume versus plate hypotheses, and he presents balanced and thoughtful explanations and alternatives for observations, some of which are based on references acknowledged under Sources of More Information, and some come from his own research efforts and experiences. New concepts in the literature and the application of stable isotopes and cosmogenic surface exposure age dating give the book an air of timeliness and relevance.

Geology Underfoot in Yellowstone Country is a guidebook first and foremost, and each vignette provides for one or more stops that detail the geologic history and uniqueness of specific features. Directions to localities appear to be straightforward. Most are along highways or well-maintained trails, but some require potentially strenuous hiking in back country.

After a brief introduction, topics are neatly arranged chronologically from oldest to youngest, beginning with the Great Unconformity (vignette 1) and ending with the 1959 Hebgen Lake Earthquake (vignette 20) and an epilogue with speculations about massive eruptions future generations will experience. In between are details of Paleozoic and Mesozoic marine incursions (vignettes 2–4), uplift and erosion (vignettes 5 and 6), Absaroka volcanism and more uplift (vignette 7), debris flows (vignette 8), fossil forests (vignette 9), and pluvial lakes (vignette 10), punctuated by the arrival of the Yellowstone hot spot and subsequent volcanism (vignettes 11–13). The Huckleberry Ridge (2.1 Ma) and Lava Creek (0.64 Ma) eruptions were the most devastating events to have transpired on this continent in recent prehistory.

Subsequent vignettes cover details of Pleistocene glaciations (vignettes 14 and 15), massive outburst floods (vignette 16), and development and hydrology of hydrothermal systems and explosions (vignettes 17–19). The 1959 Hebgen Lake Earthquake (vignette 20), M 7.1–7.5, was the third largest earthquake in North America in recent history. It triggered the Madison landslide, which killed 26 people in the Rock Creek Campground. Excerpts from the narratives of survivors and accounts of evacuees downstream of Quake Lake are intermingled with dynamics of down-dip movement of dolomite and schist debris riding out on a cushion of compressed air and dust.

Geology Underfoot in Yellowstone Country is well organized, well written, and nicely illustrated, with numerous color photos that show geologic features keyed to stops. A glossary provides help for students and nongeologists. Geologists will appreciate Hendrix's expertise. Academics will find the book laced with enough details to provide classes with at least a weeklong summer field experience. The scenic landscape of Yellowstone will always draw visitors to it, and this book provides the most up-to-date guide to the geology.

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