



The upper section of Yosemite Falls. The water flow varies seasonally: in August, the falls are sometimes completely dry. In April and May, enough water passes over the falls each day to fill a large football stadium. At peak flow, Yosemite Falls pushes out over three tons of water per second. Photo by Allen Glazner.

GEOLOGICAL SCIENCES

Yosemite rocks

by Jason Smith

Geology Underfoot in Yosemite National Park. By Allen F. Glazner and Greg M. Stock. Mountain Press, 300 pages, \$24.00.

Yosemite National Park is a staggering piece of work: sometimes, says Allen Glazner, people spontaneously decide to hop on a plane or drive all night just to spend one day there. And people seeing the park for the first time sometimes can't help crying.

Yosemite is three-quarters of a million acres of mountains, rock avalanches, landslides, meadows, sequoias, glaciers, lakes, rivers, and waterfalls. It's hard to look at many of the geological formations there—the dizzying cliffs of Yosemite Falls, say, or the sheer granite crest of Half Dome—without wondering how they came to be. Glazner's latest book is a user's guide to the whole shebang: it explains, in very clear terms, the geology underlying each of the park's iconic formations and features.

The creek that feeds Yosemite Falls, for example, runs through a relatively shallow notch it has carved in the rim of Yosemite Valley. But just to the west of the falls lies a steep ravine (visible in the photo above as the dark, heavily vegetated area to the left of the falls).

This ravine, Glazner says, seems like a more obvious path for the creek to take. So why is it plunging off the edge of the cliff instead? The answer, he says, is that the creek got pushed: over the past two million years, several glaciers formed at the creek's headwaters and crept slowly down Yosemite Valley. In fact, one glacier moved down the valley and stopped right before the spot where the water now shoots over the cliff. As these glaciers melted, they left long lines of boulders—what geologists call terminal moraines—along with smaller rocks and sediment across the creek and through the valley. Over time, the creek had to detour to get around all of this stuff. Were it not for the glaciers, the creek would likely still be bubbling meekly through the ravine instead of soaring off the cliff.

Glazner's book is divided into twenty-five vignettes, each of which features and explains a prominent characteristic, formation, or area of the park. Each vignette includes specific directions and maps to allow you to get to the site. There's a vignette on Half Dome, one on Little Devils Postpile, and one on the El Capitan Moraine. Along the way, you'll learn how earthquakes, rock avalanches, and water have shaped Yosemite. You'll learn how gigantic boulders get carried off and deposited onto precarious perches. And who knows? Maybe you'll even be inspired to spontaneously hop on a plane.

Allen Glazner is the Kenan Distinguished Professor of Geological Sciences. Greg Stock is Yosemite's first-ever park geologist.