

## Acceptance of the Dana Medal of the Mineralogical Society of America for 2017

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Thank you, Charlie, for those kind words. That's a lot to live up to. Thank you also to the selection committee, to those who wrote letters supporting my nomination, and to the Society. In so far as I've been successful, it's due to the opportunities I've been allowed to pursue, the generous mentors and colleagues I've worked with, as well as to strong institutional support.

As for the Danas, James and Edward, how could one ever measure up to them? James was described as "the preeminent geologist of his day" and as "America's Darwin." While on the Exploring Expedition to the Pacific from 1838 to 1842 he discovered that the Hawaiian Islands get younger to the southeast, that their volcanoes form two chains that he named, and we still call, Loa and Kea, and he developed convincing evidence that ocean islands subside creating coral atolls. While riding horseback south from the Oregon Country to California he made the first geologic observations of Mount Shasta and its surroundings, including describing a strange field of hummocky volcanic rocks at the mountain's north foot that we now recognize as a debris avalanche.

Edward effectively created the modern mineralogist, having studied under giants like Bunsen and Tschermak in Europe, but he, too, went west and worked in the Yellowstone region in 1875 on a patrol by the Army Corp of Engineers. Adolph Knopf referred to him then as performing geology "with a hammer in one hand and a rifle in the other," which those of us who work in Alaska will find familiar (although Charlie prefers his Remington 870). Of course, Edward is best known for perfecting the System and Manual of Mineralogy that allowed the science of mineralogy to be transferred widely and effectively without access to the great masters.

These two seem like heroes from a lost time, but in my education and career, I've interacted again and again with mentors and colleagues who share their talents. Jim Moore hired me into the USGS when I finished college and together we mapped a swath of geologic quadrangles across the Sierra Nevada batholith at the latitude of Mt. Whitney. Jim had also discovered enormous submarine landslides from ocean island volcanoes, and he determined the most accurate rates for subsidence of the Hawaiian Islands, quantifying James Dana's model. I learned many things from Jim, but foremost were to not be narrow, and to trust field observations. If field relations seem inconsistent with theory, it's usually the theory that needs improving. I worked with Cliff Hopson and R. V. Fisher studying the 1980 St. Helens blast, and then with Tim Grove on experimental petrology. Tim always went to the field, which reviewers of his NSF proposals sometimes



had trouble understanding, but these trips always paid off with insights and interpretations that could only be made by seeing the rocks in outcrop. I was a post-doc with Dean Presnall, then was asked by Pete Lipman to return to the USGS to study Mt. Rainier, which turned out wonderfully. I work in a building full of colleagues like Charlie who are experts in one aspect or another of volcanism, magmatism, hydrothermal systems, and the earthquakes and deformation they produce.

So, what lessons do I take from the two Danas? Foremost is to build fieldwork into research, in so far as is possible. To revise slightly from John Muir, the world is big and most of it has not been looked at carefully. Both Danas emphasized careful quantitative *and qualitative* observations. Both strove to do the highest quality work. Both illustrated their publications well.

Their final lesson is to say yes to research adventures. What would James have been if he had skipped the Exploring Expedition to the Pacific? What would Edward have become if he didn't go to Europe to study with the masters? My own more limited research expeditions to the Sierra, Cascades, undersea Hawaii, Alaska, and now Arabia, and new collaborations in Europe, have brought a richness to my life, both intellectually and in shared experiences with generous collaborators. We should help our students and early career scientists to do the same.

With that, I close by thanking you again for your time, your attention, and for this great honor.