2010 Distinguished Geologic Career Award (MGPV Division)

Presented to Peter Lipman

Acceptance by Peter Lipman

Thank you, Olivier, for such kind words.

And I find it difficult to express my delight, both by this award and by creation of the MGPV Division. As a field-based geologist involved in the spectrum of MGPV activities, I've now been a GSA member of for 50 years. But no Division previously had been much of a fit for studies of volcanoes and their eruptive processes. So thank you Jim, Cathy, and the others who have finally filled this gap at GSA.

As a kid who grew up in a rural part of southern New England, visible rocks were uninteresting, mainly on walls separating abandoned farm fields—think of Robert Frost's poem "Mending Wall," and I was a slow starter.

My geologic adventures have repeatedly been blessed by the luck to be in a good place at the right time, and especially to have connected with wonderful people. Additionally, the explosion of concepts and techniques for study of volcanic activity has been just extraordinary during the past 50 years. Here are examples:

A college friend told me about a camp-counselor job on the slopes of Pikes Peak in Colorado, I applied, and at age 19 ventured west of the Hudson River for the first time (a 14-yr-old in my camp tent was geology-prof-to-be, Bud Wobus). Seeing western mountains like the Tetons inspired a desire to explore them, and when I joined the college climbing club, I found myself tied to a rope with geology majors like Eric Cheney and Steve Porter.

When I belatedly decided that rocks could be interesting, midway through my junior year, the Yale geology department let me enter the second-half course without having taken Physical Geology (I'd read the textbook during the holidays). Upon switching to a geology major, I found myself in a class of only six, including such quick studies as geochemist Dick Armstrong and mineralogist Mike Holdaway, where there was no way to hide without doing the course work.

Yale had no summer field course of its own and waived this requirement when I obtained a field-assistant job with Ben Leonard of the USGS, in a wonderfully geologically diverse mountainous area of central Idaho. Ben was a meticulous scientist and superb teacher; my field methods were largely shaped during that summer.

During my initial year as a grad student at Stanford, I shared an office with Bob Christiansen and became the first grad student supervised by Bill Dickinson, both life-long friends. And Bill allowed me to start a PhD field project after only two quarters of class work, on igneous and metamorphic rocks in the Trinity Alps, northern California. When Mike Holdaway, by then at Berkeley, discovered that fellow grad student Greg Davis was headed for the same area, the three of us collaborated on adjacent theses, with improved results for all. But igneous petrology in the late 1950s at Stanford involved techniques little different from those pioneered in late 19th century Germany; so much has changed since!

When offered a job by the USGS in late 1961 to work on volcanic rocks at the Nevada Test Site, I went for it because the rocks were well exposed, and at least igneous, even though I knew little about volcanic terranes. Here again, luck and timing: the rocks turned out to be world-class ignimbrites and calderas, ripe for study with new concepts (especially just-published papers by Robert L. Smith) and innovative analytical techniques including major- and trace-element chemistry in quantity, K-Ar age determinations, and paleomagnetic pole directions for testing stratigraphic correlations.

Deciding that volcanic rocks were fascinating but concerned by my inexperience with young volcanism, I (in hindsight, utterly brashly) wrote Hisahi Kuno (then probably the foremost volcanic petrologist globally, but whom I had never met) at the University of Tokyo, asking to do a postdoc with him. He said “yes,” I obtained funding from a new NSF program, and had an amazing year following the youngest Aso ignimbrite from caldera rim, down a paleovalley, 70 km to the ocean. This work would not have been possible without guidance from Kuno’s extraordinary assistant, Shigeo Aramaki and wonderful collaborations with two recent Kuno students, Koji Ono and Kazu Nakamura.

While in Japan, I was invited to participate in quarter-million-scale remapping of the San Juan Mountains, a USGS effort being organized by Tom Steven - the beginning of another long-term collaboration and friendship. A new style of mapping for me, averaging a 7.5’ quad per week—but a terrific opportunity to explore huge areas, commensurate with the enormous ignimbrites and calderas. Even so, the scale of Fish Canyon Tuff (>5,000 km^3) and La Garita caldera (75x35 km) were utter surprises!

Fortunate opportunities kept coming: the developing concepts about plate tectonics in late 60s, just as Bob Christiansen, Hal Prostka, and I were recognizing regional volcano-tectonic trends for the American Cordillera. There was more San Juan work in the early 1970s, in conjunction with Wilderness Area studies, that included helicopter support and opportunities for more detailed work on Platoro and Lake City calderas, and informative Pb, Sr, and O isotopic tracer studies (with Bruce Doe, Carl Hedge, and Irving Friedman) on caldera-related magmatic evolution. Then work as staff geologist at the Hawaii Volcano Observatory, just in time for the M=7.2 Kalapana earthquake (largest in 100 years) and new experiences with follow-up geodetic surveys, followed by mapping and by radiocarbon dating the prehistorical activity of Mauna Loa, eruptions of Kilauea in 1977 and Mauna Loa in 1984, and new collaborators - especially Jack Lockwood, Bob Tilling, and Gordon Eaton. Then eruptive and geodetic study of the

amazing 1980 Mount St. Helens eruption, jointly with Jim Moore and Don Swanson, and a large summary publication edited jointly with Donal Mullineaux. More mainland caldera studies aimed at exploring the connection with granitic remnants of subvolcanic magma chambers at Questa, New Mexico, and Mesozoic systems in Arizona. Work with the USGS Marine Geology group, especially Bill Normark, to explore the landslide submarine flank of Mauna Loa; framework geology for the Creede Scientific Drilling Project, led by Phil Bethke in the late 1980s. Fieldwork with Russians at Lake Baikal and young volcanic rocks in the Caucasus and Armenia, during five separate summers bracketing amazing societal changes as the Soviet Union wound down.

After a couple years away from research as Branch Chief and manager of the USGS Volcano Hazards and Geothermal Programs, back to the San Juans in 1995, where jointly with Michael Dungan, Olivier, and others from the Université Genéve, we explored the Fish Canyon Tuff and its enormous caldera. Then in 1997-2002, Japanese scientists initiated an amazing collaborative effort to study underwater slopes of Hawaiian volcanoes, using submersibles provided by the Japan Marine Science and Technology Center (JAMSTEC). In recent years, mapping and petrologic study of additional diverse ignimbrites and calderas farther northeast in the San Juans that bridge to older Tertiary volcanism in central Colorado, aided by superbly precise Ar-Ar age control provided by Bill McIntosh and associates at New Mexico Tech.

In addition to collaborations with many university faculty and several postdocs, I've had marvelous times with some terrific grad students, serving on about 10 dissertation committees. And I owe so much to many wonderful guys who assisted with fieldwork so many summers in southwestern Colorado and elsewhere--to name just a few that came back for more than a single summer: Russ Burmester, Dave Johnson, John Pallister, Dave Sawyer, Olivier Bachman, and Andrea Sbisa.

It's been a wonderful trip, these past 50 years or so, with so many innovations in concepts and techniques, so much beautiful country for fieldwork, and shared experiences with so many lively associates. In all of these, I am enormously indebted to USGS management that has provided flexible support for activities that often deviated from perceived bureaucratic procedures. And most of all, to Beverly and our two sons, who often accompanied me in the field and on geology-related trips, at many times under less-than-idyllic conditions.

A final plea, though: the need for intensive field-based geologic studies. Mapping continues to be an essential research tool to identify questions and resolve hypotheses. Successful lab work depends on well-characterized samples and stratigraphy, but field relations remain poorly constrained in so many areas I've worked. So much remains to be learned, even in a place as extensively studied as the Southern Rocky Mountains, and this past summer's fieldwork continues to define fascinating questions to explore with lab work this winter. It's been a great time; stay in touch, or better still, come join in the fun!

And thank you again for this much-appreciated award.