Geological Society of America
Structural Geology & Tectonics Division

2014
Career Contribution Award
Presented to Darrel Cowan

Citation by Terry Pavlis

It is a great pleasure to present tonight's recipient of the SG&T Career Contribution Award, Darrel Cowan. I am honored to present this citation because Darrel is a unique individual whose work has influenced so many of us. One of Darrel's nomination letters said it best:

> *"Darrel's distinctive voice and rigorous attention to logic and detail has produced a body of work that has influenced decades of progress in structural geology and tectonics. Darrel is extremely clear and forthright in judging his own and other's interpretations, and has used his significant influence to return the community time and again to fundamental field/observational tests on new ideas".*

That is a very compact summary of why Darrel is here tonight. His career contributions span a broad spectrum and all across that spectrum his works are highly regarded. I always knew that but I was impressed by how obvious this was in his letters of support for this nomination (and it was a long list—we spammed the committee). They supported my opinion because each emphasized different things in their letters. To me that was an indication that Darrel isn't the geo equivalent of a one-hit-wonder artist. Some of his letter writers emphasized his work on melanges, others Baja BC, others fault zone studies, others Cordilleran strike-slip issues or Cordilleran tectonics in general. To me that shows his work is highly respected across the board, the perfect record for a recipient of this award.

Many of you also know that Darrel is an exemplary "good citizen" to our profession. We could as easily be here talking about a GSA distinguished service award. He has tirelessly worked for our division, often behind the scenes, on things from science plans to GSA business. In his own institution he has served as department chair while maintaining a stellar research record. Some of you also know him as the point man for SHEAR—a geo hostel in California. Perhaps most notably, however, is in what NSF would call Broader Impacts. His list of PhD graduates reads like a who's who in this division—most of them are sitting out there tonight. Clearly anyone could take mentoring lessons from Darrel!

Finally on a more personal note, I am sure everyone who knows Darrel cheered when they heard he was receiving this award. We could spent a few moments roasting Darrel, but I think we can save that until later where we can talk about karaoke or the contrast in the mechanical skills of brothers (Darrel has a brother who is a construction contractor), or maybe talk about being desert trailer trash.

Congratulations Darrel from all of us here!

Response by Darrel Cowan

A few years ago our class of graduating seniors asked their classmate, Harrison, to make a few remarks at our departmental commencement celebration. He said he had checked a couple of websites for guidance about what to say. One advised: "Don't talk about yourself but keep it personal. Tonight I will speak personally, and I'll talk about myself: How did I become a field geologist, and how did I arrive at working on diverse projects, some of which might have led to this award?"

The first question is easy to answer. During my undergraduate days at Stanford, almost all my teachers—Dr. Compton, Dr. Dickinson, Dr. Page, and Dr. Muller...we used the honorific then— were actively working in the field. But the singular experience was the 1965 summer field course—the "Stanford Geological Survey"—when Dr. Compton took his first group to the Raft River Mountains in NW Utah. We pilgrims dutifully and carefully mapped gently dipping and horizontal thrust faults that had the curious property of having emplaced younger unmetamorphosed units above medium-grade, deformed metamorphic rocks. Of course, the Raft Rivers have since become a poster child for extensional core complexes, and I have

had fun wondering: what if I had approached the prof in my typically shy way and said, "Excuse me, Dr. Compton, but I don't think these are thrusts, I think they're an important new type of normal fault, and in my report I'll call them "low-angle normal faults." Why he and I might have received this award decades earlier.

My research projects? I think I worked on them partly by design, but also by serendipity or coincidence. I'd like to give a couple of examples that may be of interest to the junior scholars and students here. You have to remember that my generation of graduate students was very privileged because we were present at the creation—when plate tectonics, promulgated and quantified by geophysicists largely in the marine realm, was brought into continental geology. I happened to be working for my Ph.D. research in the Franciscan assemblage, as it was called then, but not because we knew it is a subduction complex. I don't think that word had been invented. I was trying to gain some insights into unusual chaotic rocks that Ken Hsu called mélange. But seemingly overnight, we recognized that the Franciscan is part of the great triad of late Mesozoic California convergent-margin geology: the Franciscan the subduction complex, the Great Valley sequence the fore-arc basin, and the Sierra Nevada the magmatic arc.

I have long favored the idea that tectonic elements have been displaced northwards along the western margin of North America by a thousand kilometers or much more. Once again I think the seed was planted because my Masters student Lee Fairchild was working in the Leech River schist on southern Vancouver Island, and her found that the unit recorded an unusual Buchan- type metamorphism and two syn-metamorphic deformations. I've always liked to read about the western Cordillera, and somehow while Lee was working I happened on a USGS professional paper by Loney, Brew and others on Baranof Island in SE Alaska that described what I thought—never having been there—are rocks so similar that they were once contiguous but had been displaced 1200 km northwards, after 50 million years ago. I'm pretty sure that this seed is what flowered into my support for the Baja British Columbia hypothesis, about which I won't say anything further tonight.

Death Valley and fault rocks: around 1990, Marli Miller was working for her Ph.D. on the Badwater turtleback detachment fault in Death Valley. On a few trips with Marli and Terry Pavlis, I was struck by the excellent exposures of fault rocks, so I began a detailed study with my two postdocs, Juli Morgan and Trenton Cladouhos, not to learn more about detachment faulting, but rather to learn how the fabrics and textures of diverse fault rocks formed in an absolutely certain setting compared with what we observe in mélanges, where there was and is still debate about how much they owe their character to submarine mass movements. But as our work progressed, and we were joined by grad students Eliza Nemser and Nick Hayman, and our Fullerton colleague Jeff Knott, we found the geologic evidence overwhelming that the faults had accrued slip while gently dipping in the late Quaternary.

Still intrigued by the idea that perhaps the Death Valley detachments are active, I happened to be chatting with Dr. Lauro Chiaroluce from INGV in Rome, on the steps of Moscone Center at an AGU meeting around 2003. He told me about new and remarkable results from the Alto Tiberina low-angle normal fault in the central Apennines. His group had put out a temporary array of 40- odd seismometers for a couple of years and found that the fault, which is clearly visible on seismic reflection profiles, is decorated with micro-earthquakes: it is active and seismogenic. I probably would have discovered the paper on my own, but that chance conversation led, almost a decade later, to my current research with my UW colleague Paul Bodin. We were able to put out a temporary array of 12 seismometers looking for micro-earthquakes on the detachment faults which we propose dip westward beneath Death Valley. And we have recorded them.

So if I may, I'd like to contribute a few words of wisdom from a veteran to the students and junior scholars here, and emphasize again how chance and serendipity can influence a career. If you have an empirically based idea, a hypothesis, however it originates, that you feel has legs, run with it to see where it leads. Don't be intimidated by authorities who may not like it, or because it conflicts with received wisdom. Read widely and frequently. And if you are field- oriented, go look at a lot of rocks and structures.

So to GSA and this division, Terry and my nominators, the graduate students, post docs, undergrads, and colleagues who have accompanied me on this journey, I want you to know that you have been my cynosure, my North Star, and for this I am deeply grateful.

Thank you.