

Response by Kerry Sieh  
30 April 2014

Thank you, my dear friend, for your generous remarks and for your enduring that tortuous 30-hour flight from Singapore just to share this moment. Thanks also Rodger, my brother, and Caitlin, my daughter, for joining me here in Anchorage this week.

Paul, you are my closest contemporary in earthquake geology. We both began our explorations in the early 1970s – you on the largest active continental collision; and I on a part of that fault whose rupture in 1906 inspired the creation of this very Society. Just when Clarence Allen and Bob Wallace were promoting the use of tectonic landforms to decipher the activity and history of active faults, you conducted your seminal *tour de force* of the Indian-Asian collision, and I began measuring one great San Andreas rupture and its predecessors.

Paul's remarks about my life's work free me to focus on some more personal aspects of my scientific adventures. Some of you may recall that there was a little earthquake in Southern California in 1971. I was an undergraduate at UC Riverside at the time, and I (like GK Gilbert in Berkeley during the 1906 earthquake) clearly remember its vigorous attempt to pitch me out of bed very early that February morning, after a late

night with my stratigraphy and sedimentation and structural geology coursework.

About a month later, after the school term had ended, the SSA and the GSA's Cordilleran Section held a joint annual meeting at UCR, and I volunteered to help with logistics. Handing Charlie Richter his meeting badge was, I'm sure, the closest I'd ever been to a famous man.

At that meeting, two not-so-famous men presented a paper on how they had used a backhoe to create artificial outcrops of the Hayward fault. They had used these diggings to map the trace of the fault across their clients' property, so that their planned new civic center would be spared the fate of those many homes that had been torn asunder by rupture of the San Fernando fault.

It occurred to me as I walked out of the auditorium, that one should be able to do more with exposures like that than just locate a fault. That was the inception, in fact, of my interest in the field that Bob Wallace, years later, christened "paleoseismology."

Another important, more personal nudge came soon thereafter, when one of my close Fundamentalist friends, Kevin Moody, came up to me on campus one lunchtime, put his hand on my shoulder and asked me jokingly, "Kerry, what on Earth are you doing for Christ's sake?" Being a rather serious sort, I was stunned rather than amused, and I agonized over his

question for weeks. I had been contemplating a petrological career, studying Moon rocks, whereas he and many of my friends were anticipating spending their lives helping humanity and saving souls. Maybe I was fiddling while Rome burned.

Not long thereafter, our professor Wilfred Elders alerted a few of us to an NSF Student-Originated-Studies program, aimed at funding undergraduate research on topics that were relevant to society. Using geology to inform adaptation to earthquake hazards seemed to be in that spirit, so we proposed to study the nearby San Jacinto fault and investigate the social and economic consequences if it were to break. Though none of our work that summer of '72 was ever published, we did cause Caltrans a bit of heartburn when we announced that the fault ran beneath the grand, new cloverleaf intersection of two major freeways in San Bernardino. My 15 minutes of youthful fame!

So off I went to grad school at Stanford that Fall, primarily because it was so much closer to the San Andreas fault than was MIT. But to my growing discomfort once I had settled in, I found that no one there could have cared less about the Holocene record of anything, let alone of earthquakes. Amos Nur and Arvid Johnson were interested in the mechanics of faults and folds; Dave Boore, in the attenuation of ground motions; and Bill Dickinson was busy

interpreting Cenozoic stratigraphy in the light of the new paradigm of plate tectonics.

Fortunately for me, Lloyd Cluff and his geologists across the Bay at Woodward-Lundgren *were* interested in earthquake geology, for practical reasons. They invited me to join them in Alaska the following summer to look for and characterize active faults along the planned route of the Trans-Alaska pipeline. Flying over Alaska all summer in a helicopter hooked me on doing earthquake geology. I think it's fair to say that Dave Schwartz became hooked by that experience as well.

One of the jobs I made for myself up here was to characterize the last ruptures of the Denali fault using little offset landforms. I put together evidence that the most recent offsets ranged from 8 to 15 m west to east, and had been 11 m near the pipeline crossing. When I heard months later that the recommendation to the engineers was to design for only 8 m of slip, I was upset. More importantly, Lloyd was upset with me for the impetuosity of my reaction. In 2002, when the Denali ruptured and slipped a mere 5 meters under the pipeline, the fact that it didn't break was a testament to both Lloyd's judgment and the soundness of the pipeline's novel fault-crossing design.

NEHRP was just getting started in 1974, and without it I, like many of us, would have had no future in earthquake science. Fortunately too, the USGS in Menlo Park

harbored a small enclave of geologists interested in using landforms and layers to study active faults – Malcolm Clark and Bob Wallace were surrogate advisors for me in those early thesis days. They and Dick Jahns, the Dean of Earth Sciences at Stanford, saved my academic hide by helping me conceive an NEHRP proposal to work on the San Andreas. As I said my goodbyes a few years later, en route to Caltech, thesis under my arm, he confessed, with smiling eyes, that he'd initially expected me to fail – as he put it, he was just giving me enough rope to hang myself.

Being at Caltech for the next three decades exposed me to a multitude of smart seismologists, but I was clearly the ugly duckling among them. It turned out okay though, because even though we didn't quack in the same language, we did quack about the same things – earthquakes.

Half way through my focus on Southern California, it slowly began to dawn on me that it would take more than one lifetime to document, let alone to explain, the complex behavior of the San Andreas fault system and the interactions of its myriad faults. So, I turned to the Sumatran coral reefs, lying above what I thought was a simpler system, the Sunda megathrust. (Harry Fielding Reid, too, you may recall, turned from California to Sumatra a century ago to bolster his elastic rebound hypothesis.) There a paleoseismic site could be developed ten times faster and the geochronology could

be done ten times more precisely. Of course it hasn't turned out to be quite as simple as I'd envisioned, but the pivot to Asia has turned out to be a good one nonetheless.

Sorry to say, my direct explorations of Nature are giving way to vicarious enjoyment *via* post-docs and young faculty, as Paul and I work to establish the Earth Observatory of Singapore, dedicated to understanding a wide range of geohazards throughout the region. I'm enjoying my work abroad, but I assure you that I will never forget my debt to the American institutions and individuals that have nurtured me, including this Society and many of you here today.

I am deeply honored by this special recognition. I'm also gratified that by once again awarding the Medal to a geologist, the Society continues to recognize the great span of disciplines involved in the conduct of earthquake science. My sincere thanks to all of you who have been my fellow sojourners on this fascinating and illuminating quest. And my best wishes to my students and their peers, who have picked up the torch and are carrying on magnificently. I wish we could all be here a century from now to see what further progress in earthquake science and adaptation the 21<sup>st</sup> century will witness.