

# 2013 MEDALS & AWARDS

## GEORGE P. WOOLLARD AWARD

Presented to  
Peter Bird



Peter Bird  
University of California at Los Angeles  
(emeritus)

### *Citation by Eugene D. Humphries*

Peter Bird, throughout his career, has considered the physical workings of orogeny with an obvious joy in the effort to understand, a sense for the fundamental expressed in geologic specifics, and with a clarity of insight. As one of the most influential geodynamicists of our time, we all know of his work; and beyond what we know, there are important works in diverse areas you may not know. Peter's focus on addressing real orogenies and actual geological activity with geophysical methods makes him especially suited for this award.

We now discuss the delamination process routinely, without reflecting on the imagination required to associate regional patterns of uplift with deep-lithosphere convective instability, or to see the consistency of the delamination style of lithosphere loss in the geologic record. Peter has been the primary voice for lithospheric delamination, both in the creation of the idea and in its early quantitative development. Peter has been a prominent and successful modeler of active deformation kinematics and dynamics in California, the western U.S., the eastern and western Mediterranean, the greater Himalaya, Alaska, and more recently the whole Earth. This work is typified by integrating fault, stress, geodetic and seismic data in a rigorous manner. He has been a persuasive, quantitative and

rigorous arguer that faults are weak, from a regional geodynamic point of view. He is the most trusted resource for understanding the deformation and state of stress during the Laramide orogeny. And he makes available open source code that has been frequently used for lithospheric finite element modeling, and for plate boundaries, among other things.

I hope this doesn't read simply that Peter was in the thick of important work. He often is the one who both introduced fundamental ideas, and who persisted in the scientific conversations about these ideas, thereby being central in defining and establishing them into our cultural understanding. And he has done so with honesty and integrity, and with a restrained exuberance and humility. For all these reasons, it gives me pleasure to see Peter receive the George Woollard Award.

### *Response by Peter Bird*

First, my thanks to Gene Humphreys for his kind words, and to Audrey Huerta and all others who made this possible. I am pleased to be associated with the name of George Woollard because I learned about his work on gravity and crustal structure very early, in an undergraduate class by Francis Birch, and I have always considered both of them to be masters of the clear view of the big picture. I am also pleased to join the distinguished company of previous Woollard awardees; they have all been leaders, and many of them showed their abilities more quickly than I did. I am also touched to receive this validation of a decision I made 41 years ago: to make my career in the fruitful valley between the great ranges of Geology and Geophysics.

I had a lot of help in getting to this pleasant niche. My father introduced me to quantitative science, but also took me hiking up all the White Mountains of New Hampshire. My undergraduate advisor, Ray Siever, was a sedimentologist who gave us lectures on mantle convection because he saw it as the wave of the future. My graduate advisor Nafi Toksöz built a research program on the tectonics of continental collisions from funding associated with the technical geophysical issue of seismic discrimination. And, very fortunately, I came to interview at UCLA in 1976 just as the former departments of Geology and Geophysics were merging, and looking for a symbolic faculty bridge.

The greatest satisfaction I have had in research has come from the pursuit of flaky ideas. Worrying about the history and uplift of the Colorado Plateau led to the idea that mantle convection can reach into the lithosphere, through the process I called delamination. I am pleased to see that this concept has been useful to others: in explaining anorogenic unconformities, anorogenic granites, metamorphism, and the petrologic profile of continental crust (which, of course, was a great concern of Woollard's). Later, I heard from Herb Helmstaedt, Bill Dickinson, and Walter Snyder the idea that the Laramide orogeny was driven by horizontal subduction. Happily, I found that both dynamical forward modeling and geologic inverse modeling showed all the expected consequences of this primal cause to be recorded in the geology. I now consider this to be the fundamental fact about the Tertiary history of the western United States. (It is instructive to find that George Woollard was also there ahead of us, writing in 1938 that gravity data indicates the Bighorn Range was formed by lateral compression.) If I may presume to give any advice to younger generations, it would be, "Always give a flaky idea a fair trial, unless and until it conflicts with data. If you don't, you may miss out on a great ride!"