

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## NCGS DINNER MEETING

### *“Assembling California: an Update”*

*Also*

*“The initiative on recognition of Earth Science for entrance into the University: an Update”*

**Wednesday May 25, 2011**

**Speaker: Dr. Elridge M. Moores, Distinguished Professor Emeritus**

University of California, Davis

6:00 PM at Orinda Masonic Center

**(Reservations are required by May 21, 2011, Limit 100 persons)**

**We are sorry but we will not be able to accommodate “walk-ins”**

Stepping out of our normal routine, the Northern California Geological Society is pleased to announce this *special dinner and evening* with **Dr. Elridge Moores**. For this unique event, planned for our normal monthly meeting date, but starting one-half hour early, we are planning in typical NCGS style, a **Back Forty Texas BBQ dinner consisting of Pork Ribs and BBQ Chicken, Tossed Green Salad, BBQ Beans, Fresh Corn Cobettes. For vegetarian dinners a deluxe veggie burger will be served in place of BBQ. Desert will include assorted cookies and brownies. We may be again serving wines from California specials (90 pts +).** Please also note that a vegetarian option is available if notified ahead (please see the registration form below).

#### ***Abstract: Assembling California: an Update***

During the plate tectonic revolution in the 1960's, at first California geology played a small role. That changed with the December, 1969 Asilomar Penrose Conference, in which the Franciscan complex became the type example of a subduction complex, and the Sierra Nevada became a prime example of an Andean-style continental margin. Ophiolite emplacement and collisions between oceanic island arcs and the continent also were invoked in 1970 to explain western U.S. tectonic development, but acceptance of these ideas proceeded more slowly.

In the past two decades, however, many new data and concepts have enriched the picture of northern California's tectonic development, especially since publication of John McPhee's *Assembling California* (1993). North America probably rifted away some 650-750 million years ago from its former continuation currently present in eastern Australia-East Antarctica. The oldest rocks in northern California--Shoo Fly-Antelope sediments, and the Trinity ophiolite--may have originated from the Appalachians/west Africa and Iapetus Ocean, respectively. Plate tectonic activity in the past 200 million years included collision of Pacific-derived island archipelagoes with North America, as well as subduction of several plates beneath the continental margin. An ophiolitic slab beneath the Great Valley tectonically overlies the continental edge of North America, resulting in a "double Moho" beneath the Valley. This feature has probably kept the Valley low as the Sierra and Coast Ranges rose around it.

Folds and thrusts in the northern Sierra Nevada may be as young as Cretaceous in age (Christe, 2010). At least one archipelago collision (Wrangellia) may be as young as 100 million years. The "Sevier-Laramide" orogeny may have resulted from mid-Cretaceous collision of a "ribbon continent" with North America (Johnston, 2008, Hildebrand, 2009) About 50 million years ago a Tibet-like highland (also called the "Nevadoplano": DeCelles, 2004) had developed in central-eastern Nevada, with a drainage divide in eastern Nevada (Henry et al, 2008). Major streams drained westward from this highland over deformed and eroded older Sierra rocks to the ocean in the present-day Sierra foothills. Deposits

include the Auriferous Gravels of the northern Sierra and younger silicic tuffs (Valley Spring formation) derived from large calderas in central Nevada. The San Andreas Fault system began some 29 million years ago. At present, the Sierra Nevada and Great Valley constitute the *Sierra Microplate*, located between the Pacific and North American plates.

The long-term evolution of the North American Pacific margin encompasses complex processes of rifting, subduction, collision, igneous and metamorphic activity, and large-scale faulting of all types over some 650 million years. The western Pacific and Alpine orogens provide many insights into the nature of the tectonic development of the complex North American Pacific margin.

### ***Speaker Biography:***

Eldridge M. Moores is Distinguished Professor of Geology at the University of California, Davis. He was born and raised in the remote Arizona mining town of Crown King, where his father and grandfather operated small lead-zinc-gold mines. The Moores family was musically inclined, and Eldridge began to play the cello when he was thirteen, a passion he has enthusiastically pursued his entire life. He attended high school in Phoenix where he excelled in music and history. He majored in Geology at the California Institute of Technology and received his Bachelor's Degree in 1959. In 1963 he received a Ph.D. in Geology from Princeton University as a student of Professor Harry Hess. His post doctoral work at Princeton recognized the Troodos ophiolite complex on the Mediterranean island of Cyprus as ancient oceanic crust.

Eldridge came to U.C. Davis in 1966, and was Department Chair during the early 1970's. He continued his plate tectonic research, focusing on the tectonic evolution of Northern California and the Western U.S., and on the tectonics of the Alps, the Himalayas, Pakistan, Greece, and Cyprus. Eldridge has also made significant contributions to the plate tectonic evolution of Precambrian continental terranes and the associated bio-evolutionary effects. Dr. Moores has published extensively on Northern California tectonics, orogenies in the western United States, the evolution of the California Coast Range, processes of ophiolite emplacement, and on spreading center tectonics and ocean ridge ore deposition. He was President of the Geological Society of America in 1996, and editor of *Geology* magazine from 1981 to 1987. Eldridge received the GSA Distinguished Services Award in 1988 and the GSA Distinguished Career Award in 2006. He is a Fellow of the Geological Society of America, the California Academy of Sciences, and the American Association for the Advancement of Science, and an Honorary Fellow of the Geological Society of London. He received the Geological Association of Canada Medal in 1994 and was presented an Honorary D.Sc. from the College of Wooster in 1997. In 2003 the U.C. Davis Academic Senate awarded him its Distinguished Scholarly Public Service Award.

Dr. Moores is also actively involved in promoting Earth Science education at the K-12, undergraduate, and graduate levels locally, in Yolo County, and in Sacramento. He is a member of the National Science Foundation and has served on several other academic advisory committees in the Federal government. Eldridge collaborated closely with author John McPhee on the book "Assembling California," one of five books on geology in the 1998 Pulitzer Prize winning series "Annals of the Former World." He has also co-authored two geology textbooks with U.C. Davis colleague Dr. Robert J. Twiss, *Tectonics* and *Structural Geology*.

### **\*\*\*\*\* Dinner Logistics \*\*\*\*\***

**Meeting Details:** Social Hour: 6:00 – 7:00 pm; Dinner: 7:00 – 8:00 pm      **Presentation:** 8:00 – open  
**Time:** May 25, 2011, 6:00 pm, Orinda Masonic Center 9 Altarinda Road, Orinda, CA.      **Cost:** \$20/person

### **\*\*\*\*\*REGISTRATION FORM (Dr. Elridge Moores Dinner) \*\*\*\*\***

Name: \_\_\_\_\_ E-mail: \_\_\_\_\_  
Phone (day): \_\_\_\_\_ Phone (cell) \_\_\_\_\_  
Dinner:      Regular: \_\_\_\_\_ Vegetarian: \_\_\_\_\_ (Please check one)      Check Amount: \_\_\_\_\_

Please mail a check made out to NCGS to: **Tridib Guha, 5016 Gloucester Lane, Martinez, CA 94553**  
Questions: e-mail: [tridibguha@sbcglobal.net](mailto:tridibguha@sbcglobal.net) Phone: (925) 370-0685 (evening) (925) 451-1999 (day)