

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



FEBRUARY MEETING ANNOUNCEMENT

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NCGS Newsletter:

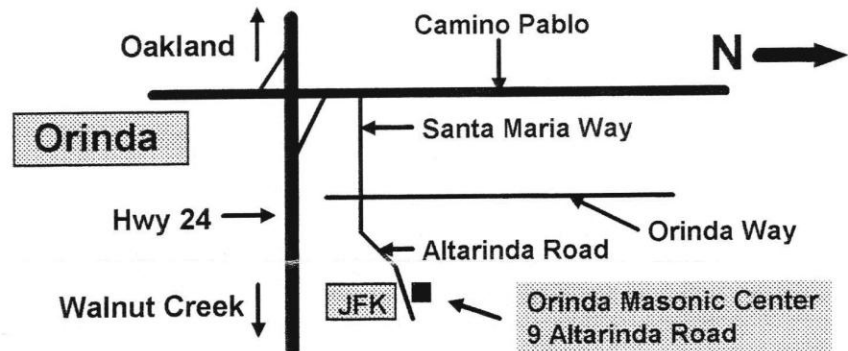
925-294-7530

DATE: *Wednesday, February 10, 1999*

NEW LOCATION: Orinda Masonic Center, 9 Altarinda Rd., Orinda

TIME: 6:30 p.m. Social; 7:00 p.m. talk (No Dinner)
Cost is \$5.00 per person

RESERVATIONS: Leave your name on the recorder at 925-227-1105 X407 anytime before the meeting.



SPEAKER: Dr. David Hill, U.S. Geological Survey, Menlo Park

The Saga of a Restless Magmatic System: Long Valley Caldera and the Mono-Inyo Volcanic Chain, Eastern California

The area of eastern California that includes Long Valley caldera and the Mono-Inyo volcanic chain has a long history of active tectonism and volcanism. The dominant volcanic event within in the last 4 million years involved the massive eruption of the rhyolitic Bishop tuff and the associated formation of Long Valley caldera 760,000 ypb. Subsequent, smaller eruptions of both rhyolitic and basaltic lavas have continued within the caldera and along the Mono-Inyo volcanic chain through the recent past. The youngest eruptions include those from vents along the southern end of the Inyo chain 550 to 600 ypb and in Mono Lake at the northern end of the Mono chain some 250 ypb. Increased seismic activity beginning in 1978-80 marked the onset of the current magmatic unrest in Long Valley caldera. The early phase of this unrest, which included upwarping of the resurgent dome in the center of the caldera by nearly 30 cm from mid-1979 through mid-1983 accompanied by earthquake swarms including four magnitude $M \sim 6$ earthquakes in May 1980 and two $M=5.3$ earthquakes in January 1983, remains the most energetic to date. Continuing unrest, however, includes episodic earthquake swarm activity, upwarping of the resurgent dome (which currently stands nearly 80 cm higher

Continued on the back page of the newsletter

NCGS Winter/Spring 1999 Calendar

Please note that some of the agenda topics below are tentative and subject to change

February 10, 1999	David Hill, USGS	<i>The Saga of a Restless Magmatic System: Long Valley Caldera and the Mono-Inyo Volcanic Chain, Eastern California</i>
February 15, 1999	George Pemberton	AAPG Distinguished Lecture at Chevron Park, San Ramon
<i>Stratigraphic Applications of Glossifungites Ichnofacies: Delineating Discontinuities in the Rock Record</i>		
March 6, 1999	Ron Crane	<i>Brushy Peak, Livermore / Altamont Pass Field Trip</i>
late April, 1999	Paul Weimer	AAPG Distinguished Lecture; topic and location TBA
May 8, 1998	David Rogers	<i>Mission Peak, Fremont, Field Trip</i>
TBA	John Sciacca	<i>Hydrostratigraphic analysis of complex fluvial deposystems, Sacramento area*</i>
TBA	Barbara Romanowicz	<i>Volcanoes and earthquakes at plate margins*</i>

*Dates and specific titles to be announced

Directions to the Orinda Masonic Center, 9 Altarinda Rd., Orinda, CA.

From Hwy. 24 in west direction:

Take Hwy. 24 west from I-680. Exit at the Orinda offramp. Bare right at fork in ramp and take the *Orinda Village* offramp. Turn right onto *Camino Pablo* at the light at end of the offramp. Turn right at the next stoplight (about 200 feet) onto *Santa Maria Way*. Go through the next stoplight at Orinda Way. The road now becomes *Altarinda Road*. Follow Altarinda Road up the hill about ¼ mile as it bares left then right. The Masonic Center is directly across from the entrance to John F. Kennedy University

From Hwy. 24 driving east from Oakland:

Take Hwy. 24 east through the Caldecott Tunnel. Exit at the *Orinda/Moraga* offramp. Stay in left turn lane at end of offramp and turn left onto *Camino Pablo*. Drive under Bart and Hwy. 24 to the next stoplight; stay in righthand lane. Turn right onto *Santa Maria Way*. Go through the next stoplight at Orinda Way. The road now becomes *Altarinda Road*. Follow Altarinda Road up the hill about ¼ mile as it bares left then right. The Masonic Center is directly across from the entrance to John F. Kennedy University

CCGO Hires Executive Director

The California Council of Geoscience Organizations enthusiastically welcomes Harrison Phipps of Davis, California, as its first paid Executive Director. Mr. Phipps has an M.S. in Hydrology/Hydrogeology and also serves as the part-time executive director of the Groundwater Resources Association of California (a CCGO member organization) and a part-time water resource specialist for the City of Woodland Public Works Department. The ED Search Committee, composed of Dave Bieber, Dave Ebersold, and Brian Lewis met with Mr. Phipps in Sacramento and negotiated a contract.

Retaining an executive director is a major milestone in CCGO's development. One of the primary objectives of CCGO's founders was to pool the financial resources of California's geoscience organizations to reduce our traditional reliance on member volunteers when we need to be heard in Sacramento and elsewhere among our state's movers and shakers. Our executive director will help us really get down to business!

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



NCGS March 1999 FIELD TRIP ANNOUNCEMENT

Brushy Peak, Livermore / Altamont Hills, Field Trip

Saturday, March 6, 1999

Led by Ron Crane, Consultant, and Pat Sotello, Ranger, Livermore Park Department

This area is generally closed to the public and can only be accessed through special arrangement with the Livermore Park Department. It features the largest "wind caves" in the Bay Area and rare views of the Altamont Hills & Livermore Basin. Ranger Pat Sotello will discuss the park's biologic and cultural heritage which include endangered and threatened species and a concrete burial chamber built into one of the caves. Ron Crane will discuss the formation of the caves and the depositional environment of these Cretaceous sandstones. Following our visit to Brushy Peak, if time permits, we will take a side trip to the Del Valle Dam to view Brushy Peak and the Livermore Basin from a different perspective. The Hetch-Hetchy tunnel is located near here and Ron will discuss some of the geology discovered during the building of this tunnel, including an outcrop of Franciscan Formation that has been thrust over 2 million year old Livermore Gravels.

Time: Saturday, March 6, 1999 from Concord at **7:30 a.m.**

Departure: Concord - Chevron Parking Lot, 2001 Diamond Blvd, Concord, at **7:30 a.m.** Exit I-680 at Willow Pass Road. Go 1 block east, turn north (left) onto Diamond Blvd. Turn left again at the third stoplight into the Chevron office complex just north of the Willows Shopping Center.

Cost: \$20 per person. This price includes transportation, breakfast pastries, lunch, and refreshments.

***** **REGISTRATION FORM** *****

Name _____

Address (Street/City/Zip) _____

Phone (day) _____ Phone (evening) _____

E-mail or Fax No. _____

Regular Lunch ____ **Vegetarian Lunch** ____ (Check one)

I am willing to drive my van or SUV on this trip ____ (check if YES) Mileage will be paid by the NCGS

Please write a check for \$20.00 payable to NCGS and mail with completed registration form to:

Bill Howell, 6651 Alisal Street, Pleasanton CA, 94566

If you have any questions or need additional information, call or fax Bill at **(925) 484-3111**

To help NCGS estimate the volume of beer to purchase, please give us some feedback of the other field trips you might attend during 1999 (this will not be considered a commitment). Please indicate your level of interest using the following code:

y = yes, am definitely interested; m = maybe; n (or blank) = no thank you.

Mission Peak: ____ Del Puerto Canyon: ____ Ohlone Wilderness: ____

Family Picnic: ____ Bay Area Volcanics: ____ Vallecitos Syncline: ____

Pinnacles National Monument: ____ Long Valley Caldera: ____

Call for Nominations for Earth Science Teacher Award

The American Association of Petroleum Geologists, and the AAPG Foundation, will award \$5,000 at the April 2000 AAPG Annual Convention in New Orleans to an individual teacher for ***excellence in the teaching of natural resources in the earth sciences***. The award will include \$2,500 for use under the teacher's supervision for educational purposes and \$2,500 for personal use by the teacher. Also included will be an expense paid trip to the New Orleans convention to receive the award. Local and regional selection of candidates will be made by AAPG's affiliated Societies and Sections.

Requirements:

1. Minimum of three years full-time teaching experience at any level K-12.
2. Teaching at least one unit per year on natural resources. Natural resources are defined as Earth materials used by civilization past and present such as:
 - a. Organic materials such as petroleum, natural gas, coal and oil shale.
 - b. Inorganic substances found in the Earth such as mineral ores, building stone and aggregate.
 - c. Energy resources from the Earth such as geothermal energy.
3. Teaching should include the scientific study of these resources, their origin, discovery, extraction and historical and present use. It should also include the preservation of the environment, reclamation and the conservation of resources.
4. Entries will include the teacher's philosophy of the teaching of natural resources, a description of the unit and two letters of recommendation – one from a colleague and one from an administrator.
5. Unit will be evaluated on depth and breadth of concepts (resource origin, discovery, processing, usage and reclamation), creativity of presentation and balanced treatment of information regarding societal need and environmental issues.
6. For further information and entry forms contact the **Northern California Geological Society** through Randy Kirby at (925) 254-2990 or e-mail rkirby.geosci@usa.net or mail at 67 Brookwood Road, Apt. 20, Orinda, CA, 94563. The NCGS will award \$200 to the winning entry in addition to submitting it to the Pacific Section, AAPG, contest. ***Entries must be received by February 27, 1999.*** The NCGS winner will be announced about March 15, 1999. The grand prize winner will be announced in January, 2000.

NCGS FIELD TRIP SCHEDULE FOR 1999

(SPECIAL Y2K-EOW EDITION)

As everyone has heard by now, the Year 2000 crisis will result in the End of the World. The predictions for Y2K-related disaster have been so dire, that it can only mean the problem is not limited to computer clock malfunctions. It must mean that all clocks will be affected, including atomic. This, in turn, means that the Earth's radioactive clocks will also be reset to zero and the planet will become confused and think it's the year 00. Accordingly, Earth will return to the conditions present over 4 billion years ago in the year 00 (i.e. molten). When this happens, all of our beloved thrust faults and folds will be dissolved and geology will become a very boring subject. On the positive side, however, it will be a dream-come-true for geologists since all those irritating obstructions to our view such as grass, trees, and dirt, will disappear and we will finally get to see those structures that have been hidden beneath all that overburden.

Accordingly, NCGS is offering a series of five 1-day trips and one overnight weekend trip during 1999 so that members can have one last chance to see some of the most remarkable geology in the world. And since money will have no value after December 31st 1999, each of the 1-day trips will only cost \$20.00. (I guess you could call it a fire sale!) Lunch and beverages are, of course, provided. A brief description is provided below. If not specified, firm dates and additional details will be provided in subsequent newsletters as soon as possible. - B.H.

Date	Destination	Leader
March 6th	<i><u>Brushy Peak (Livermore)</u></i>	Ron Crane & Pat Sotello

This area is generally closed to the public and can only be accessed through special arrangement with the Livermore Park Department. It features the largest "wind caves" in the Bay Area and rare views of the Altamont Hills & Livermore Basin. Ranger Pat Sotello will discuss the park's biologic and cultural heritage which include endangered and threatened species and a concrete burial chamber built into one of the caves. Ron Crane will discuss the formation of the caves and the depositional environment of these Cretaceous sandstones. Following our visit to Brushy Peak, if time permits, we will take a side trip to the Del Valle Dam to view Brushy Peak and the Livermore Basin from a different perspective. The Hetch-Hetchy tunnel is located near here and Ron will discuss some of the geology discovered during the building of this tunnel, including an outcrop of Franciscan Formation that has been thrust over 2 million year old Livermore Gravels.

May 8th	<i><u>Mission Peak (Fremont)</u></i>	David Rogers (Geolith Consultants, Inc.)
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This trip will begin with a van-ride to the top of Mission Peak to see spectacular views of the entire Bay Area (Dr. Rogers has the combination to the gate locks and the opportunity to ride to the top instead of walking is worth the price of admission alone!). At the top, he will discuss the structural/tectonic history of this very recently formed mountain and describe current and past landslides that have resulted. Following this, we will inspect the recent slide that Dr. Rogers has been investigating and he will discuss the results of his recent geotechnical studies. There will be an optional 1-mile (round trip) hike into an expansion crack on the flank of Mission Peak that is about 5 feet wide and 20 feet deep. After this, our trip may include a stop to collect liquid samples from a local winery at the base of the mountain.

May <i>Fall, '99</i>	<i><u>The Del Puerto Canyon Trip</u></i>	Ron Crane (consultant)
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This trip is designed to acquaint the geologist with the eastern flank of the Northern Diablo Range. This geology includes sediments from the Quaternary and Pleistocene, rocks from the Miocene and Eocene, deep-sea fan deposits from the Cretaceous, a siliceous volcanic sequence of probable Jurassic age, the Jurassic Lotta Creek tuff, greenstones and sheared Franciscan sediments, serpentine, gabbro, and peridotite. The structural/tectonic setting of this area involves an east-vergent wedge which has produced, among other features: a syncline of Jurassic-Cretaceous deposits; a backthrust fault that dips 30+ degrees to the east; isolated "blobs" of serpentine; tear/thrust faults; and Pleistocene and Quaternary-aged sediments with dips up to 40 degrees.

June 19	<i><u>The Ohlone Wilderness Trip</u></i>	Ron Crane (consultant)
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This trip will traverse the Ohlone Wilderness Trail beginning at Sunol Regional Park (near Sunol), and ending at Del Valle Park in Livermore. It will involve crossing a major portion of the northern Diablo Range (most of it through private land). Along the way, Ron will discuss (and we will see): a plunge view of the Calaveras Fault and associated "flower" structures; Cretaceous deep sea fans unconformably overlain by Miocene sands; the northern plunge of the Diablo range (with unconformably overlying Miocene, Pliocene, and Pleistocene sands that strike at almost 90 degrees from the underlying Franciscan); dismembered thrust sheets (including the Maguire Peaks thrust sheet which is a tightly folded syncline of Pliocene through Upper Miocene sands lying unconformably on a pillow basalt sequence); fault bounded Franciscan terrains with both N-S and NW-SE strikes; a tear fault; a major anticlinorium AND a major synclinorium; and a bunch of other stuff. Our journey will culminate at Del Valle Reservoir where there will be a spelling test on all the terms used during the trip!

Date	Destination	Leader
June or July	<u><i>Family Picnic at Pleasanton Ridge</i></u>	Patrick Hubbard (Treadwell & Rollo)

This year's annual picnic will be held at Pleasanton Ridge Regional Park or Augustin Bernal Park in Pleasanton. After the barbecue, Patrick Hubbard will discuss earthquake hazards in the Pleasanton area with a particular emphasis on the effects of the Calaveras fault on our lives. For those so inclined, we will then take a pleasant hike to the top of the ridge for some spectacular views of the Livermore Basin, Sunol Valley, Mount Diablo, and the Northern Diablo Range. Following this, if time permits, we will take a short drive to Tehan Canyon to see a surface expression of the Calaveras Fault.

September or October	<u><i>Volcanics of the Bay Area Region</i></u>	Andrei Sarna-Wojcicki (USGS)
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This trip will discuss the age and correlation of tephra layers in the greater San Francisco Bay Area. We will visit an area near Mount Diablo where there are a number of tuffs that formed 12 to 3.4 million years ago. Dr. Sarna will describe how these tuffs can be chemically characterized and correlated, their eruptive sources, and his recent work with re-dating tuffs using the Argon-Argon method. Current results indicate that many tuffs are older than previously reported on the basis of conventional K-Ar dating. Dr. Sarna will also discuss other regional tephra deposits, including a proposed reconstruction across the San Andreas fault system that involves units south of Mt. Diablo, within the northern Berkeley Hills, in the area north of San Pablo Bay, in the Wilson Grove Formation northwest of Petaluma, and in the Delgada submarine fan west of the main trace of the San Andreas fault and Cape Mendocino.

September or October	<u><i>Vallecitos Syncline</i></u>	Mel Erskine (consultant)
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This overnight trip is UNDER CONSIDERATION and has not been confirmed, but NCGS has sent Mel a case of Sierra Nevada to try and persuade him. IF we can get him all liquor'd up and he agrees to do it, we will get to see some very unique structural geology that Mel says is of great tectonic importance for understanding California geologic history. The Vallecitos "Syncline" is located in the central Diablo Range south of Hollister. It is the outcrop of a complex active thrust system that has been reactivated several times since the late Cretaceous. The trip will include access to areas on private property that are not accessible to the general public. Keep your fingers crossed or, better yet, apply subtle (and/or not so subtle) pressure to Dr. Erskine to accept our invitation!

- Possible Overnight Alternatives -

Fall 99/Spring 2000	<u><i>Pinnacles National Monument</i></u>	Vincent Matthews
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In the event that Mel Erskine is simply too busy (which he usually is) AND he turns out to be a tea-totaler, we may be able to arrange an overnight trip to the Pinnacles with Dr. Vincent Matthews. The Pinnacles, located south of Hollister, are the remnants of Miocene volcanic deposits that formed at a time the triple junction is believed to have first formed (in southern California). These deposits were subsequently rafted almost 200 miles to the north by the (proto?) San Andreas Fault. The Monument itself is a biological and geological oasis amid the surrounding chaparral. For example, it was recently discovered that there are over 200 species of butterflies within the Monument area, which represents a greater magnitude of evolutionary adaptation than the Finches of Darwin's Galapagos Islands. Geologically, the Monument contains the finest talus caves in the Coast Range (geotechnical engineers will be blown away), fantastic structural features, and incredible scenery. The Monument is also of great historical significance to the science of geology. When Vincent Matthews demonstrated that the volcanics of the Pinnacles correlated with the Neenach formation in southern California, it ended the controversy regarding the possibility of large lateral offsets along the San Andreas fault. If we can't do this one during Fall 1999, it will definitely be at the top of the list for Spring 2000 (see note below).

OR

Fall 99/Spring 2000	<u><i>Mammoth/Long Valley Caldera</i></u>	David Hill? (& Roy Bailey?)
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If there is sufficient interest for a 3-day trip, this is the place to go. The Long Valley Caldera near Mammoth is the site of very young explosive volcanic events that resulted in welded vitrified deposits and the Corcoran clay of the Central Valley. Its geologic effect is overprinted by glacial features from the last ice age producing a spectacular visual story of the Quaternary that unfolds before your eyes. Recently, it has also become an area of significant earthquake activity, currently under investigation by the USGS. If we can do it, it literally may be the last chance for an NCGS field group to see the area before it blows up again! (see note below).

Note: Any trips proposed after December 1999 are contingent on whether the Earth abides the Y2K crisis. ☺

The Northern California Geological Society and Chevron present:
1998-1999 AAPG Distinguished Lecture

***“Stratigraphic Applications of the Glossifungites Ichnofacies:
Delineating Discontinuities in the Rock Record”***

by **S. George Pemberton, University of Alberta, Edmonton, Alberta, Canada**

Monday, February 15, 1999

At 1:00 p.m. in Room A-1036, Building A

Chevron Park, San Ramon

The *Glossifungites* ichnofacies is a substrate-controlled assemblage of trace fossils characterized by robust, sharp-walled, unlined, passively-filled, vertical to sub-vertical domicinia, excavated into semiconsolidated (firmground) substrates. The assemblage is dominated by the ichnogenera *Diplocraterion*, *Skolithos*, *Arenicolites*, firmground *Thalassinoides* / *Spongeliomorpha*?, Firmground *Gastrochaenolites*, *Psilonichnus*, and *Rhizocorallium*, which typically cross-cut the softground, resident trace fossil suite. The *Glossifungites* assemblage demarcates discontinuity surfaces that reflect pauses in sedimentation, generally accompanied by erosion. Colonization of erosionally exhumed substrates and excavation of domiciles occur overwhelmingly within marine or marginal marine settings. Many of these discontinuity surfaces correspond to boundaries of stratigraphic significance.

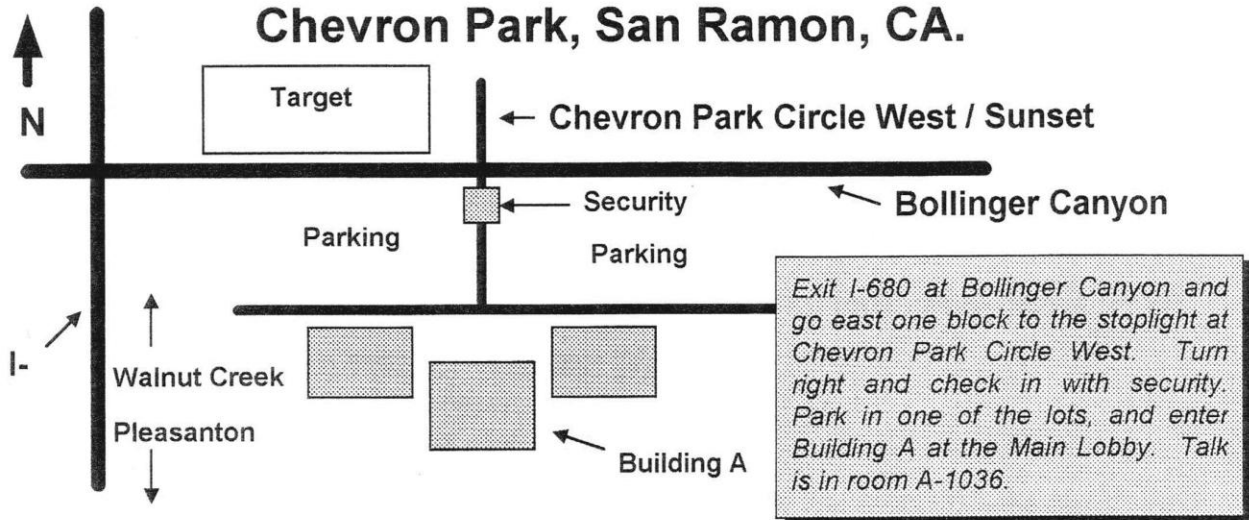
Lowstand surfaces of erosion marked by *Glossifungites* assemblages reflect settings lying in marine or marginal marine positions immediately succeeding erosion related to sea level lowstand conditions. These settings are largely limited to seaward margins of some incised valley-fills, incised submarine canyons, and lowstand (forced-regression) shorefaces. More favorable to firmground development and colonization are marine flooding surfaces (parasequence boundaries) with accompanying transgressive erosion. Under such conditions, generation of the discontinuity surface occurs within a marine setting, permitting almost complete colonization by opportunistic organisms. Examples of amalgamated (co-planar) lowstand erosion and transgressive erosion surfaces have also been recognized. Those are produced where lowstand conditions expose or exhume the substrate but the marine conditions permitting colonization do not occur until the following transgressive phase.

In addition, the emplacement of the *Glossifungites* ichnofacies can enhance the permeability and vertical transmissivity of a relatively impermeable matrix. Permeability enhancement develops when burrows into a firmground are filled with sediment from the overlying strata. If the lithology contrasts with the encapsulating firmground substrate, anisotropic porosity and permeability is developed.

S. George Pemberton received his B.Sc. (Honors) from Queen's University (1972), and his M.Sc. (1976) and Ph.D. (1979) from McMaster University. He was Assistant Professor, Department of Geology, University of Georgia (1978-1981), Associate Research Officer, Alberta Geological Survey (1981-1984), and is currently Professor, Department of Earth and Atmospheric Sciences, University of Alberta where he has been since 1984. Dr. Pemberton's current research involves the application of trace fossils to petroleum geology and genetic stratigraphy. He has applied trace fossil research to major petroleum fields in Australia, Taiwan, China, Colombia, Algeria, Brazil, Japan, the North Sea, Saudi Arabia, Indonesia, Alaska, Argentina, Canada, Venezuela, Qatar, and the United States biogenic mediated permeability-porosity enhancement program. He is editor and co-founder of *Ichnos: An International Journal for Organism-Sediment Relationships*; editor of CSPG Memoir 18, 1997; editor, SEPM Core Workshop Notes 17, 1992; 1994 recipient of the Geological Society of Canada's Past President's Medal; and received the 1997 Track's Award, CSPG. His professional affiliations include the American Association of Petroleum Geologists, the British Society History of Science, the Canadian Society of petroleum Geologists, the Geological Society of Canada (Distinguished Fellowship), the Geological Society of London, the History of Earth Science Society, the Palaeontological Society, the Society for the History of Natural History, and the Society for Sedimentary Geology (SEPM).

Note: Attendees should enter Building A, turn left at the corridor immediately past the security desk and follow the signs to the meeting room.

A map giving directions to Chevron Park is on the next page.



If you need more detailed directions to Chevron Park, San Ramon, please call Dan Day at 925-294-7530.

REQUEST FOR OUTSTANDING PHOTOS FOR CHILDREN'S BOOK PROJECT:

Most geologists understand the aesthetic qualities of rock. A children's Art of Rocks Book Project has been designed by photojournalist Lou Jacobs, Jr., a writer of over 40 books on photography and numerous children's books. The Art of Rocks book project is designed for 8 to 12 year old children, to interest them in science, in the aesthetics of geology as well as the important lesson of seeing the art in rocks. The planned book will contain numerous color and black and white photos combined with limited text about the interesting features or special history of the photo. Various scales will be represented, from x-ray crystallography, to rock thin sections, to close-ups of crystals or hand samples to landscape views.

A typical landscape photo from Lake Tahoe showing rounded boulders of granite may have the accompanying text reflect the themes of fire and ice: the original plutonic origin of the rock, uplift, erosion and deposition, and the later sculpting of the rounded shapes and striations by the more recent glaciers. This book is to fire the imagination of children with the beauty of rocks in easy and understandable (nontechnical) language. Another example might be a thin section showing various colors of crystals that is visually appealing. The text might explain the sedimentary origin of the rock and the types of minerals as well as any interesting history of the rock. A worm tube cast that now looks more like modern sculpture might be a perfect shot worth submitting for the book project.

The Art of Rocks Book Project is requesting those with appropriate photos to submit them for the upcoming book. Submitters of photos selected for publication will receive a free copy of the book and a listing in the photo credits. Rules of submission: Please send color slides or 4" X 6" prints to James A. Jacobs, Art of Rocks Book Project, 707 View Point Road, Mill Valley, CA 94941; work phone: (510) 232-2728; ext. 222; e-mail: augerpro@jps.net. The photos are requested by February 15, 1999, however late photos may be accepted. All photos, whether they are used in the book, or not will be returned, if a stamped and self addressed envelope is included with the submittal. Please mark all photos or slides with the submitter's name. No fees will be paid for the use of the photos and it is assumed that the act of submittal of the photos is the permission to use the photos for this particular purpose. It is recommended that copies be made of the submitted materials, in case the photos are lost in the mail. In addition to the photos, please submit a brief discussion of the subject matter and a few sentences about how the photo came to be taken and a little about the photographer. There is definitely a thrill of going into the local bookstore and pulling out a book with your photos in it!

About the project designers: Lou Jacobs, Jr. teaches photography and photojournalism at various southern California universities. He is the former national president of the American Society of Magazine Photographers. Jim Jacobs, is a geologist who likes photography and interesting photos of rocks. He has had several photos published in his uncle's photography books.

Are you planning to take the California Geology Licensing Exams (R.G., C.E.G., &C.HG.) and the ASBOG Licensing Exam?

REG REVIEW, Inc. is the leader in providing instruction and study aids for the California geology licensing exams and ASBOG exam. Their study manuals and courses have been used for 13 years. For more information on these programs, write to:

REG REVIEW Inc., 37 Rosewell Road, Bedford, NH 03110

Patti Sutch, C.E.G., C.HG.
(650) 947-8899

Lisa Dirth, C.E.G., ASBOG RG
(603) 472-3050

e-mail: rgreviewca@aol.com

REG REVIEW now has a "web site" through America Online where you can view basic information about the courses and study aids, and download order forms. The URL is:

<http://hometown.aol.com/rgreviewca>

The Board of Registration has many changes in store for examinees--among them:

Increased application fees from \$100 to \$250 in the Fall 1999

Increased exam fees from \$100 to \$300 starting Spring 2000

Addition of a California supplemental exam tentatively scheduled for Fall 1999 with possible additional fees

Change to a multiple choice, 8 hour ASBOG exam in Spring 2000

Geologists planning to take the exam should keep abreast of any changes by visiting the Board's website at **www.dca.ca.gov/geology**

The NCGS provides information regarding this test preparation service, and various other professional services or products only to keep its members informed that such items exist. Any purchase of literature or services offered by these professional organizations is done at the risk of the applicant.

Job Announcement

Geologists and Civil / Geotechnical / Environmental Engineers

Advanced Assessment and Remediation Services (AARS), a five year old enterprise, USSBA certified 8(a) consultant, is seeking experienced project managers / staff geologists / civil, geotechnical, and environmental engineers to work on projects in the greater Bay Area. Project experience requirements include phase I & II assessment, remediation, slope stability, excavation, grading, risk assessment, and report and document preparation. Experienced professionals (3 to 10 years) with advanced degree, registration (preferred), and solid client, computer, and communication skills should submit their resume by Fax or E-mail to:

Fax: (925) 363-1998

E-mail: aars@ccnet.com

Chevron Funds AAPG Distinguished Lecture Program

The Northern California Geological Society wishes to thank **Chevron Overseas Petroleum, Inc.** for its generous funding of the AAPG Distinguished Lecture Program. The local AAPG affiliates like the NCGS arrange for these prominent geologists chosen by the AAPG to lecture on topics of geological interest to their members. Chevron's donation helps to defray the cost of airfare, food, and lodging for the lecturers who speak to the NCGS each year. We sincerely appreciate Chevron's continuing fiscal support of this superb program, and for allowing us to use their Chevron Park facility to host these presentations.

than in 1979), and, in 1990, the onset of diffuse carbon dioxide emissions from several areas around the flanks of Mammoth Mountain on the southwest margin of the caldera. Mammoth Mountain is a cumulo-volcano, which last erupted some 50,000 ypb; the onset of carbon dioxide emissions followed a six-month long earthquake swarm and suspected magmatic intrusion beneath the mountain in 1989. The third most energetic unrest episode to date began in mid-1997 with increasing uplift rate of the resurgent dome accompanied by increasing earthquake swarm activity. From mid-November 1997 through mid-January 1998 this unrest culminated in a series of intense earthquake swarms (including nine earthquakes with magnitudes from M=4.0 to 4.9) and an additional 10-cm uplift of the resurgent dome. Activity within the caldera gradually slowed through the remainder of 1998, and caldera activity is currently relatively low. M=5.1 earthquakes on June 8 and July 14, 1998 and their aftershocks all located near the Hilton Creek fault just south of the caldera, however, served as a reminder that the area continues to be geologically active.

Dr. David P. Hill, Geophysicist, U.S. Geological Survey and Chief Scientist, Long Valley Caldera Studies, was born on June 18, 1935, in Livingston Montana. After receiving a Bachelor of Science in Geology from San Jose State University in 1958, he completed a Master's degree in Geophysics from Colorado School of Mines in 1961, and a Ph.D. in Geophysics from the California Institute of Technology in 1971. Hill has worked for the USGS since 1961. His research has focused on structure of the Earth's crust, elastic wave propagation, and seismicity and tectonics with emphasis on areas of recent volcanism. He spent 1964-66 at the Hawaiian Volcano Observatory and served as Chief of the Seismology Branch in Menlo Park from 1978-82. He as served as Chief Scientist for the U.S.G.S monitoring effort in Long Valley caldera since December 1982. Dr. Hill spent six months as a visiting professor at the Swiss Institute of Technology in Zurich in 1988. He served as U.S. Chairman of the U.S.Japan Panel on Earthquake Prediction Technology from 1979-83. He was an Associate Editor for the Journal of Geophysical Research from 1985-88, coeditor for the Bulletin Volcanologique Special Volume on the Phlegraean Fields caldera in Italy (1985), and lead editor for the Journal of Volcanology and Geothermal research special volume on Active Volcanoes and Risk Mitigation (1994). He is currently an associate editor for the Bulletin of the Seismological Society of America. Dr. Hill is a member of the Seismological Society of America, the American Association for the Advancement of Science, and he is a Fellow of the American Geophysical Union. He received the Department of Interior's Meritorious Service Award in 1990.

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