



**Volume XXXVII, Number 5**  
**May 2012**

**Livermore Valley Lithophiles**  
**Livermore, California**

Next General Meeting:  
Thursday, May 10, 2012  
Livermore Library Community Room  
7:30 PM

**Program:**                    **The Mystery of the Formation of  
Thunder Eggs.**  
by John Stockwell

Next Board Meeting:  
Thursday, May 24, 2012  
7:30 at 'The Shop'  
Members are welcome to attend!

**Meeting Location:** Livermore Library Community Room

**Refreshments:**        **Chris Hunt and Jim Gruver**



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## **Presidents Message:**

Memorable Mother's Day Lithophiles! I hope to see you at the general meeting on May 10th and later at the Del Puerto Canyon field trip on May 19th.

The geology field trip up Del Puerto Canyon is set for Saturday, May 19th. Mark your calendars! We're hoping for a great turnout. Bob Trimmingham and Lee Davisson have worked hard to create an interesting trip for us. There will be some geology, some fossil collecting and possibly some mineral collecting as we follow Del Puerto Canyon Road up the canyon and then Mines Road back to Livermore. Find more details in this Lithogram. We'll discuss logistics at the May 10 general meeting and also send out an email reminder prior to the trip. If we don't have your email address, please send it to the [info@lithophiles.com](mailto:info@lithophiles.com) address so we can keep you aware of last minute "lithonews."

The program for May has us quite excited – thunder egg enthusiast John Stockwell will discuss the origins and beauty of thunder eggs and how to find them. I hope to see you on May 10th for this interesting talk.

A big thank you to Lee Davisson and Diana Carey who have agreed to chair the Lithorama (Lee) and to chair the Food Booth at the Lithorama (Diana). These are two big jobs filled but we still need your help – please volunteer for a club assignment in the coming year. We need a California Federation representative as well as committee chairs for several club events.

At this moment, we are particularly needy for help at the Girls Scouts 100th anniversary event on May 5th. This is an all-day event so even if you can help for just a few hours, please call Lee Davisson to volunteer.

-Rich Hunt [rcjhunt@comcast.net](mailto:rcjhunt@comcast.net) 925-443-5525

## Minutes of the General Meeting

April 12, 2012

The meeting was called to order at 7.34 PM by President Rich Hunt at the Livermore Library Community Room A.

**Guests:** - Rick Kennedy, guest speaker.

**Correspondence:** - A letter from a Ms. Kimberlie Theis, a master's student at Mississippi State University, requested information on sites we visit. This information would be used for her thesis on geotourism sites in Northern California. It was decided to forward her request to John Stockwell. We also received a letter promoting a short-wave field lamp from UVTools of Round Rock Texas. In addition, we got flyers from the Santa Cruz Mineral and Rock Club show in late April worth a 1-dollar discount.

**Minutes:** The minutes were approved as corrected by voice vote.

**Treasure's Report:** As Shelley Buchberger gave the Club's checking account balance. A couple of checks were issued and a bunch of new members' dues were received.

**Help Wanted List:** A help wanted list of open Club duty slots was emphasized by Rich Hunt. Diane Carey will take care of the Lithorama kitchen duties. Several important jobs still need to be filled.

**Girl Scout 100-Year Anniversary:** The Club will man a booth at this celebration to be held at the Alameda County Fairgrounds on Saturday May 5 from 10am to 7pm, Lee Davisson will take the lead. Dick Friesen will make available his carving station for the event with Stefanie Goldsmith demonstrating. Larry Patzkowski will have his Pixie wheels at the event for cabochon demonstrations. We will need considerable help.

**Field Trips:** - The field trip to Consolidated Minerals in Vacaville on April 1 had 16 participants and was enjoyed by all. The field trip to Del Puerto Canyon, west of Patterson, will take place on Saturday May 19. Lee Davisson drove the route of the field trip, up Del Puerto Canyon returning down Mines Road to Livermore; it was a 58-mile round trip. Bob Trimmingham brought in a box of minerals typical of those which could be found along the route for us to view. He plans to drive the route to assess possible collecting sites.

**Program:** Our guest speaker, Rick Kennedy, gave us a very informative and interesting talk on a newly discovered aquamarine deposit in southern California, near Yucca Valley, named "The California Blue Mine." Mr. Kennedy had several slides and specimens for us to view. The aquamarine occurs in pockets a somewhat small, isolated pegmatite in granitic terrane in the vicinity of Big Bear Lake in San Bernardino County. The aquamarine occurs in association with smoky quartz, topaz, fluorite, biotite, muscovite, and feldspars, chiefly cleavelandite. The pegmatite apparently has experienced past fluid inflows as exposed crystals are etched and secondary quartz has been deposited. Tourmaline and lithium minerals are apparently absent from this pegmatite. Rick described the mine's history from discovery, pocket exploration, and development.

**Refreshments:** - Chris Hunt and Jim Gruver will provide refreshments for the May meeting.

The meeting adjourned at 9:05pm.

Larry Patzkowski, Secretary

## Minutes of the Board Meeting

April 26, 2012

**Attendees:** Bob Trimingham, Dick Friesen, Bill Beiriger, Rich Hunt, and Lee Davisson

**Field Trip:** Bob compiled a road log from 6 to 7 references. He will do a dry run to reconcile mileage discrepancies between references. He will also plan out stopping locations. We still need to determine how many people will be on the trip.

**Booth at the 100<sup>th</sup> Anniversary of Girl Scouts:** So far Lee, Dick, and Andrea plan to be there the whole time (10am-7pm), and Stephanie will help out part of the time. Dick plans to bring free-form rock carving equipment; Lee will bring rock tumbler, posters, demos, and polished rocks to give away. Bill gave Lee rules and regulations.

**Next Meeting:** John Stockwell confirmed for May's general meeting. He will receive \$100 as a fee for his time and travel.

**Lithogram:** Bill will include a shop report provided by Frank Gouveia, and pictures taken by Jeremy from the last field trip at Consolidated Rock and Mineral. Lee will provide Bill with a write-up for the May field trip.

**Lithorama:** Rocks and Gem Magazine require 6 months advanced notice to print announcement for Lithorama this year. "The show must go on", so Bill will send in the notification to the magazine.

So far Lee, Frank Gouveia, Dick Friesen, and Diana Carey have volunteered to help organize and run show. Dick will coordinator dealers, exhibitors, and demonstrators, Bill will run the kids corner, and Diana has tentatively agreed to run kitchen. It is anticipated Rich Langlois and Albert Hess will be willing to set up the Glow Room again. Lee volunteered as show chair and will consult with Frank to see if he will be backup in case Lee has to travel for work.

LARPD costs for Barn have gone up ~\$1000, so calculations were made on how much to raise dealer costs. It was voted and agreed to raise costs per foot of dealer space.

A new banner will need to be made and will cost ~\$1000.

**Schools:** Large specimens of Stibnite and Kyanite were mounted and labeled by Bill. These will be given to Los Positas for their teaching collection. Bill plans to do 4 classrooms at Valley View in Pleasanton. Bill mentioned that schools that helped with Lithorama last year were never compensated with a financial donation, as customarily done. A motion was passed to provide \$500 to schools for last year's help.

**Conferences:** Bob mentioned that June 1-3 is the Micromounts Conference at the Eldorado Community Center near Shingle Springs.

**Other:** A discussion was initiated about youth classes and organizing a 4-H project for the summer/fall.

### **100 Birthday Party for the Girl Scouts**

The society has been asked to have a booth at the Alameda County Fair Grounds for the 100 birthday of the Girl Scouts. We are planning on some type of a display that have members show how we make Cabochons, Free-form carving and maybe Slate and Soapstone carving.

The event will be May 5, 2012 from 10:00 to 7:00.

This will be a long day if only a couple of members work the booth.

**THIS IS A ONE TIME EVENT, SO PLEASE LEND A HELPING HAND.**

**Lee Davisson will chair the event.**

This can be a good way to get a few new members and it should be fun for all who help.

Contact Lee Davisson 371-0699 or [leedavisson@sbcglobal.net](mailto:leedavisson@sbcglobal.net).

### **Program for the May 10 Meeting**

#### **The Formation of Thunder Eggs by John Stockwell**

John will discuss the formation and the beauty of thunder eggs.

John has studied the origins of their formation for more than ten years and has collected thunder eggs from many parts of the world. He is considered one of the world experts on the mysteries of thunder egg formation.

John will have many of his own specimens for us to view. You are welcome to bring your own specimens for display and review.

This is the 3rd month in a row that we have had a guest speaker. The topic of this program should be interesting to most of our members.

**Please! Attend.**

## School Science Program

Bill Beiriger

### Castro Valley High School Science Fair

I will be representing the Lithophiles at a science fair at Castro Valley High School on May 5th, I will have my educational sand display and I will also have a digital microscope with sand samples at the event.

Bill Beiriger

### School Classrooms

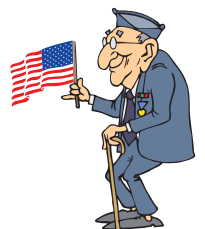
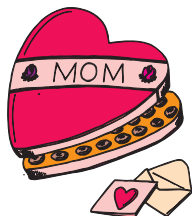
Presentations will be given to four 2nd grade classes at Valley View School in Pleasanton the latter part of May.

Stay tuned for another report in June.

*Fossils For Fun Society Invites  
You To  
The 12th Annual Tailgate  
Gemboree  
May 12 & 13, 2012  
Saturday and Sunday  
9 to 5*



*Join us at the Kennedy Mine in Jackson for  
-Free Admission (\$2 parking)  
-Fossil and Rock Exhibits & Dealers  
-Teacher Specials on Fossils  
-Saturday Evening Potluck and Live Auction  
-Kennedy Mine Tours Available*



## ***Notes From The Natural History World***



**Chechnya claims world's largest dinosaur eggs, met with skepticism.**

AFP PHOTO / CHECHEN STATE UNIVERSITY

17 April 2012

**I'm glad that the word 'Skepticism' was added at the end of the above title.  
Because if any paleontologist working in a university paleontology department would see these as  
Dinosaur Eggs and not Concretions they had better go back and retake a basic Geology class.**

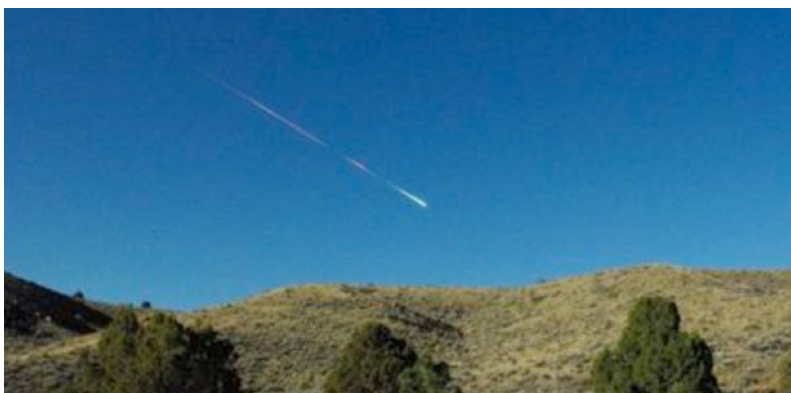


Photo KTVU-TV

Northern California giant fireball of 22 April 2012.

As I was going home after 6:45 Mass on Sunday I looked up in the sky at 7:50 and saw the explosion of a great meteor that was striking north above Livermore. During the afternoon reports started coming in from people as far away as Las Vegas, NV to Sacramento, CA.

Radar tracking of the event placed the possible impact of small pieces of the meteorite to be in the area of the Sierra foothills. There have been reports of small chunks being found near Coloma, CA, near James Marshal's California Gold Discovery Site.

I may have other information about this in a future Lithogram.

Bill Beiriger

## **The Cascade Volcanoes of California, Oregon and Washington.**

Compiled by Bill Beiriger

**Information and Photos from the Global Volcanism Program - Smithsonian Institution.**



**Crater Lake - Oregon**  
**Last Eruption - 2850 BC (?)**  
**8,159 feet**  
**42.93° N 122.12° W**

The spectacular 8 x 10 km Crater Lake caldera in the southern Cascades of Oregon formed about 6850 years ago as a result of the collapse of a complex of overlapping shield and stratovolcanoes known as Mount Mazama. The cone-building stage, during which at least five andesitic and dacitic shields and stratovolcanoes were constructed, took place between about 420 and 40 thousand years ago (ka). A series of rhyodacitic lava domes and flows and associated pyroclastic rocks were erupted between about 30 ka and the climactic eruption. The explosive eruptions triggering collapse of the 8-10 km wide caldera about 7500 years ago were among Earth's largest known Holocene eruptions, distributing tephra as far away as Canada and producing pyroclastic flows that traveled 40 km from the volcano. A 5-km-wide ring fracture zone is thought to mark the original collapse diameter. The deep blue waters of North America's second deepest lake, at 600 m, fill the caldera to within 150-600 m of its rim. Post-caldera eruptions within a few hundred years of caldera formation constructed a series of small lava domes on the caldera floor, including the partially subaerial Wizard Island cinder cone, and the completely submerged Merriam Cone. The latest eruptions produced a small rhyodacitic lava dome beneath the lake surface east of Wizard Island about 4200 years ago.

Photo by Peter Lipman, 1981 (U.S. Geological Survey).

<http://www.volcano.si.edu/world/volcano>

## Livermore Lithophiles – Help Wanted

The Lithophiles need a variety of volunteer helpers to assure that the club can provide the programs, field trips, and services that we members expect. I've listed below all the jobs, small and large, that the club needs someone to step up and handle. Critical needs are Lithorama chairperson and Federation Director. If you need to know what's involved with each job, ask me or any other long-time member. Check out the list below, choose the job that resonates with you, and let me know how you will help your club.

-Rich Hunt  
rcjhunt@comcast.net  
925-443-5525

Alameda Co. Fair Exhibit Chair - **Vacant**

Christmas Party Chair - **Vacant**

Coffee for Meetings – Albert Hess

Door prizes/Raffles – Jane Crone

Education Chair – Bill Beiriger

Federation Director - **Vacant**

Field Trip Chair - **Vacant**

Historian/ Scrapbook - **Vacant**

Librarian - **Vacant**

Lithogram Editor – Bill Beiriger

Livermore Science Odyssey – Lee Davisson

Meeting/Program Publicity - **Vacant**

North Bay Field Trip Rep - **Vacant**

Program Chair - **Vacant**

San Leandro Library Event Chair - **Vacant**

Picnic Chair - Nancy Bankhead

Sunshine - **Vacant**

Shop Foreperson(s) – Stephanie Goldsmith, Chris Hunt, Diana Carey, Frank Gouveia & Albert Hess

Lithorama Chair - Lee Davisson & Frank Gouveia

Lithorama Exhibitors/Dealers - Dick Friesen

Lithorama Food - Diana Carey

Lithorama Publicity - **Vacant**

Lithorama Set-up Dinner -Gayla Langlois

## **Shop Talk**

### **By Frank Gouveia**

Here is what you missed if you didn't make it to the shop in March, all accounts are factual and no actors were used.

3/6/12 – Stephanie Goldsmith was foreman and informed me of what happened. I was in the emergency room with a badly sprained ankle getting x-rays to check for fractures. No breaks just a bad sprain, my date that night was an ice pack and a bottle of pain killers. Lee and Josh Davisson popped in and Josh went to work on some more cabs while Lee and Dick freisen met for the first time and chatted...intellect meets wisdom. Jon Violette stopped by to ask some questions about the club and to also check out the shop. Stephanie updated me on projects she had finished and was still working on which was her pendant with a nice piece of Rhodochrosite and her Picture Jasper cab.

3/13/12 – I was foreman that night and did my best to stay out of everybody's way with my crutches. Diana Carey came in and did some more work on her Malachite cab, her husband Don popped in to see how things were going. Stephanie was there and did a little of everything as usual. Jon Violette must have liked what he heard and saw last week so he came back and joined as a member. Jon does a lot of woodworking and cut slab that he would like to inlay on the lid of a jewelry box he had made. I showed Jon how to use the flat lap on his first slab then Dick took over and trained him on how to polish his work on the pads. The rest of the evening I spent with my foot up on the table listening to Dicks' stories of his recent trip to Quartzite. Dick purchased 150 pounds of polished stones for our Lithorama show.

3/20/12 – Chris Hunt was foreman and worked on her crossword puzzle while keeping a watchful eye on everyone. Rich Hunt our president also made an appearance (without secret service). With help from first lady Chris he worked on his second cab a nice piece of Brazilian Agate. We all had fun and some good laughs trying to figure out which stencil he used for his oval shape since it didn't fit in any of them. Albert Hess opened the shop early at 3pm but once again no one showed up so he worked on his cane and walking stick while listening to music. Stephanie worked on her cabs and talked to me about how to work on my Opals. I brought in a box of fossils to work on as well, some shale with fossilized plant life and a Trilobite. After chipping away some of the matrix around my Trilobite I ground down some of my Opal pieces to remove the surrounding rock. Dick was there and showed Stephanie how to use his invention the carving machine. With his guidance Stephanie made a nice fan shaped piece.

3/27/12 – Diana Carey was foreman this night and stood watch near the heater all night while talking to Dick about her upcoming and past vacations. Diana said she didn't see Albert so perhaps he has stopped coming in early every Tuesday and will only do his scheduled 3rd Tuesday since no one has been showing up...we'll see? Dick brought in a picture of the kind of natural gas heater he was thinking about to replace our old propane one. He also discussed replacing the water heater with a gas one but there may be some line loss issues (more research needed). Lee and Josh showed up, Josh worked on perfecting his cab making and Lee brought in a crate with some of his unfinished grad school projects. Lee flat lapped some nice bookends and cut some slabs of this rock filled with Garnets. Stephanie worked on her cabs and spoke about options for my tiny pieces of Fire Opal. After grinding down my Opals some more I decided to work on the shale I had picked up on the side of the road while driving through Wyoming into Utah. Lee said it looked like Green River Shale. With my hammer and chisel I split layers off trying to find something more interesting than just stick impressions. For the most part I found only sticks, saved the best ones and made a nice pile of crumbs that went straight into the garbage. I laminated an instruction sheet for the flat lap and hung it above the machine. The evening wrapped up with Lee discussing the possibility of not having a show this year due to the lack of chairpersons. Stephanie and I said we would be willing to help so Lee will be contacting us with more info. Please help and volunteer for a position "The show must go on".

That's all from the shop...Rock on!

The Shop is open from 7pm to 10pm every Tuesday with extended hours on the third Tuesday of the month when the shop opens early at 3pm.

#### **Shop Forepersons**

1<sup>st</sup> Tuesday – Stephanie Goldsmith

2<sup>nd</sup> Tuesday – Frank Gouveia

3<sup>rd</sup> Tuesday – Albert Hess (3pm to 7pm), Chris Hunt

4<sup>th</sup> Tuesday – Diana Carey

## Shop Photos



## Field trip to Consolidated Rock Shop - Vacaville



## *California Shows And Events*

### **2012**

**May 12 - 13: RENO, NV Reno Gem & Mineral Society** Reno Livestock Events Center, 1350 North Wells Avenue Hours: Sat. 10am-5pm; Sun. 10am-4pm Contact: John Peterson (775) 849-1522 website: [www.renorockhounds.com](http://www.renorockhounds.com).

**May 12 - 13: JACKSON, CA Fossils For Fun Society** Kennedy Gold Mine, 12954 Kennedy Mine Road Hours: 9 am – 5 pm Daily Contact: Debbie Bunn (916) 929-6665 E-mail: [fossilsforfun@hotmail.com](mailto:fossilsforfun@hotmail.com) website: [www.fossilsforfun.org](http://www.fossilsforfun.org)

**June 16-17: San Francisco, CA San Francisco Crystal Show; Pacific Crystal Guild.** Fort Mason Center; 99 Marina Blvd.; Hours: Sat., 10am – 6pm and Sun., 10 am – 4pm. Contact Jerry Tomlinson; email: [jerry@crystalfair.com](mailto:jerry@crystalfair.com) website: [www.crystalfair.com](http://www.crystalfair.com)

**November 17 & 18, 2012** Livermore LITHORAMA 2012 Show and Sale, **Livermore Valley Lithophiles Gem & Mineral Society**; The 'BARN' 3131 Pacific Ave. east of Livermore Ave. Hours: Sat. 10–5; Sun. 10–4. Visit us at our website [www.lithophiles.org](http://www.lithophiles.org)

Show information is available at the California Federation of Mineralogical Societies website: [www.cfmsinc.org](http://www.cfmsinc.org)

#### **Additional Resources:**

**American Federation of Mineralogical Societies** website: [www.amfed.org](http://www.amfed.org)

**American Lands Access Association** website: [www.amerlands.org](http://www.amerlands.org)

**CO-OP** website: [www.coop.freesevers.com](http://www.coop.freesevers.com)

The California Federation of Mineralogical Societies web page [www.cfmsinc.org](http://www.cfmsinc.org) gives everyone access to the CFMS Newsletter.

## *Field Trips*

May 19 - Saturday - Del Puerto trip

June 13-16 Tri-Federation to Vale area, OR for petrified wood, plume agates, jaspers. AFMS/CFMS/NFMS, Doug True, [dtruefossils@yahoo.com](mailto:dtruefossils@yahoo.com).

June 16: Malakoff Diggins SHP for a guided tour, gold panning. Roseville Rock Rollers, CO-OP, CFMS North: Gordon Standlee and Jim Barton.

## Field Trip to Del Puerto Canyon

Did you know that a majority of the earth is made of a rock that we call the mantle? It lies anywhere from 4½ to 22 miles beneath us and goes all the way to the outer core (that's way down there). Geologists have a pretty good idea of what kind of rock it is, but have the darnedest time getting to it because drilling technology for these depths is still being developed and is very expensive (there's no oil in the mantle so only scientists try to raise money to drill to it). However, there is another way to get there.

For those of you who have already decided to join us on the Lithophiles field trip scheduled for May 19th, you've made a wise choice because we will drive through and visit one of the most dramatic displays of California coastal mountain geology exposed in an area known as the Diablo Range. And yes, we will go to the earth's mantle on this day. For those who are still on the fence or under no circumstances were you planning to go, I would like entice you to change your mind with some trip previews.

Before I begin though, a brief story needs to be told. As many of you likely know California sits along the tectonic plate margin of North America, adjacent to the Pacific Plate. These two plates glide pass each other (and not so gently) along the San Andreas Fault. Because of its location at a plate boundary, California has had a dramatic and tumultuous geologic history. Actually, movement along the San Andreas Fault today is far less dramatic than events in the geological past.

Because of this rich geologic history, the California continental margin was and still is very complex and quite unlike the opposite side of North America along the Atlantic margin. For example, Figure 1A below shows a simplified cross-section of how the Atlantic margin might look today. Notice that the continental crust transitions into oceanic crust with some unknown, but quiescent change from one to the other. Piled on top are tens of thousands of feet of sediment derived from the continent over millions of years. Out in the open ocean where continental sediment cannot reach, sedimentary deposits are derived predominantly from dead life settling to the bottom. This type of continental border is known as a passive margin.

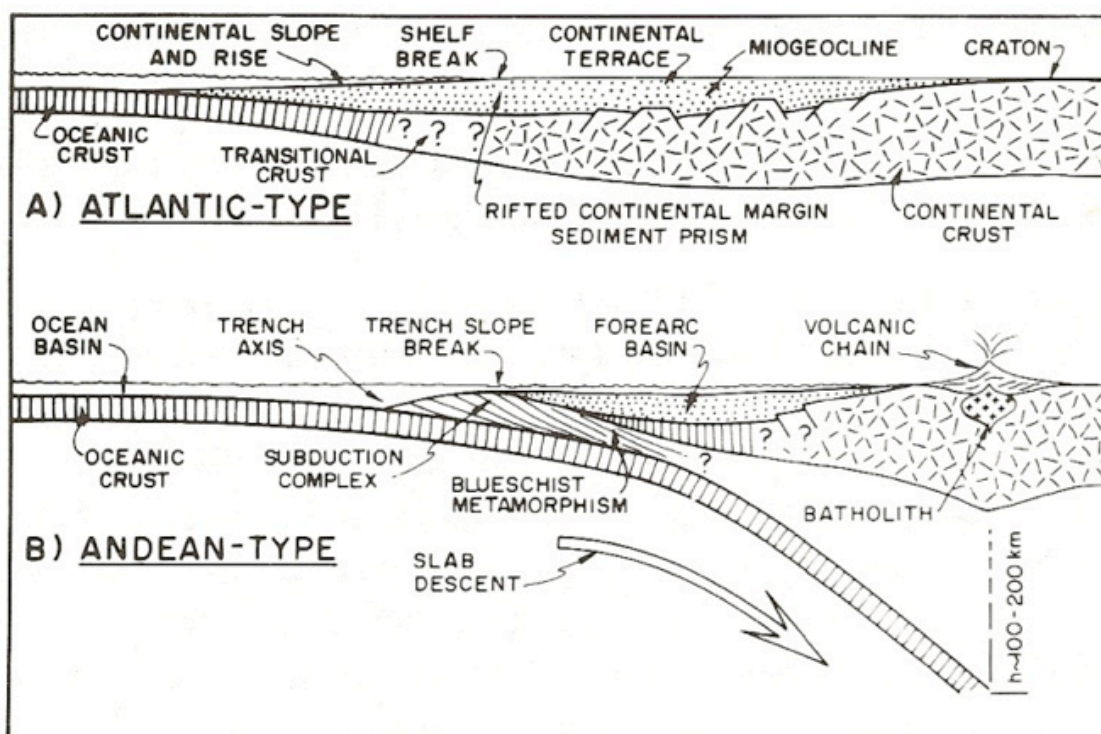


Figure 1. Comparison between A) a passive continental margin and B) a converging margin, in this case a subduction zone.

Now compare Figure 1A to Figure 1B, which shows what California in cross-section might have looked like during the height of the age of dinosaurs (65-120 million years ago). The first thing you might notice is how the oceanic crust bends down beneath the continental crust and forms a subduction zone. This is a tectonic plate margin where old ocean crust is recycled beneath continents, as might be seen today off the coast of Chile or Japan. Subduction zones also give rise to large chains of active volcanoes, and California consequently had a long history of volcanism. As a matter of fact, the Sierra Nevada granites today were magma chambers and are all that is left of this active volcanic chain from approximately 40-120 million years ago.

During this time of volcanism much sediment was deposited in a basin (known as a Forearc Basin) formed west of the volcanic chain, which today is our Central Valley. These sediments consist of tens of thousands of feet thick gravel, sand, and silt and today yield all our gas and oil. These sediments are known collectively as the Great Valley Sequence (GVS). However, when subduction was active, other types of rocks were also being piled up to the west against the GVS. These were rock materials that refused to accompany the subducting oceanic plate on its decent under the continental crust. Collectively they are known as an accretionary prism. Much of these rocks were older continental and open ocean sediments laid down before 120 million years ago.

Now it may sound pretty boring at this point to have all this dirt piling up in ancient California, but there was one additional rock type that was somewhat unusual and a real gift to geologists and mineral enthusiasts like you. At one point during this long subduction period, an ocean spreading center started to approach the subduction zone (see Figure 2). A spreading center is where new oceanic crust is being formed by partially melting some of the mantle below. They can be seen in various locations along ocean floors today, forming large zipper-shapes, with the most notable example at the bottom of the Mid-Atlantic. However, this spreading center off the coast of ancient California was likely producing ocean crust at a slower rate than ocean crust was being consumed at the subduction zone resulting in their slow mutual approach. As you might guess the spreading center eventually lost the battle and arrived at the point of subduction. Yet all was not lost because a portion of this spreading center, including a piece of the mantle itself, managed to get lodged into the accretionary prism to become part of the California geology today.

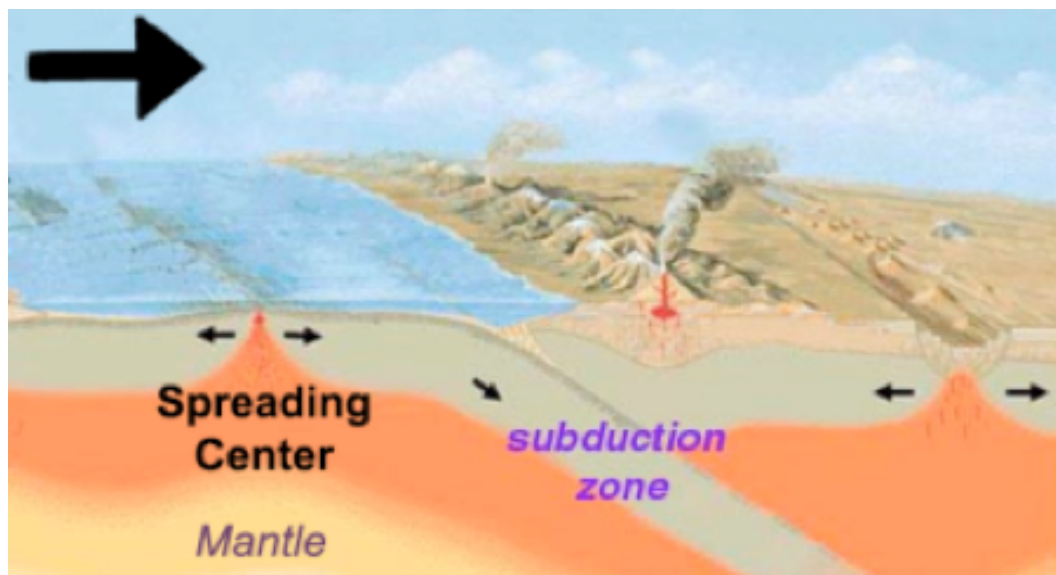


Figure 2. Sometime during the formation of the California coastal geology, an ocean spreading center was consumed by subduction that left pieces of mantle rock, ocean crust, and ocean sediments imbedded with continental sediments of the Great Valley Sequence.

Subduction ended approximately 40 million years ago when a complex transition in plate type motion appeared in the Baja area. This transition moved northward change the subduction to the present day San Andreas Fault system. You can actually see this very transition point off the coast of Humboldt County in an area known as the Mendocino Triple Junction. As this triple junction moved northward, it caused rapid uplift of both the accretionary prism rocks and the west side of the GVS causing rapid erosion and exposure of both. Today, these uplifted rocks form our California Coast Range and expose the past drama that made part of California's geology.

### **Some Things You Will See On the Field Trip**

Our trip will travel back through geologic time starting with the present in the agricultural fields of fertile Central Valley. From there we will transcend tens of thousands of feet of ocean sand and mud, and end up in the bizarre and contorted rocks of the mantle. The trip starts just west of Patterson, California in the upper GVS. Here an ancient coastal estuary that was burgeoning with plant life no more than ~25 million years ago. Many road cuts in this area can yield partial or complete fossil leaf impressions in exposed siltstones. Below in Figure 3 is a of a modest one that I found just after a few minutes poking around with a rock hammer.



Figure 3. Leaf impressions in siltstone of the Miocene age (between 5 and 23 million years ago) sediments of the Great Valley Sequence.

We will continue on from here and enter into rocks from the age of dinosaurs and see what was shedding off the volcanic chain more than 70 million years ago in a period known as the Cretaceous. A tremendous amount of sediment was deposited into the shallow sea and deep submarine canyons and laid down in thick horizontal beds. However, today because of mountain building, they no longer lie horizontally, but rather dip steeply towards the valley as shown in the Figure 4 below. These steeply dipping beds will be visible and accessible in places for many miles along Del Puerto Canyon



Figure 4. The Cretaceous age (between 65 and 150 million years ago) sedimentary beds of the Great Valley Sequence slant steeply towards the Central valley.

You can also see these beds along the eastern side of the Coast Range in a Google Earth image shown in Figure 5. Note how the trace of these thick beds also form a gentle snake-like curve caused by the active mountain-building still occurring in this area.



Figure 5. The steeply dipping beds of the Great Valley Sequence can be seen on the east side of the Coast Range in the Google image. The red rectangle outlines chromite mining areas shown in more detail in Figure 7.

Just about the time you feel that you can't stand to see another example of sedimentary rock from the GVS, Del Puerto Canyon Road enters into a broad valley and the rocks of the surrounding hills undergo a significant change. At this point, you will have entered the rock nearest the Earth's mantle, a slice of which was so generously sampled and preserved during the time of subduction. Rocks in this area are a mixture of old volcanic deposits, igneous intrusions, and sedimentary rocks >150 million years old, all of which have undergone metamorphic changes. You will also see mantle rocks known collectively as ultramafics. Most have subsequently undergone conversion to serpentine (California state rock) and can easily be recognized by their characteristic greenish color as shown in Figure 6.



Figure 6. Greenish-grey mantle rocks that have undergone conversion to serpentine outcrop along Del Puerto Canyon road. These rocks host chromite deposits.

These ultramafics in particular are where chromite deposits are located and were mined beginning just prior to World War I. As a matter of fact, several tons of high grade ore (>30% chromium) were mined during the war when demand and prices were high. Del Puerto Canyon actually had a narrow gauge railroad track built that moved ore down to Patterson. However, after the war, prices plummeted and many mines closed. A map of the most active mine sites is shown in Figure 7.

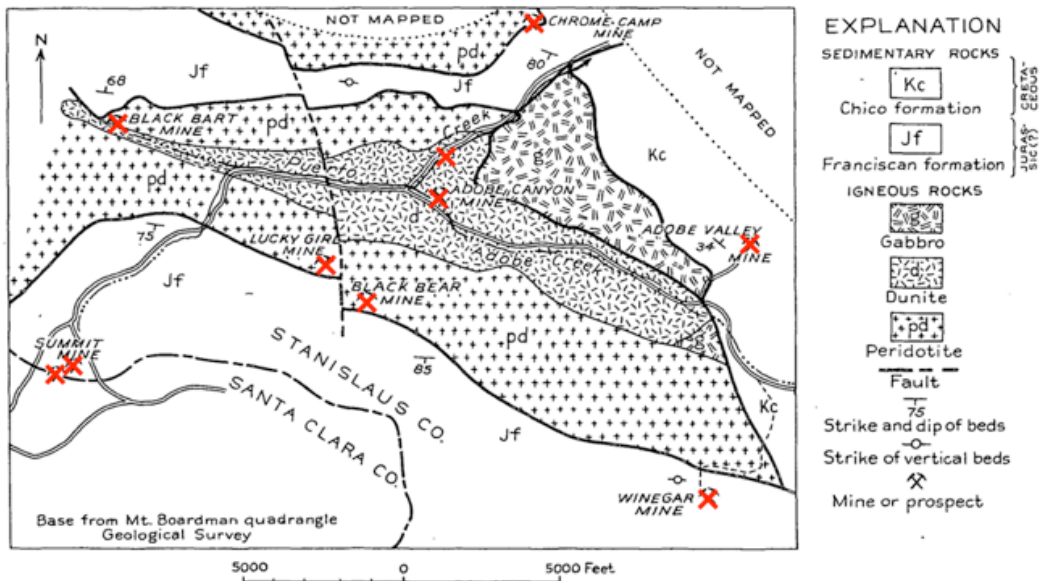


Figure 7. Red X's show the most productive chromite mine locations (from Hawkes et al., 1942, US Geological Survey Strategic Mineral Investigations Bulletin 936-D)

Other mines in the general area have produced magnesite and mercury. As a matter of fact, our trip leader will be Bob Trimmingham. Not only will he lead us through this fascinating and unusual collection of rocks, but will be sharing his experiences of collecting various mineral specimens in this very area. You will not want to miss this part in particular.

I hope this brief report gives you a little context of what you will see and why the area is important to geologists and mineral enthusiasts. Perhaps some of you now are enticed to join us on May 19th. Look for the trip announcement in this newsletter for details of times and meeting location.

### **ADDITIONAL INFORMATION FOR A SAFE TRIP**

Bob Trimmingham will have other handouts at the General Meeting on May 10th.

We will also discuss car pooling because in many of the areas there will be limited parking. We will also stop at Frank Raines Park, possible area for snaking, water and rest rooms.

Del Puerto Canyon road can be very busy and is narrow in many areas. We may setup a individual to watch for cars from the other side of the road where there are blind-curves.

### **PLEASE WATCH FOR TRAFFIC**

## Livermore Valley Lithophiles

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We're on the Web at [www.lithophiles.org](http://www.lithophiles.org)

Dues Are Due!



## Elected Officers and Club Information

### Elected Officers:

<b>President</b>	<b>Rich Hunt (925) 443-5525</b>
<b>V. President</b>	<b>Lee Davisson (925) 371-0699</b>
<b>Secretary</b>	<b>Larry Patzkowski (925) 426-7768</b>
<b>Treasurer</b>	<b>Shelley Buchberger (925) 292-7122</b>

**Membership:** The Livermore Valley Lithophiles invites to its membership anyone genuinely interested in minerals, gems, lapidary, geology or any of the other earth sciences, and who desires association with others of like interests. Membership in our club consists of three classes: Senior, anyone eighteen years or older; Junior, anyone under eighteen; and Honorary. Dues are for the calendar year and are as prescribed in the by-laws, Article III. \$25.00 per family, \$20.00 per individual and \$10.00 for Juniors (twelve and older.)

**Meetings:** General Meeting – Second Thursday of each month, 7:30 p.m. (**Locations change goto Lithophiles WEB-SITE**). Board Meeting – Fourth Thursday of each month, 7:30 p.m. at the Club Shop or to be announced in the *Lithogram*. Any special meetings or places will be published in the *Lithogram*.

**Club Shop:** The shop at the Barn is open to club members 7:00 p.m. to 10:00 p.m.. on Tuesday nights. If no one arrives by 7:30 p.m.. or if the Shop Foreman has not been informed a member will arrive late, then the shop will close at 7:30 p.m. Shop Foreman, OPEN.

**Field Trips:** Location and date will be published in the *Lithogram*.

**Bulletin:** *Livermore Lithogram*. Published monthly and mailed or emailed to active members and guests. News of interest, reports and articles must be received by the first Tuesday of the month. Articles may be reprinted by giving proper credit.

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**Shop open every Tuesday at 7:00 PM**

**General Meeting May 10th, at 7:30 PM**  
**Board Meeting May 24th, 7:30 PM -The Shop**