



ROCKHOUND RAMBLINGS

OCTOBER 2018 • PASADENA LAPIDARY SOCIETY™ • PASADENA, CA



Agate Hunting: Theory and Practice

by Karl Stull

You won't find Donald Kasper's theory of agate formation in geology textbooks. But every rockhound who takes a hammer and collecting bag to the field should know something of Kasper's theory. Why? Because how agates form has everything to do with where they will be found.

Kasper started thinking unconventionally about agate and jasper in the early 2000s, when he and a friend went collecting near Kramer (about 10 miles north of a base camp PLS uses every year). They found an abundance of jasper where it had not been found before and should not have been expected. There was a steep slope with a lot of volcanic ash. The slope dropped down about 20 feet from a lava flow to the basement layer of granite. This break in the terrain turned out to be the Helendale Fault. After some research, which included sites visited by rock clubs, Kasper realized this part of the Helendale Fault marked the world's longest run of jasper – extending seven miles.

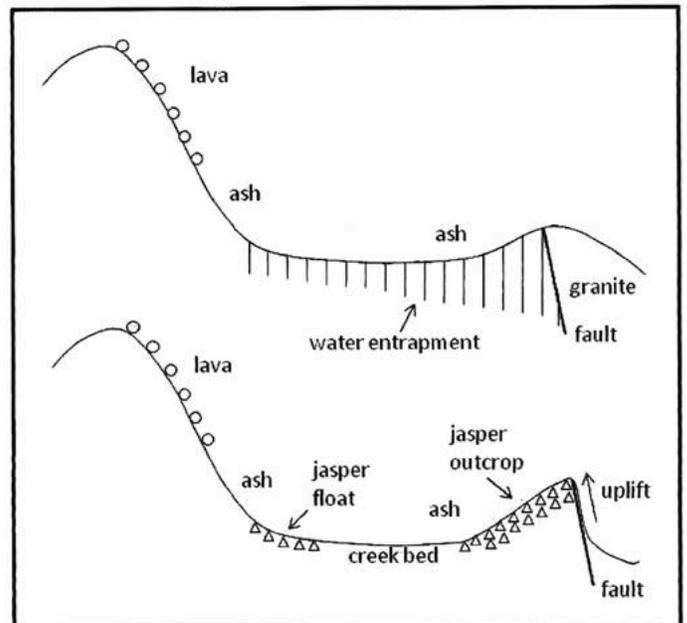
What to Look For

The Helendale slope is a key feature in Kasper's theory. It's where the three agate- and jasper-forming ingredients came together. The three ingredients are silica, water, and carbonate. In the field, looking for sites that have all three ingredients, you should keep your eyes open for:

- Volcanic rock, rich in silica (such as rhyolite and volcanic ash)
- A water-trapping feature, such as a fault
- Caliche or other source of calcium carbonate

Caliche is the crust of calcium carbonate just below the surface in Southwest deserts. A water-trapping feature is often a terrain break associated with a fault, or it could be a dry lake (playa). The playa itself is too salty for agate formation, but the area outside the shoreline might have mixed the three ingredients in a time of abundant water. Look for volcanic rock nearby.

The black lines are faults. Colors indicate recent disturbance of terrain (more relevant to earthquakes than agate hunting). 1=Kramer Junction. 2=Helendale Fault. Latic Siding is an annual PLS field trip for jasper. North of I-40 are the Cady Mountains and Cady Fault (east-west). This USGS map is from: https://geomaps.wr.usgs.gov/neotectonics/html/new_mojave_faults.html



Jasper-forming terrain along the Helendale Fault, combining silica from volcanic ash, water, and subsurface carbonate. Reprinted with permission from Donald T. Kasper, *A Student's Guide to the Genesis of the Agates, Jasper, and Opals* (2011).

Gemmy Chemistry

Agates can't form in salty conditions, says Kasper, nor in acidic conditions (see "Don't Go There" for more signs that a site is not agate-friendly). Agate forms in an alkaline environment that is neutralized by carbonate. As a lava flow cools to the right temperature (575 to 200 degrees C), the lava gives up its water, and the water in turn dissolves silica from the lava, reaching

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President's Message

We don't have our regular President's Message this month. Ellen had to take her son to the emergency room, so she asked to share these photos instead – from the CFMS Convention in Chico. Best wishes from every member of PLS go to Ellen in hopes of a speedy recovery. – *Karl Stull, Editor*



At the national level, Paolo Sanchez won first place in the AFMS Bulletin Editors Contest (Junior division) for an article in our June 2017 newsletter about "Asterism" – the star-like refraction seen in a few rubies and other gemstones.

Ellen Ferrell accepts a first-place plaque on behalf of PLS from CFMS Web Site Contest Chair Merryan O'Neill. Ellen announced the award at our September program meeting, with applause for Webmaster Ben Shutman.



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Membership Marcia Goetz

Publicity Mona Ross
Elizabeth Weston (social media)

Sunshine Ellen Ferrell

Ways & Means Phil Lahr

Workshop Carolyn Duncan

Webmaster Ben Shutman

Membership

Membership per calendar year is \$25; for a second adult at the same address, \$15; further adults, \$10. Junior members are \$10. Initiation fee is \$10 per person.

Renewals are due in October and delinquent after December 31. Mail checks to PO Box 5025, Pasadena, CA 91117-0025.

Board Meetings

1st Thursday every month.
7 p.m. at Matt Denny's Ale House
145 E Huntington Dr, Arcadia
All members are welcome.

Workshop

2nd Sunday every month.
Fees are \$3 for half-day, \$5 for a full day. Bring lunch!

Safety: Equipment instruction is required; also liability waivers, eye protection, and closed-toe shoes.

Junior members 9 and older are welcome with adult supervision.

Program Meetings

3rd Tuesday every month.
Doors open at 6 p.m.
Meeting is 6:30–8:45 p.m.
Pasadena Central Library
285 E Walnut St.

Online

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Pasadena Lapidary Society™

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Share your experiences and insights in the lapidary hobby: vacations, how-to's, favorite rock or jewelry examples, anything else of interest to PLS members. Submit articles by the 15th for publication in next month's issue. Very short items can get in as late as the 22nd but are not guaranteed to make the next issue.

Program Meeting – October 16



Deep in the Earth

The deep Earth, which encompasses the mantle and core, makes up 99 percent of our planet, and yet it is remote and unfamiliar. Scientists currently know more about the surface of Mars than about the interior of our own world. Join Krista Sawchuk for a guided tour of the deep Earth at our October program meeting, as she shares current scientific understanding, recent advances and challenges in studying the deep Earth, and her research.

Krista is a PhD student at UCLA, studying the deep Earth via geochemistry and mineral physics, but she has been collecting and studying rocks and minerals since childhood – backpacking in the Sierra Nevada. She is a member of the Culver City Gem & Mineral Club and is working toward a Graduate Gemologist credential with the GIA. In her spare time, Krista enjoys adding to her mineral collection, which features over 150 species.

Our Rock of the Month talk will be presented by Michelle Vandembroeck on Tiffany Stone. – *Mona Ross*

2019 CFMS Annual Show & Convention

Hosted by The Pasadena Lapidary Society
Fairplex, Pomona March 8–10, 2019



Non-Competitive versus Competitive Cases

This is a question that is asked often because at a PLS show we don't have competition cases. At CFMS shows, there are non-competitive cases for those who want to display their items without the rigors of competition. And CFMS shows also have competitive exhibits for those who want to see how their pieces compare to others through judging. CFMS judges go through training. I am not aware what they learn and what they look for, but they can be tough – especially when they are judging your case (or so it seems).

There are 11 divisions for CFMS competition and among them several categories. See the AFMS rules and updates at http://www.amfed.org/rules/AFMS_Rules_2017.pdf and http://www.amfed.org/rules/AFMS_Rules_2017_Updates.pdf.

Of course, the rigors of competing do have their rewards – a ribbon or a plaque to remind you that you have achieved a level of perfection in your category. If you are wondering about putting your case in competition, be sure to talk with PLS members who have been through it (and survived): Ferdie Sanchez, Marcia Goetz, Joe Goetz, Tony Fender, Jennifer Nishimura, Paolo Sanchez, and Tanner Soo-Hoo.

– *Marcia Goetz, Show Co-Chairman*

Workshop – October 14



Drop By, Catch Up, and Make Something Beautiful

Workshop hours are 9 a.m. to 4 p.m. Half day is \$3, all day \$5. Park on the street or in the lot on the east side of the building.

Entrance is on the *west* side of the building, down the walkway between buildings. Do not use the ramp in the parking lot.

For directions, please call me at (909) 593-2781 or email gem.quest@verizon.net. – *Carolyn Duncan*



Workshop users who were starting to believe a lapidary saw could be under an ancient curse, rest easy. The 14-inch saw is banished. Say hello to our 16-inch Covington. It's big, green, and gremlin-free.



Though not yet approved by the FAA, our SlabJet 1000 is the only aircraft on the tarmac with google-eyes and mineralized wings. Join Lulu Smith and other volunteers at the workshop – advancing aviation into the Stone Age.



Looking at this alluvial fan terrain with Kasper's theory in mind, you might rule out the channeled areas, because strong flows would disrupt gel formation. You would also avoid basins (playas), where salt accumulates. But the flat or gently sloping spaces in-between, if they were ever covered by water, would have potential for combining volcanic ash with carbonate to form agate. A fault scarp (crossing the foreground) is always of interest to the Kasper-minded agate hunter. The photo, from Death Valley National Park, is by Marli Miller. See more at geologypics.com.

Continued from page 1

such high concentrations that it forms a gel. The gel hardens from the outside inward, as water is forced out by the carbonate.

The hardening occurs in a fairly short time, perhaps only a few thousand years, according to Kasper. Clays that happen to be mixed in the gel determine the features we see in the finished agate. While it is hardening, the skin of the gel is negatively charged, which attracts positively charged ions of clay material, which we see as agate banding. The clays typically alter to opal, forming the plume and tube structures we see. The whitish, translucent areas in an agate are often due to calcite.

His focus on chemical processes is what sets Kasper apart. The traditional explanation of agate formation relies on weathering

crystallization, which is thought to occur when the ingredients pool in a fissure of volcanic rock and then are converted over millions of years.

Neither theory is easy to test by direct experiment. However, it is axiomatic in science that a good theory is one that not only explains a lot but also includes many predictions that can be tested. Kasper's theory is bristling with predictions (see "Don't Go There"), including one that any rockhound can put to the test: agate *may* be found in terrains that once combined silica-bearing lava/ash, standing water, and carbonate.

It's unlikely we'll ever know for sure whether Kasper's theory is cracked or canny, but there is rockhounding fun to be had in trying to find out. ❖

Don't Go There

1. Playa lakes
2. Salt flats, absolutely anything to do with salt
3. Mojave flood basalts (sheet basalt flows)
4. Cinder cones and volcanic cones with pumice
5. Obsidian outcrops of any kind
6. Vesicular basalts without volcanic ash and green celadonite
7. Sandstones, sand dunes, any kind of granular sand
8. Granitic, schist rocks of any kind
9. Metamorphic rocks bearing garnet, actinolite, rutile
10. Sulfide rock systems (exception of minor pyrite/marcasite in marine rocks)

Further Reading

Donald T. Kasper. *A Student's Guide to the Genesis of the Agates, Jaspers, and Opals*. Kasper Jasper Press, 2011. Available on Amazon and www.donaldkasper.com.

About Donald Kasper

Donald Kasper has written 22 books on rocks of the Southwest and Midwest. Some are detailed studies based on infrared spectroscopic analysis of various specimens. The title suggested above is an introductory booklet (43 pages).

Further Thoughts from PLS Veterans

JAY VALLE

If I were playing the odds, I would not look for agate on a playa either. Agate does not form in a playa, but playas are an accumulation of whatever minerals and rocks wash into them. If there is jasper nearby, you may find jasper on or in the playa (example: near Castle Butte). Various evaporites, such as the borax minerals from Searles Lake, are somewhat more common in playas, but the good crystals usually occur down deep. You can also find meteorites on several local playas.

SYLVIA CLIFFE

1. Stick to someone who knows the area. (Rockhounds like to show new people the ropes.)
2. Adapt to new locations. Look carefully at the terrain, and think about where you will dig.
3. Look in gullies and on hilltops.
4. Listen to what people around you are saying.
5. If you are not happy with what you are finding, move to another place.

MATTHEW BELL

An interesting question is: why do materials with such similar chemical beginnings result in different deposits? Agate commonly forms in veins or seams. Jasper can occur as large outcrops, resembling igneous intrusive dikes or plugs. Chalcedony is often found in float as "roses." Theories aside, rocks are found not only where they form but also where they end up – after transport by gravity, water, human activity, etc.

CLAST FROM THE PAST



Etta Lamb was a PLS Librarian in the 1980s, remembered with affection for her bright red hair, many rings, and presentations at meetings where she did comedy monologues about the gem journals and books in the library. She had everyone rolling in the aisles. Tough act to follow, Joe Goetz recalls.

Congrats to My Carving Class



The September Workshop was a turning point for my carving students. Each received a baggie containing five more baggies! That might not sound so great at first, but all the baggies had a tube of diamond paste (325 grit, 600, 1200, 8000, and 14,000), plus three brushes, and a sliver of bamboo – for polishing.

Gem carvers spend half their time polishing, so learning to use these tools – and how to

avoid cross-contamination – was a big step forward. After I demonstrated my method, we had questions and answers, and then the class went to work.

Some started right in with polishing, while others got their pieces ready to polish. All were hard at it. I visited with each and heard:

“My fingers are tingling.”

“My battery is running out!”

“I need to get a little more done before I go home today.”

“Aaach! My leaf broke.”

“I’m going to finish this at home.”

The class will continue with independent projects: some practicing just-learned skills and others trying new ideas. All have become gem carvers, ready for more fun and great new projects. I’m proud of them. – *Sylvia Cliffe*



Dear Cabby,
What are gemstone pictures, and how can I make one?

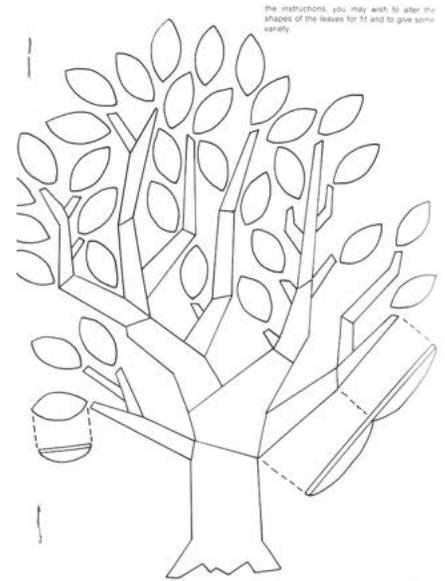
– *OUT ON A LIMB IN LYNWOOD*

Etta Lamb would love it that Out on a Limb asks this question, because I had to look in an old book of lapidary projects for a full answer. The PLS Library has shelves of such books, which members can check out for as long as you need them. Nowadays Jennifer Jang is in charge of the Library, and she also takes care of Display Cases for the annual show.

The short answer to the question is: a gemstone picture is a mosaic made of stones. They may be fitted or loosely arranged. They can be flat like tiles, or rough or domed for a 3-D effect.

For anyone who makes more cabochons than they know what to do with, there is a fun project in *Artistry in Cabochons* by Robert W. Ferguson. This 64-page booklet was published in 1976 by GEMBOOKS, based in Mentone. Price: \$2.

As you can see, the project starts with a drawing of a trunk, branches, and leaves. Side views with dashed lines show that all pieces are domed but have a vertical face around the base for fitting. Draw the trunk and branches on a single slab if possible, so colors don’t break arbitrarily. Cut the branches in segments for dopping, shaping, and polishing. For a seamless fit between branch segments, grind adjacent pieces as a pair – holding the two pieces together, topside to topside, with straight edges aligned. A flat lap helps get good straight edges. If your work is less than perfectly perpendicular, the topside-to-topside trick ensures the pieces have the same angle and will still match up.



Arrange cabochon leaves (perhaps green thulite) among the assembled tree limbs, and epoxy all to a background of your choice. Ferguson uses a pane of glass with two coats of black enamel paint on the back for a shiny, high-contrast look.

If you are searching for something to do with cabochons other than pendants, here is a great way to branch out. – *Cabby*

Field Trips



Calico Mountains, Here We Come

The first field trip of a hopefully cooler collecting season will happen on the first weekend of November. We'll go to the area around the Whittier club claim and the Calico Mountains and who knows where else.

Saturday, November 3, at 8:30 a.m., we'll meet up in Yermo in the parking lot of the Baymont hotel (previously the Oaktree Inn). It is at 35450 Yermo Rd. Take I-15 to exit 189, Yermo Rd.

Where we go will be determined Saturday morning. It'll be a surprise for all of us when we figure out where we will go.

Be sure to bring a lunch and have lots of water, electrolyte water, or even Gatorade to drink. Also bring a broad-brimmed hat, sun block, and collecting gear (i.e., a bag or bucket for rocks you find and a geology pick or something similar).

After visiting some sites throughout the day, we'll have "potluck" at Peggy Sue's where you can dine on delicacies of deep-fried pickles and wash it down with a pineapple shake.

Sunday morning, we'll meet up again at the hotel parking lot at 8:30 a.m. We'll go out to more collecting sites until 12 noon, and those that are going home can beat it before the traffic gets too heavy. For those that remain, it may turn into an exploratory trip. Or – if some are there on Sunday but not on Saturday – we may just go back and revisit some of the locations that we went on the day before. Questions? Call or text (626) 260-7239.

– Joe Goetz

Member to Member



Investment piece: Sleeping Beauty turquoise 3-strand necklace, silver findings. 43.5" of nugget beads, varying from 1mm to 3mm thick and 3mm to 7mm long. Total length with closure:

18.5". May be of Native American origin; was missing toggle when purchased; added toggle myself. \$1500 OBO. Text message Mona at (626) 437-0150.



Education Outreach



Share Rock Knowledge!

Thank you to Janie Duncan for hosting a Webelo visit to her museum last month. Her excellent presentation helped members of Den 44 fulfill badge requirements. Thank you also to Mona Ross for her able assistance!

- ★ PLS will be at Sierra Madre Elementary School's annual STEAM night on November 30.
- ★ If you'd like to participate in the Sierra Madre event or other PLS education outreach, please contact me at (323) 640-4394 (feel free to text) or email liveoak180@yahoo.com. Put something in the subject line so I won't think it's spam.
- ★ At the PLS monthly meeting, we'll have a sign-up sheet for shifts in the Demo area of the CFMS Show in March 2019. Share your skills and enthusiasm for lapidary carving, cabbing, wire wrapping, and beading.

Display Table: Ferdie Sanchez coordinates the Display Table at monthly meetings. Share items of rockhound interest, workshop projects, or rocks from field trips. If you have a rock you'd like to identify, put it near the Display Table "What Is This?" note. Knocking a corner off the specimen may provide helpful clues.

Warthog, Ready for Work

For a high shine on rocks at home, replace the buffing wheel on this ugly but beautiful Lortone unit. Or install diamond wheels (6" or 8") for polishing/grinding. PLS members, Quasimodo can be yours for \$100. Call or text Philip Lahr: (818) 926-3163.





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Time to pay PLS dues for 2019

The time has come, the Walrus said,
 To pay for many things:
 For slabs and saws and dopping wax,
 For cabochons and carvings...

Sorry about that, Lewis Carroll

Rock and Gem Shows

October 6 BORON: Mojave Mineralogical Society, Boron Community Center, 26998 John St. Hours: 9–4 daily. See Facebook page.

October 6–7 VISTA (SD County): Vista Gem & Mineral Society, Antique Gas & Steam Engine Museum, 2040 North Santa Fe Ave. Hours: 10–4 daily. www.vistarocks.org

October 14 FALLBROOK (SD County): Fallbrook Gem & Mineral Society, Fallbrook Gem & Mineral Museum, 123 West Alvarado St. Hours: 9–4. www.fgms.org

October 20 WEST HILLS: Woodland Hills Rock Chippers, First United Methodist Church, 22700 Sherman Way. Hours: 10–5. www.rockchippers.org

October 20–21 WHITTIER: Whittier Gem & Mineral Society, Whittier Community Center, 7630 Washington Ave. Hours: 10–5 daily. www.wgmsca.com

October 27–28 LANCASTER: Palmdale Gem & Mineral Club, Palmdale Elks Lodge, 2705 E Avenue Q. Hours: 10–5 daily. www.palmdalegemandmineral.com

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	
October 2018	1 Time to pay PLS dues for 2019	2 Mail check to PO Box 5025 Pasadena, CA 91117-0025	3 Dinosaur-killing impact theorist Walter Alvarez birthday, 1940	4 Board mtg PLS members always welcome	5	6  Gem shows	
7  Gem show	8	9	10	11	12	13	
14 Workshop	15	16 Program mtg "Deep in the Earth"	17	18	19	20  Gem shows	
21  Gem show	22	23	24	25	26	27  Gem show	
28  Gem show	29	30	31 				Photo: Meteor Crater (AZ), USGS via Wikimedia



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Sylvia Cliffe: British Columbia jade and rose quartz. Roses are pegged into drilled holes. Background left unpolished for contrast.

Ocean Jasper

Every rock tells a story. Some stories are weirder than others. Trying to imagine the underground circumstances that brought these colors and shapes together – a white flame, a mermaid tinged with gold, the salmon print of a sofa from a hotel lobby circa 1911 – one can only shrug and call it jasper (cryptocrystalline). Carol Sumler, who brought this pendant to the August program meeting, says simply it makes her think of Alaska.

In fact, Ocean Jasper may be more chalcedony than jasper, with its translucent banding and druzy sprays. Ocean Jasper is a trade name, created by the company that has mined the four known veins – all in northwest Madagascar. The first of the four veins, near Kabamby, was re-discovered in 1999, thanks to a low tide. Earlier specimens, known as “eye jasper,” were documented in the 1920s but then forgotten. Learn more at:

<https://www.entertheearth.com/the-geology-varieties-and-history-of-ocean-jasper-part-one/>

