

~A Fault on the Campus~

Although I am currently in the midst of my final year as an undergraduate up here in the University of California, Berkeley, I still find new challenges and opportunities in college life. However, amidst the academic workloads, grad school applications and other aspects that make the typical college life busy, I sometimes spend time looking up the geology around Berkeley and the wider Bay Area. A few years ago I wrote an article on the Franciscan complex, a statewide geological formation that gets its name from the mishmash (more colloquially known as "melange") of many different rock types strewn across California's central and northern coastline. Although the Berkeley landscape is in part made up of this Franciscan complex, there was another significant geological feature that never fails to surprise me—a feature right on the UC Berkeley campus itself.

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Inspiration Unearthed Coming in 2022

The show for this year has been rescheduled for August 20-21, 2022. It seems so long ago that we were able to hold our show and in fact the last one was the CFMS show and convention at the L.A. County Fair Grounds. That was lots of fun and work.

We will have a show meeting soon via zoom. Anyone that wants to attend can - the more the merrier. Just let me know and I'll send you a link. Email is <u>marcia.pls.emails@gmail.com</u>

Meetings

Board Meetings – 1st Thursday of the month. Members welcome to join. Contact Marcia Goetz for more information.

Program Meetings - 3rd Tuesday of the month

Contact Marcia Goetz at marcia.pls.emails@gmail.com

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A Fault on the Campus (continued from p. 1)

For those who have not yet visited UC Berkeley, I would like to describe the whole campus as a city that lies on a gradually inclining hill slope. The campus itself is shaped like a rectangle with its long sides oriented in the east-west direction, making the western part of campus face the San Francisco Bay (and a lovely view of the Golden Gate Bridge) and the eastern part rise abruptly towards the Berkeley Hills. The underlying topography of this campus is no coincidence, for the easternmost end of Berkeley's campus lies on a dangerous yet fascinating feature

of California geology: a major fault line. However, this is not about the San Andreas Fault. That fault lies over fifteen miles west of Berkeley, under the Pacific Ocean. Although the San Andreas Fault would still pose a threat, it doesn't seem quite as alarming as the fault that is only a short walk away from where I take my geology classes.



This fault, which outlines the base of the Berkeley Hills in the east, is named the Hayward Fault. Although it is not as popular as its famous cousin in the west, this fault still has the potential to be as life-threatening to many Bay Area residents. Unlike the San Andreas fault, which divides two large plates of the Earth's crust (the North American Plate and the Pacific Place), the Hayward fault stands as a large fracture within the North American plate, caused by extended stress of the two plates moving laterally against each other. As the San Andreas Fault extends across almost all of California, the Hayward fault merely starts at its southernmost tip just south of San Jose and ends under the waters of San Pablo Bay to the north-a distance of only 45 miles (72 kilometers). Similar to the San Andreas Fault, the Hayward Fault is a characteristic transform-also known as strike-slip-fault, in which pieces of Earth's crust move horizontally to one another along a jagged line. This jagged horizontal movement gives rise to the Berkeley Hills, where a bend in the line between the horizontally moving pieces of crust causes compression that squeezes the rock upwards—a process known as transpression. Unfortunately, this rough horizontal movement also gives rise to earthquakes, where the very nature of the fault's jaggedness forms a buildup of energy that, when suddenly released, causes the ground to tremble and shake. One of the greatest magnitude earthquakes in California's recorded history happened around 150 years ago, in 1868, when a magnitude 6.8 earthquake happened on the Hayward fault, devastating the cities along the Bay Area. Although only five people were killed (thirty people injured) from the earthquake itself, over a quarter of a million dollars in damage was assessed and all of downtown Hayward

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was destroyed. With the explosion of California's population and infrastructure since the 1868 earthquake, the Hayward fault now poses a much greater threat to the 2.4 million people living around the Hayward fault zone. Other than cities of San Jose and Hayward, the Hayward fault crosses through many major cities, including Richmond, Piedmont, Oakland, and yes, Berkeley. Every now and then there would be news headlines stating that the "Hayward fault is bound to break" and that "the Big One lurks on the Hayward". Given that the Hayward fault hasn't had a major rupture since the 1868 earthquake, one can truly say that "the Big One is coming". The only scary part is that we don't know exactly when it will happen.

Nowadays, the blocks along the Hayward fault move at a relatively gradual rate of about 0.3 inches (8 millimeters) to 0.4 inches (9 millimeters) per year. Although this speed may seem quite slow from a human point of view, over many years this fault has moved—and will move—large sections of San Francisco Bay northward. Since the UC Berkeley memorial football stadium is literally sitting atop the Hayward fault, one half of the stadium is moving north and the other half of the stadium is moving south

Soon enough, the stadium will have to be repaired as the discrepancy in seating and the length between the field's end zones will eventually be deemed unfair to both players and the fans.



Every now and then there arises rather small, yet detectable, magnitude 2.5 to magnitude 4.0 earthquakes along the fault itself. In this case little to no damage is done; there is only a small shake of the ground, as if a large truck or freight train was passing by. During my first three weeks at Berkeley, while I was studying in one of the top floors of a multistory building, a quick jolt suddenly made every loose item rattle for a second or two. At first I thought it was some strange plumbing mishap in the building's architecture, but later on I realized that I'd just experienced a small 3.3 moment-magnitude quake. Though an unfortunate threat to many Bay Area residents, the Hayward Fault continues to serve as a focal point of geophysical studies, where the US Geological Survey, California seismologists and Berkeley geology students have been surveying and studying the fault for the past century. As of now the fault remains what a classmate of mine once described: "a dormant beast, waiting to pounce at any moment". A dormant beast of nature, I can agree, but as a geology student I can now state that this beast is as fascinating as fearsome to witness.

Paolo Sanchez

References:

Berkeley Seismology Lab. "The Hayward Fault". <u>https://seismo.berkeley.edu/hayward/index.html</u> https://www.usgs.gov/news/featured-story/hayward-fault-it-due-repeat-powerful-1868-

https://www.usgs.gov/news/teatured-story/hayward-fault-it-due-repeat-powerful-1868 earthquake

Member-to-Member

The PLS equipment-for-sale cupboard is now essentially bare. We are down to a few pieces of odd equipment and boxes of parts. Why not take advantage of the opening to advertise something cluttering up your garage or notify fellow members of something you are in the market for? Email Phil at <u>plkslahr@att.net</u> by the 15th of the month for inclusion in the March newsletter.

Workshop February 12, 2022

New Day, New Hours, New Projects!

We have moved the workshop from the second Sunday of the month to the second Saturday. Hopefully this will allow a few more members to attend. We will also be open a couple hours longer than recently, but only if there are people there.

The February workshop will be held on Saturday, February 12, from 9 am to 3 pm. Cost is \$5 for the full day or \$3 for either 9 to 12 or 12 to 3.

We are going to play around with making stone airplanes and cars this month. We have a template for the planes, but will be starting from scratch on the cars so bring a photo of your favorite ride and memorialize it in stone. If you need the required workshop orientation or directions, call Marcia at (626) 260-7239.

Field Trip on February 19th

The fieldtrip for February is to a place I call "THE WIDE SPOT" in the road. There are a few collecting areas in the vicinity of this area. The date is Saturday, Feb. 19th. This will be a day trip only. This has always been a good trip for rock collecting, and there are assorted agates, chert, jasper, and petrified palm, to collect.

We will meet in the parking area at the Travel Lodge on Yermo Road, get off at Ghost Town Road at the bottom of the ramp make a right turn and at the stop sign turn right again, you'll see the Travel Lodge on your right. Be there at 9:00 am (don't be late), the vehicle you'll need will be high clearance at least. A 4-wheel drive vehicle is recommended. There is a possibility, but no guarantee, of a seat available in someone else's vehicle. Please make arrangements beforehand.

You'll want to bring a lunch, water, any snacks you may want, hat, sturdy shoes or boots, a container for your rocks, a rock hammer (geologist hammer), comfortable/suitable clothes and jacket in case it gets cold, gloves and whatever else you'll need.

If you are coming on the trip, you need to call to RSVP or we won't be looking for you, we can be reached at (626) 260-7239.

Surprise! it's wrong way Joe,

Joe Goetz



Pasadena Lapidary Society, Inc. PO Box 5025









Dear Members,

Here's February and for those of you who have gardens, the time for trimming back is here. And...while doing that I have uncovered rocks I had put in the garden last year. They are sure pretty and each one recalls a field trip or estate sale where Joe and I picked them up. One in particular is a yellow onyx that catches the light and each time I think 'that is so pretty'.

This month (February) we will contemplate an in-person meeting but at this point I am not too hopeful. However, even if we meet via Zoom we can have a good speaker. Normally, February would be a review of 'how to set up a case' for the show. BUT, we are postponing the show until August 20-21 due to the concern of the Covid-19. We will be planning another show meeting in the near future probably early February.

Another big announcement is the Workshop is going to be held on the second Saturday of the month from now on. The time will be 9 AM to 3 PM. We hope the new day and time will work out for more members.

Joe has volunteered to lead the February field trip to what he refers to as 'the wide spot in the road'. Please see his article in this newsletter.

As a gentle reminder, annual membership fees were due at the end of December, if you haven't sent them in yet please do so because at the end of March you will be dropped from the roster and will not receive a bulletin.

Sincerely, Marcia Goetz, President

WE'RE ON THE WEB!

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