Yosemite Nature Notes

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Photo by Ralph Anderson

Left to right—Bottom row: McLellan, Wright, Mees, Critchlow, Ricketts, Weston. Middle row: Tormey, Belisle, Gilbert, Larson, Swick. Top row: Becker, Beall, Meyer, Assistant Director Waldo. Barraclough, Gale.

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Editor's Note: This issue of Yosemite Nature Notes has been prepared by the 1951 class of the Yosemite Field School.

Cover Photo: Aerial view of Tenaya Lake-Tuolumne Meadows area, Yosemite National Park. Made and donated to Yosemite Museum by Mr. Clarence Srock of Aptos, California. See back cover for outline index chart.

Yosemite Nature Notes

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A TRIP TO MONO LAKE AND THE MONO CRATERS

By Mary Edith Barraclough, Field School, 1951

From the top of Mount Dana, Mono Lake and the Mono Craters presented a never-to-be-forgotten picture. Climbing up the northwest slope of the mountain from Tioga Pass, we came out at last upon the ridge leading to the summit. There we had our first breath-taking view of the Dana Glacier and Plateau, the desert country of the Mono Basin, and in the center of the picture the round outline of Mono Lake. Its bright blue, bluer than the sky, contrasted sharply with the dull brown of the surrounding desert and with the two islands ornamenting its surface, one black and the other almost white. To the south of the lake rose the picturesque chain of Mono Craters, grayish-black in color, and each one a perfect textbook illustration of an extinct volcano. Around and beyond the lake and craters stretched the flat desert set off by rugged mountain ranges, the Sierra in the foreground, the White Mountains as a backdrop.

During our stay in Yosemite my curiosity had been aroused about this region to the east of the park. I had learned that its geology is closely tied up with the geology of the Sierra Nevada. I knew that the Yosemite Indians had carried on trade with the Mono Indians east of the mountains, exchanging acorns for insect larvae from Mono Lake and obsidian from the Mono Craters. I had heard too that the lake has no outlet, that it is extremely salty, that it supports practically no plant and animal life, and that swimming in its waters is an educational experience.

Two weeks later we had an opportunity to learn more of the Mono country, in many ways a close neighbor of Yosemite National Park. While the Field School was in the high country, a naturalist-conducted auto caravan left Tuolumne Meadows to spend a day exploring Mono Lake and the craters. On this trip we were able to swim in the lake, eat lunch near its shore, and observe closely the life that inhabits it. We were also able to climb on one of the craters, collect pumice and obsidian from its rim, and learn a great deal about the geologic history of the Mono Basin and the Sierra Nevada.

Driving down Leevining Canyon from Tioga Pass, we had our first lessons in the geology of the area. Scratched and polished rocks, and moraines left by melting ice told us of the glaciers that filled these deep canyons on the east slope of the Sierra during the ice age. We saw beds of dark metamorphic rocks which had originated as sediments on the floor of an ancient ocean. In places along the road we could see light-colored fingers of rock reaching up into the dark metamorphics from the underlying masses of granite, telling us of the hot liquid rock, or magma, which intruded from below, changing the sediments, penetrating them in many places, and cooling slowly beneath them to form the granites of the Sierra Nevada. Evidence that the old metamorphic rocks had been tilted, broken, and eroded gave us some idea of what happened when the crest of the Sierra was pushed up to its present elevations.

Later, looking back at the mountains from the shore of Mono Lake, we were impressed by the abrupt eastern face of the Sierra and the flat basin extending to the eastward which is some five or six thousand feet below the mountain crests. How did it happen that way? We were told that this was caused by a down faulting of the basin area; that a great crack, or fault, occurred in the earth's crust along the eastern edge of the range, where the mountains pushed up and the basin sank down. As the eye followed north and south along the range one could imagine the upheavals that must have taken place to raise those mountain summits to elevations of 13 and 14 thousand feet, and one could almost see the fault line where the basin area sank down, leaving the steep eastern escarpment of the Sierra Nevada.

Mono Lake and its shores looked more barren than ever as we approached it. We ate our lunch by Mono Vista springs on the northwest shore. Here cold fresh-water springs bubble from the earth only a short distance from the briny lake, and a dense thicket of willows gives welcome shade. At the source of each of these springs are peculiar rock formations, domes of porous travertine rising 20 or more feet into the air. These travertine domes are a form of limestone deposited by the springs that once emerged beneath the surface of the lake. Similar crags in the lake rising above its surface near the shore indicated the location of other, submerged springs. These deposits are one of the evidences that at one time Mono Lake was much larger than it is today. Terraced shorelines and lake sediments around the basin have made it possible for geologists to determine the extent of the ancient lake which existed during the glacial age. We know that the larger and lighter-colored of the two islands, Paoha, was also at one time under water, as its whitish color is caused by sediments of clay and diatoms deposited when it was submerged. The darker island, Negit, is composed of volcanic rock, and must have been formed since the level of the lake was lowered.[1]

Swimming in Mono Lake was not exactly a pleasant experience but it was an interesting one. Though not as dense and buoyant as Great Salt Lake, Mono Lake is easy to swim in because of its salt concentration. The water is intensely alkaline, so alkaline that it looks greasy and feels slippery between the fingers. It tastes bitter and soapy as well as salty. In the oceans and in Great Salt Lake, common table salt predominates over all other minerals,

1. Russell, Israel C., "The Quaternary History of Mono Valley, California," *Eighth Annual Report, U. S. Geological Survey*, Washington, D.C., 1889. Much of the information in the present article was obtained from Russell's very complete study of the quaternary and post-quaternary geology of the Mono Valley.

Photo by Ralph Anderson

Mono Lake from summit of Mount Dana.

but in Mono Lake the alkaline salts and carbonates are equally abundant and obscure the salty properties. The alkalinity of the lake is due to the fact that it has no outlet, and as the salts which are brought into the lake by springs and streams do not evaporate and have no means of escape they become more concentrated as time goes by. They are reputed to be good for the constitution, but we preferred to wash off the white salt deposit left on our skin in the cold, fresh spring water close by.

It would seem impossible for living things to exist in such briny water, but we found the lake teeming with a large quantity of life though not a great variety. The only visible plant life was numerous blobs of green algae scattered over the lake bottom. As we approached the water countless millions of little flies swarmed up from the sand in front of us. These are the famous Ka-cha-vee flies *(Ephydra hians)*, the larvae of which were relished by the Mono and Yosemite Indians for food. Along the edge of the water were windrows of the fly pupae washed up on the shore. Wading into the water we found rocks on the bottom with the larval cases of the flies firmly attached. The Indians collected this insect food in late summer and autumn when the winds washed great quantities of the pupae onto the shore. These pupae were dried and the outer cases removed by rubbing and winnowing. The inner meats were stored and eaten as a delicacy and are said to have had a flavor resembling nut meats and shrimp. There are no fish or molluscs living in the lake, but we found myriads of little shrimp-like crustaceans in the waters near the shore.

On the surface of the lake and along the shore were large numbers of shore and water birds which had apparently come to feast on the crustaceans and insect larvae. The greatest number of these seemed to be Wilson phalaropes *(Steganopus tricolor)*. We watched these birds from the highway for some time and were much amused by their antics, for they have the entertaining habit of spinning around on the water like tops while searching for food. Farther out on the lake were larger birds, probably gulls, grebes, and ducks. This, I thought, would be a wonderful place to spend a day with a pair of binoculars and a good bird book.

An afternoon trip to the northernmost, smallest, and newest of the Mono Craters completed our day. The Mono Craters were thrown up by volcanos which came into existence after the ice age, just a little while ago geologically speaking, and are an indication of recent activity along the Sierra Nevada fault line. This smallest crater is really two craters—a smaller, newer one within the rim of an older and broader one. It takes only a few minutes to walk up to the rim of the outer cone, or better yet, to the rim of the inner cone, and it is well worth the trouble. Here we found pumice, the gas-filled froth of a volcanic eruption. What fun to lightly hoist above one's head a rock that looks as though it should weigh a hundred pounds! And what fun to look down into the mouth of the old volcano and see where the hot liquid rock cooled before it had a chance to flatten out or crystallize into its mineral constituents. Most interesting were the great lumps of obsidian, or volcanic glass, now black and hard but with the lines of flow and bubbles caused by escaping steam still visible. Everyone returned to the cars loaded with cherished specimens of pumice and obsidian. The best pieces of obsidian, those with the fewest flow lines and gas bubbles, were designated to go to Chief Lee-mee in Yosemite Valley to be used in demonstrating the making of obsidian arrowheads by the Yosemite Indians.

In another hour we were back in the high Sierra among the granite peaks and clear mountain streams and lakes. We were not sorry to leave the alkaline lake, the barren desert, and craters behind, but a day of exploring there had increased our understanding of the natural and human history of the Yosemite region and deepend our enjoyment of Yosemite National Park.

YOSEMITE TROUT INVESTIGATIONS

By Jack Ricketts, Field School, 1951

If you are one of the many men and women who enjoy the fine art of fishing as a part of your vacation, you will be interested in the work now being carried on in Yosemite National Park to improve your sport.

This work, a long-term project, will eventually cover all waters of the park; however, this year's part of the Yosemite trout investigations has as its emphasis the waters of the Merced River in Yosemite Valley and the lakes and streams near the High Sierra camps. The project has gotten underway through the generous donation of Mrs. Mary Curry Tresidder, whose thoughtful gift has made it possible for Park Ranger O. L. Wallis to conduct the work on a full-time basis for a period of 8 months. I would like to thank Ranger Wallis for his very kind assistance and cooperation in the gathering together of the data for this article. Also aiding in the project is Glenn Gallison, wildlife ranger, who is continuing his observations and investigations as part of the program. His card file on lakes and streams is serving as basis for the present studies.

The objective of the Yosemite trout investigations is to gather information on the biological and physical features of the streams and lakes, as well as to make a study of trout conditions. This material will eventually aid in the formulation of a basic stocking and trout management plan for each stream and lake within Yosemite National Park.

The information is being gathered in three major ways: (1) Lake and stream surveys conducted by the park personnel; (2) Yosemite Volunteer Creel Census forms distributed to fishermen by means of boxes placed at strategic places around the park; and (3) use of the Fishing Questionnaire and Data Cards by rangers and High Sierra camp operators in recording their contacts with anglers.

The survey of waters by park personnel is being made in order to determine the species of trout present, their size ranges, physical condition, abundance, the degree of fishing pressure (or the number of anglers fishing any certain water), and the amount of natural reproduction. Reproduction information is perhaps the backbone of the plan, for in some lakes and many streams natural reproduction can carry the load without additional trout-stocking assistance. In other waters, little or no natural reproduction takes place because of poor living conditions, and, if fishing is to be had in such places, trout must be planted. In still other lakes and streams, natural reproduction will have to be supplemented by stocking because the heavy fishing pressure makes natural reproduction insufficient.

This information, therefore, provides knowledge of what species of trout to plant, for some types fare better than others in certain waters. It also helps in determining the frequency of stocking, for naturally those waters which are easily accessible to trails, roads, and camps will be fished more than others.

Also included in the survey is the mapping of each lake and calculation of its area. The waters are being examined in order to find if suitable spawning areas are available, to learn what foods are present (sometimes by stomach examination), to study the presence of aquatic plants, and to investigate the fish species now present, their size groups and abundance.

The current information is being recorded in the field on special survey forms supplied by the California Division of Fish and Game. This data, along with past research and stocking records, will make up a basic stocking policy sheet for each body of water.

You might say this whole plan is an attempt on the part of the fisherman, with the help of the park personnel, to improve upon his sport. In so doing he is assuring himself a goodly supply of fish in the years to come.

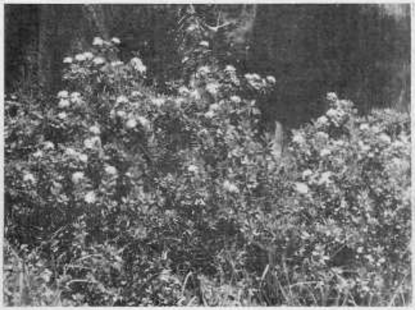
TEA FOR TWO

By Genevieve Swick, Field School, 1951

How about joining me in a cup of tea? If you don't mind a bit of variety, we will indulge ourselves and use the "makings" that are available in or near Yosemite National Park. While on recent nature hikes with the Field School, Carl Sharsmith, the naturalist leading us, mentioned many plants and shrubs that could be used in living off the land. Among these were California laurel or bay, creek dogwood for a rather heady smoke, Labrador tea, and stick or desert tea. Being curious, I tried both of the types of tea. I boiled, I drank, I liked. Because of that, I want to share my experience with you.

A little description of these shrubs might prove that you are already familiar with them even though you might not have enjoyed the beverages. Labrador tea or trapper's tea (*Ledum glandulosum* Nutt.) is described by McMinn as "a rather erect rigid shrub, 2 to 5 feet high, leaves . . . evergreen, crowded near the ends of the branches, . . . flowers white, numerous, crowded in terminal clusters." It occurs along the Sierra Nevada from about 5,000 to 10,000 feet elevation. One very easy way to identify it is to bruise a leaf; if it is Labrador tea there will be an odor somewhat resembling that of turpentine. The last statement may cause you to wonder what kind of a drink could be made from the plant. However, if you dry the leaves and then drop them into boiling water and steep for several minutes, you get an amber liquid tasting like a cup of orange-pekoe with a little too much lemon. Add a bit of sugar and you have a cup of delicious tea.

If you don't care for that cup of tea, possibly the next type will suit your palate. When driving through the foothills of Leevining Canyon, you might notice an erect shrub with many branches and seemingly no leaves. Upon closer inspection, you will note that the branches appear to be similar to the scouring rushes or horsetails, with the jointed branches having leaf-scales at the



Photos by N. B. Herkenham

Labrador tea: habit of shrub in blossom; detail of flowers and leaves.

nodes. This interesting plant is actually a closer ally of the cone-bearing trees or gymnosperms than of the other members of the plant kingdom. It is one of a primitive group known as the Ephedra or Gnetum family. The dried-out appearance of the erect, pale yellowish-green branches sticking up from the rocky soil is probably responsible for the names given to this plant —stick tea or desert tea are only two of many. Despite the appearance of the shrub, when the branch tips are picked and dried, then steeped for several minutes in boiling water (the time is governed by the strength of flavor you desire), the resulting beverage has a deep orange color and a pleasantly pungent, aromatic flavor. Add a bit of lemon or sugar or both to suit your taste, relax, and sip a good drink.

THE SCENIC SKY

By Ronald W. Meyer, Field School, 1951

Whether engaged in a strenuous climb or a leisurely stroll amidst Yosemite's magnificence, we all become aware of the beauty of the firmament. However, the part the sky plays in enhancing the beauty of the area is not fully realized and appreciated by many. Oftentimes the sky can present as spectacular a show in the course of a few moments as that which the earth, aided by the compounding of the artistry of the ages, can produce.

We of the 1951 Field School were privileged to witness such a display on the day we climbed Mount Lyell. That day the scenic sky competed favorably with the brilliant glacial snows and awesome vistas for the attention of our cameras and our eyes. The day was typically high Sierran. The intense sun shone through the clear, cool air all about us and the sky was flecked with high, wispy cirrus clouds. As the day progressed the thin clouds coalesced into one large feathery cloud. As good luck would have it, we were all reclining in a high mountain meadow when the cloud chose to drift 'twixt us and the sun. Immediately one edge of it burst into a huge arc of a rainbow-like halo. Opposite the sun and an equal distance from it was a continuation of the arc. The diameter of the circle occupied over one-tenth of the sky area between the extremes of the horizon. The comprising colors continually changed in brilliance as the innards of the cloud shuffled about, varying the density. The red of the halo was nearest the sun and it graded subtly into a yellow and this into a green, then a blue, lastly a lavender.

To produce sky scenery of this sort the sun needs the cooperation of a special cloud type. The high, feathery cirrus clouds are the ones most commonly utilized. They drift at elevations 6 or 7 miles above the earth's surface where all their moisture is necessarily in the form of tiny snow or ice crystals. These ice crystals are flat and six-sided and act as so many minute prisms, so that when the white light from the sun passes through them it emerges in its component parts. Light from the sun is composed of many colors which normally aren't separately visible, but when it is passed through transparent objects of the proper shape the various colors bend differentially and emerge in the characteristic rainbow alignment. The red is bent least and the lavender most, which explains the color sequence about the sun. It has been experimentally determined that ice-crystal clouds generally bend the light through an angle of 22 degrees, making the diameter of the colorful halo nearly one-eighth the span of the heavens.

All good things must come to an end. After about 10 minutes the cloud vaporously began to fragment and leave disjointed little curds hanging before the sun. The white light of the sun poured through the openings in the clouds, forming huge radiating shafts along which the frolicsome rays danced among the countless dust particles of the atmosphere.

Resignedly we lifted ourselves from the soft green grass of the alpine meadow and wended our way campwards. Later that evening as we lounged about the fire eating, the sunken sun bathed the curdled sky overhead and the jagged crest all about us in a soft, red glow. It is almost as if the light were reluctant to leave the friendly earth, for after the sun has dipped below the horizon its rays bend their way along the earth's convexity to linger for a few moments longer. As the alpenglow slowly faded away we couldn't help but interpret it as a farewell gesture from the scenic sky.

A FEW PUFFS FROM POHONO (TRAIL OF THE PUFFING WIND)

By Joseph E. Wright, Field School, 1951

From the sloping "Glacier" campground to the distant valley floor
We enjoyed Pohono's windings for a dozen miles or more.
There were ups and downs and vistas; every hour brought a change
In the trees and shrubs and smaller plants which are limited in range.
In a prostrate manzanita and a red fir's soaring tip
We had proof of being far above the valley's oak-lined strip.
We could never cease to marvel at the mats of flowers gay
Which brightened every open place along the forest way.
The starwort's forked white petals, and lousewort's fern-like green,
Along with white-veined shinleaf still decorate the scene.
As yet I feel the trail miles go, though many days have passed;
For memories of Pohono Trail will surely always last.

1851-YOSEMITE·CENTENNIAL-1951

DIGEST OF THE PURPOSES OF THE

YOSEMITE NATURAL HISTORY ASSOCIATION

Yosemite National Park, California

INCORPORATED for the purpose of cooperating with the National Park Service by assisting the Naturalist Department of Yosemite National Park in the development of a broad public understanding of the geology, plant and animal life, history, Indians and related interests in Yosemite National Park and nearby regions. It aids in the development of the Yosemite Museum and library, fosters scientific investigations along lines of greatest popular interest, offers books on natural history applicable to this area for sale to the public, and cooperates in the publication of

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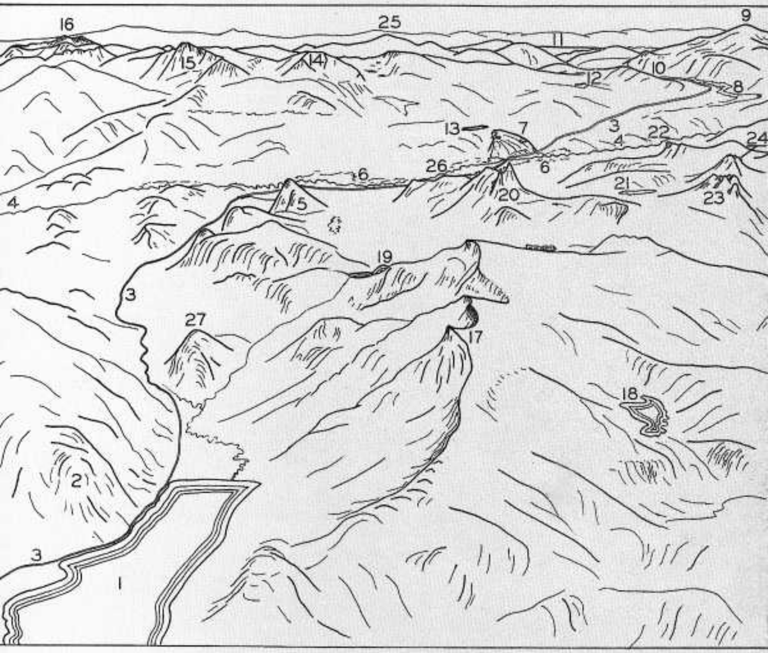
Outline index chart accompanying photo on front cover.



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