We Went to Mono Craters for Obsidian

A FEW hundred years ago—which, geologically speaking is only yesterday—Nature staged a wild jamboree in what is now the Mono basin of east central California.

From deep beneath the crust of the earth steam and gas and molten rock were belching forth from at least 20 major vents and numberless smaller ones. If aborigines were roaming the desert in those days it must have been a terrifying experience to come upon this scene of violence.

But today those craters are silent. Their long pipes, driven deep in the earth, are clogged with obsidian. But in the soft grey landscape which they dominate in spite of the nearness of the high Sierras, they seem to wait only the opportunity to blast forth again on another wild rampage of eruption.

I confess to my shame that until last September, I knew nothing about the Mono craters. Husband and I were planning a vacation trip for Inyo-Mono recreational area. Mrs. Ray Gabbert of Riverside, knowing we were a couple of rockhounds, told us about the tons of obsidian to be found in the easily accessible crater nearest Mono lake. She told us we would find the whole group of craters worthy of inspection.

There are many places in the desert Southwest where obsidian may be found, but the location described by Mora Brown in this month's field trip for Desert Magazine readers is probably the daddy of them all. Mono craters not only offer a fine assortment of volcanic glass for the rock collector, but they provide an excellent opportunity to study the formation of this mineral at its source. Here is the story of one of the most interesting geological areas in California.

By MORA M. BROWN

Our car loaded with sleeping bags, tent, water containers and supplies for any place or weather, we went in search of rocks and scenery with no fixed goal in mind. From Riverside we took Highway 395 over Cajon grade, past the tungsten mine at Atolia, and up into Owens valley. Up there it was cold. Snow was falling on the peaks.

We stopped at Independence for a visit with the Paul Ritch family. Paul is resident engineer for the Metropolitan water district, and in the early reclamation days of Idaho, he and my husband worked together.

We spent the three following days in
the lovely cabin which the Ritches built
themselves at Whitney Portal. With Mt.
Whitney towering at the head of the can-
yon, with overwhelming cliffs around us,
with spots of snow and ice and sunshine,
it was much more than beautiful.

At Bishop we made the acquaintance of
one of the valley's best known and best
loved citizens—W. A. Chalfant. It was in
1885 that his father P. A. Chalfant estab-
lished the Bishop Register and made his
son a partner. Since 1887, the son has been
its only editor and publisher. For many
men, that would be a full-time job, but in
those years Mr. Chalfant had been active
in valley affairs and has found time to
write three authentic histories of his cor-
ner of the world: "Outposts of Civiliza-
tion," "Death Valley: The Facts," and
"The Story of Inyo." He is now working
on a book about the Mono country.

North of Bishop we climbed Sherwin
grade, stopped to see the geyser at Casa
Diablo, and came at last to an upgrade
where the big desert valley yielded to
evergreens. Soon the ground under the
evergreens began to change, until the earth
was replaced by a deep carpet of what
looked like grey pebbles. But they were
not ordinary pebbles; they were the vol-
canic material thrown far and wide when
the craters were in action.

We reached Deadman's pass. There
the trees had thinned considerably, and
the grey color possessed everything. On
the left we saw a symmetrical mound; on
the right were others, one so low it looked
more like a lake bed. We didn't know it,
but we were crossing the southern end of
Mono craters.

Soft, pleasing grey. Even the day
seemed to absorb the color, so that, under
a bright sun, it had the weird tone we as-
soeate with an eclipse. Then the craters
lay behind us. But at June Lake Junction
the highway again swung north, and we
paralleled them all their 10-mile length.

Symmetrical and beautiful, bold in the
contrasts made by trees and black obsidian
against the delicate grey, they are like
nothing we had ever seen. "They are like
nothing," said Isaac Russell who studied
them for the U. S. geological survey, "in
the United States or anywhere else to my
knowledge."

They made me think of sloping round
steps set at haphazard levels. The highest

Above—Looking from the obsidian
heart of Panum crater toward the lap-
ellei slopes of the craters to the
south.

Below—Amon Brown examines the
coloring in a piece of Mono crater
obsidian. The two huge boulders in
the background are solid masses of
volcanic glass.
one occupies center place and wears an obsidian crown. Several cones are topped with obsidian. Others are flat and composed entirely of the pebbles. In two places the molten obsidian pushed through the cinder cone and down the slopes to end in high black cliffs.

From the main highway a number of dirt roads led toward the craters, but the only surfaced one is six miles south of Leevingine, opposite the loop road around Silver lake. It is marked to Benton, and passes between the two most northern cones. We followed this road for about three and one-half miles, then took a dirt road to the crater near the lake. A road of sorts leads up the slope of the cone but we would not advise attempting it. Neither would we advise turning around in the deep loose material there.

That crater seems to be the only one with a name. It is Panum. Really it is two craters encircled by one steep ring of lapilli, which is the name given by geologists to the pebbly, porous material which is thrown out with the first eruption. Lapelli is light in weight, angular, small, and it likes the inside of your shoes.

We climbed through it, sliding backward sometimes, to the rim, then down to where it stopped against a rearing madhouse of angular rock both grey and black. We clawed our way up this and found it to be a vast plug of pure obsidian, upended, fractured, jumbled, and sparkling in the sun. We had to move with care, and we wore gloves because the volcanic glass was sharp.

Both black rock and grey are obsidian. It was the presence of steam bubbles at the time when the mass was cooling that determined consistency and color.

From the jagged north side we looked down on Mono lake, a blue gem in a desert setting, dotted with two volcanic islands. From the west side we looked upon the high Sierras, their rugged grey coats brightened by the golds and reds of autumn. Leevingine lays between the lake and mountains, and the Tioga pass road disappears between the hills. To the south was the long chain of craters.

The geological story, as revealed by the men who understand the formative processes of this earth, is interesting. I am passing it along to you as it has been told to me.

Three stages of eruption are represented in Mono craters. The first blast belched out the lapelli, the fine particles of which were carried away by winds, the coarser particles falling in the neighborhood and dropping in rings around the vents. In part of the craters this is the extent of the activity. They are the flat topped craters and are composed wholly of lapelli.

In the second phase molten obsidian
was forced through the vent. In some craters it was forced up to a higher elevation than the ring of lapelli around it. The activity ceased. Panum belongs to this group.

The third phase is represented by the two overflows which I mentioned before. Here the eruptive force was great enough to force the hot obsidian over the top, through the encircling cone, and down the slopes. But this hot mass was not like most of the lava overflow with which we are familiar. Most often the lava is extremely hot, and liquid, and flows rapidly and far, ending in low humps. But here it was not extremely hot, only semi-liquid, and it pushed along in a thick sticky mass, cooling so rapidly that it fractured even as it moved. It stopped abruptly in cliffs from 200 to 300 feet high. That is the story.

From where we stood on Panum we noticed that one portion of the crater range contained an outcropping of black rock. That rock, we have since learned, is the oldest exposed rock in the group. It is the remnant of an ancient volcano; it is hornblende andesite, and differs from all the other outcropping in the range.

Much farther south, and set westward from the craters, we noticed two small hills. Isaac Russell named them the Aeolian buttes. They are composed of pink rhyolite.

From Panum we took specimens of the various types of obsidian, then returned to the Benton road to see the overflow on the east side of the craters. Russell calls these overflow coulees. I believe I’d call them Hell’s back yard. A huge jumble of obsidian all around us, a high fractured cliff of obsidian in front of us, pandemonium congealed.

Here we could see how pressure, not gravity, had forced its progress, how it had oozed and folded and fractured as it went. Angular blocks of it had broken free and fallen into the softer mass. Splintered particles of it had hardened into conglomerate. There were layers of lapelli in the black, caused by the shoeing of lapelli while the mass still moved and cooled.

We found banded obsidian here. We had seen chips of it in Nevada two days before. Now we knew where the hunting Piutes found it. The bands are narrow, semi-transparent, and are formed of layers of microscopic crystals of hornblende, feldspar and biotite. The curves of these bands, both in small specimens and in huge rocks, showed the direction of the flow.

We found the froth of the volcano, obsidian which was so filled with minute steam bubbles that it formed pumice light enough to float. Indeed, before the pumice had completely cooled the bubbles were lengthened by movement. This pumice is found on the surface of the flows. What we found had fallen down.

Such are the rocks of Mono craters. Young rock. The obsidian has a fresh, unweathered look, and it is plentiful. And there it waits in its unique setting for your exploration, be you rockhound, geologist, or mountaineer.

If you climb the center crater, the highest, you would be 2750 feet above the lake, 9480 feet above the sea. Vesuvius volcano rises only 4000 feet above the sea, and it is famous. Stromboli rises a little more than 3000 feet, and it is famous. Mono craters average better than 9000 feet, and they are scarcely known. Why?

Is it quantity? Is it because there is one Vesuvius, and one Stromboli? Does a single family of 20 volcanoes dwarf the imagination?

Or is it that tourists, filled with expectations of the high Sierras, do not look to the east? Or, if they do, perhaps they do not appreciate what they see because they have been given nothing to expect. Of this I am sure: If Mono craters were in a place where there were no 13,000 foot peaks to dwarf them, they would need only themselves to make them famous.

Are they extinct? Could they repeat the magic? Possibly, say geologists. Their location, and the line they follow, indicate that they were formed along a fissure, probably a branch of the Sierra Nevada fault. Certainly they exist on top of volcanoes of the ancient past. If geologists tell us, there were great earthquake activity again, if the old fault line should be disturbed enough to allow the escape of hot underground substances, they could blast their song again.

If they should, I’d like to be on hand ... but not in the front row.