

High Country in Season

THE GREAT SIERRA NEVADA

By Paul Webster

For weeks the sky over the Sierra Nevada has been clear—the sun warm through the middle hours of the day, the nights crisp at first and then cold. An occasional high, thin cloud has come and gone, but since the middle of September it has rained just once, and only a little then.

Picnic spots beside the highways have hardly been used for many weeks, and the deer hunters are almost invisible in small camps off the main, traveled ways. On seven of the eight roads through the mountains, occasional cars whiz up and down but only a few stop. On the eighth road, the interstate highway, it is business as usual—people just passing through a corridor to someplace else. Birds have been disappearing quietly. Deer, spooked by hunters by day and answering some herd memory by night, have been migrating down slopes toward the foothills. Bear have nearly finished their autumn gorging and are cruising the country for a wintering place. Small animals run busily but do not roam far.

Men who have been operating summer resorts nail up the last shutters; men who will operate winter resorts are taking their shutters down. Road crews have bolted blades onto their trucks and oiled up the big rotary snow-throwers. Lake tenders for power companies and irrigation districts have finished their chores, and the ditch and highline crews are checking foul-weather gear. Logging' equipment has been taken to the lowlands; forest fire crews are gone; lookout towers are locked; all over the range the scattered but numerous business and pleasure buildings have been boarded up—all but those in the ski areas. The annual winter drama of the Sierra Nevada is about to begin.

It is routine enough. Winds from the southwest sweep across the lower Pacific, picking up moisture. In late October and early November, most years, the winds are not strong on the surface, and the mass of wet air does not move swiftly, but it moves steadily. (Later will come the storms out of the North Pacific, a different kind of a storm with a different kind of power.) As the mass starts lifting along the foothills, impelled by pressure from behind and forced up by the terrain, the temperature is around 40 degrees at ground level, the moisture still in the form of vapor, visible now as an increasing cloudiness. But the bottom of the mass is sliding up the slope, climbing 150 to 300 feet in each mile of travel, and the clouds are being lifted and compressed, getting thicker. The wind at valley level is about 20 miles an hour. At 5,000 feet above sea level, in the pine and fir forest, the air is below freezing, the wind about 35 miles an hour. At 10,000 feet, above the level of the main highway passes, the air is 20 degrees, wind 50 miles an hour. Up near the top of the storm, higher than the topmost peaks, the temperature is around zero, and wind may be moving at 75 or 80 miles an hour.

Water vapor cannot remain vapor at low temperatures like these. As it cools, rain starts falling while the mass is still moving. At around 32 degrees, the vapor snaps directly into snow, crystallizing into tiny six-sided drops which lock together into larger florets. In the foothills rain is noisily drumming on the roofs and bounding off the pavements. In the mountains snow is falling quietly and steadily. It will not pile up immediately unless the ground has been frozen earlier, but even as it melts and is absorbed into the summer-dry ground, it starts its timeless work of growth and change.

The last volcanic action ended in the Sierra perhaps a million years ago. The last major glaciers withdrew to small protected cirques or disappeared possibly ten or twenty thousand years ago. It has been millions of years since sediments were deposited by lakes and seas, and rocks were formed by settling, heat, and pressure. So, except for some wind erosion, the silent chemical work of lichens, and the levering of rocks by roots throughout the year, the shaping of the mountains is now done mostly by winter and the runoff that follows it.

The first rains wet the ground. Moisture seeps into cracks and crannies. Freezing comes, sometimes before and sometimes after the first snow (parts of the Sierra have fewer than two months of frost-free days). When water freezes to ice, it expands, exerting force sufficient to crack boulders. On some of the onion-skin domes, ice pries loose slabs bigger than houses, which crash down the slopes shattering as they go. The process is seldom so spectacular, but year after year it changes the shape of the mountains. In the new cracks and crevices, small pockets of soil start to form; plants will grow there eventually. The plants will add to the habitat of insects or rodents or birds; the smaller creatures will be food for larger ones; the cycle of life continues, altered ever so slightly by each change in the terrain.

Some of the early snow melts; some of it stays and becomes the base on which later storms build the tremendous snow packs of January, February, and March. More than seventy feet piles up in some places. The first melting makes small rivulets; these move soil, gravel, and pebbles. Later runoff will pour great floods of water down every draw, every gulley, every valley, and at its crest huge boulders will be rolled and jolted along, moved by the great force. Some years bridges, highways, and cities are moved, too.

As the storms increase in frequency and power, the snow piles deeper and deeper. The permanent snow fields that lasted all summer merge with the overall white covering, and the fifty or sixty small glaciers start to grow again. When new snow falls on packed and slicked old snow, or when the wind whips cornices on the lee side of a high ridge, avalanches are born—avalanches which may move tons of rock and soil as well as snow and which can shear the top from a sizable grove of trees or fill a lake with debris.



Presently accessible only on foot over a long and rough path, the remote valley of Mineral King, in the southern part of the Sierra, is planned for extensive recreational development, over the vigorous protests of conservation groups.

Gerhard Baker photo

Lakes freeze, but never all the way to the bottom, and snow piles on the ice. The snow gets deeper and deeper—ten feet, twenty feet, thirty or more, except on the highest and barest places where the wind blows most. Unless an unusual warm rain comes, there is little melting in the winter months, even on the frequent sunny days when skiers and snowmobilers get sunburned noses while their feet are freezing, because the sun's rays are reflected from the dazzling surface.

From a distance the snowbound Sierra seems still and motionless. But there is constant movement, greatest along the highways and at ski slopes, where people and their appurtenances snort, smoke, grind, squawk, roar, pop, and screech—lesser but just as significant farther out, where a limber fir tree slips loose a branchload of wet snow, a rodent squeaks once just before the hawk strikes, the wind whispers or howls through the forest, an overburdened tree breaks and falls, or an avalanche thunders down a high slope with a tremendous roar.

While the first few snowfalls are setting the stage, however, not much moves. Hibernating animals are dened up, and the non-hibernators are sleeping until a break in the weather comes. It snows hardest at middle elevations, even more than at the crest; and once the snow starts to stick, the drifts and pack pile up astonishingly fast. For a day or two the soft white layer may be almost untracked; typical Sierra snow is light and fluffy, and moving in it is difficult. Then, as it compacts and hardens, a rabbit ventures forth, and other small animals such as squirrels, chickarees; and perhaps mice. When they are out, a coyote or bobcat or marten is sure to follow. Coyote tracks are the most common, tracing an erratic hunt from tree base, along a partly buried rail fence, around the base of a boulder, in and out of the branches of a fallen pine. At lower elevations, deer yard up and eat what they can reach, handicapped in snow by their slender feet; winter is hard on deer, especially if they have not gone low enough on the slopes or if the snow falls below its usual line.

In the inevitable spell of clear, sunny weather, skiers flock to the civilized slopes, and farther out the modest number of ski-tourers in pairs and small groups start leaving their slim tracks in a climbing pattern up the ridges, then in long sweeping paths down the steep hillsides. An occasional snowshoer makes his trudging marks up along the contours. Then the snowmobiles come out, penetrating farther back than the others, leaving deep marks in the snow and a scent of gasoline and oil in the air. Workmen, using all kinds of transportation from snowshoes through large tracked vehicles to helicopters, go to their maintenance and repair work on power lines, communication wires, water canals, dam installations, microwave stations, and airway beacons. All people on the surface are playing or working within a reasonable distance of a road end, perhaps ten or twenty miles at the most, although the helicopters may go in more deeply. Even in mid winter there are as many open, sunny days as there are stormy days, making life and activity possible.

Winter starts changing to spring in March or April, although it may snow in May or June, and some spring flowers do not appear at alpine elevations until August, for the Sierra is a complex place and does not lend itself to generalities. On an Easter Sunday, garden and wildflowers may be in full bloom in the foothills at 2,500 feet while at 7,000 feet there may be twenty feet of snow, and the airline distance between the two elevations may be only twenty or thirty miles.

While the snow is soft and melting, human activity slows down and plant and animal life picks up. Small animals are out every day; insects of special kinds appear at the edges of snow banks and birds appear to eat them. Where water trickles out from the melting edge, plants start to grow— but almost imperceptibly because the temperature drops below freezing in the early hours of every morning; differences of forty to fifty degrees are recorded in the same day. The changes in temperature affect the streams; fast melting in mid afternoon

raises the water level and velocity for a few hours, and the night's freeze cuts it back, so that sometimes waterfalls start and stop on a daily schedule. Farther down the mountain, aquatic life in the rivers adjusts to the daily rise and fall. During the spring, the big dams in the foothills fill to carry the state through the arid summer.



Wherever vegetation can get a foothold, it does so, narrowing down the streams and helping to fill the valleys.

Gerhard Baker photo

If Memorial Day is marked by good weather, and particularly if it comes at the end or beginning of a week and makes a three-day holiday possible, the influx of human beings into the mountains begins. Fishermen have been in and out since earlier in the month, but for the cabin owner and resort owner. Memorial Day is an aiming point. June, July, and August, all with benign weather, bring human and nonhuman activity to a peak; then, in the beautiful Indian summer before the storms start again, human activity tapers off and the animals and plants are busy once more beating the deadline of snow.

This article is based on The Mighty Sierra: Portrait of a Mountain World, to be published by American West Publishing Company in the spring of 1972.

Paul Webster, for many years active in the journalism field in the West, has covered a great deal of the Sierra Nevada.

Excerpt taken from the *The American West* of November 1971