SIERRA CLUB BULLETIN

May 1951

San Francisco, California

Sierra Club

To explore and enjoy the mountain regions of the Pacific Coast; to publish authentic information concerning them; to enlist the support and coöperation of the people and the government in preserving forests and other natural features of the Sierra Nevada

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Sierra Club Bulletin

VOLUME 36 MAY, 1951 NUMBER 5

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Frontispiece from The Incomparable Valley *(University of California Press)*

Published monthly except August by the Sierra Club, 2061 Center Street, Berkeley 4, California. Annual dues, $6 (first year $12), of which $1 (nonmembers $2) is for subscription to Sierra Club Bulletin. Entered as second-class matter at Post Office, Berkeley, under Act of March 3, 1879. Changes of address and manuscripts should go to address above; communications on matters of club policy should be addressed to the Secretary, 1050 Mills Tower, San Francisco 4.

Printed in the United States of America by James J. Gillick & Co.

SENTINEL ROCK, YOSEMITE VALLEY *By Ansel Adams*

. . . four nights and five days on the face

Sierra Club Bulletin

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Ordeal by Piton

By ALLEN P. STECK

THIS STORY is not unique in the relatively short history of class-six climbing—there are many two- and three-day ascents listed today in the Swiss, Austrian, and Italian Alps; indeed, directly across from Sentinel Rock, in the Yosemite Valley, is the unmistakable spire of the Lost Arrow, climbed from its base for the first time in September of 1947. This five-day ascent by John Salathé and Ax Nelson was considered the greatest achievement of its kind in the history of tension climbing.

The Sentinel climb was of equal rank, perhaps even surpassed it—who can say? John used to tell me, as we waited out the sleepless bivouacs, that he couldn't decide which was "better." "You know, Al," he'd say, looking out across the valley at the Lost Arrow, "it's still a pretty good climb. You and Long ought to climb it next." My answer was a despairing grumble: my next climb was going to be Sentinel Dome in a wheelchair.

I lay awake many a night in Berkeley wondering what this north wall was like above the buttress; it was almost an obsession with me. This sort of feeling is indeed strange to the hiker or fisherman, yet it is typical of the climber.

Many have questioned the quality of this sort of achievement, deploring the use of pitons, tension traverses, and expansion bolts, but the record speaks for itself. This is a technical age and climbers will continue in the future to look for new routes. There is nothing more satisfying than being a pioneer.

The lure of the Sentinel Wall goes back to 1936, when Morgan Harris, William Horsfall and Olive Dyer made a reconnaissance on the north face. Rising a full 3,000 feet from the grassy floor of the Yosemite Valley, its sheer north exposure presented a fantastic problem in route finding; true, there was only one possible route (i.e., the Great Chimney), still there was the big question: how to use it? They reached the Tree Ledge, a prominent sandy terrace 1,500 feet above the floor, at the very foot of the north wall proper. Although no records exist, undoubtedly Charles Michael and William Kat, in their explorations of the cliffs, had ascended over easy class-four ledges to this terrace.

Several years later Morgan Harris and Dave Brower succeeded in reaching the Tree Ledge, and from the westernmost portion of this ledge they pioneered a route across the west face of Sentinel Rock and up its broken south side. The north wall remained untouched until the early 'forties, and, after several attempts by Robin Hansen, Jack Arnold and Fritz Lippmann, a high point was finally established some 150 feet above the Tree Ledge, to the right of the huge buttress that lies up against the lower portion of the wall. The difficulty was severe, but each attempt added to the knowledge of the route. It seemed of little concern that there was over 1,300 feet of tougher climbing yet to do. That problem would take care of itself eventually.

In the fall of 1948, Jim Wilson and Phil Bettler took the initiative and reached a ledge a hundred feet still higher, setting a new record. Then in October 1949 a four-man party—Phil Bettler, Jim Wilson, Bill Long, and I—arrived at the Tree Ledge prepared to make the first bivouac on the face, and was able to climb some 200 feet past the old high point. We passed the night on a loose, tilted chockstone directly beneath the 60-foot, 100-degree "Wilson Overhang." One person could stretch out comfortably, but unfortunately there were four of us. No one was able to sleep but Phil, who had taken one of Jim's backache pills to ease his headache—they were knockout pills, a decided must for any climber's bivouac equipment. Cursing Phil for his contented snoring, the rest of us waited out the night. Morning came and we continued up over the overhang, admirably led by Jim, to a new high point about 450 feet above the Tree Ledge. All eight leads were various degrees of class-six climbing, and over fifty pitons had been necessary.

Then came the remarkable ascent over the 1950 Memorial Day week end. Bill Long and Phil Bettler, in a two-day ascent, succeeded in reaching the top of the great 800-foot buttress, and thus the first major problem of the wall was conquered. Above the top of the buttress stretched

the final 700-foot face, whose broad expanse was broken only by the Great Chimney, a large dark cleft easily seen from the valley. This still remained the only possible way to the summit.

"The first sixty feet (the Headwall Lead) above the buttress is smooth, vertical granite. The Great Chimney is over a hundred feet to the left; it seems impossible to reach even by a tension traverse. Three hundred feet above the Chimney narrows down to less than a foot and the walls are bare and overhanging. You may get into the Chimney, but 'The Narrows' looks doubtful." Thus had Long and Bettler reported the situation at the top of the buttress. The Narrows seemed—and ultimately proved—to be the most spectacular lead on the entire wall.

As on the Arrow, the route here was unmistakably clear; we joked about who was going to be the first to make the terrible 150-foot swinging traverse into the Chimney, but it seemed unlikely that this was the easiest way. There were a few small water cracks leading up the head wall that looked "feasible," to use the word loosely. In June, Jim and I made the first all-out attempt on the wall. As charter members of the recently established "Berkeley Tension Climbers' Running Club," we conditioned ourselves for the five-day attempt by covering the standard cross-country course in the Berkeley Hills. But it was of little avail; on the first day a falling rock severed our rappel rope on the second lead and we had to retreat. Leaving our supply of water—two gallons—and some fruit up on the wall, we rappelled as best we could to the Tree Ledge.

On June 30, while the rest of the R.C.S. held its annual Minarets climbing trip, John Salathé and I climbed up to the Tree Ledge, prepared for another long siege. At the foot of the buttress we sorted our supply of hardware: fifteen carabiners, ten or so horizontal pitons, about eight angle pitons, and 12 expansion bolts plus hangers. We also carried a 300-foot rappel and a 120-foot quarter-inch hauling line for the packs, along with a little dried fruit. Our water, more dried foodstuffs, and a small can of tuna were up on the ledge 200 feet above, where Jim and I had left them.

Two days brought us over now familiar ledges to the small cairn on the buttress—800 feet, fourteen leads (all class 6 in part or in whole), and some eighty pitons later. From there on all was still unknown.

We were to be another two and a half days reaching the summit, only 700 feet above, but requiring eleven leads and some seventy-six pitons plus nine bolts. The upper part of the chimney is broken, and many of the leads were composed of short class-four stretches between class-six overhangs. The last lead to the summit was a 110-foot class-four "scramble."

On the entire four-and-a-half-day climb, thirteen leads were made by

John and twelve by me. The ascent of this wall was probably the toughest one that either of us had ever made, or ever hoped to make again. Though John has 51 years to my 24, the climb seemed to have little effect on his endurance; only toward the end of the third day, did he seem to show signs of wear, but then both of us were ready to acknowledge the pleasures of simple back-country hiking. It was just too damned hot. Each afternoon at two the sun came from behind the wall and turned the face into a veritable furnace; temperatures up to 105° were recorded down in the valley and there wasn't a breath of wind. We could watch the swimmers down in the valley, languishing in the cool waters of the Merced —one would dive in now and then and we could easily see the white foamy splash as he hit the water. The thought of suddenly finding myself in a cool fragrant spring was so maddening that it was hard to keep my balance. If only those swimmers would stop splashing! And this was only the third day! John never said much about it, but I knew he was thirsty. Standing there in slings, with his hammer poised over the star drill, John would turn his head and say, "Al, if I only could have just a little orange juice!" Up on that wall, oh what such a simple thing as a glass of orange juice would have been worth!

Inside the Great Chimney, I happened upon a little crack, glistening in the shadows. I remember watching, my lips tight and drawn, while a little bead of water seeped out and smoothly slid down the rock. It was barely enough to moisten my lips and wet my mouth, yet it was a wonderful sensation. We were so short on water that we could eat little during those five days. John left his dates in the chimney; he was tired of carrying them. I threw my food away upon reaching the summit. All in all I would guess that we ate half a pound of food apiece—as a liberal guess!

With ten expansion bolts already placed, the second ascent should do better, if there should ever be one. Six were needed on the Headwall lead. John stood in slings more than ten hours on that one. That day, the third, we made a total of only two hundred and forty feet. And after struggling over every foot of it, we were faced with the possibility of having to turn back. Not being able to go straight up, we climbed back into the chimney and eventually, through an inner chamber, reached a large ledge directly beneath The Narrows. Again the same old story—where to go? I can only say that there was little there with which to work. John finally made a bold attempt, using pitons upon which only he would ever rely (the double variety—back to back!); hanging almost horizontal, he was barely able to reach around to the outside of the chimney. The piton crack that he found made the lead. The Narrows were behind us!

The leads above here were agonizing in the hot sun. Still no wind. The packs got jammed in the chimneys, causing a great deal of wear on the nerves; there were bitter words, and we weren't afraid to let our tempers explode. When Ax Nelson heard of our plans, he remarked once to John, "If you expect to make the top, Al will have to be every bit as stubborn as you!" John agreed that I was.

The awful thirst. The overpowering heat cannot be described in simple words. Once on the top we could see the thin foamy line of the stream down in the gorge. We were on top, sure, but the ordeal wasn't over. We had yet to get down to the water that was staring us in the face. I slowed down for John as long as I could stand it, and then bolted down the couloir. I paid bitterly for my haste, for I descended into steep chimneys and had to claw my way back up through the hot dusty deerbrush looking for another way. My judgment was numbed by the thought of water. I tripped over bushes, fell over unseen ledges, and finally collapsed fully clothed into a pool at the foot of a small waterfall. This was the climax of the climb, a supreme climax! And I can say, in retrospect, that it was well worth the effort. The reason, the incentive, the motive for all this? It is an intangible, provocative concept that I shall leave to the reader to explain. Some think they know why; others despair of ever knowing. I'm not too sure myself.

Down the Narrows of the Virgin River

By LEWIS F. CLARK

"You must come with me to Zion Canyon when we go down the Narrows of the Virgin River." So wrote my brother Nate to me last June. His glowing description of his scouting trip over Decoration Day and his spectacular pictures of the lower end of the stretch convinced me and quickly I replied Yes. So plans were made to devote the long week end of July 4th to the trip.

The Colorado River country is famous for its scenic canyons. Its major tributary from Utah, the Virgin River, has carved chasms that are probably unrivaled for a combination of deepness and narrowness. There are deeper canyons and narrower gorges but where will one find any that combine these dramatic features in such colorful union? In 1872 G. K. Gilbert traversed the North Fork of the Virgin from a point near its head to its junction with the East Fork (Parunuweap). These spectacular miles of canyon, in places less than twenty feet wide between sheer walls 2,000 feet high, he named "the Narrows—the most wonderful defile it has been my fortune to behold."

Zion Canyon has been visited by white men in increasing numbers for almost a century yet relatively few persons have penetrated all the way through the Narrows, particularly their upper reaches. Reliable information about these mysterious depths is so scarce that we felt like explorers.

There were the inevitable questions about what to take, who would go, and when. Zion Park has two definite dry periods, early summer and late fall. We hoped that the first week in July would still be in the so-called dry period. That was important for two reasons: freedom from flash floods was an essential safety factor, and dry weather would simplify our camping gear. My brother took care of organizing all arrangements for lightweight wool sacks in waterproof covers, food for two days within the gorge, and a section of the Zion Canyon National Park topographical map specially mounted and lacquered for pocket carrying. This excellent map shows the rugged terrain in remarkable detail, a feat made possible by aerial surveys in the 1930's.

The party was to go in three cars. As it turned out, an even dozen people went along: Joan and Nate Clark, Jim Cooper, Emma Gerling, Aubrey Kneisley, Dave and Herschel Paradise, Jonnie Serna, Jessie and Fred Servoss, Frank Sieber, and I. The roster of participants was not

settled until half an hour before departure time from Los Angeles. Just as Dave was in the midst of packing, brother Herschel suddenly popped in from Florida—on leave from Navy duty on a submarine. Dave talked fast, not wanting to miss our trip nor his brother who had crossed the country to see him.

In Zion National Park, as in a number of other national parks, all persons who wish to go climbing or exploring off the trails are required to register with the ranger headquarters. Notices to this effect are posted in campgrounds and other places in the park. This requirement is intended, of course, as a safeguard for visitors. We knew that the Sierra Club has strongly supported the view, which is rather generally accepted by the park superintendents, that it is better to have all explorers and climbers register, giving the rangers the opportunity to dissuade leaders of parties from making unwise trips, than to have flat prohibitions against such exploration and have some insurgents go anyway and perhaps come to grief with none knowing where they are.

Finding, upon our arrival in Zion, that the head ranger would be in his office about four o'clock, we passed the meantime with a swim and siesta. As soon as we had briefly outlined our proposal the ranger's first reaction was that we should not make the trip because of the hazard, and besides he knew nothing about us. Although several of our party were Sierra Club members we refrained from mentioning this fact at first, since we realized that mere membership in the club does not necessarily indicate competence nor judgment in conducting oneself off the trails.

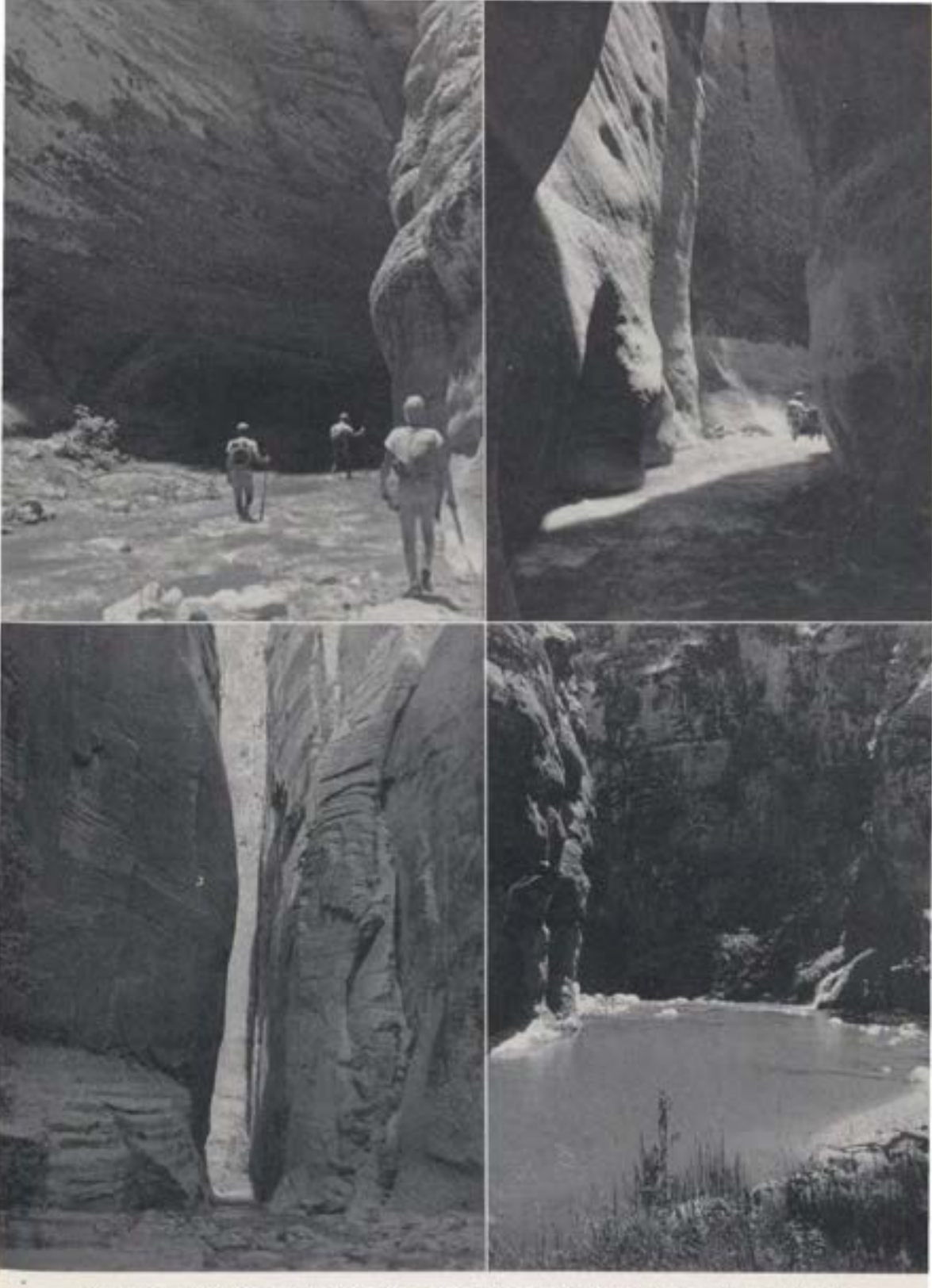
The ranger explained that from early July through August trips through the Narrows are inadvisable because of the threat of thunderstorm and flood. Late September is considered fairly safe and water is low then. In June the weather is likely to be clear but the water in the river is higher and colder. He pointed out that the thunderstorm season was imminent, that there had been no rain for weeks and it was overdue. This opinion, although quite reasonable under the circumstances, was unexpected, and to us an abrupt setback. Our leaders talked with the ranger and the park naturalist (who had been in the upper North Fork country) for a good hour and a half, going over the perils of the gorge, the experience of the party members, possible alternative trips. Finally it was agreed that our whole party would drive that evening to the chosen starting point on the uplands of the North Fork and the next day would consider the weather and the recommendations of the local residents. The long day was getting late so we drove up the Mount Carmel highway and just beyond the east gateway to the park turned north onto a graveled

county road that eventually finds its way to Cedar Breaks. The road roamed for thirty miles up and down over the rolling plateau lands of the Kolob Terrace into which the canyons of the Virgin River and its tributaries are sunk. At dusk we came to an abrupt canyon and began to look for a spur road to the ranch. A map conference by flashlight convinced us that we had just crossed Orderville Creek. On we drove, around endless turns until, in the bottom of a broad gentle valley, we crossed a bridge and there was our ranch road. At last the North Fork! We turned off a short way and soon had camp set up with a cozy campfire to drive back the nippiness of the 5,800-foot altitude.

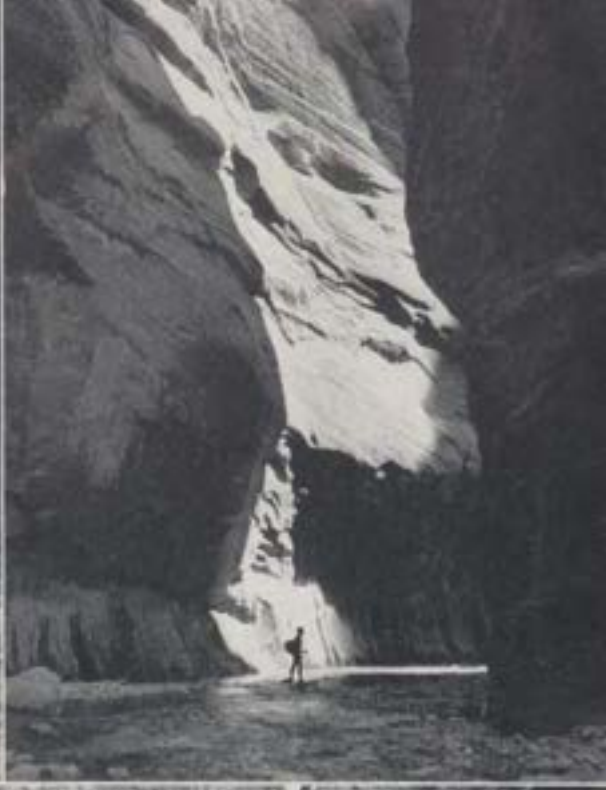
Next morning the party was astir at dawn. No clouds—a good sign. Now the decision must be made. If we were to go down the river there was final packing and the car shuttle to be arranged, and we ought to get going. The three girls were to drive the big sedan back to Zion Canyon—a drive not without its own arduous aspects to them—and meet us at the lower end of the Narrows about four o'clock in the afternoon of the following day. At the ranch we talked with Mr. Chamberlain, a genial man who with his family spends the summer with their cattle and pigs and orchard, and the winter in the town of Orderville east of the Park. We also talked with a prospector (rumored to be hunting uranium, although this remained unconfirmed). He claimed he had been down through the gorge and his assurances strengthened our determination to try it.

We drove through several gates and across the creek to the absolute end of a rough, very narrow road which extends a couple of miles west from Chamberlain's ranch to a prospector's cabin. On the map this is about at the point under the *v* in *river*, just east of the elevation mark *5506* and about 1.5 miles airline from the northeast corner of the park boundary. The girls and we had exchanged wishes of good luck and we started our hike. According to the tenth-mile marks Nate had put on our pocket map we had approximately 11.5 miles of water-grade route to reach the near end of the trail in Zion Canyon.

The valley was broad and open, the stream meandering through a series of meadows with pine-clad hills on either side. Soon, however, the valley became narrower and deeper. Instead of occasional little cliffs suddenly there was a huge vermilion precipice with tall dead trees leaning against it. The stream lapped its very base. Down logs jammed across the stream and we had to clamber around or over them. But mostly we zigzagged downstream through water which averaged a foot in depth. There were, of course, deeper pools. After half the party had passed one sloping bank, Jonnie, always alert for live things, saw a coiled rattle-



IN THE NARROWS OF THE VIRGIN RIVER: entering the North Fork Narrows; overhanging cliffs within the North Fork Narrows; at the junction of Deep Creek; spring at the head of the Main Narrows. Photographs by Nathan C. Clark.



In the Main Narrows; at the Orderville Creek Junction; in "The Auditorium" of the Lower Narrows. Photographs by Nathan C. Clark.

snake and caught it with a forked stick. After that we were more careful to watch beside our steps as well as ahead. There were several low waterfalls which we got around easily at this stage of water. One narrow fall plunged into a pool of unknown depth. To get past this we scrambled up the left wall through trees and brush about forty feet and slipped through a two-foot cleft in a huge rock, then descended a sloping ledge to the shallow end of the pool below the falls.

The last mile and a half before the junction with Deep Creek was an extremely narrow gorge with vertical walls rising in weird undulations to the sky. In the narrowest parts two persons side by side with outstretched hands could touch the opposite walls. Alternating with these sections there were alcoves and bays with more sloping sides and gardens of ferns in the fractured rock terraces. We kept our eyes alert for escape ledges. There were many, we thought, although there were also many sections of several hundred yards where no one could climb out. We are still wondering how high the water could rise here. Opinions vary from a few yards to a hundred feet, all in a matter of minutes. Herbert Gregory, in *A Geologic and Geographic Sketch of Zion National Park* (Zion-Bryce Natural History Association, July 1949), says, "Because the tributaries flow on bare rock and thus carry the rainfall quickly to the master stream, floods follow each shower. Thus many times each year the volume and velocity of the stream are increased many fold. Huge boulders are dragged along; the banks are undercut, and the walls are scoured 10 to 40 feet above low-water level. Running on the steep gradient of 50 to 70 feet to the mile, the Virgin River carries away from the park each year more than a million tons of rock waste." Some say you can smell the musty downdraft before the flood. Others say there are walls of water coming down like a wave crest. I remember having once been caught in the canyon of Bright Angel Creek in the Grand Canyon Park during an hour-long thunderstorm with an accompanying deluge of rain; and the stream rose rapidly, but there was no wall of water. No doubt, however, in the Virgin River occasionally a log jam is broken and water and bouncing logs come tumbling down the gorge as though a dam had burst.

Suddenly the hugging walls parted as if we had passed through a doorway in an ancient temple. Sculptured walls, ranging in color from reds, orange, and amethyst to white, rose skyward for thousands of feet. On our right through another portal a clear stream, wider than the one we'd been wading, flowed across the sandy floor of our temple, the bed of the new stream filled with round stones, some of them granitic in appearance. We were sure this was Deep Creek. Ahead on the far side of the amphi-

theater, through a narrow gorge, the confluent streams disappeared around a bend. We paused here to rest a moment and consider the situation. Soon there would be no more light in our deep canyon, although it was several hours before sunset on the open country above. We wanted to find a safe campsite, if that were possible. After scouting around and debating alternatives, we camped on a sandbar in Deep Creek a couple of hundred yards above the junction. Here was one 45° escape ledge on which we cached our cameras and extra food; then we prepared supper on a huge flat rock resting on the sandbar.

Jim thought each person should take turns sitting by the campfire so we could be warned if the water started rising. Deep Creek has its source in the highlands of Cedar Breaks, and a shower miles away could cause a flood where we were even with a clear sky overhead. Herschel said he didn't come 3,000 miles from his submarine into the wildest place anyone could find, 2,000 feet beneath the surface of the plateau, to stand *watch!* Well, he had a point, and that let him out. Then we felt raindrops! Above, the sky was cloudy in spots. We finished our supper while Nate, the engineer, mentally calculated acreage, precipitation, and stream flow, and finally announced that it would take eleventy gillion cubic feet of water falling over the basin of Deep Creek to raise the water in our spot in the canyon ten feet—we figured we had that much leeway. Before the debate on this had run its course, half the party had hit the sack. From where I lay on the sand I could look straight up and see three pine trees far above silhouetted against the faint glow of the sky. On my left, to the north, the stars were blanked out by clouds. I wondered if it was raining up in Cedar Breaks. Then there was a roaring sound. Water? It grew louder, like a plane. It was a plane. There were the winking lights. In our relaxed state which followed, I was reminded of some of the history of the place. I remembered reading that the first white men known to have visited Zion Canyon were the Mormon colonists. Guided by friendly Indians, Nephi Johnson went up the river in 1858 as far as the Great White Throne and perhaps to the Narrows. This was the canyon known to the Piutes as Ioogoon ('arrow quiver'—'Come out the way you came in'). We had come into Ioogoon through the back way; would we, I wondered, be able to go through and come out the front way? Moonlight now bathed the upper walls of the chasm with a soft wondrous light, but beautiful though it was it couldn't hold my attention, and I slept.

Next thing I knew, the sky was getting light, someone had the fire burning, and the doubts of night were forgotten in preparations for the day ahead. Breakfast was fairly simple: oranges, dry cereal, bacon, boiled

eggs, and a drink that as far as I can remember must have been coffee. The shutter of my camera had balked the evening before, and I had worked on it during the darkness. Now it seemed to work, but only at one speed. What a place to have camera trouble. I took pictures anyway, and later in the day the shutter seemed to forget its pout and behave more like its usual self.

Even before the direct sun hit the stream, how much more cheerful the canyon was, with sunshine on the cliffs above and a bright blue sky overhead! Two water ouzels chirped and flitted from rock to rock, as though to draw us on—and perhaps away from their nest. Some of the party had never before seen this bird and especially enjoyed its odd dipping motion and its playfulness in the water. Where Kolob Creek enters from the north, and downstream from here, we found a number of good-looking campsites: benches twenty to forty feet above the stream with a width of canyon that would seem to afford more safety than our Deep Creek site. The best one was between the entrances of Kolob and Goose Creeks. Below this the main stream snakes around so that we seemed to head in every direction in turn. We had lunch and a swim beside an alluring pool, ten to twelve feet deep, with a cool spring seeping from the east wall. Warm rocks tempted us to a siesta, but only too soon we were packed up and sloshing down the stream again.

The real box canyon of the main river begins abruptly, about a fifth of a mile below the entrance on the right of a beautiful spring-fed creek which drains out of Corral Hollow. Part of the water poured out in a fan shower from beneath brilliant orange flowers. As we rounded a turn, the walls closed in and were vertical for many hundreds of feet, then, stepped slightly, continued to rise precipitously in a series of ledges. Far down the nearly straight canyon the water extended from wall to wall, except for a gravel bar now and then. The contorted walls were generally about twenty feet apart, and in many places curved in toward the center of the stream fifteen feet or so above low water. The variation in the amount of erosion may be due to different amounts of resistance in successive layers of sandstone, perhaps to fluctuations in the number of flash floods, and undoubtedly to the effect of water seepage through fractures in the walls. There was much seepage. Often there would be a horizontal line of delicate ferns growing apparently out of solid rock; only a close inspection would reveal the faint seepage crevice. Around a bend the gorge widened but the way was blocked by huge boulders fallen from the heights. The pool was too deep to wade, so we put cameras and wristwatches into waterproof plastic bags and walked—packs and all—until there was no

bottom. The packs buoyed us up surprisingly well. On the shoal below the amphibians walked out and burst into laughter as one after another poured gallons of water out of his knapsack. Along here we had striking evidence of how the canyon had been widened yet the verticality of the walls preserved. We saw a jumbled pile of huge rock fragments several hundred feet along the left bank, and near by the wall of the gorge curved skyward to an overhanging rock cornice. As Herbert Gregory explains it (op. cit.), "The evidence is clear that the canyon alcoves are the work of rain that falls directly into them and of underground water that seeps out through their walls. The process is sapping and undermining rather than excavation. The cliff walls of sandstone are undercut by the removal of soft shales beneath, and in response to gravity, fragments fall off. The walls retreat and the rim develops curves and crenulations." We were much surprised here to find several water ouzels who lacked wariness about our approach. One sat quietly on a branch while we petted it. Another allowed us to pick him up gently and carry him a quarter of a mile, but seemed only curious, not frightened, when we set him down on the branch of a small aspen. Whether through fear or lack of it, the bird was certainly witness to a strange sight; half-naked humans splashing downstream, waving their walking sticks and shouting to each other.

Again the walls closed in over us on either side. Over the rushing waters of the stream I heard a very deep gurgling sound, mysterious and ominous. I peered around and found its source—a spring above the level of my head, pouring a stream into a dark pool. We would like to have paused, but the afternoon was getting on. Besides, there were passages where for forty to fifty minutes of normal travel there was no possibility of climbing up off the bottom of the gorge. The sky was clouding and we felt a compelling urge to keep moving. From time to time we did stop a moment to take the sand out of our shoes. The riverbed was mostly roundish boulders, from the size of a man's head down to gravel, and with occasional rocks as big as a dinosaur. It seemed many times as if we were going through high vaulted tunnels, and I thought of the pursuit of The Third Man. In some places one can, they say, look straight up and see the stars in mid-day. Not so for us; either we didn't look in the right place or the growing overcast hid the stars.

The narrowest portion of the defile was just above the junction with Orderville Creek. This tributary from the east entered on mainstream level through an even narrower gorge; a short way from the junction one person could almost touch its opposing walls with outstretched hands. In May the pool at the junction had completely covered the floor of the

chamber, and the water was a good ten degrees colder. On our trip the water was comfortably cool. Without the river this canyon would have been an oven in its more open passages.

About a quarter of a mile below Orderville Creek the gorge became roughly twice as wide, but even here the water extended from wall to wall. This is the portion of the river that is marked on the map "The Narrows." Soon we heard voices which were not ours. On the east side was the end of the trail that comes up from the loop road at the Temple of Sinawava, and there were the girls. As we walked out of the river and joined them, a crowd of tourists watched the ranger point out The Narrows beyond and heard him tell of the hazards which lurked there.

Nate tells me he heard that several weeks after our trip a big flash flood inundated the whole canyon at the Temple of Sinawava. Such a sight would be thrilling to see—from anywhere but the box canyon!

Aldo Leopold—Champion of Wilderness

By HAROLD C. BRADLEY

IT IS DIFFICULT to make an objective appraisal of the work of a man you have known and loved. Nevertheless, I venture to believe that few recent books will be more appreciated by Sierra Club readers, or found to be more deeply moving, than Aldo Leopold's *A Sand County Almanac, and Sketches Here and There* (Oxford University Press, 1949). It will appeal most strongly to the older members, because it discloses a philosophy and an attitude toward our wilderness which is their own, and the fundamental motivation of the club, and it does so with a clarity of thought and a charm of prose expression which makes it read like the best of poetry. For the younger generation, who are naturally more preoccupied with the varied physical opportunities provided by the club, it may well lead to a clearer understanding of these underlying motives which have guided the club, and have made it over the half century of its existence one of the great forces for conservation in the United States.

Aldo Leopold was not himself a member of the Sierra Club. Indeed his acquaintance with the Sierra was very limited. But as a Forest Ranger in the southwest, he intimately knew mountains and wilderness almost as beautiful as our own. He became so much a part of it, and it of him, that he might well have been one of the club's most potent leaders had circumstances brought him to the Coast.

The title of the book gives little inkling of what is to be found between the covers. One might easily set it aside as just one more item in the avalanche of print that seems to flood the shop windows these days, and the recent-books department of the library. But if you will read it you will find more in the Sierra on your next trip, or in your own backyard for that matter, because of it. Indeed my most sincere suggestion is to drop the review at this point, and take up the book! By the time you have read for fifteen minutes, it is certain that you will continue to the end. In my own case, I read it through in one sitting. And then a week or two later I returned to read it again, this time an essay or two at a time. I expect to continue to return to it, just as we return to the mountains themselves for inspiration again and again. It is that sort of book.

Had you met Aldo, you probably would not have guessed immediately that he was an artist, or a philosopher, or even a woodsman. You would have found him a genial and friendly person, graciously open to approach. While he was well proportioned and strongly framed, with clear

blue eyes and a becoming coat of ruddy tan, you might not have guessed that much of his life had been spent in the saddle, riding the forest ranges. You would soon have discovered that his interests were catholic, his reading wide and his experience out of doors extraordinarily rich. He was an easy mixer, and very much a man's man. But you would have discovered also the evidence of a gentleness and a consideration that was as characteristic of him as his strength. Sooner or later you would have discovered that he had an understanding and a love for wilderness that was second only to his devotion to his charming and gifted family. Love of wilderness and all its community of living things, and the desire to preserve them, had become the theme and the driving force of his career.

As a boy in Iowa, Aldo became first a hunter, under the tutelage of his father, from whom he learned the credo of the sportsman. Hunting was his first love, never to be relinquished—though in later years he gave up the gun for the less destructive bow and arrow.

Ornithology became his second hobby; botany his next. Naturally enough, he eventually took his master's degree at the Yale School of Forestry and in 1909 headed west on his first job as an assistant ranger in the U.S. Forest Service, in Arizona and New Mexico. By 1924 he was chief of operations, with headquarters in Albuquerque. From there he came to Madison, Wisconsin, as associate director of the Forest Products Laboratory, and its field consultant. It was during the fifteen years of intimate acquaintance with the wilderness that he came to identify himself with it and as a part of the wilderness community. As he saw the changes that came, often unnecessary changes due to thoughless exploitation, it was inevitable that he should become a champion of wilderness conservation. It was he, for example, who originated and campaigned successfully for the idea of designating and preserving Wilderness Areas in the program for land uses adopted by the Forest Service.

To save some of the wilderness, and the wild life in it, he early realized that he must seek help from an informed public opinion. He began to write. The foresters, professional and laymen, made up one group to which he addressed himself. The sportsmen and the organized lovers of nature made up another and a larger audience. His very first article was on "Game Conservation: A Warning, Also an Opportunity," which appeared in *Arizona*, in 1916. He became the secretary of the Albuquerque Game Protective Association and co-editor of its quarterly publication, *The Pine Cone*. His vigorous articles and editorials for better game management attracted country-wide attention. In 1917 Theodore Roosevelt wrote him, "It seems to me that your association in New Mexico is setting an example to the whole country." In that same year too, he was awarded

the gold medal of the Permanent Wildlife Protection Fund of America. From then on, with increasing maturity and vision he addressed himself to an ever-widening circle of listeners. He was a prolific writer. The incomplete list of his articles numbers over three hundred, and they appeared in a great variety of magazines and journals: *The Journal of Forestry, American Forestry, Condor, Outdoor America, The Audubon Journal, Journal of Mammology, Bird-Lore, Wisconsin Agriculturalist and Farmer, The Missouri Conservationist,* and a dozen more. Some of the articles were brief notes on observations made in the field, of interest to a limited group. Others were the results of long and intensive research in the general field of game management. Others still were essays, written at his leisure and for the joy of it, in which were combined the richness of his experience and the extraordinary charm of his expression. Most of the second section of the *Almanac* came from this group. If I were asked to select the essay which I find most beautiful, I think it would be the "Marshland Elegy." Through it runs a theme of poignant regret for the passing of so lovely a scene, so full of historic meaning, for such trivial reasons and to no useful end. He writes of another passing too, on another page: "Man always kills the thing he loves, and so we the pioneers have killed our wilderness. Some say we had to. Be that as it may, I am glad I shall never be young without wild country to be young in. Of what avail are forty freedoms without a blank spot on the map?"

Aldo was quick to admit that much of our wilderness had to disappear. He never would admit that necessity would require the sacrifice of all of it. He dedicated his life to the cause of saving those finer samples which in his judgment would serve their highest practical purpose by remaining undisturbed. His campaign for the Wilderness Area reserves began in 1921—and as we know achieved its goal.

From his position as associate director of the Forest Products Laboratory, Aldo was eventually called to fill the chair of Wildlife Management at the University of Wisconsin, a chair created for him, and the first of its kind in America. His immediate laboratory for wildlife research was the University Arboretum, of which he was director. But actually he ranged the state with his studies as a member of Wisconsin's Conservation Commission, and he also ranged the nation through his connections with numerous national organizations and commissions.

When Aldo came to Madison and joined the Get Away Club in 1929, we were not greatly concerned with the problems of conservation. We

The illustrations on pages 16 and 18 are by Charles W. Schwartz and are reprinted from *A Sand County Almanac* through the courtesy of Oxford University Press. The illustration on page 15 is from a drawing by Robert Eustachey.

were a group of congenial spirits who loved the out-of-doors, and especially the wilder parts of it. Once a month we met for supper together and an evening in which we were entertained, when one of our number shared a wilderness trip with us. We were hunters, fishermen, mountaineers and canoe-men, glad to get away from Madison for the evening and vicariously enjoy life in the back country. Aldo helped us to see and to understand many things in the woods we had previously overlooked. He greatly enriched our vision. In the end, the contagious fire of Aldo's own devotion to the cause of preserving some of the things we all loved welded us into a fighting unit for wilderness conservation.

On April 21, 1948, while fighting a grass fire on a Sand County farm adjacent to his own, he died of a heart attack. The following words, written by Professor Philo Buck, a fellow member of the Get Aways, gave expression to our feeling. They stand today inscribed on a tablet in the University Arboretum:

"The groves were God's first temples."
They were also man's first home.
Their varied folk were man's first companions
Nature was man's first book; to read, to
understand, to reverence, and in this day
to preserve. To this end Aldo Leopold devoted
his life; to teach others to read, to understand, to love, and to preserve.

But to understand this tribute you needs must read the book.

Robinson Crusoe in the Sierra Nevada

The Story of Moses Schallenberger at Donner Lake in 1844–45

Edited by ERWIN G. GUDDE

THE ROBINSON CRUSOE MOTIF, dealing with the fate of a man or of men in complete isolation, usually but not necessarily on an island, is one of the oldest motifs in world literature. It was brought to classical completion by Defoe's great novel. Many of the literary productions with the theme of isolation from society are based on actual occurrences. Thus it is quite generally assumed, though not proved, that the source of Defoe's desert island story is an authentic report of the Scottish sailor, Alexander Selkirk, who had lived alone on Juan Fernandez Island for five years. During the centuries of discovery and exploration, Robinson Crusoe adventures happened quite frequently but as modern ways of communication and transportation developed, they decreased in number and now it is well-nigh impossible to lead the isolated life of Robinson Crusoe, even if voluntarily. In recent years, for example, attempts to flee from civilization by settling on uninhabited islands of the Bahamas, the Windward, and the Galapagos groups have been made in vain. Voluntary or involuntary isolation from human society and the literary motif arising from it belong definitely to the past.

Several real Robinson Crusoe adventures are mentioned in the annals of California. In 1830, when the authorities refused to accept a boatload of criminals sent from Mexico on the *Maria Ester*, some thirty of the men were provided with tools, fishhooks, cattle, and grain and shipped to the then uninhabited island of Santa Cruz to shift for themselves. There is no record of their life on the island. In the end, however, they built a raft and reached the mainland at Carpinteria. In 1853, Captain Nidever rescued an Indian woman from San Nicholas Island, where she had been left behind as a girl when her people were evacuated to the mainland in 1835. Other Robinson Crusoe situations developed in the Sierra Nevada when immigrants were surprised by early snowfalls and had to spend the winter in isolation. The tragedy of the Donner Party in 1846–47 is well known: its story has been told by George R. Stewart and by others. Two years before the tragedy at Donner Lake a young man, Moses Schallenberger, was forced to lead the life of Robinson Crusoe at the very same spot. In fact, his hut was used by the Murphy family of the Donner Party two years later.

Schallenberger, barely seventeen, had joined his sister and her husband, Dr. John Townsend, with the intention of emigrating to California. In March 1844, the group met at Council Bluffs, Missouri, with the large family of Martin Murphy and other emigrants, where they organized a company for mutual aid and protection. Elisha Stevens was chosen captain, and the company became known in the history of the West as the Stevens-Murphy-Townsend party. Save the ordinary vexations and hard-

Moses Schallenberger in later life

ships of early travel over uncharted lands, the journey was uneventful until the emigrants reached the sink of the Humboldt River. During their two-day rest they became acquainted with an old Indian, called Truckee, who consented to pilot them to the river which was promptly called Truckee River in his honor. At the confluence of Donner Creek and Truckee River a party of three men and three women separated from the wagon train and followed Truckee River to Lake Tahoe, and thence across the mountains to the headwaters of the American River. The rest of the company proceeded with the wagons up Donner Creek as far as the west end of Donner Lake. There the journey seemed to end. It was only mid-November, but the snow was already two feet deep. As it seemed almost impossible to bring the train of wagons across the mountains, it was finally decided to take only five and leave the others at the lake. By following essentially the route over which the railroad and Highway 40 now cross

Donner Pass, the company reached the headwaters of Yuba River. Here the single men left for Fort Sutter, where most of them enlisted in Sutter's forces for the Micheltorena campaign. The families with the wagons remained in camp until the end of February. The company had blazed a new trail and had brought the first wagons over the Sierra Nevada into California.

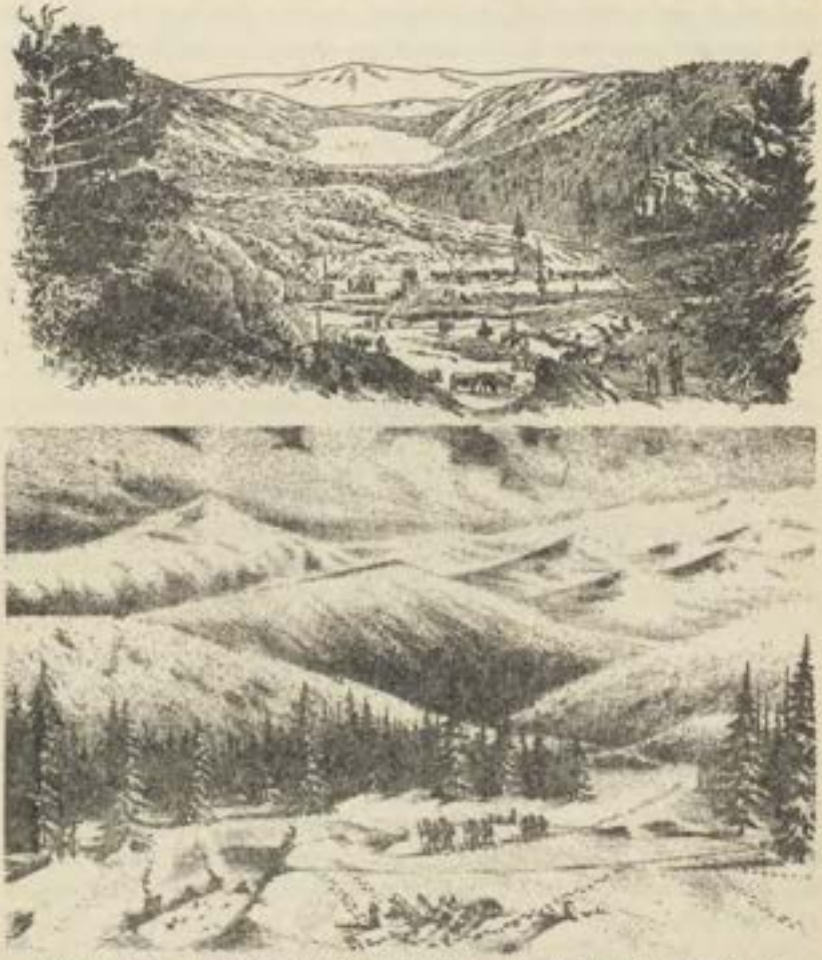
It was Moses Schallenberger, who volunteered to stay at Donner Lake to protect the abandoned wagons until the company reached Sutter's Fort, from which they could send fresh animals for the wagons. Schallenberger, despite his youth and his physical immaturity, had been an active member of the company, and was in every other respect an equal to the grown-up men. In later years he recorded the experiences of this journey under the title *Overland in 1844*. Written in a vigorous style with dramatic clarity, this account would probably be the best of the early stories of overland companies. Unfortunately, the manuscript is lost. For some time it was at the disposal of the historian H. H. Bancroft, who gives an abstract of it on page 454 of volume four of his *History of California*. Shortly after the return of the manuscript to the owner in San Jose, it was lost in a fire. Fortunately, an anonymous writer had previously published two articles in the San Jose *Pioneer*, March 15th and April 15th, 1893, which were chiefly based on Schallenberger's account and in which he incorporated the portion of Schallenberger's story that tells of his Robinson Crusoe life at Donner Lake.

"There seemed little danger to me in undertaking this. Game seemed to be abundant. We had seen a number of deer, and one of our party had killed a bear, so I had no fears of starvation. The Indians in that vicinity were poorly clad, and I therefore felt no anxiety in regard to them, as they probably would stay further south as long as cold weather lasted. Knowing that we were not far from California, and being unacquainted, except in a general way, with the climate, I did not suppose that the snow would at any time be more than two feet deep, nor that it would be on the ground continually.

"After I had decided to stay, Mr. Joseph Foster and Mr. Allen Montgomery said that they would stay with me, and so it was settled, and the rest of the party started across the mountains. They left us two cows, so worn out and poor that they could go no further. We did not care for them to leave us any cattle for food, for, as I said, there seemed to be plenty of game, and we were all good hunters, well furnished with ammunition, so we had no apprehension that we would not have plenty to eat, that is, plenty of meat. Bread we had not tasted for many weeks, and had no

desire for it. We had used up all our supply of Buffalo meat, and had been living on fresh beef and bacon, which seemed to satisfy us completely.

"The morning after the separation of our party, which we felt was only



Above, the Stevens–Murphy–Townsend party. The Indian guide, Truckee, is shown in the foreground, but Truckee actually stopped below Donner Lake.

Below, relief party arriving at Donner Lake encampment, 1847. Schallenberger wintered in the same spot in 1844–45.

for a short time, Foster, Montgomery and myself set about making a cabin, for we determined to make ourselves as comfortable as possible, even if it was for a short time. We cut saplings, and yoked up our poor

cows and hauled them together. These we formed into a rude house, and covered it with rawhides and pine brush. The size was about twelve by fourteen feet. We made a chimney of logs eight or ten feet high, on the outside, and used some large stones for the jambs and back. We had no windows, neither was the house chinked or daubed, as is usual in log-houses, but we notched the logs down so close that they nearly or quite touched. A hole was cut for a door, which was never closed. We left it open in the day-time to give us light, and as we had plenty of good beds and bedding that had been left with the wagons, and were not afraid of burglars, we left it open at night also. This cabin is thus particularly described because it became historic, as the residence [of some members] of the ill-fated Donner party in 1846.

"On the evening of the day we finished our little house it began to snow, and that night it fell to a depth of three feet. This prevented a hunt which we had in contemplation for the next day. It did not worry us much, however, for the weather was not at all cold and we thought the snow would soon melt. But we were doomed to disappointment. A week passed, and instead of any snow going off more came. At last we were compelled to kill our cows, for the snow was so deep that they could not get around to eat. They were nothing but skin and bones, but we killed the poor things to keep them from starving to death. We hung them up on the north side of the house and covered them with pine brush. That night the meat froze, and as the weather was just cold enough to keep it frozen, it remained fresh without salt. It kept on snowing continually, and our little cabin was almost covered. It was now about the last of November or first of December, and we began to fear that we should all perish in the snow.

"The snow was so light and frosty that it would not bear us up, therefore we were not able to go out at all except to cut wood for the fire, and if that had not been near at hand I do not know what we should have done. None of us had ever seen snow-shoes and of course had no idea how to make them, but finally Foster and Montgomery managed to make something they called a snow-shoe. I was only a boy and had no more idea of what a snow-shoe looked like than a Louisiana darkey. Their method of construction was this: Taking some of our wagon bows, which were of hickory and about half an inch thick, they bent them into an oblong shape forming a sort of hoop. This they filled with a network of rawhide. We were now able to walk on the snow to bring in our wood, and that was about all there was to do. There was no game. We went out several times but never saw anything. What could we expect to find in ten feet of snow? It would sometimes thaw a little during the day and freeze at night which

made a crust on the snow sufficiently thick to bear the weight of a coyote, or a fox, and we used sometimes to see the tracks of these animals, but we were never fortunate enough to get a sight of the animals themselves.

"We now began to feel very blue, for there seemed no possible hope for us. We had already eaten about half our meat, and with the snow on the ground getting deeper and deeper each day there was no chance for game. Death, the fearful, agonizing death by starvation, literally stared us in the face. At last, after due consideration, we determined to start for California on foot. Accordingly we dried some of our beef, and each of us carrying ten pounds of meat, a pair of blankets, a rifle and ammunition, we set out on our perilous journey. Not knowing how to fasten snow-shoes to our feet made it very fatiguing to walk with them. We fastened them to heel and toe, and thus had to lift the whole weight of the shoe at every step, and as the shoe would necessarily sink down somewhat, the snow would crumble in on top of it, and in a short time each shoe weighed about ten pounds.

"Foster and Montgomery were matured men, and could consequently stand a greater amount of hardship than I, who was still a growing boy with weak muscles and a huge appetite, both of which were being used in exactly the reverse order designed by nature. Consequently, when we reached the summit of the mountain about sunset that night, having traveled a distance of about fifteen miles, I was scarcely able to drag one foot after the other. The day had been a hard one for us all, but particularly painful to me. The awkward manner in which our snow-shoes were fastened to our feet made the mere act of walking the hardest kind of work. In addition to this, about the middle of the afternoon I was seized with cramps. I fell down with them several times, and my companions had to wait for me, for it was impossible for me to move until the paroxysm had passed off. After each attack I would summon all my will power and press on, trying to keep up with the others. Toward evening, however, the attacks became more frequent and painful, and I could not walk more than fifty yards without stopping to rest.

"When night came on we cut down a tree and with it built a fire on top of the snow. We then spread some pine brush for our beds, and after eating a little jerky and standing around our fire in a vain attempt to get warm, we laid down and tried to sleep. Although we were thoroughly exhausted, sleep would not come. Anxiety as to what might have been the fate of those that had preceded us, as well as uncertainty as to our fate, kept us awake all night. Every now and then one of us would rise to replenish the fire, which, though it kept us from freezing, could not make us comfortable.

When daylight came we found that our fire had melted the snow in a circle of about fifteen feet in diameter and had sunk to the ground, a distance also of about fifteen feet. The fire was so far down that we could not get to it, but as we had nothing to cook, it made but little difference. We ate our jerky while we deliberated as to what we should do next. I was so stiff that I could hardly move, and my companions had grave doubts as to whether I could stand the journey. If I should give out they could afford me no assistance, and I would necessarily be left to perish in the snow. I fully realized the situation, and told them that I would return to the cabin and live as long as possible on the quarter of beef that was still there, and when it was all gone I would start out again alone for California. They reluctantly assented to my plan, and promised that if they ever got to California and it was possible to get back, they would return to my assistance.

"We did not say much at parting; our hearts were too full for that. There was simply a warm clasp of the hand accompanied by the familiar word, 'Good-by,' which we all felt might be the last words we should ever speak to each other. The feeling of loneliness that came over me as the two men turned away I cannot express, though it will never be forgotten, while the "Good-by, Mose," so sadly and reluctantly spoken, rings in my ears today. I desire to say here that both Foster and Montgomery were brave, warm-hearted men, and it was by no fault of theirs that I was thus left alone. It would only have made matters worse for either of them to remain with me, for the quarter of beef at the cabin would last me longer alone, and thus increase my chances of escape. While our decision was a sad one, it was the only one that could be made.

"My companions had not been long out of sight before my spirits began to revive, and I began to think, like Micawber, that something might 'turn up.' So I strapped on my blankets and dried beef, shouldered my gun, and began to retrace my steps to the cabin. It had frozen during the night and this enabled me to walk on our trail without the snow-shoes. This was a great relief, but the exertion and sickness of the day before had so weakened me that I think I was never so tired in my life as when, just a little before dark, I came in sight of the cabin. The door-sill was only nine inches high, but I could not step over it without taking my hands to raise my leg. As soon as I was able to crawl around the next morning I put on my snow-shoes, and, taking my rifle, scoured the country thoroughly for foxes. The result was as I had expected—just as it had always been—plenty of tracks but no fox.

"Discouraged and sick at heart, I came in from my fruitless search and

prepared to pass another night of agony. As I put my gun in the corner, my eyes feel upon some steel traps that Captain Stevens had brought with him and left behind in his wagon. In an instant the thought flashed across my mind, 'If I can't shoot a coyote or fox, why not trap one.' There was inspiration in the thought, and my spirits began to rise immediately. The heads of the two cows I cut to pieces for bait, and, having raked the snow from some fallen trees, and found other sheltered places, I set my traps. That night I went to bed with a lighter heart and was able to get some sleep.

"As soon as daylight came I was out to inspect the traps. I was anxious to see them and still I dreaded to look. After some hesitation I commenced the examination, and to my delight I found in one of them a starved coyote. I soon had his hide off and his flesh roasted in a Dutch oven. I ate this meat, but it was horrible. I next tried boiling him, but it did not improve the flavor. I cooked him in every possible manner my imagination, spurred by hunger, could suggest, but could not get him into a condition where he could be eaten without revolting my stomach. But for three days this was all I had to eat. On the third night I caught two foxes. I roasted one of them, and the meat, though entirely devoid of fat, was delicious. I was so hungry that I could easily have eaten a fox at two meals, but I made one last me two days.

"I often took my gun and tried to find something to shoot, but in vain. Once I shot a crow that seemed to have got out of his latitude and stopped on a tree near the cabin. I stewed the crow, but it was difficut for me to decide which I liked best, crow or coyote. I now gave my whole attention to trapping, having found how useless it was to hunt for game. I caught, on an average, a fox in two days, and every now and then a coyote. These last-named animals I carefully hung up under the brush shed on the north side of the cabin, but I never got hungry enough to eat one of them again. There was eleven hanging there when I came away. I never really suffered for something to eat, but was in almost continual anxiety for fear the supply would give out. For instance, as soon as one meal was finished I began to be distressed for fear I could not get another one. My only hope was that the supply of foxes would not become exhausted.

"One morning two of my traps contained foxes. Having killed one, I started for the other, but, before I could reach it, the fox had left his foot in the traps and started to run. I went as fast as I could to the cabin for my gun, and then followed him. He made for a creek about a hundred yards from the house, into which he plunged and swam across. He was scrambling up the opposite bank when I reached the creek. In my anxiety

at the prospect of losing my breakfast, I had forgotten to remove a greasy wad that I usually kept in the muzzle of my gun to prevent it from rusting, and when I fired, the ball struck the snow about a foot above reynard's back. I reloaded as rapidly as possible, and as the gun was one of the old-fashioned flint-locks that primed itself, it did not require much time. But, short as the time was, the fox had gone about forty yards when I shot him. Now the problem was to get him to camp. The water in the stream was about two and a half feet deep and icy cold. But I plunged in, and, on reaching the other side, waded for forty yards through the snow, into which I sank to my arms, secured my game, and returned the way I came. I relate this incident to illustrate how much affection I had for the fox. It is strange that I never craved anything to eat but good fat meat. For bread or vegetables I had no desire. Salt I had in plenty, but never used. I had just coffee enough for one cup, and that I saved for Christmas.

"My life was more miserable than I can describe. The daily struggle for life and the uncertainty under which I labored were very wearing. I was always worried and anxious, not about myself alone, but in regard to the fate of those who had gone forward. I would lie awake nights and think of these things, and revolve in my mind what I would do when the supply of foxes became exhausted. The quarter of beef I had not touched and I resolved to dry it, and, when the foxes were all gone, to take my gun, blankets, and dried beef and follow in the footsteps of my former companions.

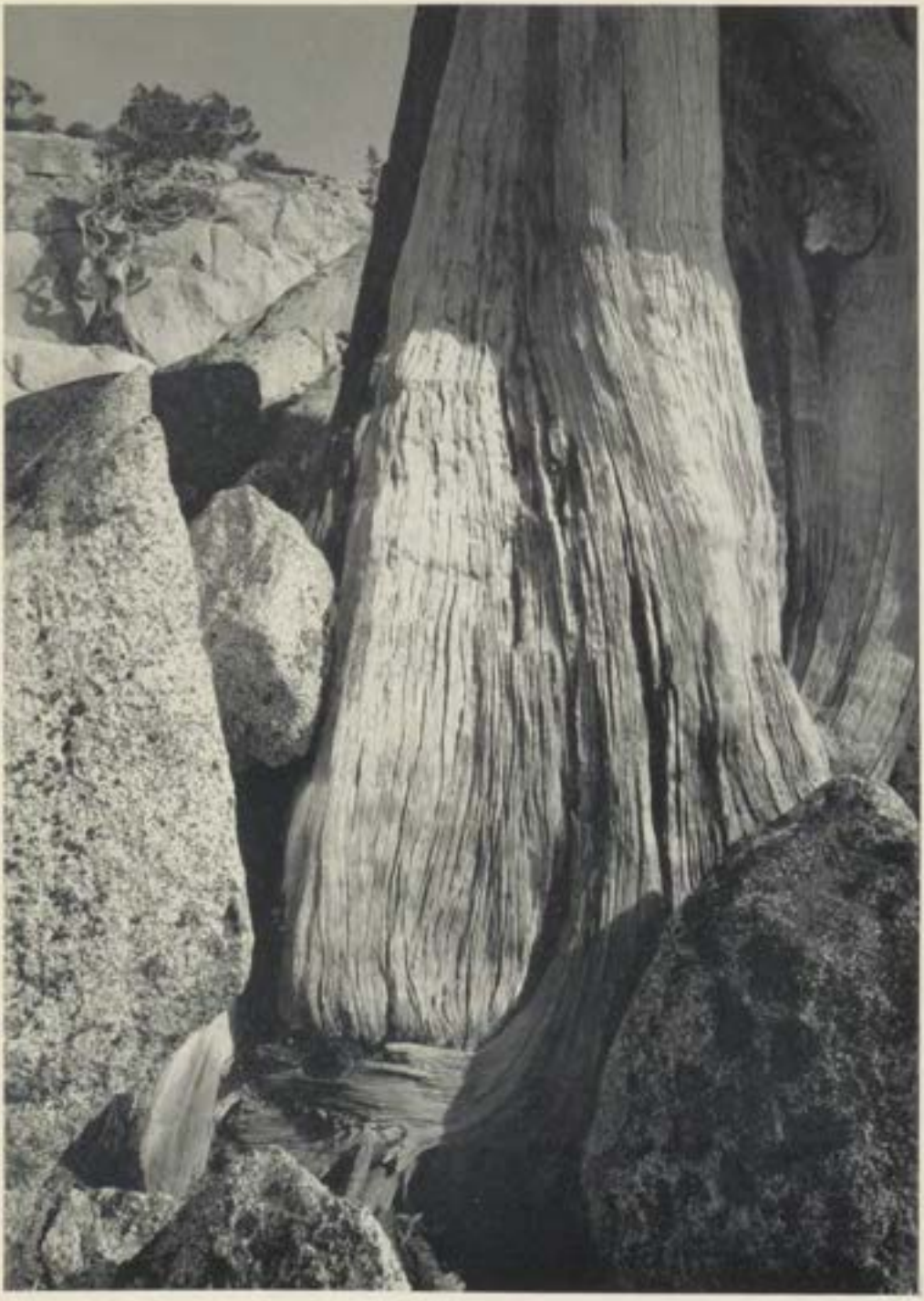
"Fortunately, I had a plenty of books, Dr. Townsend having brought out quite a library. I used often to read aloud, for I longed for some sound to break the oppressive stillness. For the same reason, I would talk aloud to myself. At night I built large fires and read by the light of the pine knots as late as possible, in order that I might sleep late the next morning, and thus cause the days to seem shorter. What I wanted most was enough to eat, and next the thing I tried hardest to do was to kill time. I thought the snow would never leave the ground, and the few months I had been living here seemed years.

"One evening, a little before sunset, about the last of February, as I was standing a short distance from my cabin I thought I could distinguish the form of a man moving towards me. I first thought it was an Indian, but very soon I could recognize the familiar face of Dennis Martin. My feelings can be better imagined than described. He relieved my anxiety about those of our party, who had gone forward with the wagons. They had all arrived safety in California and were then in Yuba. They were all safe, although some of them had suffered much from hunger. Mrs. Patter-

son and her children had eaten nothing for fourteen days but rawhides. Mr. Martin had brought a small amount of provisions on his back, which were shared among them. All the male portion of the party, except Foster and Montgomery, had joined Captain Sutter and gone to the Micheltorena war. Dr. Townsend was surgeon of the corps. My sister Mrs. Townsend, hearing that Mr. Martin was about to return to pilot the emigrants out of the wilderness, begged him to extend his journey a little farther and lend a helping hand to her brother Moses. He consented to do so, and here he was. Being a Canadian, he was accustomed to snow-shoes, and soon showed me how to fix mine so I could travel with less than half the labor. He made the shoe a little narrower, and fastened it to the foot only at the toe, thus making the heel a little heavier, so that the shoe would drag on the snow instead of having to be lifted at every step."

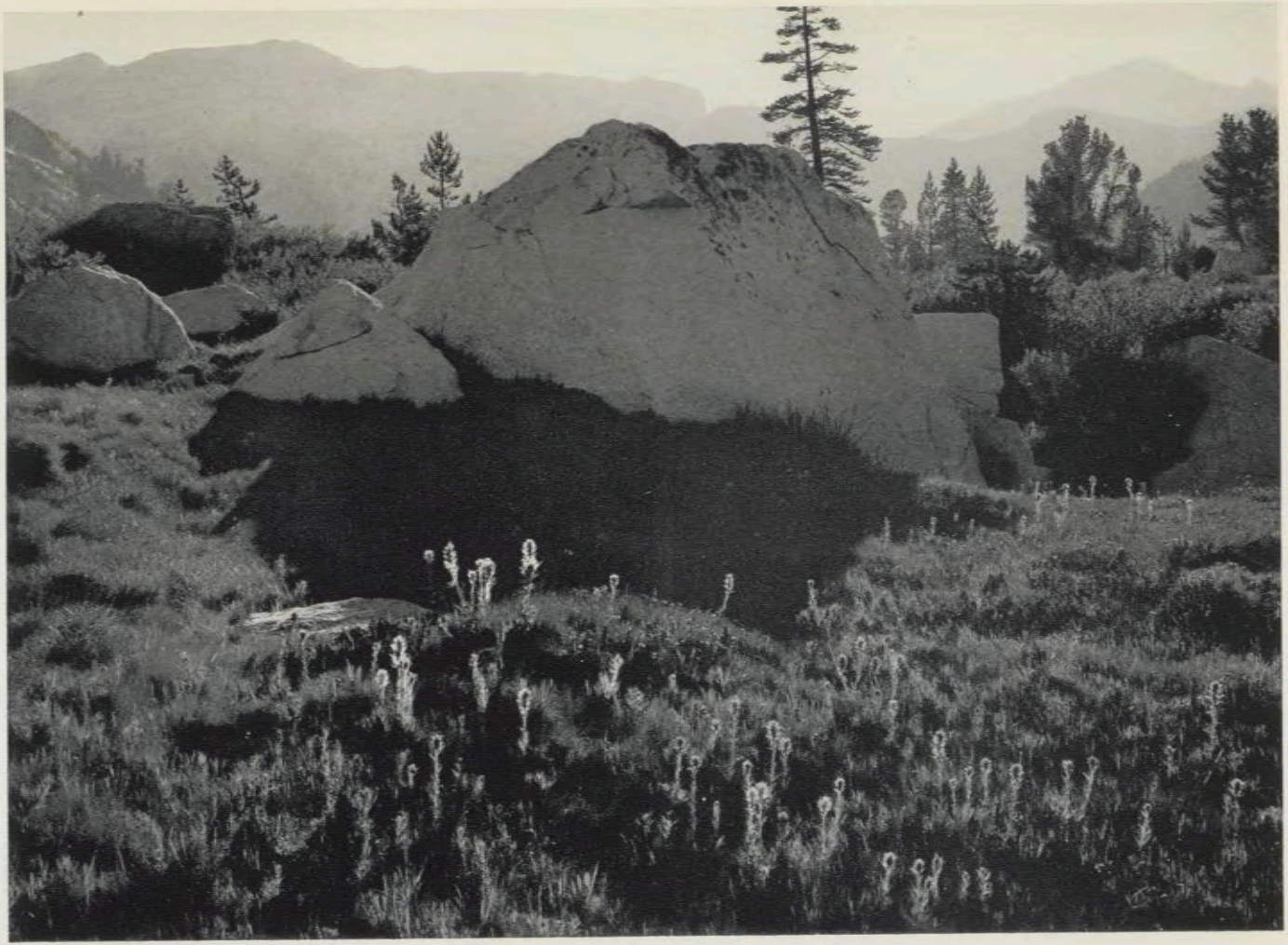
The next morning Martin and Schallenberger left and, after an apparently uneventful journey, they reached the encampment of the main section of the party at Yuba River. About the same time horses and provisions from Major Pierson Reading, Fort Sutter's commander (for the lord of New Helvetia had not yet returned from the Micheltorena campaign), enabled the party to continue the journey. They reached Bear River on March 1st, exactly one year from the day they had started out from Missouri. With some difficulty they crossed the swollen river and arrived at Hock Farm, where Sutter's vaqueros ferried them across Feather River and slaughtered for them a fine fat cow, which provided the immigrants with their first "good square meal," as Schallenberger joyfully records. A short time later the whole company, including those who had struck west via Lake Tahoe, were re-united within the hospitable walls of Fort Sutter, the western terminal of the trek across the continent.

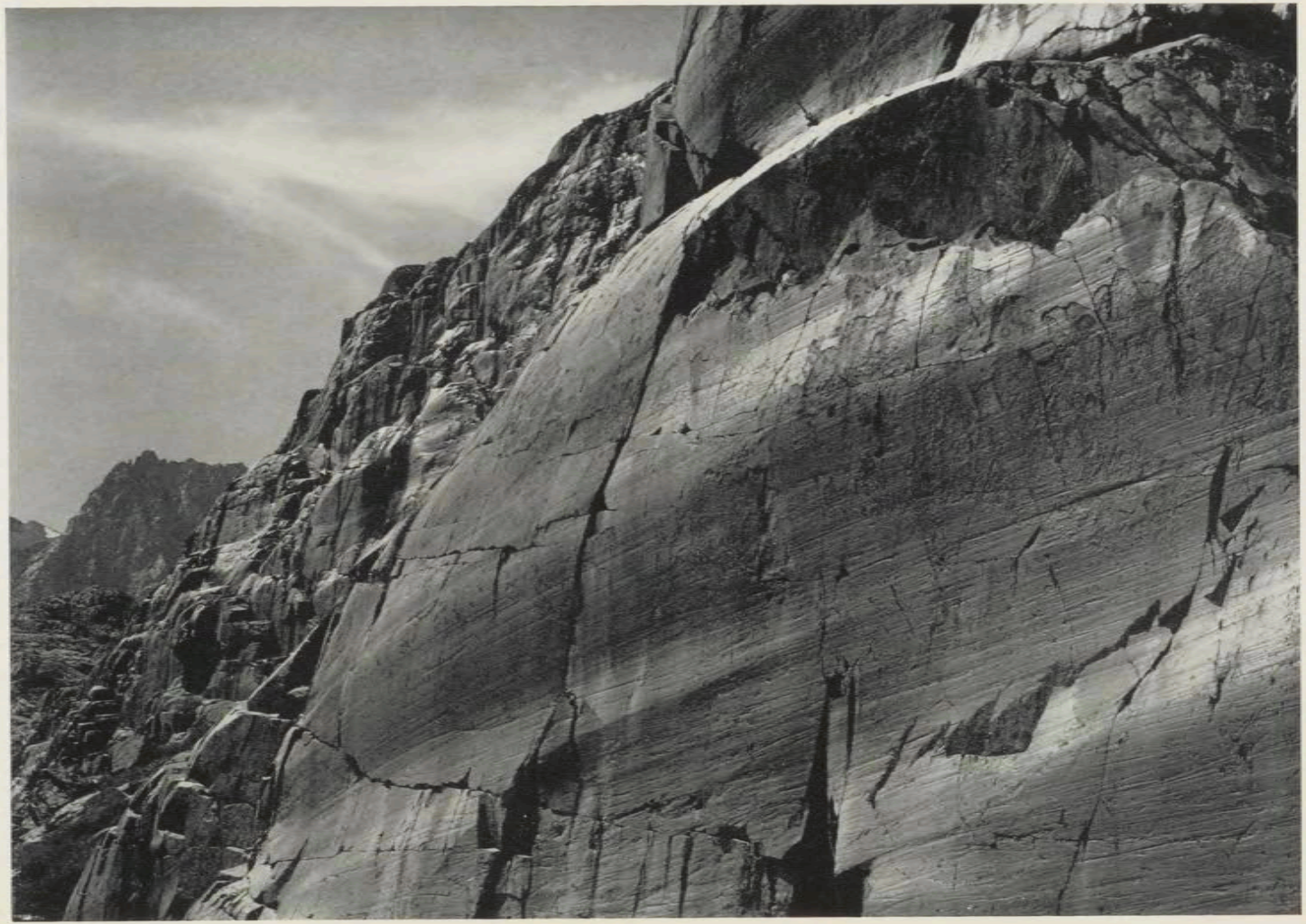
Illustrations courtesy of the Bancroft Library

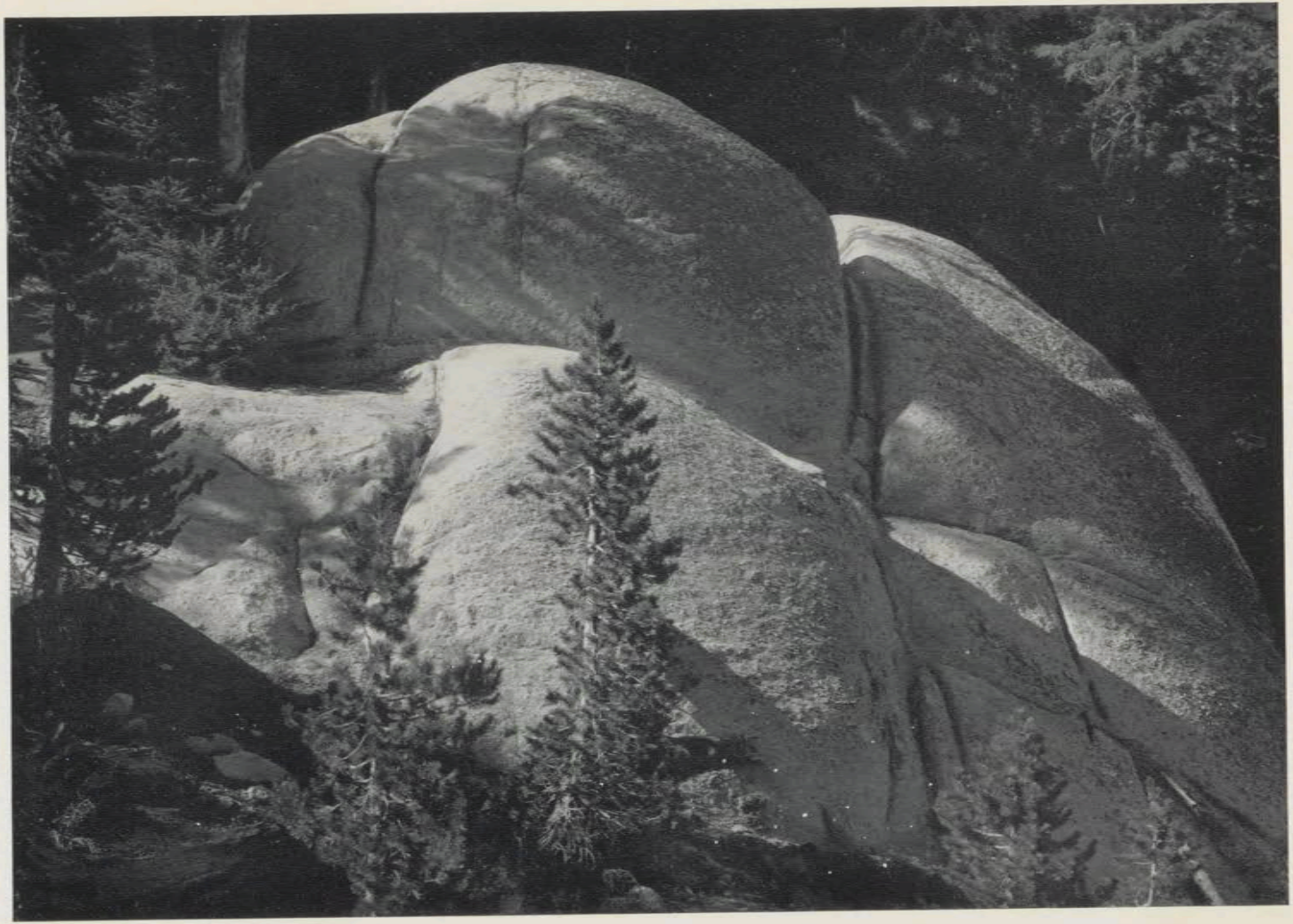


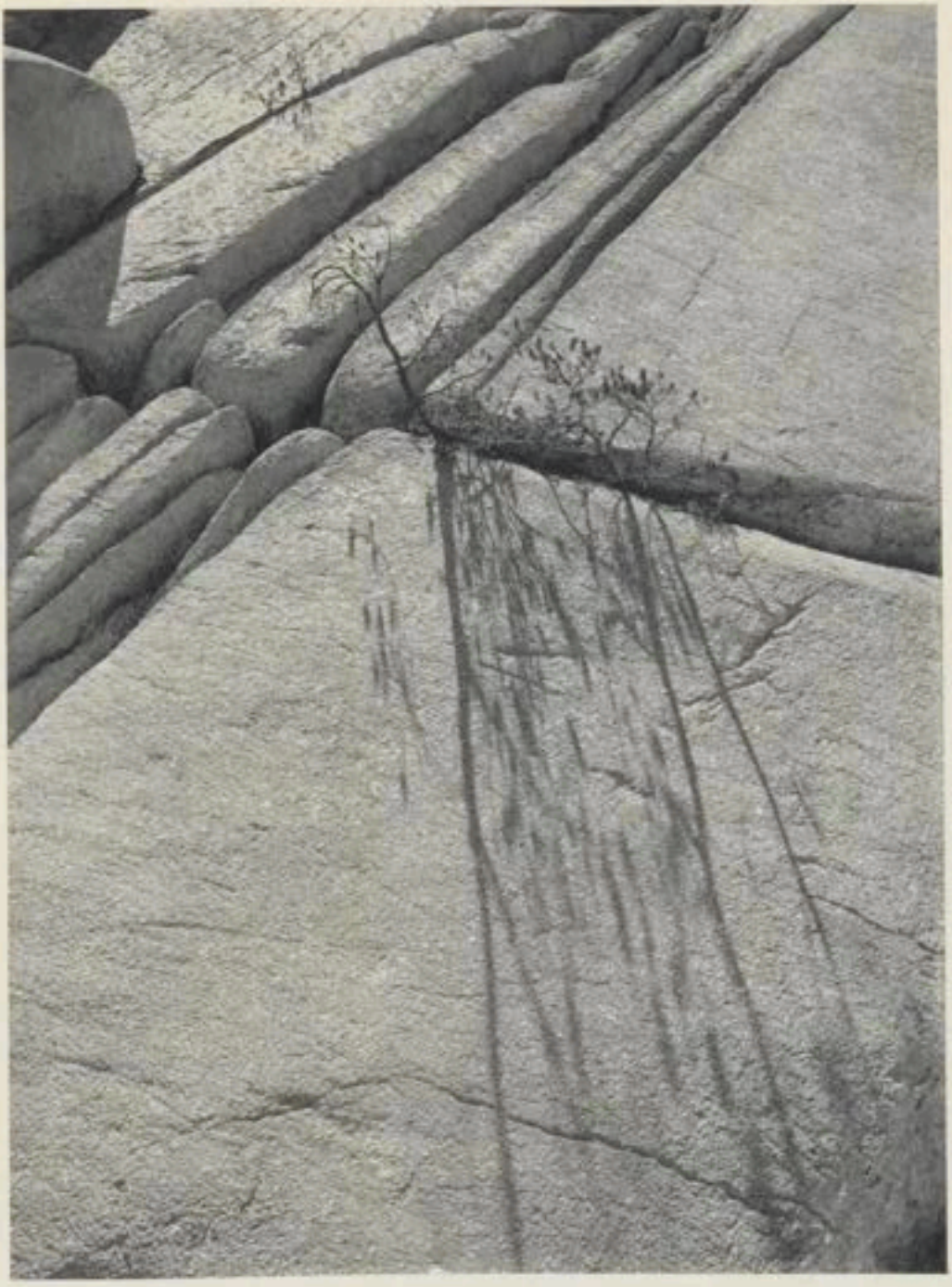
High Sierra

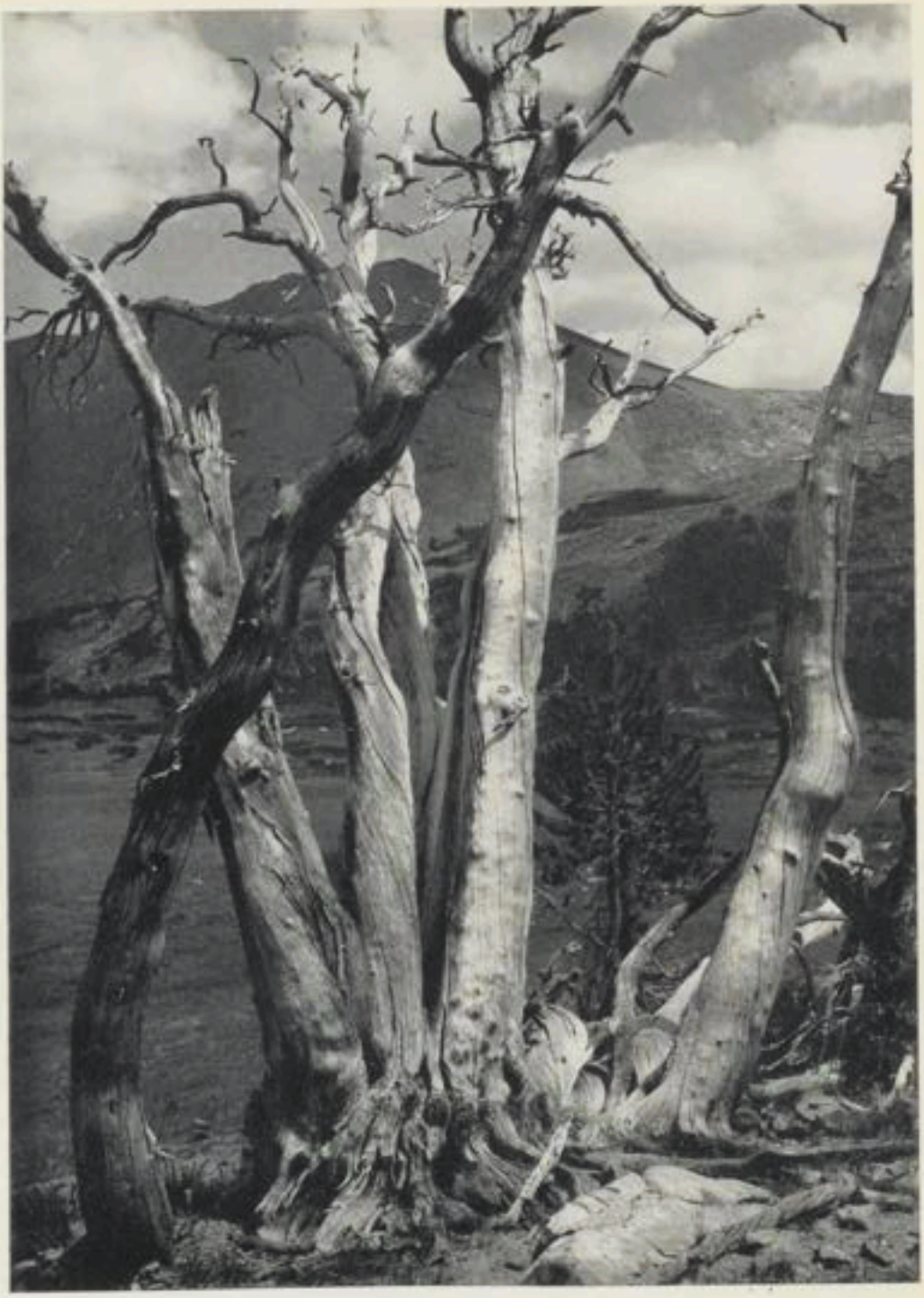
TWELVE PHOTOGRAPHS BY PHILIP HYDE











1. Juniper on Seavey Pass
2. Upper Iceberg Lake
3. Meadow in Slide Canyon
4. Glacial Polish in Shadow Canyon
5. Granite near Matterhorn Canyon
6. Boulder near Rush Creek Camp
7. Forest at Benson Lake
8. Unnamed lakelet and the Minarets
9. Pond and forest, near Benson Lake
10. Pond, Little Slide Canyon
11. Tree and shadow near Peeler Lake
12. White-bark pines near Mono Pass

High Simplicity

By PAUL H. PFEIFFER

> Our life is frittered away by detail. . . . I say, let your affairs be as two or three, and not a hundred or a thousand. . . . In the midst of this chopping sea of civilized life, such are the clouds and storms and quicksands and thousand and one items to be allowed for, that a man has to live, if he would not founder and go to the bottom and not make his port at all, by dead reckoning. . . . Simplify, simplify.
>
> —THOREAU, *Walden*

OUR AUTOMOBILE rose out of the mists of Monterey Bay. The morning star shone above Loma Prieta. From the sweet smell of willows at Jamestown we ascended to the pineapple fragrance of incense cedar on a narrower highway. The air was cooler, cleaner, brighter. We saw snowfields high on beds of granite talus. From the heat of hills barren but for sage we turned at the sign, "Virginia Lakes 8 miles." Soon evergreens and cool, clean air again. Up a canyon we rode to a sky-piercing red triangle of a mountain, a lake at its base, and Trumbull Camp. Familiar faces; handshakes with trail-mates of past years. Little campfires for us who came early enough to get wood. Lodgepole and white-bark pine black against the stars.

We were to be free of our automobiles for two weeks! Not easily free, however, for they must first be shuttled over to Bogard's Ranch near Twin Lakes. It must be admitted that it is hardly to my credit that any arrived at Bogard's at all. I use the association method for remembering names. Consequently when High Trip Manager Dave Brower said to me, "Park the cars at Bogard's," I didn't trouble to write it down. I knew I could remember it because I had a mental picture of Humphrey Bogart.

"Where will we park?" asked Shuttler One.

"Out the Twin Lakes Road at Hobart Camp."

"Where'll I park?" asked Shuttler Two.

"Out the Twin Lakes Road at Humphrey's Camp."

And to Shuttler Three I replied, "It's a camp named after a movie actor with a scar near his mouth—you know who I mean."

Back at Trumbull camp we began to forget about automobiles—about newspapers, radios, television. Early the next morning our feet were on the trail, a trail in part of rock scree, all edges; in part of dust. A trail from which burnt peaks rose on either side, on which the sun was bright

but cold in the 10,000 foot pass to Summit Lake. South of the lake was a tall mountain unnamed in this land of many mountains, and north of Shepherd Creek a creek unnamed among many creeks. We descended past creamy mariposa lilies to meadows, to a trail pressed through the turf into moist earth, to commissary on the rushing white waters of Return Creek.

Moving days are always memorable. On our move to Wilson Creek, having risen by flashlight, we were on the trail in the early morning. The trail was moist and dustless. In the air the fragrance of pines, of hemlocks. Feet moved without effort; backs hardly felt the weight of knapsacks. Here, in the sun's low rays, was the glacial polish of Spiller Creek, a sheen broken only by the isosceles triangles of conifers' shadows. Here was the pass, a notch filled with the songs of birds and a rill's ripple. A trailside note from Cedric Wright took us up an outlook on the south, where the sharp and distorted Cathedral Range peaks rose against the southern sky. Then down past flower gardens of blue, yellow and red to Matterhorn Canyon's Capitan-like cliffs, and up switchbacks to hanging Wilson Canyon.

Here half of the party spent the next day while the rest of us went over Benson Pass to Benson Lake. This splitting of the party, coupled with shuttling, reduced the number of pack mules grazing in the meadow. This moving day, like the last one, was memorable: the bold profile of Volunteer Peak above Smedberg Lake, the tiny white bells of heather, the pattern of a white-pine cone regarded end on, the bulging granite boss across the canyon, the virgin forest of fir on the northeast corner of Benson Lake.

A choice of lake or river frontage for bed sites was unusual; so too the wide beach of brown sand with near-by aspens bent ninety degrees. And unusual the sound at campfire that night of swimmers in the lake. At Wilson Canyon on this same night half our number were listening to the easy voice of packer Tommy Jefferson and his guitar, while we learned that Dray, Gray, and others had found the wreckage of an airplane on the side of Quarry Mountain. We heard reports from Tom Jukes and Bill Davies, leaders of the twenty-three who had knapsacked to the Matterhorn, reports illustrating the diversity of personalities, each valuable in its own way, which we had on the trip. Tom Jukes reserved emphasis for the scaling of the Matterhorn by three generations of Dempsters. (With modesty he said nothing of saving the party a day of travel by the route he chose back from Slide Canyon, or of his setting of a dislocated shoulder.) Bill Davies, on the other hand, told dramatically of the cataclysm

which had tossed a mountain top into a canyon and given Slide Canyon its name; and gave vibrant descriptions of flowered terraces and perfect lakes and of the ceremonial platform of rock that had served as a campsite among tumbled talus.

During our stay at Benson Lake some of us scaled Piute Peak while others clambered around the circumference of the lake. All of us suffered at night the continual clanging of the bells of the lead horses which, followed by their mules, wandered through camp.

"Look here," said Sparky Wilson in his red checkered shirt as he stepped to the right and put his hand on smooth stone, "This is pink orthoclase." We who followed him up the trail to Seavey Pass stopped and listened and asked questions. Full of enthusiasm and explanations, Sparky made the six miles to Kerrick Meadows a conversation instead of a hike. At one place a dozen of us were sitting above a snow bank eating sherbet when we saw Phil Hyde carrying over his shoulder a tripod topped by a camera. He was striding from rock to rock up a ridge. We shouted to him, asking why he hurried. Never pausing, he shouted back, "Gotta see a cloud about a picture."

Those white clouds turned gray and lowering in the afternoon, and we stretched tarps over our rucksacks, built fires under and around billycans, drank hot tea and bouillon. Some sat photographing the small ground squirrels over whose home near commissary we had erected a protective tripod, while others walked a mile or so to Arndt Lake. Several of us viewed sharp Sierra summits from Price Peak; several departed on an arduous knapsack trip to Tilden Lake. Still others had a short swim in the green pool below camp where a beach of coarse brown sand gathered heat from the frequently clouded sun.

Two days later some of us walked in scorching sun down the Bridgeport trail to Bogard's Ranch where we uncovered cars and drove home, spending money along the way. The dozen of us who had chosen to go to Peeler Lake spent no money, but saw gold in the morning mist above the still water. Food had been sent there for us by the commissary, but no canopener, no pan, pail, skillet, spoon, knife, fork, spatula. Nothing but food and a metal sheet. Nevertheless Helen Blasdale and helpers prepared a good meal. And over the rocks to our campfire came Eleanore Ginno, who had gone five miles down to The Roughs to get cooking utensils from commissary.

An objective was Crown Point. Walking over dainty hemlock cones and pink pussy paws, rousing deer out of their coverts, we zigzagged up to the ridge overlooking Snow Lake, thence to the uptilted rocks that

top Crown Point. In that relatively high world we looked down at large named lakes like Rock Island and at small green unnamed lakes; looked at the sheer side of Tower Peak miles to the north, and, many miles to the south, to the dark point that was possibly Banner. After we had descended, lightning flashed, rain fell; the peak to the north was whitened by a light snow.

We who were second-two-weekers, including Charlotte Mauk, were baa-ed at by stray sheep during our night at The Roughs. With noses and lips whitened by zinc oxide, we walked up Buckeye Pass and down a trail upon which we replaced the marks of deer hooves with the marks of keds.

To the south of the camping place on the Snow Pass trail was a granite bluff striped vertically by rock fractures and lichen, snowy patches at its base. On the northern side of the creek a wide expanse of broken ground offered many individual campsites. Tarps and sleeping bags were white with heavy frost at breakfast time. Some of us climbed to Rock Island Pass, picked up bits of black basalt among the granite there, moved down to Rock Island Lake, unfringed by either trees or great rocks and consequently hard to judge at a distance for size; we found it shallow, windy. On the camp side of the pass the hemlocks were heavily whiskered with dead and curled older branches underneath the green.

On moving day we found Snow Lake in simple oval beauty below a background of Kettle Peak. Cicily Christy and botanical friends strayed from the path to admire elephant's heads. We squudged through the four-foot-deep, fifty-foot-long channel cut in the snow the previous day by some of our own men. Embattled whitebark pines bent away from the wind at the lake near the summit. Our delight with waters splashing down from snowfields, with lakes and gaunt peaks, reached its climax with the view from Snow Pass of the pointed Sawtooth ridge turning before us to end in Matterhorn. We chose campsites below the Finger Peaks.

After shivering in the 22-degree dawn, some of us explored the Finger Peaks. Others, following between ducks the trail of scuffed and shiny grass, turned left at Burro Pass to clamber up to Matterhorn; below lay the burnt black eastern crest of Spiller Canyon and far beyond—was it Half Dome? This camp offered almost too many things to do. The crenellated ridges attracted photographers, walkers, rock climbers; the stream, fishermen. In the slide, geologists tried to read the answer to: how long ago?

Behind the commissary stove at dinner we found Ted Grubb who had climbed 3,500 feet without trail from Barney Lake to have two days with us. Next day Ted Ginno had followers on a slow walk up the Matterhorn

and next day Joel Hildebrand took a group into the head of Little Slide Canyon. Next day upon arrival at the snowy crest of Burro Pass a number of us climbed with Hermann Horn to Matterhorn, though the majority descended into Matterhorn Canyon. We were glad to find that its desolate upper reaches were not a fair sample. The creek, the trees, the flowers —especially a great island of yellow mimulus—made a pleasant descent to the commissary near the Virginia Canyon trail junction.

At successive campfires here Chairman Scanlon presented Joel, who, in accord with a suggestion from Dave Brower, proposed a National Park Defense Fund and showed how, during his presidency of the club, a comparable fund had been effectively used; and as a feature of commissary night Charlotte Mauk submitted a report on recent achievement in conservation. The bandanna show, well organized by Ethel Rose Taylor, was held on the granite near Return Creek, and in the evening came the freshman show, featuring Mort Matthews and his accordion.

From Virginia Canyon, where we used the same site occupied by the first-two-weekers, we went either by way of Virginia Pass or by Cold Canyon and the river to Tuolumne Meadows. Parsons Lodge possessed a dryness and warmth not found outside on the rain-soaked earth. Many of us laid our air mattresses on the concrete floor and woke to see above us closely laid barkless pine trunks instead of living trees.

Then we were on the trail again. From the expansiveness of the great meadow, covered with grass and trees, ringed and protected by barren peaks, from camp at Dana Meadows where Carl Russell, superintendent of Yosemite National Park gave a talk on the transplanting of camping areas to sites above Yosemite Valley, we followed a trail blazed by single diagonal cuts. At Mono Pass we were near mountains of red scree below which were little treeless ponds and the gray dumps of gold mines—dumps where iron pyrites glittered. Near by stood log cabins built in 1879 with square nails and wooden pegs. Some walkers climbed to the ridge above Helen Lake to view the glaciers of Maclure and Lyell.

We moved over the glinting and plantless Parker Pass. To the east a series of blue desert mountains were appliqued one upon the other. On the right was the enormous cardboard cut-out made by a nearer mountainside. Approaching Koip Pass we could see above us a steeply tilted plain of brown-gray shale engraved with switchbacks. Climbing them, we discerned in the desert Mono Lake, large and milky green. From snow banks on the side of Koip three white threads of water wriggled down into Parker Lake, beautifully bounded by moraines. On the switchbacks below us some climbers were moving in one direction, others in the oppo-

site, as if in a dance. At the bottom of the trail creamy grubs of ants crept—no, those were our mules with tarps over the kyacks.

As we crossed Gem Pass lines of jagged dark mountains splotched white with snow—Mount Davis to the Minarets—came toward us. We trudged uphill to camp by a knee-deep pond, seized our duffle and panted up to a southern view of many far peaks. As I puffed up the mountain side Sam Van Wyck sang out, "Tote dat barge! Lift dat bale!"

"I'd get paid for that," I replied.

"And *you* pay for this!"

True. I had paid to carry thirty pounds uphill when I was dead tired. Imagine someone at home telling me: "Tomorrow you will get up at 5:15. You will spend the day carrying seventeen pounds up 2,600 feet and down 2,600 feet—net gain 0. You will tread on rocks that are flinty, on rocks that roll underfoot. You will find a bed site on a granite mountain and bathe in snow water. Tomorrow you will wash your dust- and sweat-soaked clothes. For this toil *you* will pay *me* five dollars a day." I was crazy.

From this camp we followed a cross-country route to the crossing of Rush Creek and the John Muir Trail, down the creek a way, then up its south fork to a lake at the foot of Mount Davis. Here a sixth-week-only party joined us. And here parties to Lyell were led by Jim Koontz and Don Scanlon, to Koip Crest by Dick Leonard, before we broke camp again and followed Pat Goldsworthy cross country over two ridges to Garnet Lake—or went by the longer trail and heard again the splash of pack mule hooves crossing a creek, the click of their steel shoes on the rocks of the trail.

On the shore of Garnet Lake—varied by bushes, trees, rocks and attenuated promontories—overlooked by the almost overpowering peaks of Banner and Ritter, we made camp for three days. People fished, loafed, climbed, drank tea. Hervey Voge and Virginia Romain led parties up Banner. Enid Michael led a group curious about such things as tansy, meadow rue, flickers, and juncoes. Commissary gave another jolly show including a preview of the High Trip of 1984 and a rock-climber's song with its popular refrain, "Gory, gory, what a helluva way to die!" Next morning "Rope! Test! Climb!" came in shouts from the rock where Dick Leonard was instructing aspirants for the Polemonium Club. Regional Forester Pat Thompson and Neil Rahm, supervisor of Inyo National Forest, gave interesting talks. Others who contributed to campfires were Lowell Sumner, Francis Farquhar, Suzanne Reichard, Army Armstrong, Paul Kaufmann.

Then on to Lake Ediza, fed by snowy waters among the crowding Minarets, Ritter and Banner. The lake surface was the only area that was flat. We had to search for levels for our air mattresses. Looking up from them we saw hemlock tops bending under the weight of red cones. Moonlight radiated from a cleft in the crest of Volcanic Ridge before the moon showed itself.

In the morning Dick Leonard led a party to a mine prospect. A group led by Chuck Lawrence duplicated the previous day's climb of Ritter led by George Perry. There were trips to talus-bordered Iceberg Lake, its deep waters a heavy blue darkened by the shadow from Volcanic Ridge.

In Lake Ediza we left the reflections of the Minarets, Ritter and Banner. We tramped past the miner's cabin, past Shadow Lake. We looked back over our right shoulders at the Shadow Creek Falls, and stopped before the juniper with finger-like branches covered by an arc of boughs. At the San Joaquin were quivering aspens—and the broken shell of a luncheon egg. Next, the shade of the wood near Agnew Meadow; and last, the glint of our cars.

A Waddington Adventure

By WILLIAM E. LONG

RAY'S HANDS LOOKED COLD as he tied up the front of our two-man mountain tent. Outside a strong, snow-laden wind was trying to push our tiny nylon shelter off its small shelf, twelve thousand feet up on the north face of Mount Waddington. Hardly ten feet away from our lone tent was a hole in the snow slope, the entrance to a snow cave in which lay Al and Jim. Somewhere along the two-day route between us and base camp, seven thousand feet below on the Tiedemann Glacier, were two other tents. Four of us were here at high camp, four more of our party were part way to high camp, and a storm had blown in. How long would it last? Just that evening as I looked at the fading sun, I had said to Al, "This is real mountaineering!" Now, in our storm-shaken tent I began to understand that real mountaineering was rugged.

Plans for this 1950 Mount Waddington expedition had started in Berkeley. We elected the Waddington region chiefly because we wanted to become acquainted at first hand with Mount Waddington itself—a spectacular massif, the highest of its three peaks rising to 13,260 feet, the rime-covered summit of provincial Canada. True it had been climbed before—by William P. House and Fritz Wiessner in 1936—but only after fourteen previous attempts had been frustrated by storm, difficulty, and death. The Franklin Glacier side was climbed for a second time by Fred and Helmy Beckey in 1946. Never, however, had the mountain been climbed from the Tiedemann Glacier. Ferris and Roger Neave had attempted an ascent from this side in 1934, but had been stopped near the base of the final rock tower owing to bad weather and shortage of food. Difficulty may have stopped them had storm and hunger not done so. Our expedition would, we hoped, find out. For all but two of us it was to be our first real expedition, and we had planned and worked to make it a successful one. During the fall we carefully chose the climbers we thought would best accomplish our goal, considering also their ability to get along with one another. Committees were formed among the eight of us to plan and purchase food, equipment, and transportation. Each member had an important part in the preparations. Meetings lasted into the wee hours as countless details were discussed, argued, and finally settled. Time and the mountain would test our plans.

Our group was a well-balanced and strong climbing party. Dick Houston, the smallest of the group, was a never-ending source of witty, unprint-

CLOUDS SWEEP AROUND THE 13,260-FOOT ROCK SUMMIT

WADDINGTON ALBUM

AT NABOB PASS, the last of the forest. On Munday Ridge, in the background, are Mount Merlin, Sierra Peak (name proposed by the Sierra Club party), and Mount Grenelle.

THE FIRST PARTY, on its first day out of base camp, makes its way up an icefall on the Waddington massif.

ICE FEATHERS, a thick coating of rime, cover the cliffs of the final rock tower of Waddington. Footsteps can be seen on the upper snow slope. Until 1950, no party had found a route here; 1950 brought two routes.

→

AT HOME ON THE SNOW. *Above,* Waddington High Camp after the storm. *Below,* the intermediate camp on the Bravo-Spearman col, on the route to High Camp. *Facing,* Camp I for the Munday Ridge traverse; Whymper Dome (center) rises above the Tiedemann Glacier. *Below,* the conveniently situated base camp on Tiedemann Glacier.

Facing: Above, from Mount Irresistible to Mount White Mantle (left) and Mount Martello (center); Waddington Glacier in the middle distance. *Below,* Mounts Grenelle and Fascination from Snow Dome; The Twins in the middle distance.

Above, Mount Spearman rises above the clouds swirling beneath High Camp; Mount Grenelle is in the left background. *Right,* snowbridge on the deeply crevassed Sierra Glacier (name proposed by the Sierra Club party).

Vancouver Sun

THE PARTY

BETTLES WILSON COOK DUNMIRE
HOUSTON LONG STECK
DE SAUSSURE

Photographs by Philip Bettles (1, 6, 8, 11, 12), Allen Steck (4, 5, 7, 9, 10), and James Wilson (2, 3).

able remarks, the man with the monster pack. Oscar Cook was the gentleman of the crowd, rarely to be seen without his white shirt on and his hair combed. Both Oscar and Dick had been in the upper Tellot Glacier area in 1947, and so were somewhat familiar with the country. Sanitary engineer of the expedition, Bill Dunmire, constantly guarded against water pollution; he had had the least experience of any of us but proved himself to be a strong and cautious member of the group. Jim Wilson soon was the master of the larder, never happier than when he was concocting some new and tasty combination. Ray de Saussure, our theoretical scientist, would lie for hours talking of plans for a better tent. Phil Bettler was the silent member of the clan, and the possessor of the chess board and of several packages of firecrackers to be used for celebrating purposes. The early riser was Al Steck, a true admirer of the mountains who proved himself to be an outstanding climber, primed well by a year in the Alps.

Then the big day came. At six-thirty in the morning of July 12 six of us climbed aboard a Norseman Seaplane at Vancouver. Dick and Al waved so-long as we roared away from the Queen Charlotte Airlines dock. The next time we would see them would be when they were shoving our bundles from the plane over the Tiedemann Glacier.

Our plane headed up the Canadian coast in a northwesterly direction. Soon expansive snow fields were all we could see to the east. As we neared Mount Waddington, clouds hid all the high summits from our view. Then we were dropping and circling. Below us was a lake nearly two miles long but not shown on the best maps available—Ghost Lake. Soon spray was coming from the pontoons, and we were taxiing to shore, 170 miles northwest of Vancouver, and twenty miles of little-known country away from Mount Waddington.

When the plane had gone Oscar, Phil, Ray, and I shouldered packs containing ten days' food and supplies and started toward the Tiedemann Glacier. Jim and Bill were to wait for Dick and Al, who would land after they had helped with the air drop. Our trail-less route took us—with some effort on our part—into dense forests of the canyon of Tellot Creek, then over Nabob Pass, and finally to the Tiedemann Glacier. Rain and mosquitoes accompanied us.

Two days after leaving the plane, we slogged on up the Tiedemann, anxiously watching for the airplane. At noon it came, and out fell the precious bundles that were to insure our survival for forty-seven days in this world of snow, ice, and rock. We gathered them in—they were strewn over nearly two miles of snow-covered glacier—and officially celebrated the opening of base camp with a snack of bread and jam, freshly jarred.

This bread—all our bread, in fact—was specially baked and wrapped for us, and generously donated by McGavin's Bread Company in Vancouver. We camped on a medial moraine where it disappeared into the depths of the Tiedemann. A large overhanging rock provided shelter for cooking. A nearly flat stone beneath it was just the size of a table. Kitchen leavings could be thrown over our shoulders into a hundred-foot crevasse. We were set! At the head of the Tiedemann, towering above all else and 8,000 feet above us, stood Mount Waddington. Behind the mountain was the deep, inspiring blue of a clear sky.

The day after the air drop, July 15, four specks appeared far down the Tiedemann. We rightly judged them to be Jim, Bill, Dick, and Al, and by seven-thirty that night all eight of the expedition were together again. The weather was perfect, we had all our supplies, and Mount Waddington was waiting. Tomorrow we would start for it; we should lose no time.

The next morning we divided into groups of four. Al, Jim, Ray and I were in the first party; Bill, Dick, Oscar, and Phil were in the second, which would follow a day later. Carrying packs containing food and equipment for ten days, we threaded through the intricate, crevassed pattern of the glacier, which feeds the Tiedemann from the east ridge of Mount Waddington. As the day wore on, the snow became softer and softer, steps harder and harder to take. But when we rested and looked back down the great white slopes, we could tell that we were making progress; the great massif of Mount Munday was steadily getting lower. Ahead was the headwall about which we had worried when we had surveyed our route from below. Not until four o'clock in the afternoon were we standing below it. Al began kicking steps in the forty- to fifty-degree slope while Jim sank an ice ax in the snow and belayed. Moving slowly, one at a time, we reached the top of the headwall without mishap. The sun had long since disappeared behind the ridges to the west, so we looked for a spot for our tent and zeltsack. With ice axes we dug out a platform and made our first camp on Mount Waddington, at an elevation of about 10,000 feet. Cliffs near by hid any view of the upper reaches of the mountain, but we knew that we had more than 3,000 feet still to go.

In glorious sun the next day we dismantled camp and started up over more snow toward the col between Bravo Peak and Mount Spearman. Leaving our packs at the col, we made a fast ascent of Bravo Peak, from which we could look up to the upper slopes and summit tower of Mount Waddington. The route would be steep and long, but no technical difficulties could be picked out as far as the base of the tower. As for the tower, itself, we could only stare at it in wonder and admiration.

Checking the route to high camp again, we returned to the packs and started the familiar step-breathe-step process. Mounts Combatant, Tiedemann, Asperity, and Serra, across the upper reaches of the Tiedemann Glacier, never ceased to impress us with their boldness and grandeur. We lunched at a pass in the ridge between Waddington and Spearman and were soon under our packs again, kick-stepping up the great slopes of Waddington. The way was becoming steeper, and more care had to be taken before we could trust our weight to a step. A small level spot, one short steep pitch, and our party reached the site we had chosen from below for our high camp.

While Ray and Jim prepared supper and upped the tent, Al and I surveyed the base of the summit tower. There were possible routes, but all would mean Yosemite-like climbing—high-angle slabs with scant holds—with ice on the holds and the icy air of 13,000 feet elevation around them. We knew that the next few days would call for the best climbing our party could put forth. As we crawled into the tent, with perfectly clear skies overhead, we felt a little too sure of ourselves. The next morning we looked out to find that fog covered everything. Jim and Al were cutting a cave in a huge snow bank to protect them from the now bitter weather.

Thus the storm had caught us. How long would it last? Previous expeditions had had to sit out—or lie out—as much as two weeks of storm without a break. We were hopeful, and I dare say prayerful, that this would not be a storm of that length. There was nothing to do but to lie in one's bag and wait, wondering if our fellow climbers farther down the mountain were safe.

Then our luck started—luck that was to be with us until we again reached our homes. We awoke next day to see the remains of the storm far below us—mist and clouds among the lower peaks. Three thousand feet below we could also see two dark spots on Bravo Col. These were our companions' tents, and we felt sure that all were safe after the storm.

Not wishing to waste the good weather, Al, Jim, Ray, and I decided to try the east chimney route on the summit tower. For twenty minutes we walked up the slopes to the north base of the rock tower, or third peak of Mount Waddington. Then the real climbing began. We fastened ice axes to our packs or belts, and climbed over the snow-covered ledges that led diagonally up to the notch between the rock tower and the summit. We would cling to the rock, then chop or kick steps in ice or snow. We placed pitons to anchor us at every belay position, on most of which the belayer had room only to stand. This sort of climbing goes very slowly, and it was afternoon before we reached the notch. Here we stopped. Ahead

of us was the impossible-looking east chimney, choked by three chockstones, from which great icicles hung. The entire summit tower was plastered deep with rime.

The hour was so late and the sight ahead was so bad that we chose to return to high camp, and did so with heavy hearts and tired muscles. We would try another route the following day, but defeat now seemed entirely possible.

At camp, joined now by Bill, Dick, Oscar, and Phil, we decided to split into several parties and to try several routes. If one route proved passable, then the rest would use it the following day. With these plans in mind, we went to bed early, not because we needed sleep but because we were chilled through and it was warm in the sleeping bags.

In good early-morning weather Al and I started chopping steps and pounding in ice pitons at the great bergschrund moat of the summit tower from the north side of the mountain—to no avail. The others had no better luck than we and by noon eight puzzled-looking climbers were milling around under the defiant summit tower. A mere thousand feet stood between us and success. But it was such a discouraging thousand feet that all except Al and Phil finally returned to camp, there to lean on their ice axes and make futile attempts at conversation. Al and Phil returned with news of a possible route on the north face. By now we knew that whatever the route we were in for a real climb.

July 21, 1950, and the good weather was still holding; the thermometer read twenty-two degrees at five o'clock. When we left camp, Dick, Oscar, Ray, and I were going to try the east chimney route, even though it had looked bad on our first try. Al, Bill, Jim, and Phil would attempt to traverse the north face to the west ridge; then to the summit. Our old steps cut in the ice-covered ledges made the going faster, and soon we were at the notch. Six hundred unknown, rime-covered feet to go. How?

Oscar worked up to the very base of the ice-filled chimney, drove in a piton, anchored himself, and brought me up. From the first chockstone directly overhead great icicles extended toward us like huge spears, stopping all progress. To climb over such an obstacle as this would be impossible. There must be another way. I looked around and decided to try climbing out on the side of the chimney, thus by-passing the chockstone. I pounded in a piton, chipped some ice off a hold, and took the gloves off my already cold hands. This was to be the deciding try. If we could get around the chockstones, the going might become easier. Overexposure of bare hands to the freezing weather, a misstep on this icy footing, wrong timing in shifting of weight—any of these might spell defeat.

There was the moment of tenseness, then the moment of exertion and strain. My groping hand found a good big hold and pulled the rest of me along. More steep climbing—but with plenty of good solid holds—and, at the end of a hundred feet, a bomb-proof belay position. The pitch was made. Things looked better ahead.

Oscar led the next pitch, putting in several pitons, and we were at the top of the chimney. Three hundred feet still to go, thirteen thousand feet behind and below us! We were now in the rime-covered part of the tower. We traversed left, then up to the right, and found ourselves in a snow-filled open chute, the top of which opened onto the steep snow that made up the top one hundred and fifty feet of Mount Waddington. Beautiful, yes—but safe? That was another question.

It took several pitches to reach the top of the snow chute, but soon we were just below the summit. I strapped on my twelve-point crampons and began to kick steps toward the summit, less than a hundred feet away. The snow became steeper and my heart pounded faster. Victory was in sight. Now I could touch the summit with my ice ax, now my foot touched it, now one leg was on either side of the rime-topped ridge that made the highest point of Mount Waddington—one leg over the north face and one leg over the south face. Finding a belay spot, I began belaying the others up one at a time. No room here for group pictures—just room to sit astride the great mountain for the briefest of moments, seeing for a flash only the vast horizons below, over which Mount Waddington has towered for ages past.

Then there were voices—not our voices, but familiar voices—coming from the west ridge.

I called out, "Is that you, Al?"

"Yeah; are you on the top?"

The four who had tried the north face were only an hour behind us in reaching the top. Success was now complete; we had safely reached the top of Mount Waddington by two completely new routes. The first of us had reached the summit at about two o'clock in the afternoon, and little time was spent gloating over our success, for night soon would be upon us. We preferred our warm bags to sling ropes and rock.

We descended as fast as possible, and it was ten o'clock when the four of us started the primus stoves roaring in the tents at high camp. It was completely dark, several hours had now passed, and still there was no sign of the other party. They were spending a harrowing night on the north face of Mount Waddington, and our prayers and wishes were for their safety and comfort. We were relieved when they awakened us at four-

thirty the next morning and wanted us to start the stoves for them. They had spent twenty-four hours on the summit tower.

Oddly enough, the weather was still quite mild. We still had food enough to last several days; just above our camp was the unclimbed rock tower of Mount Waddington. Unable to turn our backs on its challenging spire of rock and ice, we spent one day hanging from its windy face and driving in pitons. Our reward was the first of the many first ascents that we were to make in the area.

The time to leave our lofty campsite was now at hand. As we shouldered our loads I noticed that there was very little conversation. We had had such a wonderful stay that it was like leaving an old friend. I wanted to turn around and say, "Thank you, Mount Waddington, for tolerating such puny things as us climbers." A jerk on the rope, and no more dreaming; my crampons were biting the snow in the direction of base camp and more food!

Base camp was like home. The four-man mountain tent seemed like a castle compared with the small two-man tent we used on the mountain. And we needed the castle, for rain held us in camp for three days. After being held down by weather we were eager to be off to the heights of Mount Munday and the ridge that formed the southern side of the Tiedemann Glacier. Mount Munday had been climbed twice before from the other side but never from the Tiedemann. Mounts Grenelle, Fascination, Merlon, Sierra, and Marcus Smith never had been climbed. Also, we soon discovered that they were incorrectly located on our maps. Our plans were to climb the north face of Munday, then to follow the ridge down, climbing as many peaks as possible, and to return to the Tiedemann near its terminus.

With shouts of *Mule train!* and *Hoopla!* eight hardening climbers left the middle of the glacier and its pile of rocks known as base camp. The day was July 29th. Ten days later, and twenty days hungrier, we were to drag ourselves again to this pile of rocks and thank our lucky stars that we had made it. The next week and a half was to be the most dangerous and the most trying part of the trip.

We left the Tiedemann and slowly moved up through the maze of crevasses in the glaciers and icefalls that come from Mount Munday. Falling waist deep into crevasses was sometimes unavoidable. I remember once seeing Jim up to his waist in snow. Then he moved on, and soon Al was up to his neck in the same spot. This seemed strange until I reached the place and found myself in the same predicament, struggling with fifty pounds on my back to gain the other side. There was apparently nothing

to do but to fall into that crevasse! Halfway to the summit plateau of Mount Munday we were forced to dig shelves for the tents, for a storm was blowing in. By next morning the storm had obligingly left, and we continued toward the acres of snowfield of the great summit plateau of Mount Munday, at about ten thousand feet elevation. By noon we were there, and a big day started.

Rising out of the summit plateau, not over two hundred feet above their bases, are five or six small peaks. Leaving our packs in the middle of the névé field, we headed, eight strong, for Cornice Peak. We gathered on its summit while the many cameras took family portraits of parkas and glasses. By this time each person had chosen a special peak to climb, and soon there were footprints to each peak of the massif. All of Mount Munday's peaks climbed, we turned to making camp for the night. The sun disappeared; primuses began to roar. By the time our feet were beginning to numb, a cupful of wonderful-tasting soup, followed by potatoes, corned beef, and hot jello took our minds off the temperature. The feast over, we once more undertook the project of fitting ourselves into the tents.

Brilliant sun, and Oscar in a union suit and bare feet, greeted us as we ventured our heads out, the next morning. More than two weeks of climbing and packing had now begun to put us in good condition and in good appetite. Breaking camp, we started the traverse of the ridge by climbing everything that could possibly be called a summit. At the end of the third day we had climbed seven more summits, among those a complete traverse of the Mount Grenelle ridge. We were now in country that had never been seen by men well enough to map before; our maps showed only blank spaces. Then a sunless day, with clouds covering sky and peaks while we moved camp to Echo Col, between Sierra Peak and Mount Fascination, both of which we climbed on the fifth day—a sunny one.

Our nearest accident came on our sixth day out. Going down Echo Col, we had to climb down a very rotten chimney. All but Dick, Oscar, and Phil had made it out of the chimney when Phil's rope dislodged a rock approximately a foot in diameter, which fell directly toward Dick. Rather than stand and be lambasted by a boulder, Dick elected to leap off the cliff. Lucky he was that Oscar's belay was solid. Not two hours later, when his snow steps gave way, Dick plummeted thirty feet, to stop on a ledge below the bergschrund. We aren't sure whether this was an accident or not, for he was heard to say a casual "Oh hell!", thereafter landing safely beside his belayer.

By three o'clock in the afternoon all of us seemed to have lost all our energy. Discovering earlier that through some slip-up we had not brought

along enough food, we had already cut our daily ration. There was no retreating from where we now were, on the opposite side of Mount Merlon from the Tiedemann, but we still had no cause to be anxious, unless the weather should change for the worse.

We awoke next morning to find visibility one hundred feet at best, and a half-snow, half-rain pattering on the tents. Now things took on a desperate look. Food would last for only three days more, even at our decelerated rate of eating. Between us and the Tiedemann were the great ridges of Mounts Merlon and Marcus Smith; crossing them high up with packs would be impossible. Our only chance was to cross one of the lower passes below Mount Marcus Smith. The maps were blank here; we would have to travel on what we could remember of what we had seen. Rather than to stay and wait the storm out, we decided that we had better move on.

We crawled out into the storm, packed, and left. The wind was driving the rain through the fog and each of us was in a world of his own; when the ropes were out full length, mists closed in between one man and the next. We walked uphill and down, back and forth and back again, under cliffs and around them. Finally we neared a pass, eagerly sped up our tired steps, and looked over to see—a sheer ice cliff! We would have to stir ourselves on into the soup. But we were then so tired and so soaked to the skin that we decided to camp right there. Tents went up, and we looked grimly at our soaking bags and nearly empty food sacks.

The storm gently covered us with fog and rain that day and the next, while we stayed put, ate half rations, and waited the weather out. Lying in our wet sleeping bags, we passed the time away planning feasts of ham, leg of lamb, and pheasant. Then, facing up to reality, we would eat a thin slice of cheese and a half ounce of chocolate for a meal.

Dick, as I said, was the morale man.

"This little group is having fun," came brightly from his tent. "Everybody warm?" Hoots and sneers subsided into low conversation and silence.

Early on the third day I found myself staring at the top of the tent. Could that possibly be sun shining on it? Quickly looking out, we found that the storm had cleared, at least temporarily, and that our chance had come. We capitalized on it, broke camp, soon found a pass, and at three in the afternoon we were on the Tiedemann, with base camp in sight. Base camp, dry clothes, food! Eat—how we ate! Gallons of noodles disappeared, ten packages of pudding had the same fate as the feasting went on for hours. Then, one by one, we gave up and went groaning to our tents. Many days were to pass before we could again look pudding and chili powder in the face.

Three days at base camp and we were off again for the mountains. This time we traveled in three directions, with different objects in mind. Oscar, Dick, and Ray went to Nabob Pass, from which they would climb Mount Jeffery. Jim and Bill went down the glacier to climb Mount Marcus Smith and the Lower Claw Peak. Al, Phil, and I toted hundred-pound loads to the upper reaches of the Tellot Glacier. All the groups would convene at camp on August 17th.

Once at the upper Tellot, climbing began. Here were Mount Stiletto and four towers of Serra yet unclimbed. We were in the peak of shape, and we tackled our projects with new vigor. Mount Stiletto was our first objective, and at noon we stood on the summit. Our attention was turned next day to the third and fourth towers of Mount Serra. This ascent required two hundred feet of step cutting in high-angle ice to reach the ice col between the two towers. From the col we ascended the ridges to both towers. The climbing was most enjoyable, occasionally requiring a piton or two. We were a high-spirited group by the end of that day's climbing. The climbing was excellent and the glorious scenery from the upper Tellot unsurpassed. In the evenings as the sun would be stretching its last rays to tint the towering peak with delicate pastels, we would stand silent outside our tent, drinking in the beauty that was spread around us in every direction. Evening chill would remind us that we still were on earth, and we would start the cooking and sleeping preparations.

A storm changed our last days' plans, keeping us inside for three days out of the five. On the 16th, it cleared, and by six in the evening all eight of us were together again. The time had come for us to leave our inspiring world of ice, snow, and rock, again to enter the civilized, rushing world we had left six weeks previously.

Of the trip out much could be written. We won't forget wading through icy glacial rivers with our legs numb to the crotch; or beating through, under, around, and over avalanche-felled timber; or Oscar's glee when he was slogging waist-deep in the mud of a morass; or driving the stage to Williams Lake after the driver had passed out from overindulgence; or Mrs. Nicholson and the wonderful venison meals that she prepared for us. Looking at my diary I see these lines, written as we left the upper Tellot camp: "Nothing but the best can be said for our trip. It has been one of the grandest experiences and successes of my life."

High Trip Impressions of a Government Guest

By ANNELORE WAGNER

[International peace is best promoted by efforts toward understanding the different peoples of the world, and surely a camping experience offers one of the finest opportunities of getting to know another people's ways. This year the Outing Committee was able to send two European girls on Sierra Club trips—to give them two weeks of fellowship in the mountains as an aspect of American life.

As we came to know her better, we felt that Dr. Annelore Wagner, a young woman doctor brought here from Germany by our government to study American public-health methods, would be an ideal choice for the club to send on one of the outings. Her time in this country was short; her time in the Sierra only two weeks. But those of us who were with Annelore on the High Trip know that she absorbed a great deal of its atmosphere (into which she fitted so well), and that she will be able to give her countrymen a better idea of a part of America and some of the ways of Americans.—DORIS LEONARD.]

NEVER WILL I forget the lucky day when Dick Leonard came and invited me to the Sierra Club High Trip. And before saying anything else, I would like to thank him and everybody who made this trip possible for me. It really was one of the most pleasant and outstanding experiences I had during my time in the United States.

How much did I know about the Sierra before I went on the trip? Well, in school I had to learn the name and the altitude of Mount Whitney, without having any idea how this country looks. Then, after the war, I heard quite a bit about burro trips and high trips from my relatives—at a time when we did not have enough food, energy and equipment to enjoy hiking. You can imagine what a big impression these descriptions made upon me, and how much I wanted to see the Sierra. I liked mountains and hiking so much, being brought up near the "Alb," the continuation of the Swiss Jura in southern Germany—and having studied in Innsbruck, Austria. And when it became reality for me to go to California, the Sierra was something I expected to see.

Well, I think my idea about hiking in the mountains up to this time was a little bit different from what it is now. In Germany and Austria you can reach some sort of lodge or cabin every night. If you are a member of the Deutsch-Oesterreichisch Alpenverein (German-Austrian Alpine Club), you have the advantage of better sleeping facilities, and during the ration-

card period you sometimes got meals without cards. But it did not matter too much if you were not a member. If you notified the lodge of your arrival or got there early in the afternoon you could be sure to find a place. If you really did not reach the lodge once in a while, because you were delayed for some reason, you could almost be sure that, as soon as you left the region with snow and ice, you could at least find a small hut with a cowherd. But even in regions of snow and ice the Alpine Club had some lodges. So before I came here I did not know how difficult it was for a single person, without a car and a burro, to see anything of the High Sierra. I did not realize that it was such a complete wilderness up there—such a wonderful wilderness, I would like to add.

This summer, before I left, I got a better impression of the Sierra, and I learned something about the life on a High Trip. Old Sierra Clubbers showed me wonderful pictures of previous trips. I recognized that the characteristic differences between the Alps and the Sierra are caused by the difference in latitude. The timberline in the Sierra is much higher, and where you would find snow and glaciers in the Alps you have beautiful lakes and creeks in the Sierra. And those lakes make the scenery so picturesque, and the country so attractive for the fishermen. Of course I cannot generalize anything, because I saw only a part of the Sierra, but I found that the formation of the rocks and the shape of the mountains is not always so different from the Alps, although the distances are much greater. When I first saw the nice green meadows, I had a question which probably all Europeans would have: Where are the cows with the bells? I got many good explanations for their absence.

Then, after this nice introduction with pictures, I started the trip. There was still one thing completely new for me: the first night in a sleeping bag. To be honest, it was not the best one. Maybe this was due to the frost on Tuolumne Meadows the next morning, maybe due to the excitement, or maybe I was not yet experienced enough to find a really soft place and to prepare it well as a "bed," as I did later. (Some people will probably remember how much time I spent later on getting rid of the rocks after I found a nice place, and how I substituted for the air mattress by shoveling pine needles in my campsite. Anyway, I learned to like my sleeping bag much more than I ever dared to hope.

There was one other perfectly new experience: to be in the mountains with so many people. Honestly, I could not imagine how it would work. But soon I found out that the Sierra is large enough for everybody; and I rarely met so many nice people as in the Sierra. My old experience was confirmed again, that people are so different in the mountains from how

they are in the cities. There is a primary understanding and a feeling of belonging together no matter where they come from or what they do in their daily life. Today I really think that to come in contact with all of you on the trip was as big an experience for me as to see the beauty of the Sierra.

Finally I would like to say a little bit about the organization as such. I never saw anything similar to a Sierra Club High Trip before. How comfortable it is if you don't have to carry a heavy knapsack; how wonderful to get served steak at this altitude—and get it served with a friendly smile from Paul, the excellent cook. Nothing was missing in this big organization. I don't think I have to mention all the other marvelous things in detail, which you knew how to appreciate as well as I did. One could really feel at ease in those camps. And the leader solved all problems to everybody's satisfaction. Also very interesting for me was the campfire program, where I learned a lot about the goals of the Sierra Club and how difficult it sometimes is to conserve this beautiful wilderness.

Soon I shall go back to my country, where I expect to find numerous occasions to speak of my fine trip and to illustrate it with my pictures. And if in the future some of you intend to go to Europe to see the Alps, be sure to let me know (Bremen, Osterholzer Landstr. 51).

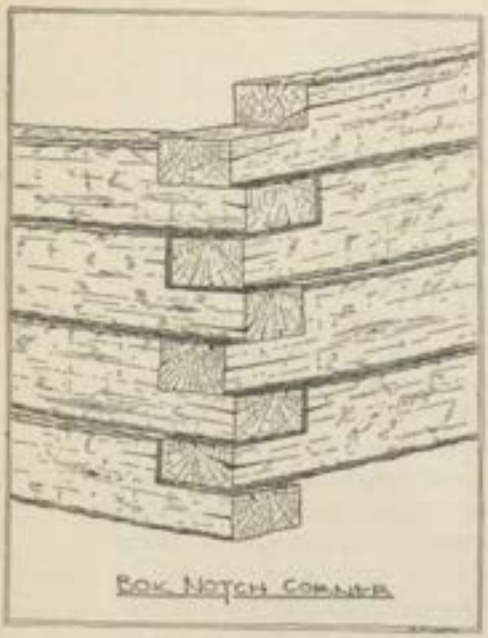
Yosemite's Pioneer Cabins

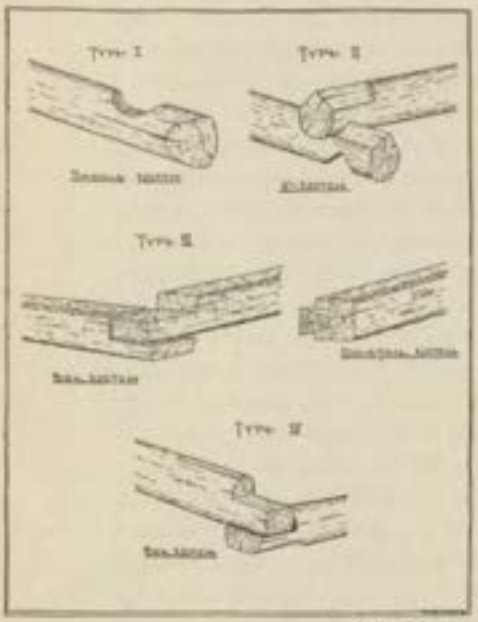
By ROBERT F. UHTE

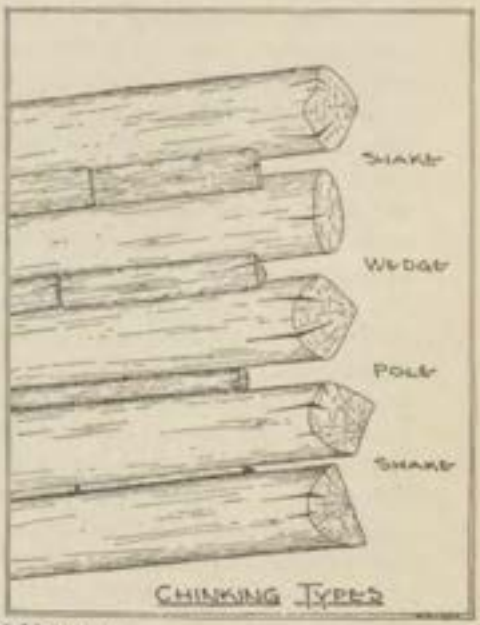
PHYSICAL EVIDENCE of the many cabins built by pioneers in the Yosemite region is disappearing so rapidly that persons interested in the history of the region have felt it worthwhile that such material as is available be gathered together quickly. The project of digesting and presenting data on the subject was assigned to me as an official duty in the course of my work as a park ranger in Yosemite National Park. The sources available to me were the field notes and rough sketches and photographs made by the several park rangers who investigated the old structures during the summers of 1949 and 1950. The account here does not pretend to be complete, and it may not be possible ever to obtain the full story of some of the cabins—even of some of those which are still standing; there may be no survivors to relate the details. It is hoped that some further information will be brought to light by readers of the present article.

As a bit of background, we know that log-cabin construction was common in the Delaware River Valley as early as 1640, and credit for the basic design has generally been given to the pioneer Swedes and Finns. Later, logs were used to construct forts and prisons in the English colonial settlements. In Pennsylvania the Germans used logs for "temporary" homes, many of which stand today. Log cabins housed the first schools and churches in many parts of the West, and helped to house the first seat of government of the Republic of Texas and elsewhere on the frontier. The construction of the cabins themselves reveals some of the culture of the early settler—his personality, character, experience, his national antecedents, and his ability to cope with the situations which confronted him. In general, the old cabins of the Yosemite region are not architectural gems; most of them are simple, even crude, but they reflect some of the hard-bitten qualities of their builders and they are worthy of attention from those who would know more of the history of the pioneers in the Sierra. In seems appropriate to review this history now while we are observing the 100th Anniversary of the effective discovery of Yosemite.

Present-day cabin builders find it next to impossible to equal the better structures of the pioneers, owing chiefly to the growing scarcity of good materials and of inexpensive but painstaking labor. Nowadays builders in many parts of the country are content to sacrifice true logs for a log veneer on the exteriors, and to compensate by making the interiors more







Notching and chinking types

elaborate by far. To the pioneers the construction of chimney and fireplace must have been something of a challenge; nevertheless much of their stonework appears incapable of toppling even if all mortar were magically to be removed. All in all, we have come to look upon the surviving frontier cabins as almost indigenous to a natural setting and have tended to retain the pioneer log-cabin architecture when a domicile in the woods is desired.

Two basic types of construction are represented in the Yosemite cabins —they are built of hand-hewn logs which are round in one type, square in the other. The methods of corner joining are more varied, however, and it is by these variations that I have classified the cabins, also taking into account the character of the logs themselves, as well as the methods of chinking. Most of the Yosemite cabins investigated were built with round logs and saddle notching at the corners. This type of construction was easy and rapid, for if the saddle notches were not cut deep enough for a tight fit, then larger chinking could be used. The cut I have called a V-notch, for lack of a better name, was also sometimes used with round logs, and was probably easier to make than the saddle notch, a V being easier to cut than a U. Although we may speculate which was better, the saddle notch at least produced a more finished appearance. A more difficult but better method of corner joining was the dovetail or box corner, customarily used with hand-hewn logs but occasionally found on round logs. Dovetailing made for a tighter fit, and chinking could often be dispensed with. When necessary, various methods of chinking were used—split shakes laid flat or on edge between the logs; small poles cut to fit snugly into the crevices; wedge-shaped slabs laid between the logs, or a complete covering of split shakes, laid vertically against the side walls as on a roof. This latter type of construction was quite common in the Yosemite region because of the ready availability of sugar pine from which the shakes could be made right at the cabin site.

Type I: Round Logs Joined by a Saddle Notch

Biledo Meadows.—Southwest of Mount Raymond near the enormous springs of Biledo Meadows just outside of the park are two unusually handsome cabins, one of hand-hewn square logs, the other of round timbers. The latter was built in 1890 by Thomas Biledo,* a French-Canadian miner who came to the vicinity in the 'eighties and was employed by the Mount Raymond Mining Company. The logs are eight-ten inches in diameter and laid on a loose rock foundation. The cabin is sixteen by four-

*The name should be spelled "Biledeaux" according to John Wegner (assistant chief ranger, 1916-1944), who knew the builder.

teen feet in area, with an overall height of sixteen feet. It is chinked with hand-split shakes laid parallel to the logs; the gable is filled in with vertical boards. A new roof and superstructure were added by the present owner in about 1932. The cabin was originally built with meticulous care and is in excellent condition. It finds regular use each summer and fall and, evidently, will last for many years.

Crane Flat.—Three log structures were erected by the National Park Service in 1915 as guard stations—the Crane Flat cabin, which still stands, although altered in recent years; another, now gone, in the Merced Grove of Big Trees; and the Hog Ranch cabin, which was replaced by the present Mather Ranger Station in 1935. The Crane Flat structure is the most spacious one studied. It originally had an enclosed floor space of 850

Biledo cabin (type I)

square feet, plus a lean-to for supplementary sleeping quarters and storage. The building had many refinements owing to its late date of construction, such as a number of glass windows, indoor plumbing, a large stone and mortar fireplace and chimney, and mortar chinking. It has shake roof, stone foundation, and saddle-notched corners. It finds use each summer by National Park Service rangers stationed at Crane Flat.

Cunningham.—Stephen Cunningham, born and educated in England, assisted Galen Clark as keeper of the Big Trees; on the flat below Camp

A. E. Wood, Wawona, and approximately eighty-five yards from the South Fork of the Merced River he built his log cabin and lived for many years. The flat which now bears his name is under development at this moment by the National Park Service as a modern campground. Cunningham filed on this land in 1861, but it is not known when he built the cabin. The structure has disintegrated to the point of complete ruin. It was eighteen by twenty-one feet, fronted on the river, and was quite luxurious compared to many of its contemporaries. All that remains of the fireplace and chimney is a pile of angular pieces of granite; no mortar was used. The walls, built of eight- to twelve-inch yellow-pine logs were neatly saddle-notched; in spite of the general ruinous condition many of the logs still fit together snugly. There is no evidence of chinking; the shakes found in the ruins were probably from the roof.

Cunningham supplemented his income as an employee of the Yosemite Grant by making curios which he sold to visitors in the Mariposa Grove. He had his own wood lathe and devoted his spare time to turning out souvenirs. A carriage road from Clark's Station (Wawona) gave access to his cabin and it persisted as a dim trail through the forest until recently when it was obliterated by the construction of a modern road into the new Cunningham Flat Campground.

Hodgdon.—At the southeast end of the Aspen Valley meadow is the Jerry Hodgdon cabin, the only two-story log cabin in or near the park. Several additions to this structure were made in later years—a front porch, a lean-to kitchen on the west side, and an outside stairway on the south end. The overall size is twenty-two by fourteen feet. A shake roof covers the perlins, which are parallel to the sides and extend about two feet on each end of the cabin. The base log suffices for a foundation. The building timbers, carefully notched on both upper and lower sides, give a neat appearance. The wedge-shaped chinking is barely distinguishable at a distance.

Hodgdon began work on this cabin in 1879, and was assisted by an old Chinese called Babcock (see below). The cabin was built for living quarters on the Hodgdon homestead and was occupied as such until a still larger home was constructed. The cabin was later used for summer billeting by a detachment of cavalry soldiers. Descendants of the Hodgdons still own and reside upon the Aspen Valley property.

East Meadows Cache.—The small trapper's shelter in the East Meadow portion of the Hodgdon Estate near Aspen Valley has rotted almost to the ground, but its features are still distinguishable. It was only eight feet long and six feet high. It had no windows and was entered by means of a

trap door in the roof. The cabin housed a very small stone fireplace and chimney.

This shelter was built by a Chinese called Babcock, an employee of Jerry Hodgdon, and used as a cache on Babcock's trap line. It is the only structure of this type known to be in the park.

Lembert.—John B. Lembert took up a homestead at Soda Springs, in Tuolumne Meadows, in 1885 and occupied himself at his high mountain summer quarters raising angora goats and collecting plant and insect specimens from surrounding meadows for museums all over the country. Lembert was living at Soda Springs at the time Prof. George Davidson was doing triangulation work in his temporary observatory on Mount Conness. Davidson reimbursed Lembert for the use of his property as a base camp and pasturage.

Lembert built his crude, one-room cabin of large round timbers laid on a granite stone foundation. The logs were chinked in a rather random manner with shakes, which were also used for the roof. Crude though this cabin was, it was adequate for summer occupancy. Lembert spent his winters in his cabin at the Indian Village, just below El Portal.

Mariposa Grove.—Galen Clark built his first log hut in the Mariposa Grove in 1858, a year after his discovery of the grove. Two photos taken about this time purport to be of the original cabin, but the differences in the photographed structures indicate that there were two different cabins on the same site. The two cabins are of the same size and in the same place, but the earlier one had shake chinking and an uncovered triangular stockade at one end, which possibly was used as a kitchen. There was no covering over the triangular area so a chimney was unnecessary.

According to the Yosemite Valley Commissioners' Biennial Report, 1885–1886, still another one-room log cabin was constructed in the grove, "for the shelter and convenience of visitors." Several years later, it was lengthened by the addition of another room. This structure, generally known as the "Galen Clark Cabin," stood for the next forty-five years, and its fame spread throughout the world, largely through the agency of photographs depicting it and its astonishing setting. In 1930 the Park Service replaced it, for owing to decay its collapse seemed imminent.

The new cabin stands on the original site, and while not an exact duplication of its predecessor, resembles it enough to carry on the tradition. We can fancy it is just the sort of log cabin Galen Clark would have built had building conditions been as favorable in his day. It differs structurally from the cabin it replaced, but not in general design. Every measure has been taken to insure it long life. It has a rubble masonry foundation and

a reinforced chimney. It is constructed of carefully fitted sugar-pine logs tied with steel dowel-pins and chinked with split-log strips over oakum packing. The shake roof is laid on roofing paper and solid sheathing. It has doweled, random-width oak flooring. The cabin now houses a small museum exhibit devoted to the sequoias.

Galen Clark's first cabin—Mariposa Grove
Replaced in 1885–86; second cabin rebuilt in 1930

McGurk Meadows.—In McGurk Meadows, one mile west of Bridalveil Creek and about one mile north of the Glacier Point road, is the site of a stockman's cabin similar in appearance and construction to the cabin in Mono Meadows. Lodgepole logs, notched on the under side only and about ten to twelve inches in diameter, were used to a height of four and a half feet for the walls, the base log being laid on the soil. Fireplace, windows, and flooring have been omitted. Wedge-shaped chinking filled the wide gap between logs. The doorway is four feet high. Shakes were used to cover the roof, which measured nine feet from eave to ridge.

This cabin was intended to have been part of the homestead of John J. McGurk, but through an error in description, the wrong property was filed upon. Thomas M. Again originally filed for the 160 acres intending to claim what is now known as McGurk Meadows, but the description entered into the county records placed the claim well up Illilouette Creek. Hugh Davanay subsequently acquired this mistaken title from Again, and sold to McGurk in 1895, who continued in possession until August 1897, when he was removed by U.S. troops, then the custodians of the national park. Their basis for this removal was the error in the original description of the claim patented by Again; the patent was for an area six miles di-

rectly east of his intended homestead. After his removal, McGurk forced Davanay to reimburse him for his loss and Davanay in turn tried to effect a trade with the General Land Office for the desired piece of land, but was refused. The land covered by the original patent was exceedingly rough and was considered worthless; Again could not dispose of it. Thus, Mc-

McGurk cabin

Gurk Meadows has always been in government ownership although occupied by several persons over a considerable period of time.

Mono Meadows.—The Mono Meadows cabin is on the Mono Meadows trail about one mile east of the Glacier Point road. It is built of small lodgepole pine logs with no indication of chinking. There is no foundation, window, or floor. The doorway faces north, and is four feet high and three feet wide. The overall size of the cabin is fourteen by fourteen feet. The walls are doorway height and the gable extends to nine feet.

This construction is like that of the McGurk cabin except that the logs used average only six inches in diameter. This shelter was built by Milt Egan and used seasonally as what is generally known as a "summer line cabin." Its later use was probably restricted to shelter for a sheepherder or cowboy when the adjacent meadow was grazed. The cabin is in a poor state of repair and is useless at the present time.

Murphy.—The west shore of Lake Tenaya is the site of a one-time long

rectangular structure built by J. L. Murphy on the Tioga Road as a home and a hospice for wayfarers. Murphy's roadhouse actually antedated the building of the road. Murphy occupied it only during the summer season, at which time he employed a cook and catered to travelers and campers. In winter he lived in Mariposa.

A photo of this cabin taken about 1890 shows a group of travelers, one of them being Galen Clark. This cabin has long since perished, but from this old photograph one is able to ascertain most of its physical appearances, and discover the substantial manner in which it was constructed. About one-third of it—that which housed the dry masonry rock fireplace and chimney—was built of exposed logs and chinked with large boards laid horizontally. Evidently this was Murphy's basic cabin. The other two-thirds appears to have been a later addition and differs greatly in that it is a frame structure completely covered by split shakes laid horizontally. The entire cabin is covered by a roof of split shakes which overlap on one side of the roof ridgepole, thereby sealing the roof from rain and snow.

An excellent description of this shelter and its surrounding terrain is found in an excerpt from the *Daily Free Press* of Bodie dated August 18, 1882: "The ample meadows surrounding Lake Tenaya at its eastern and western extremity are now owned by J. L. Murphy, who settled there and fenced in the property years ago. This gentleman also stocked the lake some years ago with trout, which are now quite abundant in its waters. On the northern shore, at a point about half way between the two ends, he has built a comfortable log house for the accommodation of guests, all the board work for which, roofing, etc., has been turned out by the laborious process of whipsawing."

Snow Flat.—The remains of the Snow Flat cabins can be found along the trail that leads to May Lake, about a hundred yards off the Tioga Road. No actual history is known of these cabins, and they have deteriorated to the point where one can only deduce what they looked like. The only trace of one of them is a pile of large granite boulders, presumably a dry masonry fireplace and chimney. The other cabin, a short distance away, has been reduced to a small square enclosure four logs high which look like a corral. The cabin was built of rough round logs laid on a stone foundation—a large boulder placed at each of the four corners. The logs were saddle-notched above and below and were closely joined at the corners. Wedge-shaped chinking was used. Piles of ore samples are to be found around the cabin sites.

Type II: Round Logs Joined by a V Notch

Beehive.—The two Beehive cabins, seven miles north of Hetch Hetchy Reservoir on the Jack Main Trail, were both built by the same family but are of different construction types. One was built on a loose rock foundation and had five horizontal logs on one side and six on the other. Short stumps or uprights were placed between the logs at various intervals to keep them from sagging—an expedient used in no other Yosemite cabin. The overall size is fifteen by twenty-four feet. Shakes covered both roof and sides. The cabin had no flooring; the occupants slept on bear rugs, believing this to be warmer. The roof has disintegrated.

This cabin was built in 1888 by Lewis and Eugene Elwell, early settlers and cattlemen in this area.

Crescent Meadows.—The Cresent Meadow cabin near Wawona was built of lodgepole logs about nine inches in diameter, joined by a V notch, the four-inch clearance between logs being chinked with wedge-shaped strips and split shakes laid flat to cover the crevices. Several large rocks were placed beneath the base logs to serve as a foundation. The fireplace and chimney, which have collapsed, were of a dry masonry type.

According to Bob McGregor, a government packer, the cabin was built by Robert Wellman for the livestock partnership of Stockton and Buffman. Some residents of Wawona believe it was built about 1887 and contemporary photographs sustain this idea.

Dana Fork.—An old sheep-camp cabin is situated on the Dana Fork, about a mile and a half from the Tioga Road on the Mono Pass Trail. Two photographs, one taken in 1925 and the other in 1949, show that the structure has deteriorated very slightly during the last twenty-five years. Construction was of white-bark pine logs eight logs high, which make an overall height of not more than seven feet. Deeply cut V notches at the corners allow for a tight-fitting chinking. Four long stringers spanning the length of the structure on each side of the ridgepole give support for the roofing material. This consisted of small poles laid parallel to the end of the building and bound together by split shakes. The shakes have disintegrated. All other features are much the same as those discussed in other cabins of this general construction type. No inkling of the history of the builder has been obtained.

Lamon.—The Lamon cabin is recorded as the first log cabin built in Yosemite Valley. James C. Lamon was one of the mountaineers who aided in the construction of the "Upper Hotel" or "Hutchings House" in 1858. The next year he located a preëmption claim at the upper end of the valley and built this small but comfortable log cabin. Lamon used unusually

large logs for his home, but they were so skillfully notched on both the upper and lower sides, and joined so proficiently at the corners, that the result was a very tight, compact little shelter. The logs were graduated in size from the base log up to a small gable which was filled in with horizontal split shakes. The perlins were parallel with the sides and were covered with split shakes. These overlapped the ridge on one side, assuring complete drainage for the roof. Numerous pictures of this cabin were published in the early books pertaining to Yosemite.

Lamon cabin

Lamon recorded his claim to 160 acres of land in Yosemite Valley on May 17, 1861.* At the same time that he built his home he planted a fine apple orchard in the valley which still flourishes today. Lamon resided here for fifteen years and endeared himself to his Yosemite neighbors. His death in 1875 marked the passing of one of the most colorful and best known pioneers in early Yosemite affairs.

Mono Pass Miners.—The Mono Pass Miners' cabins are a series of shelters at the head of Bloody Canyon. They were erected by the mining company which owned the Golden Crown mine to house its employees during a period when it was believed that the summit country would produce

*"Land Claims" (K) p. 363, Mariposa County Records.

riches. Although the cabins were erected in the 'seventies they have withstood time and the ravages of the elements.

White-bark pine logs were employed, the first of which rested on the ground, and all corner notching was V-shaped, producing a tight fit. Wedge-shaped chinking was inserted between timbers at both interior and exterior angles, making the cabins doubly protected. The stringers spanning the roof are parallel with the façade, and over these were laid vertically a series of short, small logs, placed tightly together and extending from the center ridgepole to the eaves. Apparently sod from the near-by meadow once covered the log roof.

Tiltill Mountain.—The stockman's cabin at Tiltill Mountain was built by the Elwell brothers in 1888, the same year they erected the Beehive cabins. It is not known how long the Tiltill Mountain cabin was used, but indications are that it was occupied only seasonally and for the several years that the Elwell cattle grazed in that area.

Two large trees have fallen over this cabin in recent years, but structural features can still be distinguished. The walls were five logs high, and the corners were V-notched. Chinking of split shakes approximately eight inches wide was used to bridge the interval between logs. The overall dimensions of the shelter were ten by twelve feet. Roofing was of split shakes. The base log rested on the ground. Flooring was of packed earth.

John Muir.—John Muir, "The Father of Yosemite National Park," came to Yosemite on foot in 1868 and made headquarters in Yosemite Valley for about five years. He obtained employment at Hutchings' sawmill cutting lumber for the hotels and cottages then being built in the Sentinel group. He boarded with the Hutchings family and occupied a cabin he built for himself near Hutchings winter home along Yosemite Creek. The Muir cabin was a small hideout almost obscured from view by the surrounding trees and shrubbery. Muir used round logs for his home, joining them with a V notch. The perlins were parallel to the ridgepole and extended beyond the cabin two to three feet. A shake roof covered the structure and overlapped the ridgepole on one side.

The shady environment of this cabin was not conducive to rapid melting of the snow on its roof, so Muir compensated for this by constructing a steep-pitched roof which tended to rid itself of the snow when the roof became too heavily burdened. Shakes laid flat covering the crevices between the logs produced adequate chinking for the abode.

Muir used his hands and heart in the construction of his home. A description of the cabin interior in Muir's own writing* will give the reader

**The Life and Letters of John Muir*, I, pp. 207-208.

the best picture of the quarters. "This cabin, I think, was the handsomest building in the Valley, and most useful and convenient for a mountaineer. From the Yosemite Creek, near where it first gathers its beaten waters at the foot of the fall, I dug a small ditch and brought a stream into the cabin, entering at one end and flowing out the other with just current enough to allow it to sing and warble in low, sweet tones, delightful at night while I lay in bed. The floor was made of rough slabs, nicely joined and embedded in the ground. In the spring the common pteris ferns pushed up between the joints of the slabs, two of which, growing slender like climbing ferns on account of the subdued light, I trained on threads up the sides and over my window in front of my writing desk in an ornamental arch. Dainty little tree frogs occasionally climbed the ferns and made fine music in the night, and common frogs came in with the stream and helped to sing with the Hylas and the warbling, tinkling water.

"My bed was suspended from the rafters and lined with libocedrus plumes, altogether forming a delightful home in the glorious Valley at a cost of only three or four dollars, and I was loath to leave it."

Hutchings.—James Mason Hutchings is another name that has grown to be almost synonymous with early Yosemite history. In addition to his proprietorship of the Upper Hotel or Hutchings House in the Valley, he publicized Yosemite in his *California Magazine* and in his several books on the Sierra. His *In the Heart of the Sierra*, 1886, bears the imprint, "Published at the Old Cabin, Yo Semite Valley." Hutchings was born in Towcester, Northhamptonshire, England, February 10, 1820. He left England in 1848 and arrived in Yosemite June, 1855. In 1863, he purchased the Upper Hotel from the Hite brothers, George and John, and after acquiring this primitive two-story inn, he laboriously supplied it by pack mules over the narrow rugged fifty-mile trail from Coulterville. At first, the hotel structure was most unrefined, as records indicate when Hutchings first purchased it. The windows, doors and partitions were all of thin muslin, but Hutchings proceeded to make improvements and additions so that it eventually became a reasonably comfortable lodging for the many guests who resided there while visiting the wonders of Yosemite. He used 109 saddle and pack horses to carry guests from the hotel to points of interest in and around the valley, and his fame as a guide was quite as notable as was his reputation as hotel keeper.

Hutchings' home for his family of wife and three children was erected on the warm side of the valley near Yosemite Falls. James C. Lamon assisted in the building. Round logs were placed on a stone foundation, and joined with a V notch. A covered open porch or lean-to occupied

one side of the building. Later, a frame addition was built on the opposite end to supply added living space for the family. The cabin boasted a large stone fireplace and chimney. Two extremely large granite slabs were used to form the mantel and hearthstone. Split shakes were used to roof the cabin and to chink between the logs. This residence was torn down during the early years of Army administration in Yosemite Valley.

Hutchings served as Guardian of Yosemite Valley and the Mariposa Grove from 1880 to 1883. Florence, one of two daughters born to the Hutchings, was the first white child born in Yosemite; she died there at the age of 18 and Gertrude, the other daughter, affectionately known today as "Cosie" by the local Yosemite inhabitants, came back to the park in the 1940's after many years of absence and resided there until 1949.

Type III: Square Hand-hewn Logs Joined by a Box Notch

Biledo Meadows.—A compact hand-hewn log cabin is the second of two cabins on the Thomas Biledo claim on the southern boundary of the park near the Mariposa Grove of Big Trees. The builder is unknown, but available information indicates it was completed about 1880. The cabin is in excellent condition today; a new roof and superstructure were added by the present owner in 1932. Hand-hewn logs, eight to ten inches, rest on a loose rock foundation, and rise to a height of seven feet. Deep notching of the logs made a tight durable corner joint and thus chinking was omitted. A gable of about six feet rises to the ridgepole and is enclosed with vertical boards and bats.

Gin Flat.—The Gin Flat cabin stands about 150 feet east of the old Big Oak Flat road in the south end of the meadow. Actually, there are two separately built cabins placed so close together as to give the appearance of one long unit. The larger unit is 16 by 24½ feet, and the smaller 14 by 18½ feet. There is a common porch 6 feet in depth spanning both structures. Wedge-shaped chinking was inserted between the pine logs which were hewn on the two exposed sides, and secured at the box-notch joints by large oak dowls. Granite was used for the foundation and again for a dry masonry fireplace built in a corner of the larger unit. The perlins are parallel with the sides and covered by a sugar-pine shake roof. The gable is filled in and sealed with vertical boards.

Construction was begun in 1883 by John Curtin, a stockman who had frequented the Gin Flat area since the early seventies. Mr. Curtin lived at Keystone, California, near Knights Ferry.

Kibbe.—This structure was erected on the shores of the natural Lake Eleanor by Horace J. Kibbe, a homesteader; the building and its site are

now under the waters of the Lake Eleanor reservoir. Very little is known about either Kibbe or his residence. An oldtimer of the Lake Eleanor area, Theodore B. McCleod, when questioned, recalled his first visit to Lake Eleanor in 1877 when he was six years old, at which time Kibbe instructed him in the art of catching trout. McCleod volunteered the information that Kibbe was a "Squaw Man" and had his squaws pack trout from lake to lake, thereby stocking them so the Indians and Kibbe would have good fishing. The cabin consisted of one room and the sides were covered with

Biledo cabin (type III)

overlapping shakes. The perlins were parallel to the ridgepole. The deed to the Kibbe place was not recorded until 1890.

Hodgdon Ranch or Branson Meadows.—About two miles within the park on the Big Oak Flat road is the former Hodgdon Ranch. T. J. Hodgdon, a colorful pioneer, was the father of the Jerry Hodgdon who later built the two-story cabin at Aspen Valley, previously described. The site of this ranch was first called Moore and Bowen Camp, then Bronson Meadows, and eventually, when Hodgdon acquired the land, Hodgdon Meadows. T. J. Hodgdon was only twelve years old when he first visited Bronson Meadows, and perhaps this visit instilled in him the desire to

own the place. On May 15, 1865, he purchased the land by squatter's title. Hodgdon raised cattle here and two log cabins constituted his first physical improvements.

In 1870 Hodgdon's ranch was at the end of the Big Oak Flat wagon road. Passengers en route to Yosemite would spend the night at Hodgdon's and travel in the saddle from that point over the trail to the valley. In 1872, Hodgdon, together with a Mr. Shoup, engaged in a staging business and continued in this enterprise for seven years.

The ranch finally contained a number of buildings, including a hospice for travelers which was completed in 1871. The two early log cabins were tightly constructed of square hand-hewn logs placed on a loose rock foundation and roofed with split shakes. They were chinked with split shakes laid parallel with the building timbers.

Smith Meadow.—One mile southeast of Smith Peak and Hetch Hetchy Reservoir is a cabin in relatively good condition with only the shake roof in poor repair. Hand-hewn logs were handsomely laid, and the box corners were secured with hardwood dowls driven at an angle to the adjacent log. The cabin is twelve by sixteen feet and rises to a height of thirteen feet six inches. Eight logs approximately twelve inches square constitute the walls. The roof joists are so spaced as to accommodate three-foot shakes and extend five feet beyond the front of the cabin and two feet at the rear. This extension is also covered by shakes. There is an interesting doorway in the front. The door is hung on hand-carved wooden hinges and pivoted on wooden pegs. The wooden latch is so constructed as to allow the occupants to lock the door from the outside. Beveled cross bracing is attached across the upright boards by means of Belgium nails. A small fireplace of dry masonry stone is situated in the rear wall, which appears to be only a blackened niche. The fireplace did boast a mantle, however, held in place and supported by wooden pegs.

Evidently great care was exercised to make this cabin comfortable, for a double chinking was used between the square timbers. From the exterior side, small poles the size of the niche were inserted deeply between the logs, so deeply in fact they can barely be discerned. For further insulation against cold, split shakes were applied over the gap between logs on the interior side, which in addition to affording a double seal also produced a smoother wall surface.

This cabin was built in 1885 by Cyril C. Smith, an early settler in these parts who came from Maine. He had holdings in Merced and settled on lands now known as Mather, Hetch Hetchy, and Smith Meadow, which he used as summer pasturage for his stock. Smith was primarily a sheep

man, but did at one time raise hogs on the Mather site. Cyril Smith was the father of Elmer Smith of Merced, who sold parts of these lands to the City of San Francisco for a recreation camp.

Tamarack Lodge.—On the Big Oak Flat Road was a hospice for travelers known as Tamarack Flat Lodge. A photograph taken in 1903 shows the lodge in reasonably good condition. Several bicycles appear in the pic-

Door of Smith Meadow cabin

ture. At that period more than a few cyclists Yosemite-bound rode bicycles all the way from the San Joaquin. Tamarack Lodge possesses several features unlike any other cabin studied. Granite rocks were piled high at each of the four corners on which the first of the logs were laid. Two large stone steps led up to the doorway. The building logs were square, hand-hewn, and connected with a box-corner joint. Over this corner were nailed short pieces of split shakes to protect it from damp weather.

Split shakes were used to cover the roof and again to chink between the square timbers. They were secured flat against the logs to produce a good tight seal. The gable was filled in with vertically laid boards. There were two signs over the door, one reading "Tamarack Lodge" and the other "Tamarack Flat."

Miguel Meadows.—What remains of the Miguel Meadows cabin can be seen seven miles from Hetch Hetchy Reservoir on the Lake Eleanor trail. Presently, the cabin is in a state of collapse and will not be found standing many more winters. From an old photo presented by Celia Crocker Thompson of Lodi, California, it appears that in its younger years the cabin was quite substantial and well constructed to carry the winter burden of heavy snows. Split shakes completely covered the exterior, and hand-hewn timbers were used as structural members. A large dry masonry fireplace and chimney in sound condition still stands.

Miguel Herrara and his partner, Jonas Rusk, owned the meadows. They grazed a large herd of cattle and horses in this area in the summer. Herrara is described as a small man with black hair and dark complexion, and was apparently of Mexican or Spanish descent. In addition to Miguel Meadows, he also had holdings at Lake Vernon at one time.

Type IV: Round Logs Joined with a Box Notch

Beehive.—The second of the two Beehive cabins, seven miles north of Hetch Hetchy Reservoir, was also established by the Elwell family as summer headquarters during the grazing season. Large logs were used for this cabin, the first of which was half buried in the ground. Five perlins were laid from the center ridgepole down to the wall height, and these were covered with split shakes. The perlins extended approximately three feet over the front of the cabin to shelter the doorway. This extension was covered with split shakes.

The Elwell family also built cabins on Tiltill Mountain and another near Lake Vernon, but the latter is no longer standing. Very little information is available about this family. However, District Ranger John Bingaman talked to a few of the oldtimers west of the park and learned that the Elwells once lived near Groveland, California, and each summer drove their cattle up into the higher country and returned to their home range in the fall. These cabins were built in this period. About 1889, Mr. and Mrs. Thomas R. Reid filed on Lake Vernon by preëmption and built a cabin there. At the same time, Lewis Elwell filed on Mount Gibson and Eugene Elwell field on Beehive.

McCauley.—One of the more recent of the log cabins in Yosemite is John McCauley's in Tuolumne Meadows. Many modern features are found in this building but they do not conceal its original character. Round logs were used and the corner joints were square or box notches. It stands on a rock foundation, and the chinking is mortar. Alterations include a shingle roof with flashing, screen door, and glass windows.

McCauley built this cabin about 1912, probably before actually acquiring title to the land which he purchased from Jean B. Lembert, who had obtained a homestead patent here in 1895. Soon thereafter the Sierra Club acquired the property from McCauley.

Tuolumne Meadows cabin

Tuolumne Meadows.—This small house is on the Elizabeth Lake Trail in Tuolumne Meadows and is in reasonably good condition. It was roughly and crudely constructed of unusually large lodgepole timbers, extending from the base log on the ground to a height of approximately nine feet at the ridgepole. Entrance is gained through a doorway about five feet in height at the left side of the façade. The manner in which the logs were joined at the corners produced a fairly tight cabin, thus minimizing the need for chinking. However, some chinking, in the form of small wedges placed parallel between the logs, was used in places.

Although round logs were utilized, the corner joints were secured with a box corner. Only two courses of long shakes were used on the roof, which produced a shabby appearance.

Information regarding the cabin's historical background is sparse. Mr. William E. Colby, who has long known the Tuolumne Meadows area, states that the cabin was there in 1894 to his best recollection, and that it

was built by one of the sheepherders who used to drive sheep into the meadows prior to the establishment of Yosemite National Park.

Devil's Postpile.—Southeast of Yosemite National Park is the Devil's Postpile National Monument. It is stated in Gudde's *California Place Names* that Red Satcher, a sheepherder, settled in this area about 1878. He built a cabin with a large fireplace at the foot of the Devil's Postpile, easily accessible from the pasturage in the immediate vicinity. Mr. Douglas Robinson of Bishop, California, states that he visited this area in 1909 and that a Mr. Moore was living in the cabin. At that time, the structure was in good repair, indicating that possibly Mr. Moore had rehabilitated it.

Architecturally this cabin has some features not found in most of the early pioneer structures. Large logs were used at the base and as the walls proceeded upward, smaller elements were employed. This produced a sturdy appearance. The doorway and windows were deeply recessed and boxed in by cut lumber. Shake and wedge-shaped chinking were used. At the present time the structure is in a state of collapse, but all of its parts are recognizable.

Other Cabins

The additional cabins listed below are known to have been of log construction. Pertinent information on structural features and historical data are not available; they are only mentioned to record their approximate location and to solicit information from readers who may know something about them.

Buck Camp.—East of Wawona. The cabin no longer stands but remains of it were seen by District Ranger John W. Bingaman in the early 1920s.

Cathawood.—In Zip Canyon along the South Fork of the Merced River below Cunningham Flat. Reported by Frank Ewing.

Empire Meadow.—The original cabin was built near the road that leads to Deer Camp, southeast of Chinquapin Ranger Station.

Hazel Green.—West of Yosemite National Park on the Coulterville Road.

Lake Vernon.—Built on the shores of Lake Vernon by Thomas R. Reid in 1889.

Little Yosemite.—In Little Yosemite Valley. Probably belongs in the group of early National Park Service cabins mentioned under Crane Flat.

Ostrander.—Stood near the present Bridalveil Creek Campground.

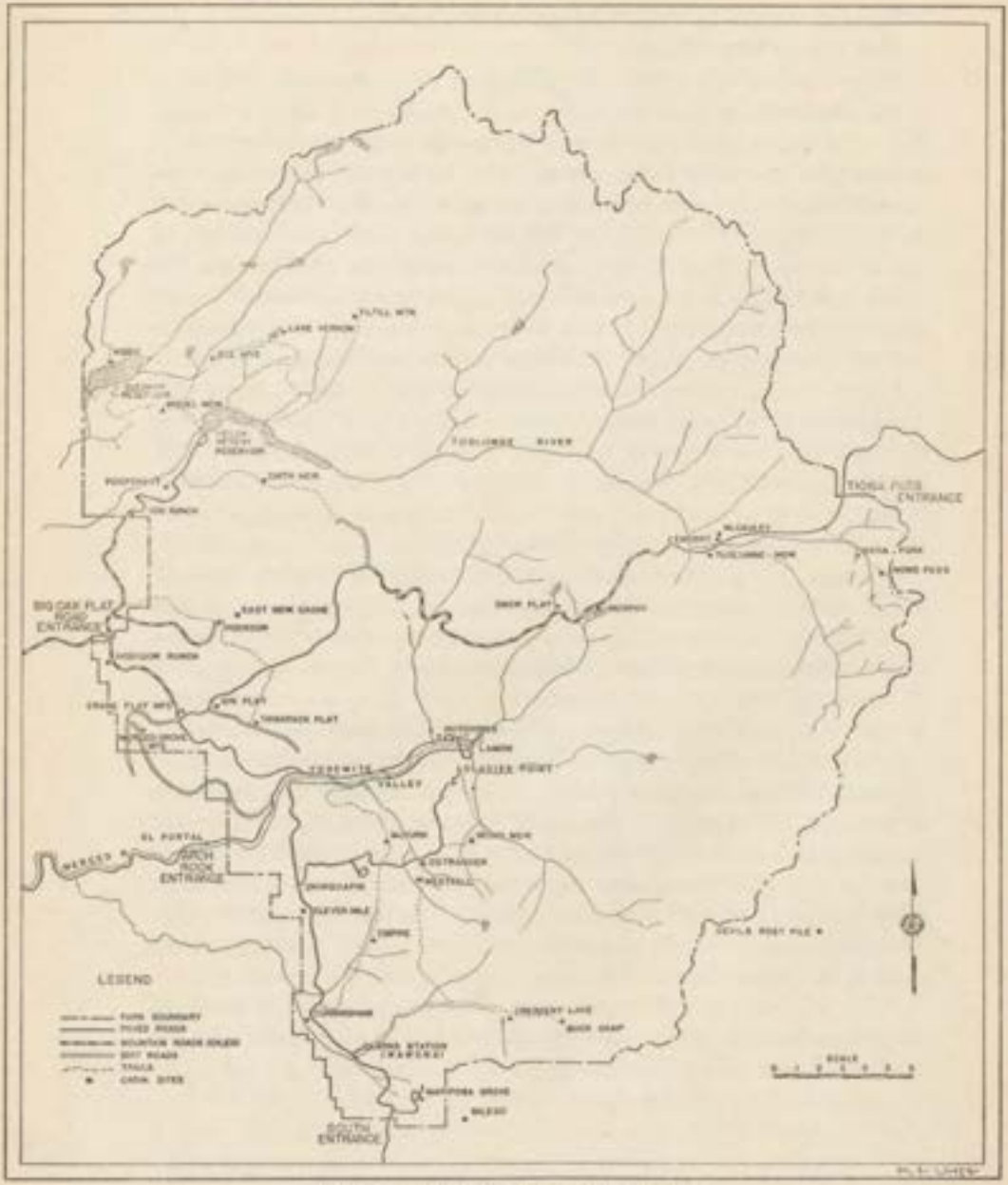
Rancheria Mountain.—Above Hetch Hetchy on Hat Creek near the the trail crossing.

Turner Meadow.—Stockman's cabin four miles below Crescent Lake, east of Wawona.

Westfall.—Built by J. J. Westfall on Bridalveil Creek, south of the present Glacier Point Road.

These notes serve to crystallize the thought that even the back country of this, the oldest and one of the great scenic reservations in America, did not escape exploitation. Now, as we celebrate the 100th anniversary of the discovery of Yosemite Valley, we can take satisfaction in the fact that most of the pioneers who occupied their chosen spots in the area which became Yosemite National Park did not bring about such changes as would menace the integrity and values of the preserve. Miners made but feeble scratches as they sought mineral deposits which were never found; sheepmen and cattle ranchers were a very real threat and it is impossible to state accurately the extent of damage done to land and flora, but their period of activity was brought to an end before a great deal of irreparable damage was done; trappers were present but they have left little trace of their activity; homesteaders, generally, wreaked no havoc—their claims with few exceptions have reverted to nature. Two of the exceptions exist in the Hetch Hetchy reservoir and the artificially enlarged Lake Eleanor. Some of the lands acquired by Horace J. Kibbe, J. L. George, M. A. Wheaton, C. C. Smith, Horatio and Eveline Kellett, Nathan Screech, Joseph Screech, George Marshner, and Thomas R. Reid were purchased by the City and County of San Francisco and are now embraced, together with some National Park Service lands, in the Hetch Hetchy water project. Other lasting effects of private ownership are seen in the Wawona area where a section of land in the park now provides homesites for several hundred people. At Foresta near the west boundary of the park a somewhat similar condition has developed on lands which were the homesteads of James M. McCauley and Thomas A. Rutherford. At Aspen Valley and in East Meadow, owned by the Hodgdon Estate considerable timber has been cut, as is also the case on a quarter section near Wawona which originally was patented by Emily V. Dodge. The National Park Service has been quite successful in buying most of the other private boldings touched upon in this account.

All in all, there is little or no mark of the pioneer owner to be found upon these lands other than the old cabins which are slowly melting into the ground from which they sprang.



Pioneer cabins in Yosemite National Park

ACKNOWLEDGMENTS

My deep appreciation is extended to my wife for her coöperation and to Superintendent Carl P. Russell for his many hours of laborious work in gathering material and for instigating this article. Also my gratitude to Assistant Chief Ranger Homer Robinson for information freely given, and to the following men who have obtained data, measurements, and photographs of some of the early cabins: District Rangers Louis W. Hallock, John W. Bingaman, Samuel L. Clark, Harry R. During and Carl Danner; Park Rangers Kenneth R. Ashley, John Wilbur and C. A. Walquist; Park Forester Emil F. Ernst provided comprehensive data regarding land titles and Information Specialist Ralph H. Anderson made available his many photos of pioneer structures. I have obtained assistance, also, from the Yosemite Museum staff in locating certain photographs and manuscripts preserved in the Yosemite Museum Library. To Chief Ranger Oscar Sedergren I express appreciation for the coördination he has given to field studies and to my work in compiling this material.

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Centennial in Yosemite

By CARL P. RUSSELL

On March 25, 1951, Yosemite celebrated the 100th anniversary of the effective discovery of "The Incomparable Valley." In observing the Centennial we may appropriately look back through the record of experiences of the pioneers who conceived the idea of a park for all the people. One fact stands out most conspicuously—it required a struggle to save the superlative scenic and scientific offerings of this place of very special beauty. Leaders in the unique work of creating the world's first scenic reservation came from the ranks of California statesmen; in Lincoln's presidency, the idea took hold on Capitol Hill. How much richer the nation became owing to the farsightedness of those first conservationists is best understood by the man who observes the crowds of vacationists now claiming Yosemite as their own. During pioneer times—in the days of travel in the saddle (1855–1874)—some 14,000 people came to Yosemite Valley. In 1874 wagon roads were built and from that date until 1913, when automobiles were permitted to enter the park, 200,000 visitors arrived. Since 1913 more than 13,000,000 have come and the travel now approaches a million visitors each year.

In spite of this heavy use the distinctive qualities of the Yosemite wonderland are today essentially as they were in 1851 when the Indian fighters from the gold camps first entered. The ideals of protection and recreational use prescribed by the first proponents of the national park idea have been honored and adhered to. Similarly, the standards of preservation of those Yosemite resources which might have gone into the maw of commerce and industry have been upheld, generally. Neither the extra-special demands of war nor the more commonplace selfish wants of the ever-ambitious production interests have made devastating inroads upon many of Yosemite's natural treasures.

It has not always been easy for the guardians of the park to forestall the invasions planned by mining interests, stock growers, logging promoters, and the builders of dams. Even while the glow of excitement which accompanied the discovery of Yosemite Valley was still spreading across the nation a local mining company surveyed the possibilities of creating a reservoir between the spectacular walls. The first house in Yosemite Valley was a shack built in 1855 by the surveyors who worked on this project. After two years of effort on the parts of the surveyors it was decided that it would be impracticable to attempt to deliver Yosemite water

by gravity flow to the Mariposa region and this particular claim upon the valley was dropped.

A succession of claims and claimants have followed these earliest promoters. Hotel operators and squatters seized portions of Yosemite Valley before the close of the 'fifties and during the early 'sixties. These claims were disposed of by the state after Yosemite Valley and the Mariposa Grove were granted to California as public trust in 1864. In the 'sixties and 'seventies miners, homesteaders, and sheepmen occupied parts of the Yosemite back country. The miners were gradually dispossessed by poverty as it became apparent to even the most optimistic that "everything was going in and nothing coming out." Some of the homesteaders did perfect their claims and even today a few relics of their pioneering exist as inholdings within Yosemite National Park—private properties which are being purchased as rapidly as possible by the Government.

One tremendous raid from which the western part of Yosemite will never recover was the invasion of the Hetch Hetchy by the water and power interests of the City of San Francisco. In spite of the adequate provisions of the Yosemite National Park Act of 1890, political maneuvers resulted in San Francisco's acquisition of rights in 1908 and the passage of the Raker Act in 1913 surrendering the Hetch Hetchy Valley for reservoir purposes. The coup served to alert protection forces throughout the country and to impress upon the public mind that eternal vigilance is necessary to defeat the attempts to invade the national parks for commercial and public utilities purposes.

When World War I ruptured the tranquility of national affairs, renewed attempts were made by commercial interests to gain access to the natural resources of the Yosemite. A few very moderate concessions were made by the Government, but the period of emergency was short and the damage done was not of lasting nature. During World War II lumbermen, stockmen, and miners re-opened their drive to enter Yosemite under the guise of war necessity. The National Park Service did not take a hidebound attitude regarding its place in the war program, but careful analysis revealed that the superlative natural qualities of the reservation were of far greater value to the nation if left unspoiled than would be the inconsequential contribution to the production of lumber, food, fiber, and mineral stores which could be derived from the park's potential resources if the standards of protection were relaxed. This fact was recognized by most of the production interests, and the park came through the war practically unscathed.

In the postwar years Yosemite quickly returned to its regular programs

of protection, maintenance, and interpretation. Visitors came in ever greater numbers; in 1950 the record-breaking total of more than 800,000 was reached. Appropriations did not keep up with demands for expansion of public services, but even so some gains were made in this field and the park's protective measures were reasonably adequate to meet the heavier impact of use. The prospects of successful operations seemed to be good until the present shock of new war preparations shook the foundations of park planning and financing. Now the rumble of new proposals to draw upon park resources for war purposes is faintly heard through the sounds of the 100th Anniversary Celebration. A sane approach to the problems presented by these new demands will be possible as it was in 1942.

As Director of the National Park Service, Newton B. Drury said, "Problems of protection—particularly against attempts to undermine the basic concept of the [National Park] System through commercial utilization of the forests, or the mineral resources, or the forage, or the flowing waters—we shall probably always have with us. We cannot expect to defeat these attempts if these problems remain the active concern of only a few, or if the principles we upheld are passively accepted by the great majority of the people of this country . . . . Conservation gains, of whatever sort, have never been made without effort and struggle and heartbreak; it is equally true that they cannot be held effectively in any other manner. We in the National Park Service are strong in our faith that the American people require their national parks and monuments and historic areas to be defended so that they may minister alike to their physical and their spiritual needs."

In the course of the one hundred years of Yosemite history the effectiveness of the park's program in ministering to spiritual needs has become ever more apparent. As the second century of public service in the park begins, new demands for expansion of tourist facilities are heard, plans for better roads are afoot, and population trends are such as to indicate that each year even greater crowds of visitors will get to Yosemite. Park planners will now, more than ever, shape their physical developments and the general program of service in a manner to guarantee that the heritage of natural beauty shall be preserved—that Yosemite shall be used but not used up.

Stephen Mather and the National Parks

By HORACE M. ALBRIGHT

A STORY has badly needed telling. At the time of Steve Mather's death Congressman Louis C. Cramton, the most productive of the Washington friends Mather made for the national parks, told the House of Representatives: "There will never come an end to the good he has done." That was twenty-one years ago, and, in the interval since, the good that Mather did has reached larger and larger numbers of the American people —last year, in fact, more than 30,000,000 of them. But the name of the doer has not grown correspondingly. In the years 1915 to 1930 few if any public men were better known in the West than he, but some of those who knew him best have been passing on, and a full-scale record of his achievement has been lacking.

Now we have *Steve Mather of the National Parks*,* a record worthy of that achievement. It is detailed and accurate, as it should be, and it is extremely entertaining, as it should be also if it is to be widely read. It gives us a splendid picture of the era when Americans were learning to see America first and a vivid account of the man who did so much to encourage them.

The Mathers were one of the most illustrious of New England families, but Stephen Mather's father, Joseph Wakeman Mather, migrated to California in 1864 to take advantage of a business opportunity, and that was where Stephen was born—San Francisco, July 4, 1867. He grew up a Californian to the core, proud of his New England ancestry but happy to be where he was—so near to what he was already convinced were the most beautiful mountains in the world, the High Sierra. After finishing up at Lincoln Grammar School and the Boys' High School, he went to the University of California at Berkeley, taking his degree in 1887. He got his first taste of the great mountains and forests of his native state while doing a student salesman's job in vacation time. The scenery and wilderness charm of the high country seem to have diverted him from profitable achievements that summer for he barely broke even on the venture.

Five years as a reporter for Charles A. Dana's *New York Sun* followed, and then he joined his father in the borax business, first as an employee of the Pacific Coast Borax Company and then as a partner with Thomas Thorkildsen in a business of their own. One of the most interesting chap-

**Steve Mather of the National Parks.* By Robert Shankland. Introduction by Gilbert Grosvenor. Alfred A. Knopf, New York, 1951. xxxiv + 326 pages. 24 photographs and 1 map. Price $4.00.

ters of this book is one dealing with the borax industry and its fabulous history—the story of "Borax" Smith, the twenty-mule teams, and the old days in Death Valley.

As an independent businessman, Stephen Mather found his niche. He was a big, handsome fellow with an effervescent, winning personality and almost unlimited resources of energy, and there is no doubt that he was one of the great salesmen of his time. In eleven years of operation Mather and Thorkildsen, who was a production specialist, made themselves well-to-do, even rich by the standards of those times, in spite of the formidable fact that their chief competitor was much older and vastly bigger in resources—both in borax ore reserves and organization.

Busy as he was, Mather kept up his interest in the High Sierra and indeed in the scenic outdoors everywhere. He joined the Sierra Club in 1904 and made the Mount Rainier climb under Will Colby the following year. Naturally, one of the things he kept his eye on was the national parks. At that time, of course, there was no such thing as a National Park Service. In fact, as J. Horace McFarland pointed out in 1912, "Nowhere in official Washington can an inquirer find an office of the national parks or a single desk devoted solely to their management." Conditions inside the parks fully reflected this lack of adequate administration, and after a trip through Sequoia Park and its hinterland in 1914 Mather became so indignant that he wrote a warm letter of protest to the Secretary of the Interior. The Secretary happened to be an old college friend of Mather's, Franklin K. Lane, and he also happened at that time to be looking for the right kind of man—some capable "millionaire with an itch for public service," as Woodrow Wilson characterized him—to come to Washington at $2,750 a year and put the national parks in working order—to end the apathy with which both Congress and the public viewed the parks and to make the parks worthy of their great purpose as public pleasuring-grounds. Lane wrote his famous reply: "Dear Steve, If you don't like the way the national parks are being run, come on down to Washington and run them yourself." The fact that Mather accepted and was the kind of dynamic man he was is the reason he is known today as the father of the National Park Service.

It was characteristic of Mather to move fast and make quick decisions. He was ever restless; always developing new projects to engage his vast energies and driving ahead to attain his objectives; enlisting his friends, including business and government associates, to aid and support him. The Sierra Club, as this fine book explains, was a pillar of support, power, and influence on which he leaned throughout his career as head of the

national park bureau. The club helped him acquire the toll rights on the Tioga Road in 1915; it supplied the legal advice in the purchase of the Giant Forest in 1916–17; it worked with him ceaselessly for the enlargement of Sequoia Park to include the Kern Canyon and Mount Whitney which was accomplished in 1926; and exerted constant pressure to add the Kings River canyons and their high country to the national park system while seeking the restoration of the Minarets–Devil's Postpile–Reds Meadow country to the Yosemite, a magnificent region taken from that park in 1904. And the Sierra Club never faltered when Steve Mather needed support in his effort to compel San Francisco to fulfill its promises regarding the Hetch Hetchy project. Of course, Mather was a devoted disciple of John Muir and a bitter opponent of the Hetch Hetchy scheme before he joined the Interior Department. One wonders sometimes why a fighting Sierra Club member should have been asked to head the national parks after that Hetch Hetchy fight. It must have been obvious that never again, at least while he was in office, could the sacred confines of a national park be invaded for exploitation of its resources.

Sierra Club old-timers well know that Mather made friends fast. He made them so fast in Congress and he so forcefully presented the urgency that the long-needed bureau was authorized in 1916—and Mather himself became Director. The next year he stimulated papers all over the country to publicize the parks. He attracted private businessmen of the highest type to the parks to provide the services—housing, transportation, and so on—that had been badly lacking. He induced Congress to vote the kind of appropriations that were needed to build roads and make other unavoidable developments in the parks. He established himself and the National Park Service as an unyielding foe of all encroachments on park territory by predatory interests, setting a precedent that conservationists have often fallen back on since. He secured the addition of tens of thousands of acres in new parks and monuments as well as in the older members of the national park system. He built up a government bureau of the highest standards. None of this was done without opposition, sometimes bitter opposition, and the book is full of the interesting reading that conflict makes for. It is my opinion that anyone who has ever enjoyed a national park will enjoy this book.

Are Our Glaciers Advancing?

By ARTHUR E. HARRISON

GLACIAL GROWTH during the recent drought in California seems incredible, yet the evidence is there! Increased ice thickness can be observed consistently on several of the Sierra Nevada glaciers, indicating that the long period of shrinkage is ended, at least temporarily. This increase in ice thickness is advancing down the glaciers, although the ends of the glaciers are still receding. The phenomenon is not an isolated or accidental occurrence; in fact, there is reason to believe that this change in glacial behavior is continental in scope and may be world-wide. Such changes have usually been world-wide in the past.

Proof of this change in California is provided by the glaciers in and near Yosemite National Park. I reported the increased thickness of the east lobe of the Lyell Glacier near the old ice fall last year,[1] but at that time the phenomenon was dismissed as an interesting anomaly.

A clue to the explanation of the increased ice thickness on the Lyell Glacier was found in data in a United States Geological Survey Report by Arthur Johnson[2] which indicated that in 1944 the Nisqually Glacier, on Mount Rainier, began to increase in thickness at an altitude of 6,800 feet, although the ice thickness had been decreasing prior to that date. This change from a decrease to an increase in ice thickness had progressed downward to 5,900 feet by 1949 and the ice thickness at 6,800 feet was increasing at a rate of twenty-five feet per year. The significance of Johnson's data was not immediately recognized, but the correlation between these observations of glacial growth on Mount Lyell and Mount Rainier during an identical time interval eventually became apparent. The implication is that both glaciers are responding to the same climatic change; therefore a recheck of data on the Sierra Nevada glaciers was made.

Careful measurements of my photographs of the Lyell Glacier taken from the same point on September 5, 1937, and September 8, 1949, indicate that the ice had increased in thickness about twenty-five feet near the position of the icefall. This increase cannot be attributed to unmelted snow because most of the surface of the glacier was bare ice in September 1949, while there was an unknown depth of snow covering the entire glacier on September 5, 1937. The increase in thickness amounted to approximately twenty feet under the cliff at the east end of the glacier, above the point where the glacier appears to have receded from the moraine. There is also an increase in the area of stagnant ice on the rocks

above the head of the east lobe. No positive indication of any change in ice thickness on the west lobe could be detected.

The "Report of Glacier Studies in Yosemite National Park for 1949"[3] prepared by Robert N. McIntyre provides additional evidence of glacial growth. It indicates that most of the ice in the vicinity of the icefall had accumulated in the period of heavy snowfall between 1937 and 1941. However, the buildup of ice at this point continued at a reduced rate between 1941 and 1949, which included one of California's worst droughts.

This report also includes data on profiles across both the east and west lobes of the Lyell Glacier which support the evidence of glacial growth. The ice thickness (or unmelted snow) at the profile across the east lobe increased between 1939 and 1943 during a period of heavy snowfall. The thickness decreased between 1943 and 1949 but the rate of decrease was slightly less than during the decade between 1933 and 1939. This profile is a considerable distance below the icefall and might not be expected to respond to a climatic change to the same extent. The profile across the west lobe followed a similar pattern during these years but the decrease in thickness at the middle of the profile during the interval between 1943 and 1949 was slight and the ice was actually thicker in 1949 than in 1939.

A letter from Harry C. Parker, Associate Park Naturalist at Yosemite, states that he feels that their measurements in 1943 and 1949 with an Abney and chain were too crude to reflect accurately the changes in the ice thickness. However, it seems reasonable to conclude from these figures that the rapid shrinkage during the early thirties had ended.

My photographs taken September 5, 1937, and September 8, 1949, looking from the summit of Mount Lyell toward Mount Ritter and Banner Peak, also give some indication of increased ice; but it is not possible to obtain quantitative data from these prints. New ice appears to have formed between 1937 and 1949 at the head of the largest glacier above Marie Lake. This glacier is not shown on the Mount Lyell quadrangle. These observations cannot be considered additional proof, but at least they do not discredit the theory of glacial growth.

Data on the Dana Glacier add to the proof because they show that the effect is not limited to the vicinity of Mount Lyell. There is a huge mound of ice below and at some distance in front of the cliffs of the peak. This mound of ice is deeply crevassed. The mound gives the glacier a slightly convex appearance in contrast with the familiar concave shape of a receding glacier. A ranger naturalist at Tuolumne Meadows in 1949 surmised that this accumulation of ice was the result of an unusual amount of snow's having been blown off the top of the mountain. It now seems

reasonable that this mound is caused by the same factors which are producing growth in other glaciers.

My photographs of the Dana Glacier taken in October 1940 indicate that the mound was not then a distinctive feature of the glacier. Although the surface of the glacier was free of snow in 1940, there was no evidence of the crevasses which were so pronounced in 1949. These 1940 photographs also show less ice in the chute above the glacier than the Park Service photograph taken October 12, 1949. An estimate indicates that the thickness of the ice in the chute had increased approximately fifteen feet during the interval between 1940 and 1949. Additional ice is also seen on the cliff above the bergschrund to the right of the ice chute.

It is apparent that this glacial growth is not accidental but is part of a new pattern of glacial behavior. Data from other parts of the country are meager. It is hoped that this report will encourage others to look for evidence of glacial growth in order to confirm or refute the possibility of a new glacial advance. Arthur Johnson informed me personally that a profile on the Sperry Glacier in Glacier National Park remained unchanged from 1949 to 1950, although previous data along the same part of the glacier had indicated considerable shrinkage between 1938 and 1949. This evidence is not too convincing because the location of the 1938 profile had not been accurately established. The report is interesting because the Sperry Glacier is a cirque glacier similar to the one on Mount Lyell but in an entirely different latitude and longitude. Yet both glaciers seem to be responding to some climatic change in a remarkably similar manner.

Correspondence with Robert P. Sharp, Associate Professor of Geomorphology at the California Institute of Technology, indicated that there had been recorded an interesting expansion and advance of several small glaciers between 1935 and 1941 in the Wolf Creek area on the northeast flank of the St. Elias Range in Canada, about twenty miles east of the Alaskan border. It was his opinion that this expansion seemed to have died out in some of these glaciers by 1947. He also stated that H. W. Ahlmann, C. C. Wallen, and others had reported that the catastrophic recession of Scandinavian glaciers had slowed down about 1940. These scattered reports all seem to reinforce the identity of the time interval and hint that the change may have been world-wide.

The parallelism between the behavior of the glaciers in different geographic regions has other interesting aspects. The Nisqually Glacier is a huge affair in comparison with the Sierra Nevada cirque glaciers. The front of the ice advance, defined as the profile where the ice thickness stops decreasing and begins to increase, is almost a mile from the present ter-

minus of the glacier, and the terminus is still receding rapidly. The lower portion of the glacier is moving so slowly that it is being rapidly eroded by rain water, which has carved a deep V-shaped gully. On a smaller scale, the Sierra glaciers are following the same pattern. The ice advance has not reached the lower end of the glaciers and recession still dominates.

A search for the explanation of this change in the glaciers has been made but the data are pitifully inadequate. It is unlikely that precipitation is the principal factor because fluctuations in precipitation did not stop the recession which was dominant for several decades. Apparently a decrease in average temperature must be the cause. Possibly this decrease in temperature is limited to the region above a critical altitude which is closely related to timberline in any locality.

Weather Bureau data for Seattle, Longmire, and Paradise Park have yielded few clues. The climate at Seattle and Longmire has not shown any significant trends. There is the possibility of a slight reduction in the average temperature and the length of the melting season at Paradise Park during 1946, 1947, and 1948. Unfortunately, data were not obtained at Paradise Park during 1944 and 1945 because of the shortage of manpower during the war, and data have not been obtained at this station during the last two years because excessive snowfall has made it impractical to keep the road open.

Possible conclusions from this study are intensely interesting. We may have passed a minimum in the glacial cycle and are now on the way to a glacial maximum similar to those of 1850[4] and previous centuries.[4,5] The change appears to be due to a decrease in temperature, perhaps only at high altitudes, which occurred rather suddenly about 1938 or perhaps a few years earlier. The change was apparently continent-wide and may extend over the world; although it may prove to be temporary, there is a possibility that the "Little Ice Age" has received a new lease on life.

[1] A. E. Harrison, "Glaciers Then and Now," *SCB* 35:6, 113–116 (1950). Illustrations in this article show the distinctive features of the Lyell and Dana glaciers but are not the photographs mentioned in the discussion above.

[2] Arthur Johnson, "1949 Progress Report on Nisqually Glacier, Washington." Report on file in office of Arthur Johnson, District Engineer, Water and Power Branch, Conservation Division, U. S. Geological Survey, Tacoma, Washington.

[3] Robert N. McIntyre, "Report of Glacier Studies in Yosemite National Park," 1949. Report on file in Museum, Yosemite National Park, California.

[4] François E. Matthes, "Moraines with Ice Cores in the Sierra Nevada," *SCB* 33:3, 87–96 (1948).

[5] Donald B. Lawrence, "Glacial Fluctuation for Six Centuries in Southeastern Alaska and Its Relation to Solar Activity," *Geographical Review* 40:191–223 (April 1950).

A Trans-Sierra Ski Tour

By WILLIAM W. DUNMIRE

THOSE THREE WEEKS were strenuous, but they did wonders for our wind. Rain or shine, day after day, a group of us ran the course we had laid out from the Berkeley campus of the University of California to Grizzly Peak, some fifteen hundred feet above. It was a workout, all right, but we needed the conditioning, even though most of us had spent an industrious seven weeks in the Coast Mountains of Canada just a few months before. For now we wanted abruptly to leave our books and make a ten-day ski crossing of the Sierra, at the apex of the range.

We began thinking of a long ski-camping trip last summer when Jim Wilson mentioned the possibility of a loop tour in the Humphreys region. When it turned out that eight people were interested, and that two of them had cars, we got a brilliant idea. We could make a trans-Sierra trip—one party traveling west and the other east—and exchange cars at the finish. The general plan we finally worked out was for George Bloom, Ray de Saussure, Bill Long and Bob Swift to start from Whitney Portal, east of Mount Whitney, while Norman Goldstein, Al Steck, Jim Wilson, and I would ski from Giant Forest. Our four would follow the High Sierra Trail to Kaweah Gap and then detour, via a knapsack pass north of the Kaweahs, to the pass across the Sierra crest between Mounts Russell and Whitney. We would carry food for fourteen days, the extra four day's rations to be used in case of storm. Being rock climbers first and skiers second, we could not forsake our rock-climbing gear—we knew that many peaks would beckon along the way.

It was fortunate that our plan also called for an overnight stay at Giant Forest before hitting our skis; for when we arrived at road's end we all had violent headaches due to monoxide fumes which had leaked from the motor of my ancient Chevy (since sold as junk by request). Next morning, after discussing our proposed route with the ranger, we hit the trail. Parkas and long johns were out of place that day, for on the south-facing slope the sun showed no mercy. This had been one of the driest of Kaweah-country winters and the trail was barely covered with snow, to the detriment of our base wax. It certainly didn't seem like the middle of January as we skied without shirts and camped that night on dry ground.

Above Hamilton Lakes the trail rises 2,000 feet in a very short distance and we knew from the concentration of contour lines on the map that this stretch would cause some difficulty if the snow were soft. Happily it was

firm but a real problem arose. Although the trail looked as if it extended without interruption, we suddenly came upon a deep cleft in the slope. The rock overhung and the trail had been blasted into the granite wall of a couloir so deep that the winter sun hardly touched the snow, which was powdery and insecure. Al started without skis, cautiously probing with his ice ax, deliberately kicking footholds. We cheered when he reached the corner and firm snow and took our time as we followed—Hamilton Lake 1,500 feet below, seemed all too near.

By sundown we were on Kaweah Gap putting on those long johns; we knew we were in for a chilly night. Jim started the run down into the shadows of Nine Lakes Basin and we all made the most of our first downhill skiing of the trip. In camp the thermometer dipped to 16°F.—no problem at all for ski mountaineers with a tent up and a small fire going (outside). Hot jello was welcome as always. The rest of our fare was not all taken from the manual, for we found that a dinner of instant potato and slow horse meat went well after a heavy day.

We had planned to spend a day or so climbing here in the Kaweahs, but next morning ominous clouds scudded overhead, and we knew we had better push on. We steered directly for the lowest notch in the Kaweah ridge, thinking this to be the correct pass. Halfway up the slope the wind-crusted snow became so steep that our sealskin climbers would not hold; packing skis on rucksacks, we kicked steps up into the mists which now swirled down around the high peaks. Haste seemed of great importance, and we looked forward hopefully to a speedy descent from the saddle. But instead of seeing a gentle snow expanse leading to Kaweah Basin from the saddle, we peered down the east face to see, as the only route, a steep couloir in which we could not hope to ski safely. The wrong pass! Taking off my pack I kicked a few trial steps but was glad to return quickly to the notch. We must have ropes on this one, for the snow was too powdery for comfort and there was a slight cornice. A few flakes drifted down to hurry us along. We picked out a belay spot 100 feet below and Jim headed for it, with Al paying out rope. At the end of his rope, Jim sank his ski pole shaft for an improvised-ice-ax belay—we only had one ax, and it was left for me, the last man. When Al and Jim had progressed several hundred feet, Norm and I began the descent. It was cold and we wished—especially when belaying—that we could move faster, but discretion won. The couloir took eleven belayed pitches but we beat the storm. As one last gesture we shook our fists in defiance at the couloir, which was then vanishing in the mists. A short run took us down to the forest, where a huge dead log was soon merrily crackling in flames.

Not much snow fell that night and the next morning was clear. We were ahead of schedule so we could afford a layover day. During breakfast making the usual controversy ensued: "Should the oatmeal be thick or gruelly?" Jim is the proponent of "gruelly gruel," thinking for some reason that food at its best should be of about the consistency of blood. Norm and I, on the other hand, feel that in order to get a man started off right for the day, the mush should stick to his ribs even if it has to be cut with a knife. The gruel faction usually won out, however, since water was unlimited but oats were not.

No one was very energetic that day. After a few repairs were made, out came the Chinese puzzles which Jim had brought along. These little demons, bad enough to solve in a warm house, are quite a challenge when one is wearing mittens. No one was allowed to ski that day until he had worked all the puzzles. Nevertheless, three of us managed to get up to Milestone Basin that afternoon. The snow was too crusty for descent running, but we did get a first-rate view of the Kaweah Peaks.

By sundown clouds had closed in again and soon snow was falling heavily. Next morning it was still snowing. With the prospect of spending some time indoors, we settled down to the usual mountain-tent diversions. First it was Ghost, then a rhyming variation of Ghost, and then Twenty Questions. Was it alive? No. Was it singular? No. Were they real or imaginary? Yes . . . Al's object turned out to be the Russian salt mines; we got it on the seventeenth question. This went on until noon when someone had the flash of genius to open a tent flap. The clouds were dispersing, so we quickly packed up to take advantage of the break.

A foot of snow had fallen—fluffy powder snow, the kind we had so far looked for in vain. For several hundred yards at a time our ski tips would be hidden under the crystals as we schussed the gentle slope. Real skiing at last! Too soon our skis started to stick as the sun began its work, and before long we had to pole even on the steeper portions. I was getting fed up, and since we had a long downhill stretch ahead to Junction Meadow, I decided to try a little wax. I persuaded Al that wax would end our troubles, that a waxed ski was a controlled ski; Norm and Jim would have none of it. I'm not sure that Al has forgiven me yet; no sooner had we waxed than we got into steep terrain. Norm and Jim could slog straight down; Al and I picked up more speed than we could handle. To make matters worse, we were in a talus-brush combination, with just enough new snow to hide the obstacles. We'd snowplow and catch an edge, sideslip and catch an edge, and with each catch down we would go. The snow cover kept getting thinner, and Norm and Jim's tracks, neat and parallel, went

straight down it. We didn't dare follow. Rocks, brush, more rocks, more brush, and *crunch*, there went the rest of my base job. On one especially horrible section I sat down fully prepared to weep, but Al's distant curses raised my morale. I'll take any uphill grind any time over a day such as that one was! It was long after dark when we finally reached Junction and we were all pretty exhausted. Nevertheless, after supper we had a song festival, running through everything from our yodel repertoire to excerpts from Gilbert and Sullivan. Our jolly campfire seemed much cozier than sleeping bags on snow, so it was not until midnight that we hit them.

It was an easy uphill day to Wallace Creek. We arrived in early afternoon with plenty of time to pick out a good campsite. Just as we settled in one place Jim would rush ahead and find a better spot, and with loud grumbles we would move on. At the third site we decreed that no suggestions of new and better spots would be tolerated. We couldn't have found a better winter site. It had all the desirable features: water near by, dry-pine-needle bed sites, and most important, enough dead wood about for a whiteman's fire (i.e., any fire in which the flames rise at least eight feet and force its admirers back at least six feet). We would always camp far enough from trails not to leave our charcoal where summer travelers would find it. We wondered if winter travelers would find it either—namely, the westbound party, which should have passed us by now. We finally concluded that they must have had car trouble, and stopped worrying.

A climb was now in order—we were still ahead of schedule and we chose Mount Tyndall (14,025). That evening before retiring we recorded a temperature of 10°F. (our lowest), so we slept with boots on in order to get a headstart for the mountain. We were up by dawn and on our way after a breakfast of cold "gorp" (a dry cereal, powdered milk, sugar, raisins, cinnamon, nutmeg, etc., mixed together in a single pot). What a relief to be skiing without those packs! Although it was calm about us, all the major peaks bore snow banners—certainly the best I've ever seen. Many of the banners must have been at least 300 feet high; Mount Bernard had an especially fine one. Unlike Clarence King's, our climb of Mount Tyndall involved no shinnying on ice columns, nor did we have to lasso talus blocks and climb "sailor-fashion, hand over hand up the rope." In fact, when we realized that the west face was relatively free of snow, we left our skis and ropes in the bowl below. However, the climb was not entirely summer-like, for we were continually raked by windblown snow and ice particles—and the summit temperature was 19°F. Ours was presumably the first winter ascent of Tyndall, but we didn't pause long to celebrate. The threat of a new storm sped us back to camp.

We now decided that the other party must have turned back; we hoped that they would leave a car waiting for us at Whitney Portal but we planned on an extra day's travel to Lone Pine in case the car should not be at road's end.

The storm threat proved to be merely a bluff, so we were ready to push on toward Whitney country. That morning, to get us started right, we concocted a pot of stuff affectionately named "grease honey." We had hoarded until then a pound of solidified honey which, heated with a pound of margarine, comprised the morning meal. It was quite a change from the usual diet of oats and where would science be today without the experiment? For some reason we couldn't seem to average much faster than a mile an hour that day.

Fresh clouds the following day urged us over Whitney-Russell Pass, where there were extraordinary wind-crust formations, some of them in the making. The terrific wind blasts did not abate until we were well down the east side. Skiing here was better than we had expected, although our tracks did cause one minor avalanche.

At Whitney Portal next day we were relieved to find from their note that the westbound party were all safe; before they reached the pass Bob Swift wrenched his knee, they were forced to spend a severe stormy night just beyond the pass, and then had decided that retreat was in order. Generously they had left their car for us and had hitchhiked home. That car was a mighty welcome sight, for Lone Pine was many miles away and we were in no mood for desert walking.

Ski touring today is certainly not the arduous undertaking it was twenty years ago, and the reason for this lies solely in improved equipment. I am not implying that persons who are in other than tip-top physical condition should attempt tours but rather wish to point out that the advent of the nylon tent, the nylon air mattress, and the lug-soled ski boot has meant lighter packs on the trail and greater comfort in camp. We have found the four-man army nylon tent, when pitched properly, to withstand very heavy winds; and wind, rather than cold, is the villain on any winter trip. Some sort of insulation is always essential for sleeping on snow, but until recently extra clothes had to be used above timberline. Now these clothes can be put to better purpose inside the sleeping bag since a nylon air mattress weighing only fifteen ounces has been developed. Of course the old rubberized mattresses weighing up to eight pounds are out of the question on tour. The lug-soled ski boot, also recently developed by the army, allows rock climbing to be combined with skiing, and a tour can often involve rock work, intended or not. A new safety binding has been

developed that will give all the downhill tension one could need without requiring the monstrously heavy ski boots that have been the rage. These and other developments in mountaineering equipment have not only improved comforts, but have also increased the safety factor. With needless weight cut, greater amounts of emergency food and better repair kits may be taken along instead.

Judging from our recent experience it would seem that spring, rather than winter is perhaps the best time for ski touring in the southern Sierra, at least in a light snow year. Spring snow should have a better skiing surface and be generally more consistent. Most of our snow was breakable crust, unskiable at any speed so far as we were concerned. But maybe our trouble was the gorp!

On the Study of Avalanches

By ANDRE ROCH*

I WAS indeed interested in the articles on avalanche control in the *Sierra Club Bulletin* of June 1950. I don't like polemics, and I hope that the following few words may help in tackling avalanche problems more efficiently.

Step by step, science progresses by an ordered combination of observation of nature, development of theory, and experiment. It is sometimes dangerous to establish a theory first and check it afterward against natural phenomena, and it seems to me that the right approach to a scientific problem is to observe nature first, establish a theory, and then check it by experiment and measurements in nature. Obviously, before the problem is tackled all that has been done or written on the subject should be known.

At Alta the first step has been well done, namely the observation of nature. Even rules have been established. The tendency is to generalize these rules, and this seems dangerous. As a matter of fact, conditions at Alta look quite simple to the observer in the valley. The regular sequence of events includes frequent heavy snowfalls which provoke avalanches and, in between, periods of relative safety. These apparently simple conditions may lead to dangerous generalizations, based on too-primitive background information. The problem is not the validity of the Ramm profile method; the problem is to establish all the characteristics of the avalanche climate. For this, the how and why of avalanche occurrence must be known. How can an avalanche climate be characterized without knowledge of the properties of the various strata in the snow cover?

My purpose here is to explain as well as I can the mechanism of sliding and rupture of avalanches and how the degree of danger can be determined. It is only recently that scientists have tried to explain the mechanism of avalanching, although in the Alps avalanches have been observed for more than three hundred years.

There are two different kinds of destruction of balance of the snow cover. Either can be regarded as a special aspect of the other.

1) The loose-snow avalanche.—As long as the snow grains do not adhere to each other, they stay in balance on an inclined plane whose angle with the horizontal is called the angle of repose. This angle depends on the friction between grains. The friction is a function of the shape of the snow

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particles and their hardness. If the snow cover is disturbed, as by the falling of a cornice chunk or the passage of a skier, the snow particles are pushed around, destroying their fragile contacts. The delicate structure of the snow layer is destroyed. The grains start to roll or tumble over each other; these bring more grains out of balance; and they slide in a loose-snow avalanche. These avalanches are rarely very dangerous because their speed is relatively low.

Metamorphosis of the snow (change of shape and size of the snow crystal) complicates this phenomenon. Fresh-fallen star-shaped snow crystals can stay in balance on a vertical slope, hooked together by their branches. Atmospheric conditions speed up or slow down the metamorphosis of these stars, but sooner or later they become grains. It is clear that the angle of repose of round grains is less steep than that of stars. Rounded grains cannot stay in balance on a vertical slope and will start to slide on every mountainside steeper than their angle of repose.

Another kind of loose-snow avalanche is the wet snowslide. High temperature destroys the firm, frozen contacts between grains. Then the only forces holding them are the slight wet friction and the capillary force of water filling the pores. Clearly, steep layers of snow will slide when wet.

A series of observations and measurements is necessary to determine when loose snowslides may start. Usually loose snowslides will occur after a snowfall as soon as the sun destroys the branches of the star-shaped snow crystals, but such slides may come down only after two weeks of sunny but cold weather. This means that the snow took this much time to reduce its angle of repose to the angle of the slope.

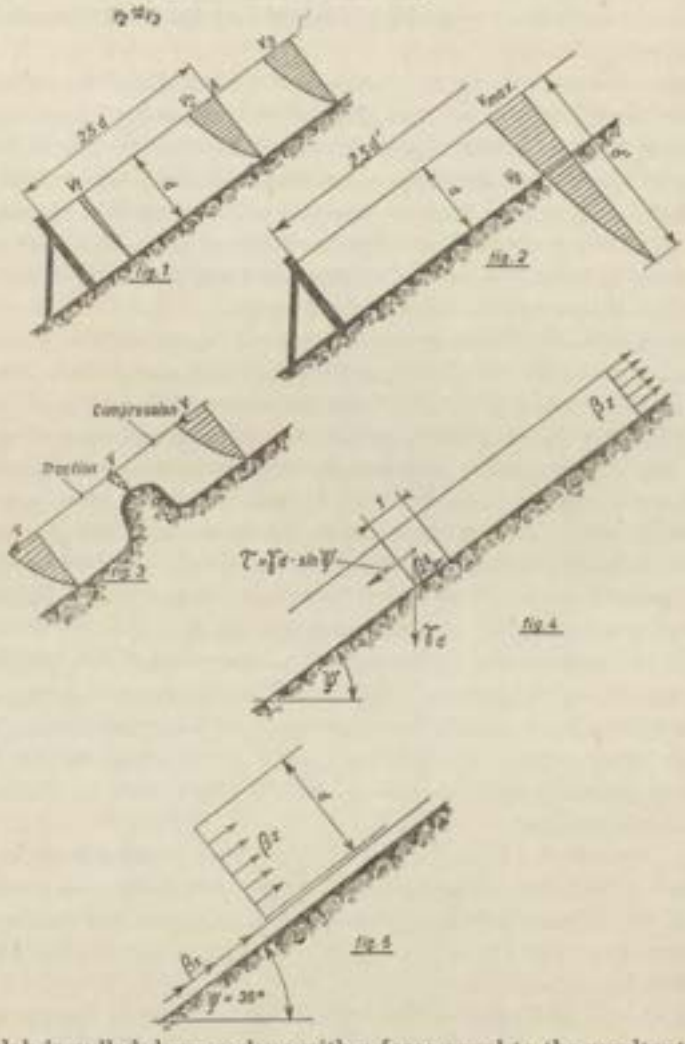
2) The slab avalanche.—The mechanism of rupture of slab avalanches is still more complex because it depends on the very numerous properties of snow and the many natural influences on these properties. Basically, as soon as the snow grains of a layer acquire a certain cohesion, that layer has a proportionate resistance to stress. Also, the snow is a plastic and compressible material.

Snow accumulates in successive strata whose properties depend on thickness of the layer, temperature, kind of crystals, contacts between the crystals, etc. When a hard layer rests on a softer one or on a thin layer of hoarfrost—both these having a small resistance to shearing,—the hard layer may be unstable.

Snow creeps downslope with a velocity determined by its plasticity, the steepness of the slope, the weight of the layer, and the friction on the ground or on another snow layer. Any variation in any of these conditions causes changes in the creeping velocity and thus of the stresses in the snow

layer. As soon as the stress is equal to the breaking resistance of the snow, rupture occurs and the slab slides down the slope.

Thus, the problem consists in determining on the one hand the stress in the snow slab and on the other hand the resistance to breaking of the slab, and in analyzing how these values vary.



A slab is pulled down a slope with a force equal to the resultant of its weight parallel to the slope. The slab is held on the slope by bottom friction, or it may be anchored at its top or sides or supported from below.

When snow does not creep on the ground, experiment and theory agree that an obstacle is effective up to a distance equal to 2.5 times the thickness of the layer. That is, a retaining wall brakes the velocity of creeping snow up to $2.5d$, where d is the thickness of the snow layer (fig. 1). A retaining wall really has an effect to an infinite distance, but after $2.5d$ the effect is so small that it can be neglected. Thus, from point A in figure 1, the weight of the snow upslope is supported by friction on the ground. An obstacle evidently does not affect a creeping layer of snow very far upslope. If this layer is anchored at its top or sides, the effect of this anchoring acts through such short distances that it can be neglected on a wide and long slope. This means that the stability of a layer of snow depends on the friction with the ground, or on the shearing strength of the weakest layer between the slab and ground.

When the snow layer creeps on the ground, it acts on a retaining wall as would a thicker layer, or an imaginary thickness which depends on the velocity of creep on the ground and on the plasticity of the snow layer (fig. 2). This simply means that the effect of a retaining wall acts at a greater distance. Reversing this effect, a length of about 2.5 times the imaginary thickness of a snow layer anchored at the top and sliding on the ground is pulling on its anchor. Beyond this distance the effect is negligible.

Any obstacle under or in the snow cover reduces creep and causes compression and tension stresses (fig. 3). Sliding on the ground, if it occurs, accentuates these stresses and lengthens the distance through which they act.

The stability of a snow cover might be expressed as the ratio of the shearing strength, βs, of the weakest layer between the slab and the ground to the shearing stress, $T_x \cdot s = \frac{\beta s}{T_x}$ where s is the stability coefficient. If s is less than or equal to 1, the situation is unstable. If s is greater than 1, the situation is stable.

An unstable condition does not mean that the potential avalanche will break loose. It means only that the shearing strength is not large enough to hold the snow cover on the ground or to hold the upper layers to the lower ones. The layers may be anchored at their tops, sides, or from below.

For easier understanding let us neglect any anchoring at sides and bottom and consider a slab anchored or hanging from above (fig. 4). Assume the slab is a rigid body like a wooden board. If the shearing strength (for the board, friction on the ground) is not sufficient to hold the board on the slope, then every unit length pulls at the top anchor with a force equal to the difference $T_x - \beta s$. If the board is not held by its sides and has a

length L, the force on the top anchor is $(T_* - \beta s)L$. If the mean tensile strength at the top of the slab were known, it would be easy to calculate the length of the board necessary to break itself. If βz is the breaking resistance to such a force, the slab will break when the force pulling down is equal to the tensile strength:

$$(T_* - \beta s)L = \beta z, \text{ and } L = \frac{\beta z}{T_* - \beta s}$$

In reality, the snow is plastic and the length with a downslope pull on the slab equals 2.5 times the imaginary thickness of the snow. This means that a slab might hang on a slope a whole winter, always menacing but never breaking. If such a slab does break, the cause of rupture must be sought in (1) additional stress brought by the weight of a new snow layer, (2) weakening of the strength of the slab caused by a rise in temperature, (3) the slab's becoming thinner through extension.

As can be seen from the development described above, causes of rupture are complex and difficult to measure. However, in order to characterize if possible the kind of rupture peculiar to a particular avalanche climate, as many avalanches as possible ought to be measured after their rupture and a stability computation made.

The following calculations were made concerning a slab avalanche investigated at Davos (Schafflüger south slope, January 20, 1950).

Average thickness of the slab, $d = 5.5$ dm.

Slope, $\varphi = 36°$.

Shearing strength of the weakest layer (on which the avalanche slid), $\beta s = 0.250$ kg/dm.^{2}

Mean specific weight of the slab, $\delta = 0.315$ kg/dm.^{3}

Assuming a slab of unit width, the shearing stress is then (fig. 5)

$$\tau \max = \delta \sin \varphi \, d = 0.315 \times 0.59 \times 5.5 = 1.02 \text{ kg/dm.}^2$$

The stability coefficient is $s = \frac{\beta s}{\tau \max} = \frac{0.250}{1.02} = 0.246.$

The stability coefficient s is very small and the slab must have been anchored at its top. The average tensile strength at the rupture line was measured, $\beta z = 30$ kg/dm.^{2}

Neglecting the side anchoring and assuming the snow slab was a stiff body, we can calculate the length of the slab necessary to break itself at the top:

$$T_* \cdot L = \beta s \cdot L + \beta z \cdot d$$

$$L = \frac{\beta z \cdot d}{T_* + \beta s} = \frac{30 \cdot 5.5}{1.02 - 0.25} = 214 \text{ dm.} = 21.4 \text{ meters.}$$

This avalanche fell during a storm, and the various values measured afterward might have been different from those during the storm. It is equally hazardous to assume that an average stress of 30 kg/dm^2 was necessary to break the slab at its top, because the rupture might have

occurred first in the upper layer which was under greater stress and had less strength and then have propagated itself to the whole slab's thickness. But in spite of the possible inaccuracy of the measured and calculated values, we may say that the primary rupture was due to traction at the top.

This example gives an idea of the complexity of the problem. Perhaps it will encourage investigations out in the snowfields to explain why avalanches break and slide.

Generally avalanches occur during or shortly after a snowfall. During the snowfall, tensile strength is usually small and the snow will accumulate until $\tau \max = \beta s$. Knowing the weakest βs and the rate of snowfall we may forecast when the slab should break. After the snowfall the strong metamorphosis of the snow causes packing and creeping of the layers. These augment the tension stresses and bring about a rupture. If the shearing strength is small enough, the slab will slide, otherwise it may only break and not slide down.

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The First Ascent of Mount Deception

By BRADFORD WASHBURN

On September 18, 1944, a Douglas C–47 of the Air Transport Command, on a routine flight from Anchorage to Fairbanks, Alaska, crashed into the icy face of a great peak sixteen miles east of Mount McKinley. There was not a single survivor among the nineteen persons aboard the plane at the time of the accident, and the aircraft itself was completely demolished after hurtling down a fifty-degree slope for 1,600 feet after the initial impact.

To this day, no living person knows the exact cause of the accident. The plane was last reported bucking an eighty-mile westerly wind and on course over Talkeetna, sixty miles south of the point where its wreckage was found. When it crashed it was thirty-six degrees off course and thirty-five miles northwest of the regular Anchorage–Fairbanks airway above Broad Pass.

The wreck was discovered by a freak of good luck after a fruitless preliminary search. One of the searching planes, on its way home after a long, discouraging mission, happened to see a bright flash of light in the midst of the savage jumble of peaks at the head of Eldridge glacier just east of McKinley. Thinking that it might be the emergency mirror flash of a survivor of the crash, the search plane hurried to investigate, only to find that it had been the sun glinting off one of the few unbroken windows in the shattered remains of the fuselage.

If it had not been for that glittering window, there is little doubt that nobody would ever have known what happened to the C–47. A radio report of its exact location brought Search and Rescue aircraft from both Anchorage and Fairbanks. Over and over again, they skimmed low above the debris, scattered wildly about on a lonely snow shelf, perched halfway up the formidable southern face of one of the highest unmapped peaks east of McKinley. No sign of life was visible, and, even more curious, there was scarcely a single object which remotely resembled a human being or even a part of one. Both wings had been torn off. The fuselage was wrenched apart and twisted into three pieces. Only a small part of the cabin aft of the wing was undamaged. The wheels, a door, luggage, and mailsacks were scattered about on the snow in wild confusion. A long trail of deep scratches in the snow-and-ice wall above the wreckage marked the route down which the plane had plunged after its crash.

Two hundred feet below the crest of the sharp, corniced summit ridge

of the peak, one of the plane's engines was still firmly embedded in a terrific slope of clear blue-green ice. A tell-tale streak leading to the engine showed where the left wing had sliced into the mountainside. A hundred yards farther to the west and the plane would have cleared the ridge; beyond, not a single peak blocked the way to Fairbanks, 140 miles to the northeast.

Five major lawsuits have grown out of this single accident. How did it happen? Whose fault was it? Were there any survivors? Why were experienced Captain Roy Proebstle and his co-pilot Lieutenant Bliven flying so far off course, so near the big peaks on such a stormy day?

Few of these questions can ever be answered. Even today little more factual information is known about the only crash ever to take place on the slopes of McKinley than was learned in the first ten minutes of search after the discovery of the wreckage.

In order to determine the details of what clearly appeared to be a totally fatal crash, the commanding general of the Alaskan Department ordered a forty-man expedition into the field with instructions to climb to the wreck, make a full investigation, and evacuate all the bodies that could be located.

Mount Deception, as we have called the peak in our survey of McKinley, can be reached easily only from the north, via Wonder Lake, McGonagall Pass, and Brooks Glacier. The first eighteen miles of this route are identical with the approach to Muldrow Glacier for the ascent of McKinley. A four-mile walk down Muldrow and across to its south bank brings one to a spot where Deception can first be seen at close range, towering five miles to the southeast of the junction between Brooks and Muldrow glaciers. Its last 5,000 feet is a steep ice-veneered rock mass with only one obscure passage by which a party of climbers can attain the summit ridge without great difficulty. Much of the lower part of this route lies beneath a barrier of tottering ice blocks, any one of which could wipe out several hundred yards of the trail in a matter of seconds. From the ridge, a steep 1,000-foot descent on the south side leads to the lonely shelf where the wreckage was discovered. Blue ice, coated with patches of wind-slab snow, guards the shelf from above. A virtually impassable 3,000-foot icefall isolates it from the head of Eldridge Glacier below.

General Dale Gaffney and his Search and Rescue experts at Ladd Field were completely opposed to making any effort to investigate the crash on the ground. Both Paul Victor and I were called into conference with them and heartily respected their sound judgment. But there had been at least one well-known passenger on the plane and high officials in Washington

were demanding a detailed explanation of what had happened. Why was it so dangerous or difficult to climb a 12-000-foot peak in Alaska when you can drive easily over roads almost that high in Colorado all winter?

When General Gaffney heard that a full-scale "rescue" effort was planned (two weeks after the accident), he ordered Major Dick Ragle, one of his top Arctic Search and Rescue experts, Paul Victor, and me to fly to Anchorage to try to influence the General there against a difficult and dangerous mission which was predestined to failure. A three-day trip and earnest conferences with the top officers of the Alaskan Air Command produced no results at all. Lieutenant-General Delos Emmons insisted that a determined effort should be made to reach the scene of the crash at once, regardless of the obvious possibility that further casualties might easily result from large-scale operations on a high Alaskan peak at an exceedingly unpropitious time of year.

Grant Pearson, of McKinley Park, was luckily obtained as guide and technical advisor for this extraordinary expedition, which was under the official leadership of Captain A. R. Peracca, of Anchorage. Pearson felt as we did: no conceivable result of the search could justify the inevitable risk involved; at best, all that could be accomplished would be the recovery of nineteen frozen corpses. However, he generously volunteered to do his best to carry out the Army's stubborn decision. There is little doubt that a good dog team and three competent climbers sent out immediately after the accident could have discovered twice as much in ten days as this behemoth of a party was to accomplish in five weeks and at incredible expense.

By railroad, truck, tractor, snow jeep, and airplane the forty-three members of the now-famous "C–47 Crash Expedition" reached Wonder Lake in the closing week of October. In the meanwhile, my small four-man party flew from Fairbanks to Wonder Lake just before the freeze-up and reached McGonagall Pass on November first. Two months before, we had chosen this part of the Muldrow valley as an easily accessible, cold, barren, isolated spot where an objective test of Air Force Arctic emergency equipment could be carried out—and we arrived there to find two-score men, two snow jeeps, a dozen tents, six hundred pounds of fresh meat, and mountains of equipment stacked on every side.

Although Grant Pearson had in his party as fine a group of outdoorsmen as I have ever seen together in one camp, he was very short of men with experience on steep ice and snow, and he asked if I could accompany his party for a week or ten days until they located the scene of the wreck. Permission was obtained from my headquarters at Wright Field by radio,

and for the next twelve days I was a part of one of the most extraordinary exploits in the history of Alaskan mountaineering.

My small test party set up camp five miles east of McGonagall Pass at the junction of Brooks and Muldrow glaciers. There they were to begin our experiments with rations, tents, and equipment with Captain Robert P. Sharp[1] in command. His two comrades were Major Bruce Bass, of Louisville, Kentucky, and Lieutenant Alvin Ivler, of New York. Neither had ever set foot on a glacier or camped out on snow or ice in his life. They were to act as the volunteer guinea pigs in our tests.

Grant Pearson's party spent the first five days of November scouting out a route down Muldrow Glacier, across it, and thence up Brooks Glacier five miles to the foot of the superb north face of Mount Deception, on the other side of which the ill-fated C–47 had crashed.

Two years before, we had become very familiar with the problem of trail picking on Muldrow afoot, but trying to figure out a safe path for a 3,000-pound M–7 snow jeep to follow was an entirely different problem. Frequently, where traveling afoot was just plain arduous slogging ahead on snowshoes, the jeep would take off at twenty miles an hour for a mile or more. Then we'd overhaul it and spend an hour trying to find a practicable way to get it safely across a frozen glacial stream in a little icy canyon six feet deep which anyone could easily jump across, even on snowshoes!

After two days without air support owing to bad weather both in Fairbanks and Anchorage, we had four supply planes arrive all together just at twilight and our advanced camp at "Brooks Moraine" was literally bombarded with food and fuel for half an hour. One of the most thrilling sights I have ever seen was those big C–47s roaring up the valley at 120 miles per hour, only fifty feet above the surface of the glacier, their red and green riding lights shining brightly in the gathering dusk, and the great peaks of Mather, Brooks, Deception, and McKinley towering cold and gray above them into the deep purple of approaching night.

Anyone who has ever depended heavily on air support knows the feeling of both feast and famine. One minute you are running for your life to avoid being killed by showers of fresh fruit and gunny sacks full of fresh rolls and juicy meat. The next you are almost out of food and fuel, and five men are huddled together in a three-man tent, trying to keep warm because the pilots dropped your stuff by mistake at a camp ten miles away!

[1] Associate Professor of Geomorphology at California Institute of Technology and member of the Wood Expeditions to Mount Wood and the Seward Glacier.

On November 5 we advanced five miles up Brooks Glacier in forty minutes by snow jeep and joined Jim Gale and Malcolm Greany,[2] who set up our advanced base camp at 7,000 feet the night before. While Jim Ford and a native boy called Ivanoff shuttled supplies between McGonagall Pass, Brooks Moraine, and this camp, Grant Pearson, Greany, Jim Gale, four other men, and I started out just before noon to reconnoiter a route up the northwest face of Mount Deception.

We had flown around the peak several times about a month before. Both Gale and I were certain that a possible, though rather dangerous, route to Deception's 10,800-foot west shoulder existed by way of a precipitous icefall that tumbled down the western edge of its northern face. The weather was clear and cool (zero) when we left camp. The sun had not yet hit the tents, as we were at the very foot of the steep ice face and the sun never rises very high in Alaska in November.

My diary describes that eventful afternoon thus: "We started up the hill toward the C–47 at 11:20 A.M. I wore my felt boots and they worked much better than the mukluks used by the others. We had a long, steady pull, first over patches of hard windpacked snow, occasionally covered by drifted powder knee-deep. For thirty minutes we climbed up a steep and dangerous avalanche slope—an assignment which I never relish. At one o'clock, after hurrying through avalanche debris till we were panting for breath, we hit a level plateau about 1,500 feet above camp. At the far end of this rises the steep ice gully which we saw from the plane a month ago. We had a bite at the bottom of the first steep pitch and at 1:30 we tackled the hard-packed snow after putting on our crampons. It was –4° and icy cold in the shadow.

"The weather cleared as we climbed, after a very lovely sunrise, and the views of McKinley and Silverthrone to the west were stunning. What a magnificent cirque this is! The first steep slope turned out to be excellent snow for step-kicking and Grant took over the lead from me at the top of it. Then came two very steep (50°) pitches of blue ice which Jim Gale led beautifully. The séracs to our right were terrific—we were climbing right up a cascade of huge ice blocks.

"At 4 o'clock we dumped our extra food and trail markers 3,650 feet above camp and then plowed on to the shoulder 400 feet above through knee-deep flour snow with a lovely coating of fresh rime on it. The sun was bright and warm as we worked our way up through the final drifts,

[2] Greany now runs one of Juneau's best photographic stores. Gale now lives in Anchorage and was assistant leader of the 1947 McKinley Expedition of the Boston Museum of Science.

and, as we approached the pass, it set behind McKinley, an icy red banner cloud trailing southward from its peak.

"At the pass (4:35 P.M.) a glorious twilight panorama burst on us. The whole lowland to the south was cloudless and filled with the deep blue and purple shades of gathering night. Mount Marcus Baker, Mount Hayes, Mount Susitna, and Mount Spurr still rose up pink against the curtain of darkness rising into the sky to the east and south. The chaos of peaks to the southeast of McKinley, around the heads of Ruth and Eldridge glaciers was staggering, a savage mass of jagged ice and rock silhouetted in frigid white against the dark valleys below.

"The C–47 was clearly visible as we peered over the great cornice which overhangs along the crest of our peak to the southeast. It was all buried under deep fresh snow and at least 1,000 feet below where we stood. A 45° slope of hard snow with blue ice patches dropped from us to it.

"We hustled back to camp, first in the dusk, then in the dark, creeping down the steep pitches as we belayed each other, then stumbling over icy avalanche debris for 30 minutes in the inky darkness till we reached camp at 6:50 P.M."

The C–47 was at last located and within reach, even though we had not yet actually touched it. But the main topic of discussion that night was not how we'd get to it; it was how on earth we could ever get even a single body out of that wreckage, up to the shoulder, and down the icefall.

After another air drop and two more visitations of the snow jeep, under the able guidance of Jim Ford of Q.M., we were nineteen men strong and well supplied for the next move forward. I shall never get used to looking out a tent door halfway up an Alaskan glacier to see two headlights speeding into camp! That snow jeep looked even more out of place than the airplanes among those magnificent peaks.

Each day was shorter and every night seemed a bit colder as winter slowly but inexorably descended on us. However, the thing that surprised us was that it was not nearly so cold as we had expected it would be—it averaged around zero in the daytime, five to ten below at night.

We passed election day in camp with a blustering wind and snow flurries. Then on November 8 the weather moderated a bit and Grant sent three of us up to occupy a small advanced camp right on the crest of the shoulder, perched halfway between Brooks Glacier and the wreck of the C–47. My diary relates our arrival there:

"Roosevelt won the election—snow flurries and cold (9 below zero) last night and today. Jake Stalker (of Kotzebue), Jack Yokel (of Jackson Hole) and I are now at the Ridge camp, about 11,000 feet high, with a

cold north wind. We are above a sea of frosty clouds which has covered the lower flanks of the range all day. We climbed up through them. Left at 10:20 and got here at 4:15. Another superb sunset. Cloudless south of the range. Airplane due with supplies early tomorrow if all goes well. The three of us are filling one of the '4-man' tents to bursting. We've rigged part of a parachute inside to warm it up and it's fine. Fried Spam tasted like caviar for supper! The stars are all out and it looks like a nice day tomorrow, if this frost doesn't stay in the valleys and the wind goes down. Radio N.G.—partly 1943 batteries and partly cold. We'll try again in the morning. Now to bed."

We got the radio going at breakfast after sleeping with the batteries all night, and a C–47 arrived at noon with the final load of airborne supplies. The pilot and crew were a crack team and they pinpointed two cases of rations and a five-gallon can of gasoline right square on the ridge only a few feet from the tent. Then they circled and tossed us a large crate full of fresh bread just baked the night before in Anchorage. The crate burst into a million pieces and for twenty minutes we picked up loaves of bread all over the hillside.

The plane next descended a thousand feet and looked over the scene of the crash directly below us—and we had the weird experience of sitting on terra firma a thousand feet *above* an airplane as it dropped all the equipment for our next camp on the level snow shelf far below us.

After lunch, we started down toward the wreck, but that easy-looking slope turned out to be a terror. We kicked and hacked steps down it for about 500 feet. Then the hard snow face turned to blue ice and became nearly vertical for 60 feet or more. Every step in the ice took twenty or thirty vicious chops. The sun disappeared over the ridges to our right, a stiff breeze came up, and it rapidly got too cold for safety. We clambered back up to the comfort of our little tent on the ridge and reveled in a sumptuous supper with lots of hot food, topped off with toast made from our tremendous bread supply.

The next morning we got an early start in the warm sun and actually reached the C–47 wreck at 2 P.M., leaving two long fixed ropes to facilitate the descent by Grant and Jim's party which (radio told us) would join us late in the afternoon. By sunset twelve of us were pitching camp on that lonely shelf perched halfway up the south face of Mount Deception. Somewhere near us, buried deep in the windpacked snow, lay nineteen other Army men, but not a single trace of them was in sight anywhere.

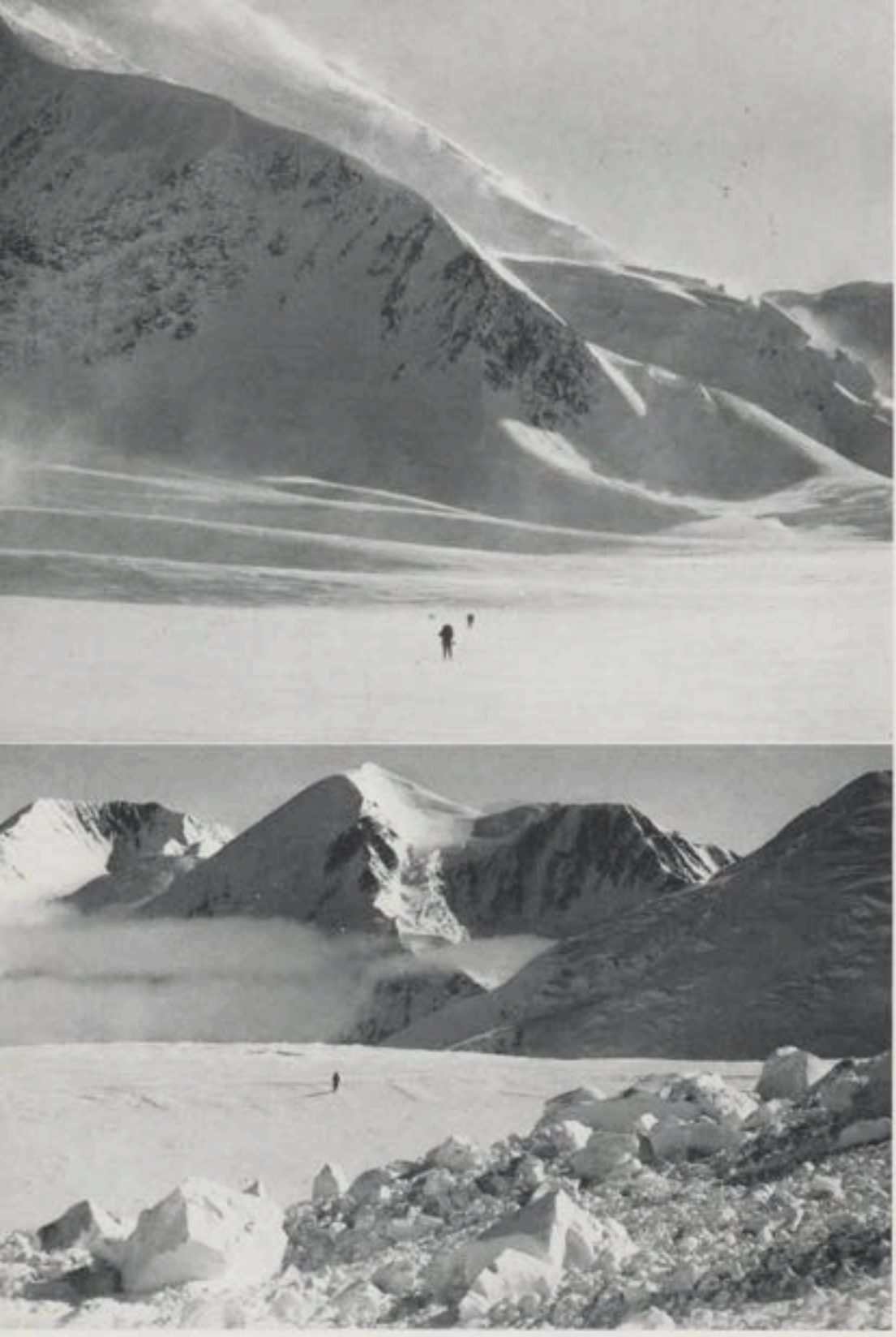
The work of the next three days was the most extraordinary experience of my life. There we were, camped less than 200 yards from the wreckage

MOUNT DECEPTION, BROOKS GLACIER, AND MOUNT BROOKS—SOUTH FROM FLIGHT OVER MULDROW GLACIER

To Mount Deception

PHOTOGRAPHS BY BRADFORD WASHBURN

Jim Ford pilots the snow jeep across the rough medial moraine of Muldrow Glacier. Grant Pearson and Lieutenant Dillman point out best route.



Mount Brooks towers 5,000 feet above base camp on Brooks Glacier at the foot of Mount Deception—always in the shadow at this time of year.

←

Up Brooks Glacier to base camp at foot of Deception (in rear).

Below, Mount Deception from near Silverthrone Pass. Route of ascent clearly seen in the sunlight at center. Mount Mather at left. Shoulder at right was site of "Ridge Camp." The wreck was found *down* the back side 1,000 feet below the shoulder.

Beneath a huge cornice of Deception's ridge, just before starting the descent to the crash.

Below, the route up the ice cascade on Deception. Brooks in rear.

→

Ridge Camp, on the shoulder of Deception (elevation 10,800 feet), which rises out of sight to right.

Below, Mount McKinley from Ridge Camp early in the morning. Mount Silverthrone at left; Silverthrone Pass and head of Brooks Glacier in shadowed center.

Mount Mather (12,075 feet), seen during the descent of the south face of Deception to the scene of the wreck.

Scene of the crash—the camp at 9,800 feet on the shelf of Deception. Wreckage visible just above tent. Ice cliffs above are lower part of 1,600-foot wall down which wreckage fell.

Yokel and Stalker and the wreckage as found 53 days after the accident.

Gale examining the port engine on the south face of Deception.

Digging out the wreckage around the tail of the C–47. Gale in foreground.

MOUNT BROOKS FROM GREAT ICE CASCADE ON NORTHWEST APPROACH TO MOUNT DECEPTION

of that airplane, with twelve husky men, plenty of food, and a comfortable camp; yet dig as we might, we simply could not find the slightest evidence of a human being or even a tiny part of a human being anywhere in that wreckage. Owing to endless red tape and confusion, we had not reached the scene of the crash until fifty-three days after the accident. If there had been more action and fewer conferences, somebody could have arrived long before everything had been hopelessly buried in fresh snow.

Using the hideously heavy and awkward manure shovels (!) dropped from the air, we dug harder and longer than I've ever dug in all my life. My diary for November 11 (the day after we arrived) tells the story:

"In half an hour after breakfast, we picked up all the stuff dropped by the plane yesterday. Then went to work on the wreck. Six hours of steady digging in shifts (directly beneath a dangerous avalanche slope) yielded not a single body, but a terrific tale of destruction. The plane is an unbelievable wreck. Its left wing ticked the mountainside 1,600 feet above camp and then it plunged end-over-end down a 50° slope after leaving the port engine embedded firmly in the ice far up there above us where it first struck.

"The fuselage was smashed and twisted in two just behind the trailing edge of the wing. All aft of the door, except the tail and stabilizer assembly, was nearly intact but full of snow. The doors were broken off and nowhere to be found, and the whole cabin forward of the wing was twisted right off, with the floor and ceiling squeezed together, like a rolled newspaper that has been bent over. The right wing had been torn from the cabin and lay squarely on top of the tail. Under the wing and beside the tail, *pointing backward*, were the twisted, shattered remnants of the pilot's cockpit—a mad tangle of wires, cables and torn aluminum, which looked as if it had been pounded from every angle by a gigantic piledriver."

In almost every scene of terrible destruction, the contrasts are striking: the entire dashboard was shattered and smashed, yet the delicate "automatic horizon," torn from its place, lay in the snow a few feet away, completely intact without even the glass broken! The co-pilot's canvas suitcase (the familiar B–4 bag) was dug out of a drift outside of the cabin. It had evidently been thrown clear of the plane when it crashed, then rolled and bounded a quarter of a mile down that icy wall after the careening wreck, finally winding up on top of the twisted wreckage—yet a bottle of whiskey in the outside zipper pouch of the bag, protected only by being wrapped in some cotton shorts, was unbroken and full.

We dug in relays all that day and all the 12th with cloudless skies and

a howling, gusty north wind. As we rested from our task, we sat on the wreckage and took in the magnificent panorama around us: the great Eldridge Glacier winding its way to the valley of the Chulitna; the maze of sharp peaks and ridges immediately south of McKinley; the beautiful snowy pyramid of Mount Deception towering above us with twisting streamers of wind-driven snow curling upward from it into the deep blue sky. I wonder how long it will be before anyone else ever climbs to that isolated mountain shelf, surrounded by America's most beautiful and savage mountain wilderness.

On the morning of November 13 Grant Pearson declared that the job was done. Every major part of the plane had been discovered and excavated, yet not one single tiny trace of any one of the nineteen occupants had been found! As we packed our loads and prepared to climb back homeward over the lofty shoulder of Deception, our final analysis of the weird situation was this:

How the plane got off course and why it crashed nobody will ever know. Those secrets are locked for all time in the heart of Eldridge Glacier. At the moment of impact, the plane apparently split open like a huge melon, spewing its cargo and passengers out all over the mountainside. Playing cards scattered throughout the wreckage and unfastened safety belts clearly showed that no one on board had the slightest premonition of danger or disaster. The wreckage of the plane must have rolled and plunged down the icy face of the peak. Its contents, scattered in every direction, slid down after it in a huge snow-and-ice avalanche started by the crash. The remains of the plane lay atop a mound of this debris a dozen feet high, covered in turn by eight feet of windpacked snow that had fallen since the accident. Every passenger and every scrap of small, heavy wreckage must have been buried deep beneath the surface both in and around this mound.

All this analysis seemed logical but for one fact: Why had we not found any trace of even one of the passengers? It seemed uncanny that we had been within a few yards of the remains of nineteen people and had never discovered the slightest evidence of a single one of them. This will forever remain the unsolved mystery of Mount Deception.

The fixed ropes hanging over the ice pitches of Deception's face were a great help as we clambered back up toward the shoulder. It was a superb day. Every inch of the Alaska Range and the lowlands to the south was cloudless and glittering in the brilliant sunshine.

Four of us were assigned to the task of investigating the port engine of the C–47, still clearly visible far above us, jammed securely in the blue-

green ice just below Deception's summit. This little party consisted of Sergeant Jim Gale, Sergeant Richard C. Manuel, Private Elmo G. Fenn, and me. To quote my diary again, these were my recollections of our final day on the mountain:

"We took till noon to reach the pass and were plenty tired from pulling and hauling on the fixed ropes and trail-breaking, as yesterday's windstorm practically obliterated the old route all the way. At 12:45 we left the ridge camp and started up to investigate the motor and climb the peak. It was perfectly clear in every direction, about ten below zero and a gentle northwest breeze. We climbed up the crest of the hard-packed ridge for 750 feet to a point directly above the motor, which I located after crawling out on my stomach half a dozen times, well secured by the rope, and peering over the beetling edge of the huge cornices which overhang to the south.

"Unfortunately the take-off point to descend to the engine was a very large cornice with a 15-foot overhang below it. We had brought 350 feet of ⅜-inch double prime rope with us, so we anchored this to an ice ax 20 feet back from the edge. Then we tied both of our nylon climbing ropes (a total of 240 feet) onto Jim Gale and he rappelled safely to a point 100 feet above the motor in a jiffy. He unroped there after cutting himself a small platform on which to wait; I followed in the same way.

We descended the last hundred feet by handline without the added security of the nylon rope around our waists and reached the engine at 1:45 P.M. Around it was another terrible scene of destruction. Perched on a 53° slope and driven two feet into the solid ice, the motor and propellor still clung dizzily to the peak, 220 vertical feet below the ridge. If the plane had flown a hundred yards higher, it would have cleared the mountain—not another thing lay in its way for a safe descending flight all the way to Fairbanks! Below us 1,540 feet we could see the wreckage that we had excavated after so much back-breaking work. The last group of men had just evacuated camp and was starting the long, steep climb up to the shoulder."

Beyond the engine for a hundred yards was a mass of small scraps of debris, still splattered along the ice face—an oxygen bottle, securely held in the ice by the sharp end of its connecting tube; bits of aluminum, torn splinters of plywood. Above the wreckage, the slope was veneered with a foot of packed snow—around and below the point of impact this had been stripped off by the crash and the slope was still a bare sheet of gleaming blue-green ice, probably the result of the last unseasonal autumn rain, a rare but possible occurrence at this altitude even in Alaska.

While Jim stood beside the motor recording its number for our report, I swung fifty feet away on a rope pendulum and took a picture of him.

We had a terrible time getting back to the ridge. It was bitterly cold and the wind was coming up again. It was now 2:30 and the sun was getting rapidly lower. Our hands were numb from pulling ourselves up the handline and we both finally had to be hauled up the overhang and through the cornice like sacks of meal. When we reached our friends on the ridge they were congealed from waiting for us—a frigid northwest wind was sweeping the ridge and an ill-omened banner cloud was floating in the lee of McKinley's peak. We beat the snow out of our gloves and sleeves, wiped the icicles from our eyebrows, re-adjusted our rope and started quickly up the ridge toward the top of Deception. No ascent had ever been made to its summit, and we figured that the Army would not mind our taking a 45-minute leave of absence for this little side trip, now that our job was done.

The easy though spectacular ridge got extremely sharp just below the peak. A few ice steps had to be chopped up a steep corniced drift encrusted with frost feathers, and at 3:05 we were on top, exactly 1,000 feet above our camp on the shoulder—11,800 feet above the sea. The view, of course, was magnificent. The Kantishna hills, Wonder Lake, Mount Hayes, and the broad interior lowlands all crystal clear. A curtain of high clouds coming in from the west cut off the sun just before we reached the summit, and Cook Inlet was buried in a sea of advancing fog. In fact, the whole sky to the south and west was black as ink and becoming more menacing every moment. Manuel had an Abney level (Heaven only knows why!) and we took rough readings on the peaks around, steadying it on top of an ice ax. Mount Brooks, four miles to the northwest, appeared to be only a scrap higher than we were, Mather a bit higher than Brooks, and Silverthrone's beautiful snowy dome towered at least 1,000 feet above us at the head of Brooks Glacier.[3]

Fenn and Manuel set up a little flag of yellow parachute cloth, tied to a bit of box wood, then we all hustled down the ridge, chilled to the marrow. We stopped at camp long enough to pick up our packs. The last men had not yet managed to reach the shoulder from the scene of the crash, but it was too cold and miserable to wait for them. We headed down the ice cascade into the darkening gulf of the Brooks Valley. The sun had set and night and storm were both coming on fast. The descent was cold and windy, with great twisters of blowing snow sweeping up the slope into our

[3] Our survey now sets these altitudes as follows: Deception 11,800, Brooks 11,900, Mather 12,075, Silverthrone 13,200.

faces. McKinley was lost in a sinister mass of clouds and a thin gray streamer of mist was coursing over the top of Silverthrone.

We reached camp at 5:15 and were greeted with oceans of hot supper and a hearty welcome from the gang who had kept base in our absence. A blinding blizzard swept down on us while we ate, yet at seven o'clock loud shouts and bright headlights outside heralded Jim Ford's arrival from McGonagall Pass with the snow jeep! More hot coffee and grub were brewed in a four-man tent, jammed to bursting with eight of us—steam, smoke, lantern light, and half a dozen stories all being told at once in that wildly flapping tent are my last memories of our camp at the base of Deception.

Then, warmed and rested, four of us climbed aboard the jeep in an inferno of wind and blowing snow. At nine o'clock at night, in the pitch dark and in the midst of a wild blizzard, we chugged steadily along at fifteen miles an hour, our headlights clearly picking up one willow trail marker after another in their brilliant beam. What a ridiculous way to be traveling along an Alaskan glacier and what an incongruous end to a thoroughly fantastic experience!

Midnight saw us cozily snuggled in our sleeping bags at Brooks Moraine camp. Bob Sharp, Bruce Bass, and Al Ivler were safe and sound despite ten unpleasant days of living on experimental emergency rations. The final cavalcade of the great C–47 crash party retreated past camp on the way to McGonagall Pass after lunch on the 14th, and we were at last alone on Muldrow. Three more weeks' work and over one hundred miles of snowshoeing still lay between us and civilization. The skies to the west were clearing and a frigid breeze coursed down Muldrow. McKinley towered at the head of the valley, an inky cascade of clouds pouring past it down the vast canyon of Traleika Glacier. The Alaska Range is a marvelous but desolate wilderness in the dead of winter.

A Climber's Guide to the High Sierra

Part VII. The Kings-Kern Divide and the Adjacent Crest

By HERVEY H. VOGE

PUBLICATION OF SECTIONS of "A Climber's Guide to the High Sierra" was initiated in the *Sierra Club Bulletin* in 1937 and was continued through 1942.[1] Now the project is being resumed with the aid of the William Shand Memorial Fund, and is dedicated to the memory of Bill Shand, Sierra Club mountaineer who lost his life in an automobile accident en route to the Tetons in 1946. When coverage of all the major regions of the Sierra Nevada has been completed, a final guide book will be issued.

It is the purpose of the guides to present information on ascents and routes for the major climbs in the Sierra. In many places information is incomplete and the descriptions of routes are meager or nonexistent. Even when fairly complete detail is available on a route, the directions cannot be in any way considered a substitute for sound mountaineering judgment, and it is expected that climbers will, to a great extent, have to find their way up a route even if they hold the guide book in hand.

Climbs have been classified according to difficulty, when knowledge has permitted, according to the following scale:

Class 1. Easy. Any serviceable footgear will do.
Class 2. Moderate. proper footgear is essential—nails or rubber.
Class 3. Difficult. Ropes should be available.
Class 4. Very difficult. Ropes and careful belays essential.
Class 5. Severe. Pitons should be used for safety.
Class 6. Very severe. Anchors must be placed for direct aid.

THE KINGS-KERN REGION

The rugged ridge of the Kings-Kern Divide connects the main crest of the Sierra with the northern part of the Great Western Divide like the bar in a giant letter *H*. To the south of this bar lies the high plateau where the Kern River starts, while on the north the tributaries of the South Fork of the Kings River flow northward in several canyons between the subsidiary ridges which jut out from the divide. The Muir Trail crosses the Kings-Kern Divide at Forester Pass.

The entire area is one of the finest and most representative of the High Sierra. Clarence King, in *Mountaineering in the Sierra Nevada*, described the view eastward from the ridge just south of Mount Brewer as follows: "The

[1] Regions covered in parts I-VI are: Sawtooth Ridge, Ritter Range, Palisades, Yosemite Valley, Whitney Region, and Evolution Region. *SCB* 22:1, 23:2, 24:3, 25:1, 26:1, 27:4, 1937-1942, respectively. Six sections have been collected in *A Climber's Guide to the High Sierra: Preliminary Edition*, published by the Sierra Club William Shand Memorial Fund, 1949.

Sierras are here two parallel summit ranges. We were upon the crest of the western ridge, and looked down into a gulf five thousand feet deep, sinking from our feet in abrupt cliffs nearly or quite two thousand feet, whose base plunged into a broad field of snow lying steep and smooth for a great distance, but broken near its foot by craggy steps often a thousand feet high. . . . Rising on the other side, cliff above cliff, precipice piled upon precipice, rock over rock, up against sky, towered the most gigantic mountain-wall in America, culminating in a noble pile of Gothic-finished granite and enamel-like snow. . . . From the two opposing mountain-walls singular, thin, knife-blade ridges of stone jutted out, dividing the sides of the gulf into a series of amphitheatres, each one a labyrinth of ice and rock. Piercing thick beds of snow, sprang up knobs and straight isolated spires of rock, mere obelisks curiously carved by frost, their rigid, slender forms casting a blue, sharp shadow upon the snow. Embosomed in depressions of ice, or resting on broken ledges, were azure lakes, deeper in tone than the sky, which at this altitude, even at midday, has a violet duskiness. To the south, not more than eight miles, a wall of peaks stood across the gulf, dividing the Kings, which flowed north at our feet, from the Kern River, that flowed down the trough in the opposite direction."

This description by Clarence King is apt, and correctly suggests that the Kings-Kern region has much to offer climbers of various tastes. The main peaks range from easy to moderate by the standard routes, and are without exception very fine viewpoints. The precipitous Kearsarge Pinnacles, the crags north of Mount Ericsson, and many of the north and east faces of the larger peaks present real challenges to rock climbers.

HISTORICAL

Recorded climbing started in 1864 with the explorations of the party of the California State Geological Survey. This party was led by William H. Brewer and included Charles Hoffmann, Clarence King, and Richard Cotter. Brewer and Hoffmann ascended and named Mount Brewer, while King and Cotter made their way from Roaring River across the Great Western and Kings-Kern Divides to Mount Tyndall and back in the classic trip described in King's *Mountaineering in the Sierra Nevada*. King's narrative relates climbing adventures in the dramatic style of the nineteenth century, and two of the most exciting passages concern the Kings-Kern Divide. The first of these describes the crossing of the divide, from north to south, somewhere between Thunder Mountain and Mount Jordan, in the course of which crossing the adventurous climbers at one time pulled themselves up by a lasso thrown over a partially loose spike of rock thirty feet above, and at another time descended by rope-downs when neither forward nor return progress was certain. The other dramatic episode occurred when the two climbers, on the return journey from Mount Tyndall, passed around the south end of what is now called Lake Reflection. Here they encountered a sheer bluff which could only be passed by ascending a steep tongue of icy snow and climbing a cliff at its head. After an

unsuccessful attempt by King, Cotter led up the cliff and seated himself at the top. He called down to King and said, "Don't be afraid to bear your weight [on the rope]." Thus reassured King made the climb unaided, only to discover that Cotter had a very precarious perch and that the least pull would have dragged him over. King considered this an act of great courage on Cotter's part, and so should we, although our methods in the situation would now be different. The corner at the southeast end of Lake Reflection where this episode occurred is readily identified, and is substantially as King described it. Anyone who has read the book will be interested in visiting the spot.

John Muir climbed several unidentified peaks near the Kings-Kern Divide in 1873. The region was more thoroughly explored by Bolton Coit Brown, J. N. LeConte, and others in 1896 and thereafter, and by E. T. Parsons in 1903. (The early history of the Kings River Sierra has been described by Francis P. Farquhar (*Sierra Club Bulletin*, 1941, 26:1, p. 28). In later years many have climbed these peaks, and Norman Clyde alone has at one time or another visited most of the major summits. Sierra Club parties in 1932, 1935, and 1939 conquered most of the Kearsarge Pinnacles and Ericsson Crags. There still remain, however, very many possible and apparently interesting routes that have not been tried, as well as numerous smaller unclimbed pinnacles.

GEOGRAPHY

The arbitrary region here considered extends about eight miles along the crest from Kearsarge Pass to Shepherd Pass, westward along the Kings-Kern Divide to the Great Western Divide, and north along the latter to its terminus. Also included are the subsidiary ridges running north from the Kings-Kern Divide, as well as outlying peaks down to about 11,000 feet elevation. Peaks are for the most part high points on ridges rather than isolated mountains. Extensive glacial action in the past has sculptured the higher basins and valleys into the familiar U shape, and has made the north and east faces of many peaks and ridges quite precipitous by undercutting. The rock is mostly granite, but dark, metamorphic rock is found on Center Peak, the Videttes, and in a few other areas. The granite varies from firm material in some places to rather badly decomposed rock in others.

APPROACHES

From Independence. Kearsarge Pass (11,823). From the end of the road in Onion Valley at 8,900 feet a good horse trail leads over Kearsarge Pass to Bullfrog Lake. Just below Bullfrog Lake this lateral joins the Muir trail, which may be followed south to the upper part of Bubbs Creek, Center Basin, and the Kings-Kern Divide at Foresters Pass. To reach East Lake, the Muir Trail may be left where it comes to Bubbs Creek at Vidette Meadow, and the trail down Bubbs Creek followed to just below the juncture with East Creek at a spot called Junction Meadow, where a trail leading up East Creek begins.

Shepherd Pass (12,000 +). The Shepherd Pass trail starts at an elevation

of about 6,500 feet at the end of a road which leaves U. S. 395 at Independence. The rather poor trail leads over Shepherd Pass to the Tyndall Creek plateau just south of the Kings-Kern Divide. Knapsackers may turn north at an elevation of about 10,500 on the east side of the pass and follow the old Junction Pass trail across Junction Pass (13,200) into Center Basin. The Junction Pass trail is not recommended for animals.

From Kings Canyon. The Bubbs Creek trail leaves the Kings River Canyon at 4,800 feet and follows the creek until the Muir Trail is reached at 9,700 feet in Vidette Meadow. At Junction Meadow, at an elevation of about 8,500 feet, the trail to East Lake leaves the Bubbs Creek trail and goes south up East Creek.

From the North. The Muir Trail leads over Glen Pass (11,900+) and to the foot of Bullfrog Lake, from which point various routes may be followed as described for the approach over Kearsarge Pass.

From the South. The Muir Trail traverses the high plateau east of the Kern River and crosses the Kings-Kern Divide at Foresters Pass (13,200). From the pass the trail descends to the headwaters of Bubbs Creek and Vidette Meadow.

From the West. Several routes to the high peaks are possible from the west. Either the trail up Sphinx Creek or that from Big Meadow may be followed to Moraine Meadow, Scaffold Meadow or the headwaters of the Roaring River. These trails are described in more detail in Starr's *Guide* (1951). Knapsack routes lead from these points via Brewer Creek or Longley Pass to East Lake or Lake Reflection.

CAMPSITES

Camps suitable for knapsackers may be found up to about 11,300 feet elevation in nearly all valleys. Popular camping spots for those traveling with animals are situated at Bullfrog Lake, along Bubbs Creek from Vidette Meadow to the lower part of Center Basin, on East Creek from East Lake to just below Lake Reflection, and on the south side of the divide along Tyndall and Milestone creeks.

PASSES

Besides the main trail passes mentioned under approaches, several others are of interest to climbers and knapsackers.

Junction Pass (13,200). This pass crosses the main crest and connects Center Basin to the head of Shepherd Creek. It was once the main horse trail for north-south travel in this region, but is no longer maintained. Parts have been obscured by slides, and the trail is not well marked, so that knapsackers following it should pay close attention to the topographic map.

Harrison Pass (12,600+). This pass across the Kings-Kern Divide leads from East Lake to Lake South America. It has occasionally been crossed by pack animals, but like Junction Pass is only recommended for foot travel. The

trail is not clearly marked over the higher portion of the north side, but the place of crossing the divide is not especially critical.

Lucy's Foot Pass (12,500+). In 1896 Bolton Coit Brown and his wife Lucy crossed the Kings-Kern Divide just west of Mount Ericsson, and since that time the pass has borne her name. There is no trail, and considerable rough talus is encountered, but the route is class 1.

University Pass (12,700+). This is a climber's pass from Onion Valley to Center Basin; it is the lowest point between University Peak and Peak 12,910. There is a steep snow gully on the northeast side and a long rocky chute on the southwest side. Class 2.

Brewer Creek to East Lake Pass (12,800+). This pass crosses the ridge between Mount Brewer and South Guard, and leads from Brewer Creek to East Lake. It is for foot travel only. The routes are about the same as for Mount Brewer, Routes 1 and 2, except that the summit of Brewer is bypassed.

Longley Pass (12,600+). Class 1. This foot pass leads from the stream below South Guard Lake on the west to Lake Reflection on the east side of the Great Western Divide, and passes between Peaks 13,232 and 13,021. On the west it is quite easy, and on the east not difficult except for a possible, seasonal, steep snow bank. There is a trail part of the way on the east side.

ROUTES AND RECORDS FOR THE PRINCIPAL PEAKS

The descriptions of routes and records are arranged in the following order:

Peaks of the main crest (north to south)
Peak east of the main crest
Peaks of the Great Western Divide (north to south)
Peaks west of the Great Western Divide
Peaks of the Kings-Kern Divide (west to east)
Peaks north of the Kings-Kern Divide
Peaks south of the Kings-Kern Divide

In the next to last category, peaks north of the Kings-Kern Divide, are grouped all peaks in the interior region between the Great Western Divide and the main crest. These peaks are arranged roughly in order from west to east. It may be noted that several prominent peaks, although very close to their respective divides, are not actually on the divides, and therefore they are to be found among the peaks north of the Kings-Kern Divide. Examples are South Guard, the Ericsson Crags, and Mount Stanford.

Peaks of the Main Crest (North to South)

Peak 12,423 (¾ mile south of Kearsarge Pass)
Ascended by Norman Clyde, April 4, 1926.

University Peak (13,588)

Route 1. From the northwest. Class 1. First ascent July 12, 1896, by J. N. LeConte, Helen M. Gompertz, Estelle Miller, and Belle Miller. From the environs of Bullfrog Lake proceed southeast up the basin between the Kear-

sarge Pinnacles and the main crest to the upper Kearsarge Lake and continue toward a low gap in the ridge west of University Peak, passing over rough, giant talus and some snowbanks (seasonal) to the gap. From the gap the easiest route is to traverse around and up on the sandy southwest slope of the peak. It is also feasible to proceed from the gap to the ridge running northwest from the summit and to follow the ridge to the top; this variation (Walter Starr, Jr.) is class 2-3.

Route 2. South face. Class 1. From Center Basin the long, rather easy slope to the summit may be climbed by a number of routes.

Route 3. North face. About class 3. First known ascent by Norman Clyde, prior to 1928. From the group of lakes at the northern base, at about 10,500 feet (Slim Lake) climb up a steep, rocky slope, several thousand feet in length, to the eastern end of a knife-edge which can be followed to the summit with comparative ease.

Route 4. Southeast face. About class 3. Climbed by Norman Clyde, Sept. 29, 1928. He described it as a good but not very difficult rock scramble.

Route 5. Southeast ridge. Class 1. From University Pass (see above, section on passes) the ridge may be followed easily if one stays somewhat on the south side.

Route 6. Northeast ridge. It is reported that this ridge was climbed in 1947.

Peak 12,910 (¾ mile southeast of University Peak)

This little peak may be climbed readily by following the northwest ridge from University Pass. It was ascended May 21, 1934 by David R. Brower and Hervey Voge.

Center Basin Crags (about 12,700–12,800)

These sharp crags lie on the main crest between Peak 12,910 and Mount Bradley. The three most prominent crags were traversed in class-4 climbing by David R. Brower and L. Bruce Meyer in July 1940. The traverse was from north to south, and ended with a long rappel.

Mount Bradley (13,280)

Route 1. West face. Class 2. First ascent July 5, 1898, by Mr. and Mrs. R. M. Price, J. Shinn, and Lalla Harris. The summit can probably be reached by any one of a number of chutes leading up from Center Basin to the main ridge. The easiest way is to climb straight up the talus chute below the main summit. When the chute forks about three-fourths of the way up, take the branch to the right, which leads to the saddle between the two summits. From the saddle go around behind (to the east of) the main summit, which is the left or northerly one, and ascend a narrow, easy chute to the top. The party of the first ascent took four hours from camp in lower Center Basin to the summit.

Route 2. Northwest ridge. Probably class 3 to 4. This ridge was followed from peak 12,910 on Aug. 31, 1948, by Fred L. Jones.

Route 3. East ridge. Probably class 2. Climbed Oct. 27, 1948, by the east ridge from Symmes Creek by Fred L. Jones.

Peak 13,370 (¾ mile northeast of Mount Keith)

All but the last 15 feet was climbed July 15, 1940 by Paul Estes. The summit is a difficult and exposed monolith.

Mount Keith (13,990)

Route 1. Northwest face. Class 1 to 2. First ascent July 6, 1898, by R. M. Price, J. E. Price, J. C. Shinn, and C. B. Bradley. Time from camp in Center Basin to the top was four hours.

Route 2. Southwest ridge. Class 2 to 3. The sharp ridge from Junction Pass was followed by two Sierra Club parties in 1916, and it was thought that this route had not been used in any previous ascents.

Route 3. South face. About class 2. According to Norman Clyde the ascent from about 10,000 feet on the Shepherd Pass trail is comparatively easy.

Junction Peak (BM 13,903)

Route 1. South ridge. Class 2. First ascent August 8, 1899 by E. B. Copeland and E. N. Henderson. Ascend the west wall of Diamond Mesa near the lower (southern) end and proceed north along the sandy plateau and along or somewhat to the west of an easy knife edge leading to the summit.

Route 2. West ridge. Class 2. From Foresters Pass follow the ridge eastward, passing over or to the south of one small subsidiary peak. On the main peak stay to the south of the northwest ridge, and proceed southward and upward from one chute to another as convenient.

Route 3. Southeast ridge. On August 21, 1929 A. R. Ellingwood followed the ridge from Shepherd Pass to the summit.

Peak East of the Main Crest

Independence Peak (11,773)

This may be climbed by the north slope from Onion Valley. Norman Clyde ascended the peak three times in 1926 and twice in 1927.

Peaks of the Great Western Divide (North to South)

Cross Mountain (12,140)

Ascended in 1929 by Walter L. Huber.

Peak 12,871 (¾ mile northwest of North Guard)

First ascent July 17, 1932 by Sierra Club parties, including Norman Clyde, Thomas Rawles, Lincoln O'Brien and eleven others, from Sphinx Lakes. The climbers said that it was a splendid peak and that the highest point was a large slab almost overhanging the steep east face.

North Guard (13,304)

First ascent July 12, 1925, by Norman Clyde. The summit is a large, sloping obelisk, which overhangs the east face.

Route 1. South ridge or slopes. Class 1 to 2. From the north fork of Brewer Creek proceed to the saddle between Brewer and North Guard, or up the south slopes of the peak.

Route 2. East and north faces. Class 4. Climbed May 28, 1934 by David R. Brower and Hervey Voge. From East Lake proceed up Ouzel Creek and tributaries to the northeast flank of the mountain and ascend this wall to the prominent shoulder or col north-northeast of the summit. From the col climb a thirty-foot *V* crack on the nose of the ridge to a platform, and from this platform go to the right (west) on broken ledges on the north face and ascend a second difficult crack to the easier rocks leading to the summit.

A subsidiary peak north-northeast from North Guard, about 13,100 was climbed from Ouzel Creek Aug. 10, 1948 by James Koontz and two others.

Mount Brewer (13,577)

Route 1. West slopes and south ridge. Class 1. First ascent by W. H. Brewer and C. F. Hoffmann, July 2, 1864. From Roaring River or Moraine Creek go up Brewer Creek to the notch just south of Mount Brewer and follow the easy ridge of broken rock to the summit.

Route 2. East slopes and south ridge. Class 1 to 2. First ascent by Bolton C. Brown and A. B. Clark, 1895. From East Lake proceed up Ouzel Creek, taking the middle fork which leads almost directly toward Mount Brewer. From this fork, in one of several possible places, climb the ridge to the south. Alternatively, the ridge may be climbed over rounded slabs at its foot from the junction of the first fork of Ouzel Creek shown on the map. This ridge joins the main south ridge of Mount Brewer at about the southern edge of the summit pyramid. Where this subsidiary eastern ridge joins the peak, work to the left (south) through a small notch to the main south ridge, and proceed northward up this to the summit. Time from East Lake to the top is about four hours.

Route 3. Northwest slopes. Class 1 to 2. Climb from the north fork of Brewer Creek.

Route 4. Northeast couloir and north ridge. Class 2 to 3. Ascended August 4, 1940, by Oliver Kehrlein, August and Grete Frugé, E. Hanson, L. West, R. Leggett, and A. Mulay. From the east side of the mountain ascend a steep couloir filled with snow and (or) ice which leads to the base of the main pyramid of the mountain on the north side, and then climb the north ridge or face to the top.

Peak 13,232 (¾ mile east of South Guard Lake)

This peak may have been climbed by Clarence King and Richard Cotter on July 4, 1864. Clarence King wrote, in *Mountaineering in the Sierra Nevada*, that from the notch just south of Mount Brewer "with very great difficulty we climbed a peak which surmounted our wall just to the south of the pass . . ." From this peak they attempted to follow the Great Western Divide southward. ". . . we had a rather lively time scaling a sharp granite needle, where we found

our course completely stopped by precipices four and five hundred feet in height. Ahead of us the summit continued to be broken into fantastic pinnacles . . . so we sought the most broken part of the eastern descent, and began to climb down."

Peak 13,021 (1½ miles west of Mount Jordan)

First ascent by Norman Clyde in 1925.

Climbed August 8, 1940, by Oliver Kehrlein and five others from Lake Reflection by ascending the east side of the Great Western Divide somewhat north of Peak 13,021, and traversing along the divide, from north to south. Several minor summits were climbed before Peak 13,021 was reached.

Peak 13,110 (½ mile north of Thunder Mountain)

First ascent August 8, 1940, by Oliver Kehrlein and five others who traversed along the north ridge of the peak from Peak 13,021 (see above).

Thunder Mountain (BM 13,578)

First ascent August 1905 by G. K. Davis of the U. S. Geological Survey. The second ascent was made on July 27, 1927, by Norman Clyde. The customary route of ascent has been from the southeast, from a lake just under the mountain which drains into the northern branch of Milestone Creek. There are three pinnacles on top which increase in difficulty from east to west.

Peaks West of the Great Western Divide

Sphinx Crest (11,278, 11,500+, BM 11,709)

There are no records of climbs of this crest, except for the bench mark installed on Peak 11,709 by G. K. Davis of the U. S. Geological Survey in 1903.

Peak 12,680 (½ mile west of South Guard Lake)

There are no records available regarding this peak.

Peak 12,620 (1½ miles west of Thunder Mountain)

No records of any climbs are available.

Peaks of the Kings-Kern Divide (west to east)

Peak 13,241 (¾ mile east of Thunder Mountain)

First ascent unrecorded. Second ascent by the east face, August, 1939, by Fritz Lippmann, Dave Nelson, Don Woods, and Edward Koskinen.

Peak 13,102 (½ mile south of Mount Jordan)

Norman Clyde, July 5, 1931, climbed the first pinnacle south of Mount Jordan, and found no cairn.

Mount Jordan (13,316)

First ascent by Norman Clyde, July 15, 1925.

Route 1. From the south. In 1936 two Sierra Club parties, led by Lewis Clark and Carl Jensen, made the ascent. They found a cairn on the northern summit and also climbed the interesting southernmost pinnacle, which is the

higher. It bore no evidence of any previous ascent. The intermediate points were not climbed.

Route 2. Northern slopes. Climbed August 3, 1940, by Art Argiewicz and six others from Reflection Lake and a basin to the southeast of the lake. A delicate five-foot leap was made to attain the summit.

Route 3. West face. Descended August 3, 1940, by Art Argiewicz and party.

Mount Genevra (13,037)

First ascent July 15, 1925 by Norman Clyde, who also climbed it in 1927. A Sierra Club party led by Lewis Clark and Carl Jensen made the ascent from Milestone camp in 1936.

Route 1. East face. Ascended August 6, 1939, by Dave Nelson, Earl Jessen, and Hal Leich.

Route 2. North ridge. On August 3, 1940, Robert Schonborn led a party of six to the top from East Lake by way of Lucy's Foot Pass and the north ridge.

Mount Ericsson (13,625)

Route 1. West ridge. Class 1 to 2. First ascent August 1, 1896, by Bolton C. Brown and Lucy Brown. From Lucy's Foot Pass follow the easy ridge to the summit.

Route 2. East ridge. Class 1 to 2. Descended August 1, 1896, by Bolton C. Brown and Lucy Brown. From Harrison Pass climb the east ridge.

Route 3. South ridge. Class 2 to 3. Climbed by Lewis Clark and Carl Jensen in 1936.

Route 4. Northwest couloir. Class 3 to 4. Climbed in July 1946 by Norman Clyde, Robert Breckenfeld, Jules Eichorn, Joe Brower, and Danny Kaplan. From Lake Reflection ascend toward Harrison Pass to small lake at about 10,900 feet, and turn south toward Lucy's Foot Pass. Climb the rocky chute which heads between Mount Ericsson and the first crag to the north. About one hundred feet below the head of this chute turn left (south) and ascend a steep, icy couloir which leads to the Kings-Kern Divide somewhat west of the summit of Ericsson. An ice ax is necessary in the couloir. From the divide climb the west ridge or the southwest slopes to the top.

Gregory's Monument (about 13,960)

Route 1. West or southwest slopes. Class 1. First ascent July 1894 by Warren Gregory, Emmet and Loring Rixford, and W. Sanderson. This peak is the south and lower peak of Mount Stanford and is separated from the latter by a jagged, class-three ridge about one-fourth of a mile long. Technically speaking, the many who have ascended only to this point have not climbed Mount Stanford.

Route 2. North ridge. Class 3. Follow the ridge from Mount Stanford. See routes on the latter in the section on peaks north of the Kings-Kern Divide.

Route 3. East face. Class 3 to 4. Descended July 23, 1929 by Walter Starr,

Jr., who wrote: "Left summit at 4:30 and descended to Center Basin via the first chute (lowest gap next to the peak) on the Junction Peak side. Bad rock climb down to ledge. From ledge descended steep snow chute, and from bottom down snow in talus along stream to Center Basin and down Bubbs Creek. Arrived at Vidette Meadow 7:45 P.M."

Peak 13,826 (1 mile northwest of Junction Peak)

This is the highest point on the divide between Junction Peak and Gregory's Monument. First ascent June 3, 1934 by David R. Brower and Hervey Voge. Class 3. From the lake on the south side of Foresters Pass they ascended the southeast face of the peak to the ridge between Gregory's Monument and the peak proper, reaching the ridge at nearly its lowest point. They then proceeded eastward along the west arête to the top. Descent was by way of a shallow chute which led down the southeast face from the ridge just east of the summit, and included a rappel of about twenty feet.

Peaks North of the Kings-Kern Divide

South Guard (12,964)

First ascent July 26, 1916, by Walter L. Huber, Florence Burrell, Inezetta Holt, and James Rennie. They followed the south fork of Ouzel Creek to the snow field of its upper basin, and finding the snow too hard for secure footing, climbed the rocky northeast ridge of the peak, described as a very thin knife-edge of very loose rock. This ridge led them to the summit. To avoid the slow ridge, descent was made by ledges of the north face to the snow, and down the snow. Probably class 2 to 3.

Peak 11,844 (1½ miles northwest of East Lake)

Ascended from East Lake by Art Argiewicz and seven others on July 30, 1940.

Peak 12,610 (1½ miles west of East Lake)

Traversed May 26, 1934, by David R. Brower and Hervey Voge who proceeded from Ouzel Creek to the saddle between the peak and North Guard and then ascended the west ridge. Descent was by the south face. Both routes are class 2.

Peak 11,597 (½ mile southwest of East Lake)

This is actually a long ridge which extends northeastward from South Guard; it offers interesting and convenient climbing.

Route 1. Southwest ridge. Class 2 to 3. David R. Brower and Hervey Voge, May 28, 1934. From the upper portion of the south fork of Ouzel Creek climb to the ridge and follow it eastward, weaving among small towers, blocks, and knife edges.

Route 2. South face. Class 2 to 3. David R. Brower and Hervey Voge, May 28, 1934. An entertaining descent, just below the difficulty requiring a rope.

Route 3. North face. Climbed August 3, 1940 by parties led by Alan MacRae and Oliver Kehrlein.

Peak 11,593 (½ mile northwest of Lake Reflection)

The north face of this cleaver-shaped peak was climbed on July 31, 1940, by Oliver Kehrlein and six others.

Peak 12,311 (¾ mile west of Mount Jordan)

First ascent August 8, 1940, by Peter Friedrichsen and three others.

Peak 12,047 (½ mile south of Lake Reflection)

No record is available regarding this peak.

Mount Bago (BM 11,868)

U. S. Geological Survey, 1905.

Ericsson Crags

There are three main crags on the north ridge of Mount Ericsson. Crag 1 is that closest to Ericsson, and Crag 3 that farthest away. These crags are most readily accessible by way of the rocky chutes which lead up to the ridge from the west. The crags offer challenging climbing and there are many possible routes and many minor pinnacles that have not yet been explored.

Crag 1. About 13,000. **Southeast face.** Class 4. First ascent August 4, 1939, by Edward Koskinen, Don Woods, and DeWitt Allen. Ascend the chute which goes up from the west between Crag 1 and Ericsson. About two-thirds of the way up this chute branches. Take the left or north branch, which will lead to a broad shoulder on the ridge just south of the topmost portion of Crag 1. A smaller and rather difficult crag (climbed in 1939 by Voge, Waller, and Woods) separates this shoulder from the north face of Mount Ericsson. From the shoulder a rather open chimney leads up the southeast face of the crag, but at the bottom the chimney ends in an overhanging crack. The climbable portion of the chimney can be reached by a delicate, downward traverse from a little arête just to the left (west) of the creek. This pitch would require a piton for safety except for the fact that it is possible to provide adequate upper belays without one. The route then leads up the chimney, over several large steps, and finally up the northwest side of the summit block.

Crag 1W. This is a formidable looking crag quite a distance out on the ridge running west from Crag 1. There are no records of any attempts. The most feasible route appears to be on the north and northwest faces.

Crag 2. (About 12,950.) Class 3 to 4. First ascent August 3, 1939, by David R. Brower and Hervey Voge. Ascend the main rocky chute coming down to the west between Crags 2 and 3. From this climb the next to the highest chute, which enters this main chute from the south and which leads to the northwest face of Crag 2. Take the right (west) branch of this next-to-highest subsidiary chute and climb out of it just to the left (north) of some caves by means of a class-4 pitch. From there rather easy slopes lead to the top.

Crag 3. (About 12,900.) Class 3 to 4. First ascent prior to 1939. Ascend the main chute coming down to the west between Crags 2 and 3. When nearly to the top of this chute cross a rib to the left (north) by a band of broken rock and continue up the next chute to the north. Leave this by means of a rather delicate chimney which leads to the crest of the south ridge of the crag. Proceed along the east side of the ridge to a little arête running east from the top of the crag. Climb up the arête to the main ridge and follow this to the top. The climb can also be made by way of the southwest slope from the main chute.

Peak 12,222 (¾ mile northeast of East Lake)

First ascent Sept. 19, 1926, by Norman Clyde. Climbed July 30, 1940, by William Morrison and four others from East Lake, by way of the lake basin at the foot of Deerhorn.

West Vidette (12,229)

First ascent August, 1920, by Norman Clyde and Louis Schichter. This peak is class 1 to 2 from the southeast, from Vidette Creek.

West Spur Peak (12,500+, ½ mile south of West Vidette)

First ascent Sept. 19, 1926, by Norman Clyde, who climbed the West Vidette and the peak to the south.

West Spur Peak (12,685)

On July 14, 1940, Dick Goldsmith and Anna Shinn stopped 50 feet from the top. On August 8, 1940, William Morrison and three others made the ascent from the west, from East Lake.

The Minster (12,200+, ¾ mile west of Deerhorn)

This is a jagged ridge of grotesque spires extending westward from Deerhorn Mountain. A complete east to west traverse was made on August 3, 1939, by Ted Waller, Don Woods, and Edward Koskinen, who found no records of previous visits on any of the spires.

Deerhorn Mountain (13,275)

The twin peaks of Deerhorn make it an easily recognized landmark. The southeast peak is slightly higher. The first recorded ascent was made on July 8, 1927, by Norman Clyde, who found no cairn on the southeast peak, but possibly one on the northwest peak. Various routes have been used; those listed below are not necessarily arranged in chronological order.

Route 1. Southwest chute. Class 3 to 4. Ascend the chute which heads between the twin peaks of Deerhorn. The most difficult portions are near the bottom and near the top. From the notch the southeast peak may be climbed by its north face or its northwest arête. This peak has a small, steep top, and in 1939 a party of three was so cramped there that they lost the can containing earlier names down the north face.

Route 2. West ridge. Class 3. From the trail to Harrison Pass, at about 11,000 feet, ascend the southwest slopes of the ridge to a point a little east of

the lowest point on the ridge between The Minster and the west gendarmes of Deerhorn. Proceed eastward on the ridge, staying more on the north side than on the south. Ascend the northwest peak of Deerhorn on cluttered ledges. Descend to the notch between the two peaks, and climb the southeast peak by its north face. This route was followed by Norman Clyde, Hervey Voge, and Ted Waller on August 5, 1939.

Route 3. Northwest basin and west ridge. Class 3. Climb into the basin almost due east of East Lake and proceed from its upper end to the west ridge of Deerhorn, which may be traversed as noted above to the summits. Route done by W. Morrison, R. Kauffman, and Norman Roth on August 5, 1940.

Route 4. Southwest face. Class 3 to 4. From the Harrison Pass trail at about 11,000 feet climb the southwest face of the mountain, aiming for a point just west of and about 300 feet below the northwest peak. From here work around to the north and climb to the top of the northwest peak. The traverse may then be made to the southeast peak. It is also possible to climb directly up the west face of the northwest peak, which for 300 to 400 feet is quite airy but not really difficult. This route was made by Norman Clyde, Jules Eichorn, Robert Breckenfeld, and others in July, 1946.

Route 5. North buttress. About class 4. This buttress leads from upper Vidette Creek directly to the northwest peak of Deerhorn. It was climbed by Norman Clyde.

Subsidiary Peaks of Deerhorn Mountain

To the east of Deerhorn there are two sharp subsidiary peaks. No records exist regarding the double-pointed peaklet nearest the main southeast peak. The next peaklet to the east was climbed August 3, 1939, by DeWitt Allen and Fritz Lippmann by the southwest chute. They used a piton a number of times for safety in the wet chute.

An arête running north of Deerhorn somewhat west of the northwest peak was traversed by Norman Clyde, David R. Brower, and eight others on July 13, 1940. No record was found of previous ascent of peaks on the arête.

East Vidette (12,742)

First ascent by a Sierra Club party in 1910.

Route 1. Southeast ridge. Class 2 to 3. A variation of this route is the ascent of the north side of this ridge and the traversing of the upper portion of the ridge to the summit.

Route 2. North side. About class 3.

East Spur, Peak 12,722

Climbed for the first time by Jim Harkins and Pat Goldsworthy on July 14, 1940.

Peak 12,288 (1½ miles west of Center Peak)

There is no record of any ascent.

Peak 13,440 (¾ mile east of Deerhorn)

Climbed by Boynton and Edith Kaiser, August 7, 1948. This peak may possibly have been traversed by Norman Clyde and David R. Brower on August 4, 1939, during a descent from Mount Stanford. It was climbed from Vidette Creek by the Kaisers, who went up the northwest slope, staying somewhat northeast of the ridge leading from 13,440 to the low pass to the west.

Mount Stanford (13,983)

This peak is separated from Gregory's Monument (see peaks of the Kings-Kern Divide) by a knife-edge ridge about one-fourth of a mile long.

Route 1. South ridge. Class 3. From Gregory's Monument follow the ridge, with minor deviations to one side or the other. The crossing takes about 20 minutes. First ascent August 1, 1896, by Bolton C. Brown.

Route 2. West face. Class 3. First descent August 1, 1896, by Bolton C. Brown, who went down the chute where the knife-edge from Gregory's Monument joined the peak of Stanford (just south of the final peak). He went down the chute for about one thousand feet and then proceeded downward and toward the south from chute to chute to the cliff base near a small lake below Harrison Pass.

Route 3. West face and north ridge. About class 3. The west face may be ascended to the ridge north of the summit and the ridge followed southward to the summit. This route was followed by Art Argiewicz and three others in August 1940.

Route 4. North ridge. About class 3. This route was descended by David R. Brower and Norman Clyde, August 4, 1939. They traversed the north ridge from the summit to the saddle east of Deerhorn.

Route 5. East face. About class 3. A steep couloir or chute usually filled with snow descends almost directly from the summit of Stanford toward the basin west of Center Peak. The face to the south of this chute may be ascended to the summit, or the chute itself may be followed, if one keeps to the north side. These climbs were made in August 1947 by James R. Harkins and several others. In 1948 Beckett Howorth and party ascended the "east ridge."

Kearsarge Pinnacles (about 11,700 to 11,967, 12,009, etc.)

These sharp little pinnacles are numbered consecutively from southeast to northwest, numbers 1 through 12, after the 1939 system of Edward Koskinen. Several numbering systems have been applied in the past, and the numbers on the summits, if any, may differ from those given here. The minor summits are not numbered. The pinnacles may be identified from the accompanying figure. Pinnacles 11 and 12 are farther down this ridge toward Bullfrog Lake.

Pinnacle 1. First ascent July 28, 1935, by May Pridham, Miles Werner, and Pan Coffin.

Pinnacle 2. First ascent as for Pinnacle 1.

Pinnacle 3. First ascent August 1, 1939 by Ted Waller, Don Woods, David Nelson, and Edward Koskinen.

Pinnacle 4. First recorded ascent as for Pinnacle 3.

Pinnacle 5. Records unknown.

Pinnacle 6. Records unknown.

Pinnacle 7. This pinnacle has been climbed numerous times.

Pinnacle 8. Probably unclimbed. Appears to be a class-5 climb.

Pinnacle 9. This pinnacle has been climbed many times. It is about class 3 from the northeast. Climb up the chute to the high V-notch between 8 and 9, go around to the south side of the ridge, and climb up the face, reaching the lower summit first. An ice ax may be needed in the chute.

Pinnacles 10, 11, 12. All have been climbed many times. Records of the first ascents and the routes are not available.

Besides the ascents mentioned above, climbs of unidentified pinnacles were made earlier. In July, 1932, Glen Dawson, Thomas Rawles, and H. H. Leschke climbed "the most difficult" of the northwestern group. On July 28, 1935 a Sierra Club party including Peter Grubb and Neil Ruge climbed " a few" of the northwestern pinnacles. In 1932 Jack Riegelhuth climbed up the nearest chimney from Vidette Meadow to the top of "the highest pinnacle."

THE KEARSARGE PINNACLES FROM THE NORTH

Center Peak (12,767)

First ascent July 5, 1898, by C. B. Bradley, by an unknown route. Two hours to the top from the meadow at the foot.

Route 1. North face. Class 3. David R. Brower and Hervey Voge, May 22, 1934. Three chutes discharge prominent talus fans into Center Basin northwest of the peak. Take the center chute and climb well up within the mountain wall; then turn to the right (southwest) up a chute which leads up to the northwest buttress of the peak. Follow along the buttress to a saddle, and there cross to the west side of the northwest ridge and climb upward close to the ridgetop to within two hundred feet of the summit, then cross to the north face for a short way, back to the west, and then to the top.

Route 2. East face. Class 1 to 2. This face may be ascended in several places from about 11,500 feet in Center Basin.

Peak 12,774 (1 mile south of Center Peak)

On May 23, 1934 David R. Brower and Hervey Voge walked to this peak from the Junction Pass trail at about 12,500 feet. Descent was made via interesting chutes to the northeast of the peak.

Peaks South of the Kings-Kern Divide

Peak 12,492 (¾ mile southwest of Mount Genevra)

This peak was climbed from Milestone Creek in August, 1939 by Fritz Lippmann, Dave Nelson, Don Woods, and Edward Koskinen.

Peak 13,844 (1.3 miles west of Junction Peak)

Climbed by Norman Clyde, June 22, 1926.

Peak 13,028 (1.3 miles west of Diamond Mesa)

Climbed July 10, 1939, by Jack Sturgeon.

Diamond Mesa

Strictly speaking there is no summit of the Mesa, since it rises continuously toward Junction Peak. It was climbed July 10, 1898, by Bolton C. Brown and a companion in an attempt on Junction. It may be ascended by the west face, especially near the southern end, and may also be reached by following the ridge from Junction Peak. There is a meadow and a stream at the Mesa's lower end.

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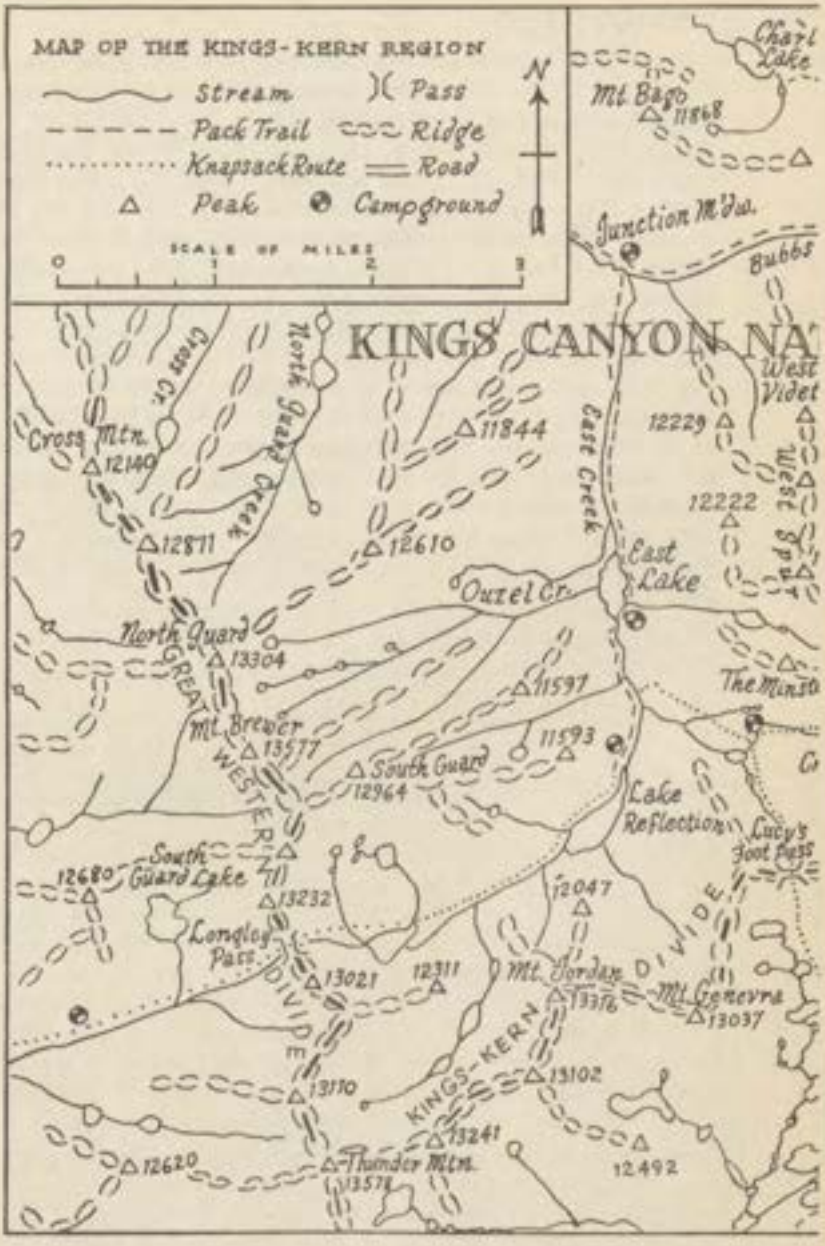
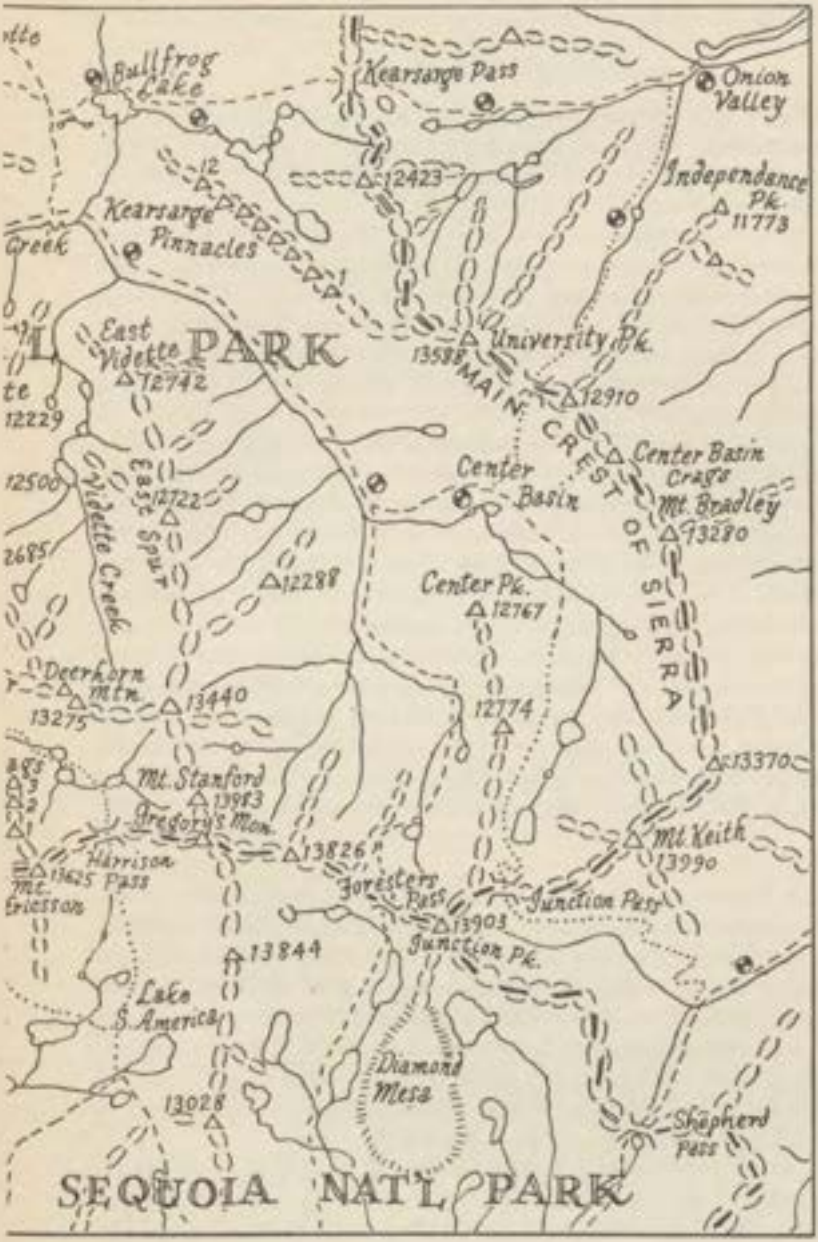
PHOTOGRAPHS

Sierra Club Bulletin magazine numbers, year and facing page as shown: Mount Bago: 1910, 236. Mount Brewer: 1897, 17, 20 (sketches); 1902, 95 (from Kearsarge Pass, from Bullfrog Lake); 1903, 278, 281 (on climb from East Lake), 282 (view from); 1907, 162 (from Brewer Creek); 1917, 206 (from east); 1926, 237 (from Kearsarge Pass); 1941, 94-5 (from Mount Gould); 1945, 62 (from east). Center Peak: 1923, 378; 1933, 14; 1941, 14-15. Deerhorn Mountain: 1913, 25 (from southeast); 1930, 67 (from north). East Vidette: 1903, 282; 1911, 13 (from north); 1917, 179 (from north); 1930, 67 (in winter); 1941, 14. Foresters Pass: 1923, 23. Mount Ericsson: 1897, 92 (sketch from west, with crags); 1913, 25 (crags). Mount Jordan: 1911, 15. Junction Peak: 1917, 178 (from east); 1933, 15. Kearsarge Pinnacles: 1894, 100 (from north, as are most of the following); 1902, 95; 1910, 237; 1911, 12; 1917, 190, 207; 1919, 407; 1926, 220; 1941, 94. Kings-Kern Divide: 1897, 21, 22, 26 (sketch maps); 1917, 207 (from Mount Gould); 1945, 62 (peaks above Lake Reflection); 1941, 95. North Guard: 1903, 278. South Guard: 1897, 20 (sketch). University Peak: 1910, 238-9 (from north in winter); 1912, 285; 1917, 190, 191 (from Kearsarge and Pothole Lakes); 1944, 46 (from north). West Vidette: 1912, 274 (from Junction Meadow); 1941, 94 (from Mount Gould).


MAP OF THE KINGS-KERN REGION
Stream
Pack Trail
Knapsack Route
Peak
Pass
Ridge
Road
Campground
N
SCALE OF MILES
0
1
2
3
KINGS CANYON NA
Charl Lake
Mt Bago 11868
Junction M'dw.
Bubbs
West Videt
12229
12222
Mt West
East Lake
Ouzel Cr.
East Creek
Cross Mtn. 12149
Cross Cr.
North Guard Creek
11844
12811
12610
North Guard 13304
GREAT WESTERN DIVIDE
Mt. Brewer 13577
11597
11593
The Minst
South Guard 12964
Lake Reflection
Lucy's Foot Pass
12680
South Guard Lake
13232
12047
Longley Pass
13021
12311
Mt. Jordan 13376
Mt. Genevra 13037
KINGS-KERN DIVIDE
13110
13102
13241
12620
Thunder Mtn. 13571
12492


Bullfrog Lake
Kearsarge Pass
Onion Valley
12423
Independence Pk. 11773
Kearsarge Pinnacles
Creek
East Vidette
12742
PARK
University Pk.
13598
MAIN CREST OF SIERRA
12910
12229
Center Basin
Center Basin Crags
Mt. Bradley 13280
12500
Vidette Creek
East Spur
12722
12288
Center Pk. 12767
2685
Deerhorn mtn.
13440
13275
12774
13370
Mt. Stanford 13983
Gregory's Mon.
Mt. Keith 13990
13826
Harrison Pass
13625
Forester Pass
13903
Junction Pass
Junction Pk.
13844
Lake S. America
Diamond Mesa
13028
Shepherd Pass
SEQUOIA NAT'L PARK

Part VIII: The Clark Range and Adjacent Peaks

By RICHARD M. LEONARD

THE CLARK RANGE early attracted the attention of geologists, topographers, and mountaineers because of the commanding position of its peaks, standing as they do near the center of the granite wilderness of the headwaters of the Merced River. Clarence King wrote of its principal peak:

"From every commanding eminence around the Yosemite no distant object rises with more inspiring greatness than the obelisk of Mount Clark . . . its slender needlelike summit had long fired us with ambition . . . . There was in our hope of scaling this point something more than mere desire to master a difficult peak. It was a station of great topographical value, the apex of many triangles, and, more than all, would command a grander view of the Merced region than any other summit."

Accordingly, after he had spent the summer of 1864 surveying the Yosemite Grant, the new park that had just been granted by the Federal Government to California, King could not resist the challenge to climb Mount Clark. He started out on November 11, 1864, with Richard D. Cotter, and reached a fine camp near timberline in the cirque between Clark and Gray Peak just to the south. There a violent early winter storm nearly trapped them in a foot and a half of new snow. Their escape provides a fine tale of early mountaineering. More prudently, his next attempt was made in warm weather, July 12, 1866, with James Terry Gardiner. They made the ascent by a thrilling route along the southeast arête from the same cirque at the head of Gray Creek. By the time the Wheeler Survey occupied the summit in 1878, George Bayley, later a member of the Sierra Club, had recorded his ascent in the *San Francisco Call* for September, 1876, and possibly others had also reached the summit.

GEOLOGY

The Clark Range is a remnant of the ancient, folded, metamorphic mountains of Appalachian type that reached an elevation of approximately half that of the present range about 130 million years ago. The northwest-southeast trend of these peaks is roughly at right angles to the great southwest slope of the Sierra granite block, which was uptilted only ten millions years ago. Remnants of the ancient metamorphic rocks can still be found in the quartzite of "Quartz Peak," just north of Mount Clark, and in the ancient metamorphic lavas similar to those of the Ritter Range which give the dark color to Merced Peak and explain its earlier name, "Black Mountain."

Mount Clark is composed of a very firm granite rather free of master joints, and would probably have become a dome except that it was severely glaciated on three sides. The absence of the black iron-bearing minerals gives Mount Clark an exceptionally light appearance. Gray and Red peaks, as the names indicate, are strangely different. Their granites are similar to the white granite of Mount

Hoffmann, but on Red Peak the black iron-bearing minerals seen in Gray Peak are weathered to an iron rust that colors the granite brilliantly. On Gray Peak these minerals are still predominantly black. Merced Peak is composed of extremely hard metamorphic lavas approximately 190 million years old, similar to those that form the sharp crest of Mount Ritter and the Minarets. The mixture of red and white granite and the black rocks of Merced Peak combine with brilliant blue lakes and bright green meadows to form a bowl at Ottoway Lakes that is one of the most colorful in the Sierra.

APPROACHES AND CAMPSITES

The peaks of the range are easily accessible by fine trails and open benches on all sides. The easiest route is from Glacier Point or Mono Meadow to the point where the trail crosses the Clark Fork of Illilouette Creek, where there is fine camping and scattered animal feed. There are many additional camp spots above the trail along the west slope of the range, with a particularly fine site on the trail at Ottoway Lake; across Red Peak Pass there are good campsites by a series of fine lakes at timberline on the Merced Peak Fork of the Merced River. Mount Clark can also be reached from the Nevada Fall trail by the old Army trail to Starr King Meadow, or from Merced Lake Ranger Station up the other end of this early trail on Gray Peak Fork of the Merced River. The trail has not been maintained for nearly fifty years and therefore must not be considered as more than an indication of a feasible route. The southern peaks of the range are easily accessible from the roadhead at Clover Meadow Ranger Station, on Sierra National Forest, reached from the Bass Lake junction of the Fresno–Wawona Road.

There are four passes, each crossed by good trails, which bring one into the southern portion of the Clark Range and its adjacent peaks. See the Mount Lyell quadrangle (U.S. Geological Survey) for details.

ROUTES AND RECORDS

This portion of the guide includes the peaks of the southern Yosemite National Park and northern Sierra National Forest from the Merced to the San Joaquin rivers. The peaks are listed alphabetically owing to their scattered location. Elevations are corrected by the addition of 6 feet to map figures.

Mount Ansel Adams (about 11,700, 1 mile northeast of Foerster Peak)

Class 3. First ascent July 11, 1934, by Glen Dawson, Jack Riegelhuth, and Neil Ruge. From the Lyell Fork meadows on the Merced River this is the most spectacular and beautiful peak in sight. Two days after the first ascent, Ruge led to the summit a Sierra Club High Trip party which proposed the name "Mount Ansel Adams." The route ascends a prominent gully to the south of the peak, thence to the summit over the south face.

Black Peak (10,513). See Madera Peak.

Buena Vista Crest (9,718)

Class 1. An excellent ski ascent from Ostrander Lake Ski Hut.

Mount Clark (11,512)

Route 1. Southeast arete. Class 3. First ascent July 12, 1866, by Clarence King and James T. Gardiner. A thrilling account of this climb is given by King in *Mountaineering in the Sierra Nevada*. Although a rope has probably never been used on this route, one should be available. The sharp southeast arête can be reached without difficulty from either west or east. On the arête, King's thrilling gaps in the knife-edge will still be found, and it is at those points that a rope is welcome protection. Approach from Merced Lake: Cross over logs at the confluence of the Merced River and Gray Peak Fork and proceed up fishing trail along Gray Peak Fork to the upper basin (above the waterfall) and, keeping to the right, follow to a small creek (9,500 feet) running from Mount Clark into the gray Peak Fork. Follow this watercourse to the lakes and thence to foot of Mount Clark over fairly open and gradual slopes.

Route 2. Northeast face. Class 2. Although Mount Clark was a popular climb with at least four ascents before 1893, it was not until the solo ascent by Francis P. Farquhar on July 4, 1916, that the easiest route was clearly described. He climbed from Merced Lake, and observed, on reaching the head of the snowfield on the northeast face, that a series of broad ledges on the north edge of the face provided a simple route to the summit.

Route 3. Northwest arete. Class 4. On September 8, 1935, Kenneth May, Don Parkin, and Howard Twining pioneered this difficult route, which is unmistakable to one with class-4 training and equipment. It consists of 1,500 feet of roped climbing on sound granite.

The true north face at the head of the great cirque has not been attempted so far as is known.

Winter Ascent. Class 4. On February 21, 1937, Kenneth Adam, David Brower, Kenneth Davis, Hervey Voge skied from a camp low on the Starr King Plateau to the notch southeast of the summit, from which they continued on foot and belayed across the east face and thence to the summit, arriving at sunset.

Electra Peak (12,468)

Class 2. Ascents were made by Norman Clyde in 1914 and 1919, and one by Ansel Adams in 1931. Ted Waller led a Sierra Club High Trip party of eight to the summit on July 12, 1934. From the upper Lyell Fork of the Merced, climb to the ridge north of the summit, and thence southward to the summit.

Foerster Peak (12,068)

Class 2. Norman Clyde led a knapsack party in 1914, Robert Owen made an ascent on July 13, 1929, and three ascents were made on successive days by the Sierra Club High Trip in July 1934. The best route is on the southern slope. The west face is dangerous owing to rotten rock.

Gale Peak (10,696)

Class 2. The first recorded ascent was made in 1920 by Lawrence Fley, Freeman Jones, and Thomas Jones. The peak is well situated at the head of the beautiful Chain Lakes, almost at the southernmost boundary of the park, and can be climbed easily by ascending the ridge dividing the Chain Lakes from Breeze Lake to the north.

Gray Peak (11,587)

Class 2. In 1920 Ansel Adams placed a Sierra Club cylinder type register on the summit. The best route is up the broad southwest slope of the Illilouette Basin. From the Gray Peak Fork side, an ascent would be considerably more difficult.

Horse Ridge (9,600)

Class 1. An excellent ski ascent from the Ostrander Lake Ski Hut. Fine view of the main crest peaks.

Isberg Peak (11,006)

Class 1. The first recorded ascent was made April 20, 1924, by Ansel Adams. It is an easy ascent from the upper basin of the Triple Peak Fork of the Merced.

Long Mountain (11,474)

Class 2. Ansel Adams made an ascent in August, 1922. The best route is from the south.

Madera Peak (10,513)

This is the approved name for the "Black Peak" of earlier editions of the topographic map. The peak is the southernmost high point of the northwest-southeast ancient ridge that formed the Clark Range. Class 2. Mr. and Mrs. Garthwaite, their 7-year-old son Ted, and Mrs. Hermina Daulton made the ascent in August, 1931. They "found a cairn but no records." The Brewer Survey reports an ascent on August 19, 1864, but they were probably referring to Merced Peak, 7 miles to the north, which at that time was known as "Black Peak" owing to its dark volcanic rock. The peak may be ascended from the upper basin of the Black Peak fork of Granite Creek. An easier ascent can be made over the west slopes.

Merced Peak (11,728)

The highest peak of the Clark Range was an early favorite as a climbing objective. In 1870 the California Geological Survey wrote that "All these points [of the Clark Range] except Gray Peak have been climbed by the Survey." In 1878 the peak was again occupied, this time by the Wheeler Survey party under Lieutenant M. M. Macomb. On July 29, 1897, Robert M. Price, his wife, F. W. Reede, and Theodore S. Solomons, placed Sierra Club Register number 56 on the summit. Fifty-two years later the tube was still there, though the records were missing. In 1871 the glacier in the cirque below the north face

was found by Muir and described in detail in 1875 as the first living glacier to be found in the Sierra Nevada. His drawing of the great icicles in the bergschrund "12 to 14 feet wide" is a fascinating bit of recent Sierran geological history. The glacial milk in the lakelet below the cirque in 1949 prompted Alfred R. Dole and Richard M. Leonard to reëxplore the glacier. Ice was still present in good quantity, but they felt the glacier, one of the lowest glaciers in the Sierra, should probably be classed as "fossil" or inactive.

The early accounts do not give the route of climb.

Route 1. Northeast arete. Class 2. On a traverse of the peak in August, 1949, Alfred R. Dole, Stewart and Elizabeth Kimball, and Richard M. Leonard found the northeast arête the easiest. It is reached from fine camping on lower Ottoway Lake by following up the canyon to the class-2 pass between Ottoway and Merced peaks, ascend the blocks of talus, keeping to the ridge crest to lessen danger from loose blocks.

Route 2. West arete. Class 3. This route is a half-mile in length and contains several steep pitches that require detours on the south slope down onto smooth 50 degree slabs of very hard ancient metamorphic lava. Traversed in August, 1949, by Dole, the Kimballs, and Leonard.

Ottoway Peak (11,500)

Class 2. The first recorded ascent was made by Ansel Adams on September 16, 1934, when scouting the route for the present trail, just a half-mile to the west. The route from the summit of the trail is easily ascertained.

Post Peak (11,002)

Class 1. The first recorded ascent was by Ansel Adams. It was climbed September 7, 1930, by Walter A. Starr, Jr., who described it as "A fine vantage point from which to get a fine view of the upper Merced and San Joaquin region." A branch of the old Isberg Pass Trail passes within a few hundred feet of the summit. The route is obvious.

Mount Raymond (8,552)

Class 1. Two miles by easy trail from Wawona Point, in the Mariposa Grove of Big Trees.

Red Peak (11,706)

Class 2(?). Presumably climbed by the California Geological Survey by 1870. In 1910 S. L. Foster made a solo ascent and found a cairn. In 1920 Ansel Adams placed a Sierra Club cylinder type register. This peak has some steep cliffs on the north. The easiest route is via the canyon to the north of the three summits, or via the crest of this summit ridge. The cliff face is very difficult.

Redtop (9,950)

This peak, on the south boundary of Yosemite, was at one time known as "Madera Peak" (*which see*). William Frederick Badè made an ascent prior to 1919.

Rodgers Peak (13,062)

Class 3. This peak was known in early literature as "Kellogg Peak." The first recorded ascent was made on August 5, 1897, by Robert M. Price, who climbed from the Lyell Fork of the Merced. Captain N. F. McClure made an early ascent, and in 1924 Ansel Adams placed a Sierra Club cylinder type register. The best route is from the east (Rush Creek Basin). It can be climbed from the upper canyon of the Lyell fork of the Merced, but is more difficult.

Triple Divide Peak (11,618)

Class 2. The peak splits two forks of the Merced from the East Fork of Granite Creek, a tributary of the San Joaquin. It affords a fine view. It was climbed by Norman Clyde in 1920. Ansel Adams, Elizabeth Adams, and F. C. Holman placed a Sierra Club cylinder type register in 1922. The best route is from the upper valley of Triple Peak Fork. The summit should be approached from the northeast.

Peak 10,755 (10,761, 2 miles southwest of Triple Divide Peak)

Class 2. Climbed in August 1934 by Edwin L. Garthwaite, Ted Garthwaite, and Jean Scupham.

Peak 11,250 (1 mile southwest of Triple Divide Peak)

Climbed August 5, 1934, by Edwin L. Garthwaite, Ted Garthwaite, and Jean Scupham.

Peak 11,500 (between Foerster Peak and Long Mountain)

Climbed July 13, 1929, by Robert Owen.

Peak 12,000 (¾ mile east of Foerster Peak)

Climbed July 13, 1934, by Marjory Bridge, Helen LeConte, and Louise Hildebrand.

Peak 12,500 (between Electra and Rodgers)

Class 2. Climbed July 10, 1924, by Ansel Adams, Cedric Wright, and Willard Grinnell.

Other peaks

[There is no record of ascent for Buena Vista Peak, Cattle Mountain, Green Mountain, Junction Butte, Lion Point, Moraine Mountain, Quartz Mountain, Quartz Peak, Sadler Peak, Sing Peak, or Timber Knob. Several of these summits should afford fine panoramas, and none of them is likely to exceed class 2 in difficulty. It is quite possible that ascents have been made of all these peaks —Green Mountain especially, since a trail passes almost over its summit.

To complete the story of the exploration of Sierra peaks we should like to correspond with those persons who know of climbing evidence which has escaped the notice of the various Sierra Club archivists. We should also like to hear from those who see in these slightly grayish blanks in the record a challenge to go out and see what the facts are, to find whether or not there may be on some of these summits a dilapidated cairn, giving scant shelter to some

barely discernible document or other artifact. If such be found, we should like to see it carefully preserved in the Yosemite Museum and the discovery duly noted and the note protected on the peak itself. Further, we should appreciate learning what the explorer discovers, and how he got up the peak and down it, so that future editions of the Guide may be more complete than this. That a peak should be easily climbed is no reason for our looking up to it condescendingly. No peak in The Range of Light can be utterly without character. So let those share their discovery who explore and find this to be true!—Ed.]

Photographs in Sierra Club Bulletin

Mount Ansel Adams: 1922, p. 258. Mount Clark: 1917, p. 230; 1930, p. 59. Electra Peak: 1935, p. 31. Gray Peak: 1941, p. 94. Rodgers Peak: 1932, pp. 23 and 26; 1935, p. 31.

References. See page 122.

CASTLE ROCK SPIRE. The route lies up the slope on the right skyline. By Philip C. Bettler.

CASTLE ROCK SPIRE. *Above,* general view from Moro Rock, Sequoia National Park, by Ansel Adams.

Below, making the traverse (Bettler), near the halfway point (Steck), and on the top (Bettler).

Castle Rock Spire

By PHILIP C. BETTLER

SOUTHEAST OF MORO ROCK, across the valley of the Middle Fork of the Kaweah River, Castle Rock rises in a confusion of jagged peaks and cliffs. Nestling close in under the summit peaks are two arresting and greatly contrasting formations. One extends northward in a long, finlike dome, surprisingly symmetrical as it curves gracefully down to the talus more than a thousand feet below. Close by to the west, and joining the dome at its base in a steep chute, rises a slender, bladelike needle—Castle Rock Spire. The graceful dome and the jumble of peaks in the background, rising to 9,150 feet elevation, would be enough to bring a glint into the eye of any climber if only the great spire of granite were not so dominant. Its walls on all sides are nearly vertical and even overhang on some portions of its upper reaches. To the north it drops a sheer 1,500 feet toward the Kaweah Valley.

This magnificent spire of granite has remained until recently one of the few untrodden and seemingly unattainable peaks in all of the Sierra Nevada. It has long been one of the foremost climbing problems of the area. Just how long ago climbers began looking seriously at the spire we don't know. Certainly the area has not often been visited by the cragsman, owing, no doubt, to his intense dislike of hiking, even to the base of a climb. The first climbers known to reconnoiter the peaks were Anton Nelson, DeWitt Allen, and Ted Knowles. In the summer of 1947 they packed in from the Atwell Mill Ranger Station on the Mineral King road and camped in Castle Rock Meadow at 8,500 feet. They climbed the highest summit of the upper group of rocks and a few of the lesser peaks, but did no more than survey the general situation on the spire itself.

Closer inspection did not alter the earlier estimates, made from a distance, that the climb would be difficult. The broad east face, opposite the dome, had two relatively large ledges. But how was one to get on them? The walls above and below were smooth and vertical. High above the upper ledge the wall was split by a large open chimney. But, if one could attain the chimney, would it offer any help? Adjoining the extreme northern edge of the east face was a buttress. Perhaps a traverse to the buttress might disclose a route beyond. Certainly a strong party would be needed, loaded with hardware and prepared to bivouac.

My interest in the spire was first aroused by John Salathé on his return from a reconnaissance in September of 1948. He reported, "It is better

than the Lost Arrow," and his pictures corroborated him. Two weeks later Salathé, Jim Wilson, and I were camped at the notch below the spire ready for another try, but the first snowstorm of the season intervened, driving us down the mountain before we could unlimber our hardware. These two trips were the start of an intermittent but concerted effort by a small group of climbers. Whenever they felt the conditions were right and they had time, they made another try.

The beginning of the end really began in September 1949. On this next-to-the-last attack Will Siri, Wilson, and I succeeded in finding and climbing more than half way up what seemed to be the best and perhaps only feasible route to the top. The approach to the spire, as on most of the previous trips, was made by way of the steep gully between the spire and the dome. From Hospital Rock and the Generals' Highway we followed Paradise Creek trail to its junction with Castle Rock trail. The latter, approaching through the forest close under Castle Rock, crosses two distinct flood channels leading up toward the spire. The first has water in it the year round and is the last chance to fill canteens. The route goes up the second (dry) channel, between the spire and the dome. Here the way becomes rugged and tortuous. The final pitch to the notch is almost class 4. With the heavy packs of equipment and food we found the 5,000-foot rise from the valley in seven miles to be a real workout.

The camp at the notch, anything but spacious and level, is situated a few feet below the ridge of the notch in a small patch of shrubs and trees. It overlooks a chute which falls steeply away to the valley. Across the way are Moro Rock and the far rim of the Kaweah canyon. At night one can see the lonely lights of cars winding up to Giant Forest.

From the notch a long class-4 traverse leads out across the east face over a series of broken rocks and ledges. About 300 feet out, rounding a corner, the route drops down to join the buttress. A hundred-foot lead, protected by two pitons, up a 70° crack brings one onto a platform of chockstones in the chimney where the buttress joins the wall of the spire. Passing through a roofless tunnel to the other side of the buttress one looks directly down on the valley. But still the very edge of the east face has not been reached; some thirty feet of smooth granite intervenes.

Continuing diagonally downward along the edge of the buttress one finds a sixty-foot, vertical, right-angle chimney rising up toward the ridge of the face. This chimney is topped by a horizontal overhang but seems to be the only means of access to the northeast face just around the corner, where the angle of the rock lessens somewhat.

The base of the chimney represents the start of the really difficult

climbing on the spire. Taking the lead I slowly built a piton ladder up the crack at the back corner of the chimney until my head and shoulders were jammed up against the overhanging block. Here the crack ended and two expansion bolts were required to turn the overhang. Standing in slings and on tension, and leaning far out to the left, I laborously drilled the two holes for the bolts. Then, exhausted, I came down and passed the hammer to Jim. The day was getting well along but Jim was able to climb the overhang and make another twenty-five feet before approaching darkness forced him to retreat. He set up a fixed rope and came down. We returned to camp for the night.

The next morning Will and Jim prusiked* up the fixed rope. With Jim belaying, Will took over the lead and made his way slowly upward. For one waiting at the base of the climb the hours seem almost interminable. I could hear shouting and hammering above me and sensed that the others must be making progress, but oh so slowly. Finally, about noon, they shouted for me to come on up. I found Jim half wedged in a crack. He was standing on a small, outward sloping projection with one foot. The other foot was supported by a sling and he was tied to a piton at his waist. There he had been standing, belaying, most of the morning and since there was no room for another, nor at Will's similar position above, he would have to wait while I worked up to Will and led on.

Will had made a beautiful lead to the right out of a second overhang. Above there he gained the lesser angle of the northeast face and, cutting back slightly to the left, he followed a crack up another fifty feet. There I found him under a third overhang. This one was not so big, but a good piton crack was lacking and I had to use an expansion bolt to get over it. Above, a narrow chimney, into which I could almost jam a leg and arm, led upward slightly to the left. At the top of this a small projection served as a third belay point.

The route above was obvious but disconcerting. One lone crack led on. It terminated 100 feet above at the base of a gendarme on the north ridge of the spire. Above that there was promise of easier going but the crack itself would take hours of piton work.

Our time was running out; the shadow of the spire was rising higher and higher on the wall of the dome across the way, warning us that we should soon have to go down. But we knew that we had found a way.

On the evening of April 25, 1950, after the long grind up from the

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**Prusik* (proo'zik), v.i.; PRU'SIKED (-ict), PRU'SIKING. [G., after Dr. Karl *Prusik*]. To ascend a rope by means of slings attached with prusik (often cap) knots, which have a detent action.

valley, Bill Long, Al Steck, Wilson, Siri, and I were again camped at the notch, ready for another attack on the spire. In order to eliminate the long traverse each morning and evening we were prepared to bivouac at the chockstone ledge on the buttress. Next morning Bill, Al, and Jim started the climb. Will and I spent the day relaying supplies and taking pictures. The climbers reached the previous high point that day and established a fixed rope. That night we all gathered at the bivouac, cooked supper on primus stoves, and settled down to endure a night on nonconforming rock. The return of light was most welcome. Limbering up, Will, Jim, and I continued the attack. We reached the top of the fixed ropes at 10:00 A.M. and, with me belaying, Will began work on the hundred-foot crack. The hours dragged on as Will slowly made his way up, piton by piton. At 4:30 P.M. he shouted that he had found a ledge just below the ridge and that there was room for Jim and me. He tied in and belayed us up.

Looking the situation over carefully, we felt that it still might take quite a while to make the summit. Will was understandably tired out by his terrific lead and, in view of the approaching darkness, decided to go down. Jim and I elected to continue on and chance a night on the summit. A quick scramble to the ridge twenty-five feet above us showed no route there. Beyond was a sheer wall. A large rock dropped from here did not return a sound for several seconds. Then there was a dull thud as it hit in the timbered area far below. Returning to the ledge we traversed to the left and then up. Jim led a class-6 pitch which proved to be easier than expected. We were on the top at 5:20 P.M. We congratulated ourselves and let out a yell to let the others know that we had made it. Happy with the sense of victory our hearts swelled as we looked at the view around us, but, conscious of the passing time, we did not tarry for long. Setting up another fixed rope we went down, reaching the bivouac ledge in the failing light.

The next morning the rest of the party prusiked up the 350 feet of fixed rope and added their names to the register. By early afternoon we were all headed down toward the Kaweah, happy that we had at last answered the challenge of the great spire.

Reports and Correspondence

Letter to an Editor

Mr. Francis P. Farquhar
Somewhere near Mount Olympus

Dear Francis:

Late in the afternoon of February 17, when you said good-by and walked away from the meeting of the Board of Directors which you decided had to be your last, something went with you—many things went with you—that we don't see how we are going to replace. We cannot put those things into words and perhaps none of us can say what ought to be said, even if we try hard. That Saturday was such a busy day that we could only stammer when we realized finally that the last minutes of your twenty-seven years on the board were hurrying by. Then they were over, you were out the door, and there was that empty space at the table.

We know you feel you had done your bit during all those years as a director, twenty of them as Editor, four as President, and so on. And we know that you will be on hand to give counsel when it is asked, and we're very glad of it. You have done wonderful things for the club, and have helped it to do wonderful things, too. Your good sense has given strength to the stands the club has taken; again and again we have seen that sense go to work on a chaotic disparateness of opinions, somehow (and every time to our amazement when you were done with it) pulling out of the chaos a sound unanimity. That ability is at a premium these days, all but indispensable; and the club has drawn so heavily on this talent of yours through the decades that we cannot begrudge you your vacation. Perhaps, with your counsel, the club can find someone else to do most of the things you have done almost as well as you did them. In one respect, though, the search will fail. Happily or not, each man is unique—and we won't find anyone who will combine your wisdom with your educated heart. For we know, and all the members of the club should know, that of the many good things your presence meant to the board, the pleasantest of all came from your sensitivity to the feelings of others. We shall not forget your sense of occasion, your knack of seeing to it that deeds of good report were well remarked.

The occasion of your leaving richly merited some sort of ceremony. But none was there to speak as you would have spoken were we losing a lesser benefactor.

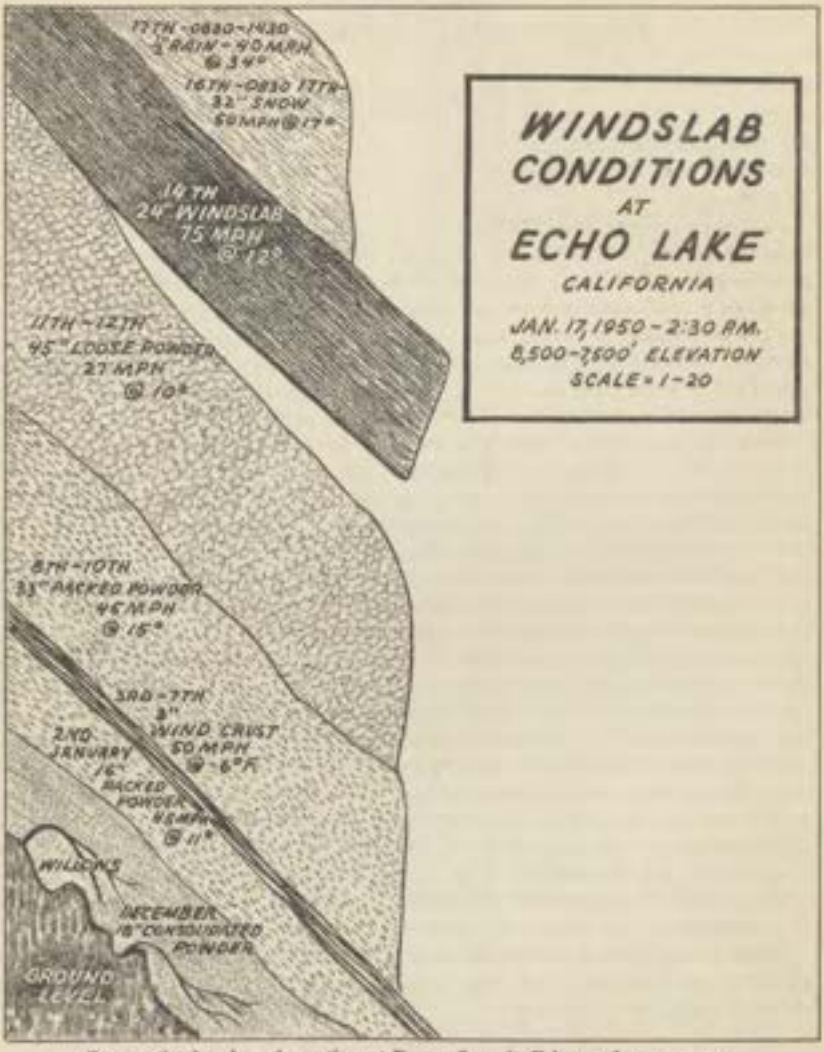
We hope that faltering and belated good words are better than none, and may even surprise you pleasantly as you open these pages, half a globe away from the scenes you have helped so much to save.

THE EDITOR

Echo Lake Avalanches, 1950

By RICHARD M. LEONARD

FOR THE SECOND time in two years avalanches descending from the slopes above the south side of Echo Lakes, at 7,500 feet elevation near the southwest corner of Lake Tahoe, have caused destruction of several summer cabins. The 1948 avalanches were described in detail in the *Sierra Club Bulletin* for June 1949, and it is thought that some observations concerning the 1950 avalanches should be added to the record.



Cross section based on observations at Donner Summit. Echo weather was worse.

Echo Lakes are bounded on the south by a glaciated ridge rising to 8,800 feet, about 1,300 feet above the glacial depressions now occupied by the two Echo Lakes. This trough is almost a pass in the crest of the Sierra running from west to east, forming a funnel for high velocity winds. Detailed hour-by-hour snow and weather records are maintained at an elevation of 7,000 feet 36 miles northwest of Echo Lakes. Those records are maintained by the Central Sierra Snow Laboratory of the U.S. Army Corps of Engineers at Soda Springs and the U.S. Weather Bureau at Donner Pass. All agree that data obtained at 7,000 feet at Donner Pass would be entirely compar-

able to indicate conditions at the same elevation 36 miles southeast. The diameter of these huge cyclonic winter storms is measured in terms of 1,000 to 1,500 miles, so that meteorological conditions are relatively uniform for the same elevation. Conditions at the average elevation of 8,000 feet for the central portion of the avalanche courses at Echo Lake would tend to result in lower temperatures and higher wind velocities than at 7,000 feet at Donner Pass.

In the storm of January 2, 1950, a 16-inch snowfall, driven by winds up to 45 miles per hour, was followed by five days of clear weather. That period of time together with wind (as high as *50 miles per hour* on January 7th) consolidated a base of two or three feet of packed snow with a firm windcrust, smoothing out irregularities in the ground cover and providing a relatively frictionless base for the future avalanches. Later observation showed that this hard windcrust was actually the surface upon which the avalanches shot down.

High wind velocities up to 45 miles per hour for the next three days then laid down 33 inches of fairly firm powder on top of the preceding smooth windcrust. The storm became increasingly colder and snowier, depositing 35 inches on the 11th and 10 inches on the 12th. Wind velocities died down to 27 miles per hour maximum, with minimum temperature of 3.3° F.

On the 13th the first high winds of "a major low" reached the Sierra at 70 miles per hour, increasing to a full gale on the 14th at a maximum of *75 miles per hour*, W.S.W., depositing 24 inches of snow in the one day at a minimum temperature of 11.6°. Such extremely high-velocity winds would strip the new snow and a great deal of the old off several square miles of the southwest slopes of the mountains and deposit it in severe windslab-forming conditions in some parts, and in very deep unstable masses of powder snow on other parts of the north face of the 1300-foot ridge above Echo Lakes. The storm continued with wind velocities as high as 50 miles per hour on the 16th, depositing 12 inches of somewhat heavier snow at 17°, with 20 inches more up to 8:30 A.M. of the 17th at a minimum temperature of 28°, a total of 32 inches of heavy new snow on top of the severe windslab and unstable snow conditions of the 75-mile-per-hour windstorm of the 14th.

In the meantime, the 45 inches of powder snow of the 11th and 12th was settling from under the windslabs of the 14th, and the slabs themselves were under increasing stress due to creep, resulting in an extremely dangerous condition of the windslabs. At 8:30 A.M. of the 17th snow changed to a mixture of rain driven by winds up to 40 miles per hour. Haven Jorgensen, owner of Echo Chalet, one-half mile from the avalanche courses, became worried and went up the lake to check conditions at the cabins for which he was responsible. Between 2:00 and 2:30 P.M., while he was eating lunch in a cabin at the upper end of the upper lake, about one-half mile from the nearest avalanche, all seven avalanches fell essentially simultaneously at separate points along a mile of the north face of the 1300-foot ridge. Only a half inch of rain had fallen up to that time, not enough to do more than wet the top layer of the 72 inches of snow involved in the avalanches.

The conditions at the moment the avalanches were set in motion can be summarized as the trigger action of a heavy blast of a mountain windstorm upon an overloaded weakening 75-mile-per-hour windslab bridging over 45 inches of cold loose powder snow, with more below it.

The central avalanche of the seven is described in detail as representative of most of the others, all of which were established and released by identical high-velocity

wind conditions. Four days of careful study of the avalanches, begun before any further snowfall intervened showed the following facts:

1. The vertical drop was approximately 1,000 feet, at angles of 55°, 45°, 32°, and 22° for approximately each successive fourth of the drop.

2. The average width of the avalanche was 355 feet. The approximate center of gravity was at least 500 feet from the lake, both vertically and horizontally. This would give a 1,500-foot slide from center of gravity to lake edge. The measured depth of snow involved in the avalanche was 6 feet down to the windcrust of January 7th. The average density showed 31.2 per cent water content. This means that the avalanche involved a mass of about 64,000,000 pounds with a kinetic energy of about twenty-seven billion foot-pounds at the moment of maximum velocity at the edge of the flat surface of the lake.

3. By calculating and subtracting the friction losses, very high velocities can be demonstrated, and can be confirmed by the fact that the velocity was sufficient to carry the avalanche 535 feet out on the ice of the lake, the mass losing energy from the time it first struck the flat surface.

4. The average width of 355 feet was combined with a temporary height of 25 feet. This front moving at 100 miles per hour would create a wind at about 45° to the path of the avalanche, with a velocity ranging from 100 to 150 miles per hour. Such a wind also has a strong upward component, tending to lift things into the air.

It would seem that the increasing use in winter of cabins which have been safe in summer, points to the need of careful study of the avalanche hazard in the Echo Lakes region. Certainly it is important for cabin owners to be aware of the tremendous forces involved when the innocent-looking snow slopes above their sites go on the move.

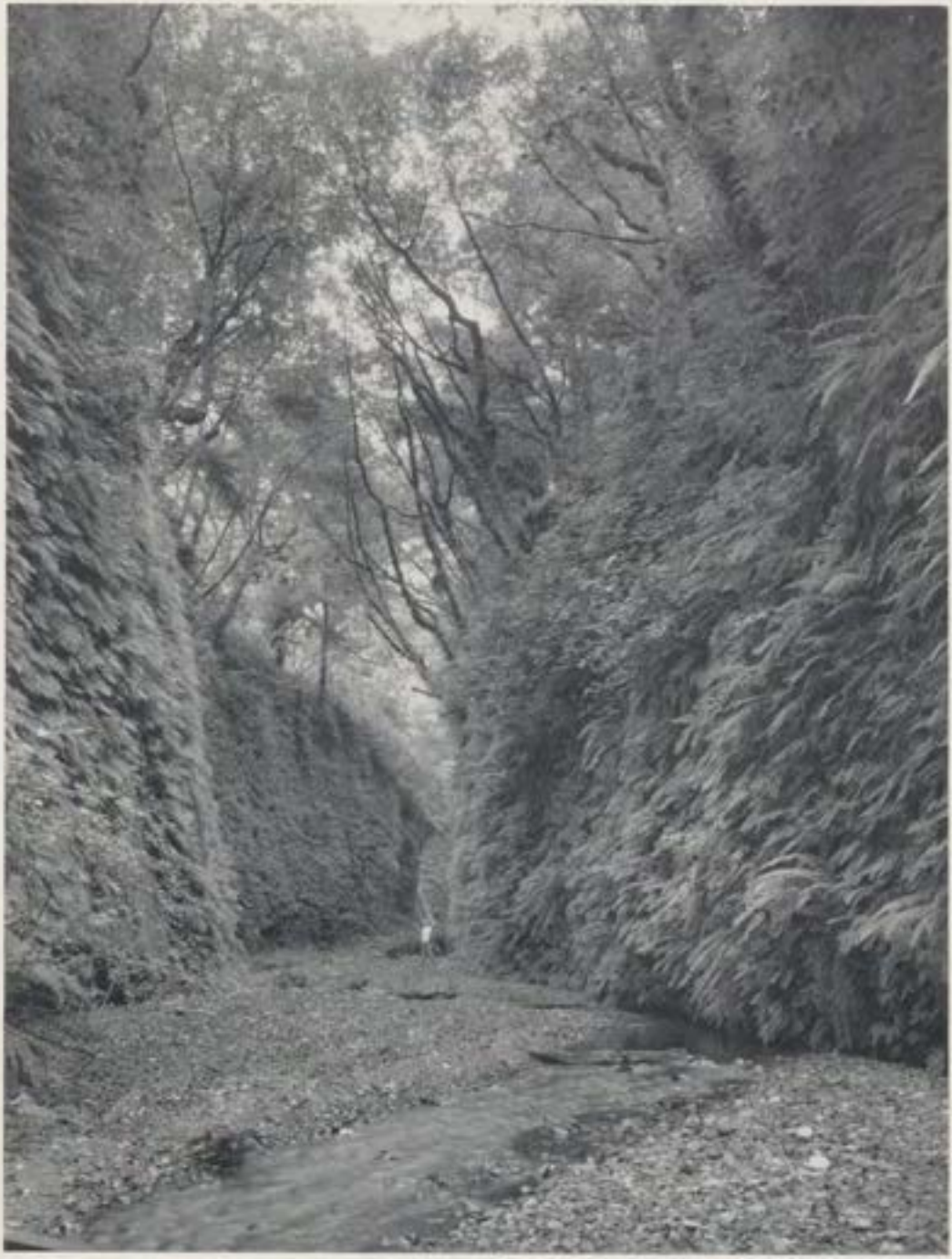
Generous Bequests to the Club

By WILLIAM E. COLBY

RECENTLY the Sierra Club has received two generous bequests from former members who held the club and its work in high esteem. These bequests will not only be a lasting memorial to their generosity, but will also enable the club to enlarge its sphere of influence and bring the importance of conservation to the attention of a much greater audience.

Mexia Bequest

MRS. YNES MEXIA (1870–1938), who for a great many years prior to her death was a member of the Sierra Club and participated in many of the club's annual outings, was a remarkable woman. She was the daughter of General Mexia, of the Mexican Army under President Diaz. Her trips with the Sierra Club stimulated her interest in botany and botanical collection, and she acquired technical knowledge of the subject at the University of California. She joined several of the university's botanical expeditions to Mexico, making five trips in all, one to Alaska and two to South America. On one of these trips to South America she left the United States in October, 1929, and returned in March, 1932. She represented the United States Government with a special commission for collecting South American plants in which the government was interested and also had letters from the University of California. This trip, however, was largely on her own. It was a striking exhibition of courage and heroism. She went into the interior of Brazil and established headquarters in a region where



IN THE CANYON OF HOME CREEK, a few miles west of the Prairie Creek Redwoods. Here, where the creek nears the ocean, and extending for several hundred feet, are curtains of five-finger ferns—the most amazing display of this character that

[*continued on next page*]

previous collecting had been meager and incomplete. After more than a year in this locality she ventured on a trip across South America, traveling up the Amazon for over 2,000 miles and establishing a camp in the wilderness on one of the upper branches of the river, close under the eastern uplift of the Andes. She employed two natives to assist during the last portion of the trip, which was made in native dugout canoes. Her nearest neighbors were Indians who had had little contact with the outside world. She remained in this isolated camp for several months. Then, having sent the canoes back down the river after reaching this campsite, she carried out her plan of constructing a raft of balsa wood. On this she and her two natives were carried down this branch of the Amazon through a rather perilous gorge to a point where she was again in contact with the outside world. Flying by hydroplane from here to a field on the east side of the Andes, she crossed the Andes by air and continued collecting in Peru for some time before returning to San Francisco.

The magnitude and importance of her work is demonstrated by the fact that she collected upwards of 150,000 specimens. Among them were two new genera and 500 species previously unknown. Fifty of these were named after her. On the Amazon trip she collected more than 65,000 specimens, incorporated into 3,200 numbers. These collections were distributed to all parts of the world and are now in the herbaria of the world's leading botanical museums. Two of her accounts of her South American trips were published in the *Sierra Club Bulletin*: "Three Thousand Miles up the Amazon" (*SCB*, 18:1 [1933], 88–96), and "Camping on the Equator" (*SCB*, 22:1 [1937], 85–91).

Mrs. Mexia died July 12, 1938, and her will established a trust giving her two half-sisters a life interest in the income from the estate, half of which was to go to the Sierra Club when one sister died, the other half to go to the Save-the-Redwoods League when the other sister died. Last spring I, as trustee of the estate, turned over to the Sierra Club securities worth about $25,000 to be devoted to the purposes of the club, there being no restriction on the bequest. The club will use the income to carry on its work of conservation and, in line with this, has set aside $10,000 as a revolving fund to be used for publications which will advance the purpose of the club.

It will be of interest to the members to know that upon the death of the second half-sister, which occurred recently, the Save-the-Redwoods League received the other half of the estate, likewise approximating $25,000 in value. As trustee of the estate, I took a trip up the Redwood Highway last June and selected an area to be purchased by the Save-the-Redwoods League, in conjunction with the State Park Commission, which will serve as a lasting tribute to Mrs. Mexia's generosity. The area selected contains a magnificent stand of redwoods, Port Orford cedar, Sitka spruce, and northern hemlock. The undergrowth of giant ferns and local shrubs is most luxuriant. The area lies a few miles west of Prairie Creek and borders on the ocean, where there is a splendid beach. One of the outstanding features of the area is the canyon of Home Creek, which, as it approaches the ocean, has cut a vertical gorge about 20 to 30 feet across, the walls of which are about 50 feet high. On both sides of these walls, and extending up Home Creek for several hundred feet, are curtains of five-finger ferns—the most amazing display of this character that exists in California. This site was selected for a particular reason: Mrs. H. P. Bracelin wrote that her very close friend, Mrs. Mexia, "had a very especial love for ferns . . . . She collected huge quantities and found new species, some of which have been named for her. So, a fern canyon in the redwoods would be wonderful."

Morley Bequest

Frederick Hitchcock Morley was also devoted to the Sierra Club and was on many of its annual outings into the Sierra. He was a prominent mining engineer, and very early in his career he secured a mine in Mexico for his clients, retaining an interest for himself which brought him a moderate fortune. Giving up the further practice of his profession because of his health, he lived, with his wife, a life devoted to benevolent activities. He established a small "Kid Colony and Fresh Air Farm" for boys near Santa Barbara. In World War I he became a captain in the Engineers Corps. His great hobby was the development of bromoils or pictorial photographs, in which work he attained a remarkable success. He was also devoted to Boy Scout work. In 1921, while on a Sierra Club outing, he fell from a high ridge between the Cockscomb and Echo Peaks, just south of the Tuolumne Meadows. Though he lived for a few days, he succumbed to concussion of the brain. In appreciation of the effort made by members of the Sierra Club to save her husband's life, and also because of his great interest in those members, his wife Evelyn contributed to the work of the club for some years following his death, making it possible for persons to go on the club outings who could not otherwise have afforded them. Some of the money she contributed was used to put trails in condition so as to facilitate the travel of the pack trains on the outings, and the Club's collection of famous mountain photographs by Vittoria Sella was acquired with these funds. Mrs. Morley died a few months ago, and the club has just received her bequest of $20,000. Under the terms of her will the income from this bequest is to be used to send selected teachers on Sierra Club outings each year.

Special Report on High Trip Operations

By LOWELL SUMNER

Again in the summer of 1950 a study was made of the Sierra Club's annual High Trip operation, as further modified from the procedure of previous years. This year's outing was spread over three consecutive 2-week periods. I spent from August 19 to 26 of the last 2-week period with the club in the Mount Dana-Minarets Wilderness Area of the Inyo National Forest and adjacent parts of Yosemite.*

Proportionate Damage, Large Parties vs. Small. In 1950 the pack animal reduction program was carried even further than in previous years as shown by comparison with past records.

Year	*Period*	*Persons*[a]	*Livestock*[b]	*Per man*
1948	1st 2 weeks	175	73	.42
1949	1st 2 weeks	169	70	.41
	2nd 2 weeks	130	64	.49
1950	1st 2 weeks	155	57	.37
	2nd 2 weeks	172	61	.35
	3rd 2 weeks	158[c]	55	.35

[a] Includes paying members, plus average of 13 packers and 21 commissary.

[b] Pack mules, plus average of 13 saddle horses for packers and 7 for emergencies and for occasional use on hardest moving days.

[c] Average; all figures from Bruce Morgan's written records.

* Reports for the 1948 and 1949 seasons appeared in the *Sierra Club Bulletins* as follows: 34:6, 140–143; 35:6, 109–112.

As pointed out in last year's report, it is impossible to cut down the number of stock beyond a certain point without changing the entire organization of the trip, because the club's time-tested commissary setup contains certain indispensable equipment such as large cooking kettles, stoves, and miscellaneous tools which cannot be eliminated. As pointed out previously, it takes about as many commissary members to prepare camp and cook for 130 people as it does for 170. For this reason the present ratio of .35 head of stock (approximately ⅓ of a mule) per man probably represents the lowest figure and the most efficient ratio that can be obtained without completely altering the type of outing.

The practice, commenced in 1949, of traveling a lesser total distance during the outing, with fewer and shorter moves and considerably more time spent at each stopping place, was carried about as far in 1950 as it could be without the High Trip's losing its essential character and becoming a modified base camp outing. The longer stop-overs this year permitted a still greater development of the shuttle method of bringing up supplies, whereby each pack animal makes several trips in order to move the club from one camp site to another.

The increased shuttle service, together with the club's choice of rather out of the way camping spots, did protect the meadows, and greatly reduced competition with other mountain parties. Club members seemed to enjoy the more restful type of trip, while the more ambitious still could go on various mountain climbing trips during each stop-over.

The condition of all of the meadows used during the writer's stay with the club was excellent right up to the end of the pack stock's stay in each area. This was partly because special effort was made to hold the stock in more remote meadows not used heavily by other parties. In at least one instance members smoothed a way over a rocky shelf so that the stock could be brought over to a healthy meadow and kept out of a meadow habitually used by other campers.

It cannot be overlooked that the club's continued effort to reduce the number of animals has caused the packers and their stock to work harder for the same amount of money than they would have had to do for smaller parties operating under a less efficient system. Bruce Morgan, manager of the Mount Whitney Pack Train, which packed for the club, stated that from his point of view eight strings of pack animals would have been "ideal"; six strings actually were used. In other words, he would have preferred about 75 head of stock to the average of 58 that he actually had. He also estimated that, for each additional 25 persons, above the current 158 (see table) 6 additional animals would be required.

A pack string consists of five pack animals plus the saddle horse ridden by the packer who is responsible for that string. In addition to the regular strings, five or six extra saddle horses usually are needed to transport the occasional individuals who become incapacitated during the trip. This year several such persons had to be taken out of the mountains on short notice; others who are not in top condition need a horse from time to time for particularly severe moving days in order to avoid harmful exertion.

Problems in the Long Lay-over. These were mentioned in last year's report (*Sierra Club Bulletin,* 35:6, 111), but appeared to have been admirably met during the present season. The fish population did not suffer unduly, at least during the writer's stay, in part because camps were mostly by large lakes where fish were hard to catch. Camp sites were well cleaned up and waste pits covered over. Obtaining enough wood was

quite a problem at some high camp sites because of the scarcity of suitable dead timber. The regular firewood department of the commissary not only had to work harder but had to ask for supplementary assistance.

High Trip Dates. In line with last year's recommendations, the traditional opening date of the High Trip was postponed approximately two weeks, and started July 16 instead of July 4. This year there were three instead of the customary two 2-week periods, the last period ending August 26 instead of July 31 as in previous years. The result was a better distribution of meadow use, and a larger number of camper days with a smaller number of pack animals.

Suggestions. Essentially all of the suggestions for reducing wilderness damage that have been offered in previous seasons of study now have been incorporated into the High Trip operation. It would be very difficult to make practical suggestions for additional improvements to the organization of a trip of this type, which probably gets more appreciative people into the wilderness with less damage *per person* than any other comparable type of operation.

Some observers on the Yosemite staff have suggested that the High Trip be cut to 50 persons. However, as frequently brought out in the past, an on-the-ground study of the logistic and supply pattern of the present organization shows that the resulting loss in operational efficiency would render a corresponding reduction in the number of livestock impossible. Such a proposed reduction in the number of persons also would so greatly increase the cost of the trip per person as to place it beyond the means of the average club member. Elimination by this means of all but the most wealthy would seem to be a somewhat undemocratic method of obtaining the desired meadow conservation. Unfair discrimination might logically be charged against a suggestion that the very group that pioneered the Sierra for so many years now proceed to extinguish the outing operation that *per person* undoubtedly is the most efficient, and the least harmful to meadows, of any group using the mountains today.

On the other hand, it cannot be denied that large numbers of people, even Sierra Club members, do bring more pack animals to the meadows and thereby increase the grazing pressure. However, the most practical program, and the one this service has been working on for the last ten years, seems to rest on properly managing current meadow use before setting up additional prohibitions.

The following management measures, already voluntarily adopted by the Sierra Club, are of general application. If adopted by other large groups and by the majority of the High Sierra Packers, they should relieve the most serious meadow use problems at least for the immediate future.

1. Work for a ratio of about 1½ animals per man for small parties; ⅔ to ½ animal per man for larger, more efficient parties like the Sierra Club.

2. Take as much as possible of the present grazing load off the most strategically placed and heavily used meadows by selecting other, more out-of-the-way travel routes. Planning itineraries to accomplish this will have to be the responsibility of the leaders of large parties, consulting with the park superintendent well in advance of the trip. In the case of small parties, such itinerary planning will have to be the responsibility of the packer, consulting when necessary with the park superintendent.

3. Revisit the same area at intervals spaced sufficiently far apart to permit meadow recovery. In the case of large groups like the Sierra Club, this interval will be about seven years. In the case of smaller parties, it will be the responsibility of the local

packers to route their parties on a rotation system based on recognized grazing management practices.

4. Have trips fall as much as possible after August 1 and particularly avoid the first two weeks of July. This is because soils are still wet and grass shoots are not mature during the early part of the summer. At such times great damage can be done by even a small band of stock, while three weeks later the same band might spend an equal amount of time in the same meadow without doing any damage at all.

Trails in Sequoia and Kings Canyon

Sequoia and Kings Canyon National Parks
June 14, 1950

Memorandum to Trail Foreman and Chief Ranger—

The following are some thoughts I have on the 1950 trail program, particularly as related to future planning.

First, I want the effort to clean up the back country continued with vigor during 1950. Let us get *all* the cans, papers, and rubbish out of sight this year. My trip last fall . . . indicated that both the trail crews and rangers still were not fully alert to the situation. I found where cans had been picked up and buried in the garbage pits. Naturally, the bears dug them up. As explained previously, I do not advocate burying cans.

We need constant study of trail locations, particularly on snow on the high passes. Can we avoid the snow bridge at Helen Lake on Muir Pass? Is there a better way up to Colby Pass so it will open earlier? What new trails are needed to round out the system? Which ones should we abandon? These, among others, as well as relocation of sections of trails so that maintenance will be easier, are things we should *get on the record*.

It would seem that we should have fairly complete information as to drift fences by this fall. We do not want too many gates along our trails. However, we would like to be able to hold stock say within two miles of major camping areas. By careful study, all such fences should be kept short. At Little Five Lakes I noticed a site which should hold all the stock which may try to get back toward Mineral King from the Big Arroyo and adjacent areas. Also, a few feet up the trail toward Timber Gap from Cliff Creek merely a gate would save campers the worry that their stock will go home. These are just examples. We do not want to fence our mountain meadows unless for the purpose of keeping stock *out* instead of in. I would like to have it all put on paper this winter.

What type of fence should we have? What is the best design for a gate? We do not want this to be a "baling wire job." Let us plan for something good.

Some of our plans for spreading back-country use must consider the matter of fishing. Should we plant some additional waters? I would say that we should do so on the Monarch Divide. However, we do not want to plant all the present barren lakes. What should we recommend?

Can we develop some "off-the-main-trail-sites" for government use? We had a complaint last year about our trail stock being grazed for long periods on critical grazing. It would seem that our crews and expeditions should not compete with

visitors for wood and forage. Can anything be done? Our mountain areas are covered with abandoned trail camps that were never cleaned up properly. See that all our work crews know how to leave a camp.

Everyone should assist the back country traveler, particularly in following practices that will preserve the wilderness. If opportunity presents itself, teach him to burn his cans, proper sanitation procedures, not to drive nails in trees, cut green boughs, etc. Most of the people who are deficient in such respects just don't know. Also, some of the "old-timers" do not realize that too many people throw away cans these days so that a willow thicket will not hide them any longer. A number of accepted practices of the past need correction. Politely, patiently, but insistently, we must educate people on how to use the wilderness correctly.

I am confident that our "high country" can be used far more than even at the present time, with even less damage, provided management is well thought out and effective. It is the most important operating and planning problem in these parks. I think we should get down to bedrock on all phases of it.

E. T. SCOYEN, *Superintendent*

Airplanes and the Parks

2 March 50

Mr. E. T. Scoyen, Superintendent
Sequoia National Park

Dear Mr. Scoyen:

In answer to your recent letter regarding my landing in the park, I wish to state that at the time I landed I did not know there was such a regulation, and I wish further to thank you for your nice letter. I hope I can always count on you as a friend, for I realize that you have your job to do, but I want to state very definitely that I am objecting with all my might to this regulation. May I ask who makes the park regulations and who can change them?

One of the things I looked forward to while in service was the pleasure of flying into our magnificent mountains when the war was over. The fellows used to talk rather vaguely about fighting for independence and democracy. Such terms seem to have become meaningless these days, and we as Americans are daily losing more of the rights upon which our country was founded. I do not believe anyone has the right to any activity which will bring harm or unhappiness to others; but I do believe that everyone should be free to do as he wishes as long as he stays within these limits. In no way can I understand how my flights bring any harm to the park proper nor to any person.

The day will come when flying is more popular and people will insist upon using planes for transportation just as cars are used. No one with whom I have discussed this problem feels that it is reasonable or just. If a vote were taken I am sure that such a regulation would be repealed and that further the extensive park system would be reduced or combined with the Forest Service, a possibility which would not only relieve some of the irritation, but would also save taxes.

Another point in this problem is the use of tablelands. I know that there are few if any finer ski regions, so naturally and ideally formed by nature. Tablelands are very close to a road yet the Park Service will not consider their development.

Quite frankly I am going to do all I can in my small way to see that people become interested in trying to change these regulations. After all the mountains are the property of the people and the administration the servants of the people.

Perhaps after this diatribe you will not listen to what I ask, but this is it: Will you, can you, grant me permission to make a few landings in the park area for the remainder of this winter season? There are a number of test flights I have planned and certain regions in the park are safer and more suited to ski flying. The day may soon be here when my experiments will prove of value in snow survey, rescue or patrol of the back country in winter.

Sincerely,

[Name withheld]

Sequoia and Kings Canyon National Parks
March 15, 1950

Dear———

I note that your letter to me of March 2, 1950, has been acknowledged with the promise I would reply in detail on my return to the park. This I shall now do.

First, as to your question about the method used and authority for issuing regulations. The Act of August 25, 1916, creating the National Park Service (39 Stat. 535) states in Section 3, "That the Secretary of the Interior shall make and publish such rules and regulations as he may deem necessary and proper for the use of the parks . . . ." After a regulation has been proposed to and then approved by the Secretary, it is published in the *Federal Register*. It then becomes the law.

It is my opinion that our present regulation is approved by a very large majority of those who are interested in and use our mountain areas. That the airplane is a mechanical intrusion of a primeval area seems to be proved by the Air Space Reservations which the President has recently established over a Forest Service Wilderness Area in Northern Minnesota. Further, at a meeting of the Interior–Commerce–Agriculture Airport Committee on February 1, 1950, it was agreed that when further revisions of aeronautical charts are made, our regulations will be printed on the back. Also, a statement requesting pilots to maintain a minimum altitude of 2,000 feet above or adjacent to the terrain of the parks and monuments will be printed on the charts. This program was agreed to by the Administrator of Civil Aeronautics of the Department of Commerce.

I note your statement of opinion that a vote on the matter would result in a repeal of the regulation. On this point about all that I can say is, we differ. We regret that administration of the parks and monuments in accordance with principles and objectives as stated in the laws passed by Congress makes it necessary at times to place restrictions on individuals or even groups. For instance, starting well back in the '70's and continuing for many years, strong efforts were made to build railroads and electric lines in some of the parks. Personally, I am glad they did not succeed.

I have known for many years, of course, of your interest in the tablelands as a ski area. However, here again it is my judgment that a roadway into the area and its development would harm more people than it would benefit. I hope Mineral King will eventually provide the answer to demands for a highly developed ski resort.

I have no authority to grant the permission which you request, to make experimental landings, and regret that I cannot do so.

I hope I have explained our position. I realize that the finest of the mountain country is in the parks or other designated wilderness areas. However, with reference to the flyer who is restricted by our regulations, Director Drury expresses the hope that he will be able to "... share with others freedom from the noise of flight, and enjoyment, if he wishes to seek it, of the silence which is one of the finest gifts the parks offer the visitor."

Sincerely yours,

E. T. Scoyen, *Superintendent*

Dallas 4, Texas
December 25, 1949

Mr. Newton B. Drury, *Director*
National Park Service
Washington, D.C.

Dear Sir:

The other night I heard the head man for the Chamber of Commerce of the United States give a talk.

He came here from Washington to address the annual meeting of the Dallas Chamber.

He said creeping Socialism was threatening us, coming in the back door, unawares. I had heard that line before, and was not impressed by his arguments.

Yesterday I read an AP story out of Washington, Dec. 24, that jerked me into wonderment. The story quotes you as reviewing the whole "question" of greater air space reservation over scenic areas.

"Currently, the park service prohibits construction of landing fields within national parks, ..." says the AP.

Why? I'm in dead earnest. That's a "question" you can "review" right now.

Why does the park service, granting the AP story is accurate, prohibit landing fields in national parks?

Could it be possible, in this land of the free, that any person or group of persons can decree what method of transportation Americans must use to enjoy their own parks?

I do want wilderness and park areas preserved in all their majestic beauty; I do strongly side with conservationists against commercialization of those dwindling places of nature where man can "hold communion with her visible form" just as God made her.

And I say that no damned little autocrat has the right to tell me how I am going to get there.

If he wants to get there by automobile, motorboat, motorcycle, mule train, bicycle or afoot—that's his business, and he has every right to expect my tax money for roads and trails and dredging.

If I want to fly there, what moral right has he to obstruct development of landing fields, as necessary to private fliers as roads to motorists?

But now comes the part which may make a Republican out of me for the first time in my life.

"Conrad L. Wirth, park service chief of lands," the AP story today goes on, "said Interior is negotiating with the CAA for a minimum of 2,000 feet above ground on air travel over parks in which wild life is an important factor."

Why? Have our American animals become so neurotic that the sound of an airplane motor will produce complexes that only a veterinarian psychoanalyst can straighten out?

I have never seen the wild ducks which visit city parks pay the slightest attention to the passing of roaring locomotives or rackety motorcycles.

I like to fly. In open country, where safety permits, I like to fly low enough to see what's going on below, just as a motorist likes to drive slow through beautiful country.

But you tell me that may soon be illegal in the very areas flying tourists may most want to visit.

Before taking this matter up with as many aviation groups as I can reach, including the Flying Farmers and members of congress who know something about aviation, I would like to hear your side of the case—if you have one.

And it had better be stronger than that sop from C. Girard Davidson that no "blanket raise" is under consideration.

One Iron Curtain in the world is enough. I don't want to see an Iron Blanket clamped on America's private flyers.

Very truly yours,

JACK MCBRYDE

National Park Service
Washington 25, D.C.
February 3, 1950

Dear Mr. McBryde:

I have received your letter of December 25 and enjoyed its forthrightness. Your protest as to the policy of the National Park Service in opposing the development of airplane landing fields in the national parks, and its desire to have airspace reservations established over the parks, similar to that just approved by the President for a part of the Superior National Forest, gives me an opportunity to clear up a few points as to our conception of our duty in the matter of keeping the national parks unspoiled.

The Associated Press story to which you refer doesn't reveal a new policy at all. The policy precluding the development of airports in the parks is one of long standing, which has had the approval of three Secretaries of the Interior; the endeavor to place minimum flying altitudes has been similarly approved within the department. I offer that simply as information, and not at all as refutation of the points you make. The policy is based on long experience in an endeavor to keep the national parks the great places that the American people expect them to be.

Attached is a copy of a press release issued by the service on December 26, 1946, which I honestly believe provides the answers to most of your questions. I ask you to read it; if it leaves you still not satisfied on any point, please write me again and tell me why. Your enthusiasm for plane travel is understandable. Lest you think I harbor some personal prejudice against the airplane, let me tell you that I was in the Air Corps in World War I, and that my annual mileage of airplane travel on official business probably averages between 15,000 and 20,000 miles.

One point which you raise is not covered in the release. "Could it be possible," you ask, "in this land of the free, that any person or group of persons can decree what method of transportation Americans must use to enjoy their own parks?"

If you mean to ask whether anyone, in or out of government can tell Americans

what mode of travel they can use in going to the national parks or anywhere else, the answer, of course, is "No."

But if the real question is whether the agency charged by law with the protection of national parks can as a means of such protection endeavor to prevent the construction of landing fields *within* the parks, the answer is: "Yes, they can and they do." Limitations of this sort have been applied, as a matter of protecting public property, ever since there was a national park. Although there are one or two places, such as the South Rim of the Grand Canyon, where railroads lie inside the parks, they have in all cases been constructed before the land acquired park status. No railroads have even been permitted to be built on national park land. I am sure that you, as a resident of Dallas, would not expect the city to provide you with landing fields in each of the larger city parks, just so you might use an airplane to go to them. The United States Capitol is yours, too, exactly as the parks are, but you can't roller skate or ride a bicycle in its hallways.

I hope and believe that the National Park Service has approached this question sanely and logically. We want to be reasonable, and we are far from being antagonistic to air travel. We are working with the CAA for legislation which will permit us to participate in the construction of airports close to the parks; I believe that if these are provided, as I hope they will be, the airplane owner can derive quite a full enjoyment from the parks as he could if fields were developed within them. More, in fact, for with no park landing fields and with a minimum flight ceiling, he will share with others freedom from the noise of flight, and enjoyment, if he wishes to seek it, of the silence which is one of the finest gifts the parks offer the visitor.

I hope that I have convinced you. If I haven't, write me again.

Sincerely yours,

NEWTON B. DRURY, *Director*

Mountaineering Notes

Edited by ALLEN P. STECK

In the Coast Mountains of British Columbia

By WILLIAM W. DUNMIRE

FOR THE FOURTH TIME, Sierra Club mountaineers have visited the British Columbia Coast Mountains. There is good reason for the interest in this relatively inaccessible area, for certainly no other region in North America except Alaska offers such a challenge to rock and ice climbing ability. The granitic type rock is generally sound, and we seldom experienced natural rockfalls on our climbs, although in many of the bowls funneling into the Tiedemann Glacier rock and snow avalanches were a continual daytime phenomenon. However, the instability of these faces was obvious, and they were always avoided by the climbers. We all wore boots with Bramani-pattern lug sole, and these proved definitely satisfactory for climbing conditions which combined rock, ice and snow. All place names and elevations listed herein are primarily taken from W. A. Don Munday's sketch map with additional data borrowed from maps by William Putnam, Ulf Ramm-Erickson and Philip Bettler. For a complete story of the trip see "A Waddington Adventure," pages 34-43.

Mount Bravo (10,500). Possible first ascent by the entire party, four climbing the peak on July 17, and four on July 18, 1950. Possibly ascended by Neave party in 1934.

Although the summit of Mount Bravo is prominent from below on the Tiedemann Glacier, this projection is really an uplifted buttress on the southeast side of the Waddington massif. The short snow climb from the col northwest of Bravo was made by both groups on their way to the Waddington high camp.

Mount Waddington (13,260). Third ascent. *Southeast Chimney*. First ascent by Cook, de Saussure, Houston and Long on July 21, 1950 (*op. cit.*).

Northeast Face. First ascent by Bettler and Steck on July 21, 1950. At 5:30 A.M. Bettler, Dunmire, Steck, and Wilson traversed below the thousand-foot rock crown of Waddington to a place on the northeast face where the bergschrund had been crossed the day before by Bettler and Steck. Using their steps, we had no difficulty with the schrund and soon had passed two rock pitches, one of which required two pitons for safety. Bettler and Wilson, on the first rope, continued leading diagonally upward on a snow-covered ice slope into which firm steps could be kicked. From the top of the snow we made an airy traverse to the northwest for several hundred feet, using one or two pitons on each pitch, although the rock strata afforded firm handholds. In several places, steps had to be cut in order to cross ice patches. Where the rock became less broken, Bettler chose to ascend a vertical chimney; he placed five pitons because the rock was extremely rotten. At this point our rope assumed the lead, and Steck continued upward, hacking footholds on the heavily glazed rock. Three treacherous pitches took us to the northwest summit ridge. We pushed along this knifelike ice ridge toward the final 60-foot Summit Tower. At 4:00 P.M. we heard voices from the summit, and we knew that the others had been successful. A deep cleft in the arête separated us from the summit snow chimney. Owing to the lateness

of the hour, Wilson and I decided to stay behind and set up the rappel, while Bettler and Steck continued to the summit, crossing the deep cleft with a surging tension traverse. In twenty minutes Steck stood on the summit, followed shortly thereafter by Bettler. Had we known that the final pitch would yield so submissively, Jim and I would surely have continued. At 6:00 P.M., with the sun ever approaching the horizon, we began our first rope-down; by 11:00 we were descending in darkness. The Northern Lights were of some help. The diagonal snow slope which was so easily overcome on the ascent now took us several hours to bypass, since the steps could not be seen but had to be felt, and ice pitons had to be placed for safety. By 4:30 A.M., we were back at camp, the climb having taken 23 hours. No pitons had been used for direct aid.

Waddington Rock Tower (12,900). First ascent by Bettler, de Saussure, Long, and Steck on July 23, 1950. From our high camp, several class four pitches took the climbers to a large ledge on the southeast side of the tower. From here seven direct-aid pitons were needed to ascend the overhanging south face. This was followed by a traverse around the southeast corner of the tower. The next lead was directly up the east face through broken slabs. The summit was reached after two more leads on the ice- and snow-covered east ridge. The ascent took four hours.

Mount Spearman (11,000). First ascent by Bettler, de Saussure, Long and Steck on July 24, 1950. The ascent was made from a camp directly below Mount Spearman and about 500 feet above Bravo Col. The party slowly ascended the low-angle snow slopes until they were on the slopes of the peak, and then up steeper snow, at about 50°, for 200 feet to the summit. The ascent took forty-five minutes.

Whymper Dome (7,500). First ascent by the entire party on July 25, 1950. This being the closest summit to our base camp, we waited until afternoon before sloshing down the glacier to the base of the climb. A low-angle snow slope and a minor bergschrund were overcome without difficulty before reaching the rock. We climbed unroped, since the general angle was low and there was loose rock in the gullies on the southwest side of the dome. The summit was snow-covered.

Mount Munday (11,500). Ascents by the entire party on July 30, 1950 (a third ascent). The several summits of Munday culminate a long northwest ridge on which we later completed a traverse. This ridge is between the Tiedemann and Waddington Glaciers. None of the summits of Munday rise higher than a few hundred feet above the snow level, and none offered technical difficulties to the climbers. We named one of the peaks "The Don," after Don Munday, and another "Cornice Peak." On the highest peak we found a cairn containing a register of Mr. and Mrs. Munday's first ascent from the Corridor Glacier.

Snow Dome (11,000). Named and climbed by our party on July 31, 1950, while continuing on the Munday Ridge traverse. With full packs, we crossed over the dome, ascending the northwest side and continuing southeast for the descent.

The Twins (10,000). These two rock pinnacles lying southeast of Snow Dome were climbed by all members on July 31, 1950. On both peaks the climbing was continuous, the rock being sound and the over-all angle not too steep. These summits were named by the Sierra Club party.

Mount Irresistible (10,000). Named and climbed by the entire party on July 31, 1950, while on the Munday Ridge traverse. As the name implies, we almost passed this one by, but at the last minute we decided that the peak merited an ascent. The climb involved a long tramp across mushy snow and then a single belayed pitch to

the snow summit. Mount Irresistible does not lie on the Munday ridge, but is a projection rising to the west of the ridge.

Mount Grenelle (10,000). First ascent by Dunmire, Long, Steck, and Wilson on July 31, and by Bettler, Cook, de Saussure, and Houston on August 2, 1950. After a long climb up a snow couloir on the west side of Grenelle we reached the ridge. We climbed upward to the southeast on the ridge over an icy face, and then a single rock pitch took us to the summit. Although this was the high point, we decided to continue our traverse, which involved several pleasant rock pitches. From the southeast end of the ridge we descended by another couloir to the snow, one thousand feet below, and thence back to camp. The other party, making their ascent on August 2, omitted the complete traverse, but did climb the summit of Grenelle.

Mount Fascination (10,000). First ascent on August 2, 1950, via the north arête by Bettler, Cook, de Saussure, Dunmire, Houston and Wilson. From the col between Mount Fascination and Sierra Peak, we followed the north arête to the summit. Snow, ice and rock pitches gave the climb great variety and interest. We did both continuous and belayed climbing.

Ascent by Long and Steck on the west face. Possessing 12-point crampons, Long and Steck wished to obtain practice in using their toe irons, and the steep west ice face provided a fine opportunity. On each pitch the belayer was protected by ice pitons. After 800 feet of climbing directly upward, this route joined the north arête route.

Sierra Peak (11,000). First ascent by Dunmire, Long, Steck and Wilson on August 2, 1950. Although this is a very prominent peak, it was not shown on Munday's sketch map; from where the map was drawn the peak was probably hidden behind Grenelle Ridge. It was therefore named by our party. From our camp directly beneath Sierra, a few talus pitches on the south side of the peak brought us to an icy chute, which we ascended by cutting steps and using the rocky side wall for handholds. As the chute steepened, we took to the wall and gained the southeast arête. From here the summit was made in easy pitches. We descended via the south face in order to avoid the ice chute.

Mount Merlon (10,800). First ascent by Bettler, Cook, Dunmire, Houston, Long, and Steck. Cook, Houston, Long, and Steck chose one couloir on the southeast face, while Bettler and I decided to take another farther east. Using crampons, we were able to ascend to a saddle in the rock rib running down from the summit. Two delicate snow-covered slab pitches brought us to another saddle, where our route joined that of the others. We continued along this southeast arête to the summit and met the other climbers there. All descended down the first gully, since this had proved to be a faster route. This was the last peak climbed in the ten-day Munday Ridge traverse.

Mount Marcus Smith (9,500). First ascent by Dunmire and Wilson on August 11, 1950. This peak, the easternmost summit on the upper Munday Ridge, was not climbed during our Munday Ridge traverse because of a storm, so we decided to make a later attempt from the Tiedemann Glacier, at a point about five miles below our base camp. By 6:30 A.M., we were across the Tiedemann and ascending a tributary glacier coming from the ridge east of Marcus Smith. Although the angle steepened considerably on the upper reaches of this unnamed glacier, we managed to kick steps and gain a saddle in the ridge. Since the ridge leading from our position in the saddle to the actual peak would present a difficult traverse problem, we descended southwest to another glacier, and from here worked our way up among crevasses to a second

saddle, from which we could ascend the rocky east arête of Marcus Smith. A series of class three and four pitches brought us to the summit at 3 P.M.

Mount Jeffery (8,500). First ascent by Cook, de Saussure, and Houston on August 11, 1950. From Nabob Pass (5,500 feet), the climbers followed a series of subsidiary ridges toward the north until they reached the highest, which culminates in a vertical cliff facing to the west. The climbers were turned back at this point in an attempt on the south face, but a subsequent traverse around the east side of the main peak disclosed a route on the northeast face, up a series of intermittent ledges, which was ascended with maximum class-four techniques. The name of the peak was previously proposed in honor of Mr. Stanley T. V. Jeffery of Canadian Pacific Railroad, who greatly aided us in obtaining supplies at Vancouver.

Mount Stilleto (10,800). First ascent by Bettler, Long, and Steck on August 11, 1950. After leaving camp on the upper Tellot Glacier, the trio reached the north face of Stilleto and proceeded up the wall, climbing on cracks and slabs. A traverse was made to reach the evident snowpatch in the center of the peak, which was ascended directly. Above, the crux of the climb involved a rope traverse followed by a minute fingerhold traverse protected by rock pitons. Just as the rope was running out a suitable belay spot was found, where the severity of angle of the cliff lessened. The top was reached after two more class-four pitches, and a plastic tube register was left on the summit. The time of ascent was 5 hours.

Mount Serra (12,200). Towers 2 and 3. First ascent by Bettler, Long, and Steck on August 12, 1950. The upper Tellot camp was left at 6:00 A.M. By 8:00 A.M. the climbers had crossed the bergschrund below the col between Serra 2 and 3, and were 200 feet above the glacier in the col itself. This had involved strenuous step-chopping. From the col they traversed the Serra ridge in a westerly direction, keeping just below the ridge on the south side. One direct-aid piton enabled the climbers to cross a gully and reach ledges leading to the forty-foot south pinnacle, which proved to be the true summit. Several class-five pitons were used. Tower 4, highest unclimbed peak of the area, appeared to be only several feet higher than Tower 3 and quite accessible.

Retracing their route to the notch, the climbers decided to attempt Tower 2. Following an obvious route up the ridge from the col, they reached the summit after several varied pitches over sound granite.

Lower Claw Peak (9,000). First ascent by Dunmire and Wilson on August 11, 1950. By 6:00 A.M. we had started across the Tellot Glacier. The hard snow crust made glacier walking easy, and soon we were facing the first pitch on the southeast arête of the claw. The three maximum class-four pitches were reminiscent of Yosemite climbing in every way, the holds few but sound in a granite chimney. From the top of the chimney continuous climbing brought us to the summit at 10:00 A.M. On the descent the difficult pitches were circumvented by rappeling on our nylon rope.

The Black Tusk (9,000). First ascent by Dunmire, Long, Steck, and Wilson on August 12, 1950. The evening before, on our way to Tellot high camp, Wilson and I had passed beneath this monstrous tooth on the southwest side and had decided that the climb would involve some class-six techniques and more time than we had to spare. However, when we approached from the north side on the following day, we found that the snow line was much higher here. We crossed a bergschrund and had no trouble in reaching the overhanging summit after three leads of moderate class-four difficulty.

Peruvian Junket

DURING February and March of 1950 four colleagues from the University of California and I spent several weeks in the Peruvian Andes engaged in research on high-altitude physiology. Mountain headquarters was a newly established laboratory in the mining town of Morococha, situated on the crest of the Andes at an altitude of 15,000 feet. Unfortunately, the expedition was not equipped for, nor were the other members of the expedition in the least inclined toward, mountain climbing. Although climbing was further impeded by Selkirk-like weather and a rather tight research program, it was nevertheless possible to make a few ascents. These were peaks in the vicinity of Morococha that were climbed with Sr. Baldeon, a young Peruvian Indian, and the aid of 75 feet of rope smuggled in with the scientific paraphernalia.

The more interesting of these ascents was that of Yanasinga, a 17,200 foot Peruvian Matterhorn. Ordinarily an easy class-4 climb, it was rougher that day, for it was imbedded in a storm, fresh snow, and several glaciers that grumbled incessantly. However, we could not choose our climbing days. As is true of any other mountain in storm, the summit ridge provided discomforts and thrills—the things climbers enjoy so much in retrospect. It always seemed paradoxical, though, that at this altitude where air is so thin when you try to breath it, it can still have sufficient substance to blow so hard.

Pack food is difficult to find in Peru. We enjoyed a lunch of iced bananas and papaya with soggy crackers, while clinging on the lee of the summit ridge. Housekeeping was simple, we tossed the banana skins above us into the air and they took off horizontally, headed for the Amazon jungle where they came from originally.

Baldeon was a natural climber, though unfamiliar with roped climbing, and enormously fascinated by my piton (I sneaked one along by explaining to my colleagues that it was a medieval shoe horn and I never traveled without it). Unlike his North American companions, Baldeon never once complained while his complexion made the slow transition from light mahogany to deep blue. (I was blue at the start.)

On several occasions we visited, rather briefly, other parts of the Peruvian Andes. We saw at close hand the 20,000 foot peaks of Mounts Veronica, Auzangate, Salcantay, and the great peaks of the Cordellera Blanca. I had at least seen enough to develop an overwhelming urge to return properly equipped for serious mountaineering as well as for a longer visit with the delightful and hospitable Peruvians.

WILL SIRI

Slide-rule Climbing

IT IS TOO EARLY yet to suggest that one day rock climbing will be aided by radar, sonar, and atomic energy. Even such moderately mechanized devices as expansion bolts have found slow and reluctant acceptance in some quarters. It does not seem unreasonable, on the other hand, for climbers to learn for themselves a few facts about present equipment and techniques through the application of engineering principles and devices, particularly if the results can suggest safer climbing methods.

Engineering studies will never supersede experience in producing skilled climbers, but experience alone provides us with only the loosest concepts of safe limits and best choice of techniques. With this in mind a planned engineering study of rock-climbing mechanics was undertaken by the Rock Climbing Section of the San Francisco Bay Chapter in September 1950. Much of our present climbing technique is derived from

the studies on the theory and practice of belaying reported in the classic papers of Richard Leonard and Arnold Wexler. There still remain, however, many questions about the mechanics of climbing for which we have only intuitive guesses for answers. The tests now under way are designed to answer a few of these questions through measurements of various factors under simulated climbing conditions. In part they include measurements of the maximum tension belayers can sustain with various belay methods, failure loads for pitons in many varieties of rock, frictional forces on the climbing rope over rock, through carabiners, and around belayers and an effort to evaluate undrawn nylon for use in safety belts.

The tests are not yet sufficiently advanced to allow any positive conclusions to be formulated, but this much can be said at least tentatively: the best belay positions appear to fail under 300-400 pounds tension—only twice a man's weight. The secret of success in stopping a fall lies, of course, in the use of the dynamic belay and particularly in allowing the rope to run over a rock ledge or through a carabiner, either of which can absorb the greater part of the shock load. We also know now that the belayers coefficient of friction is about 0.5, which means he can hold 150 pounds by applying only 15 pounds to the free end of the rope around his waist.

The program will require perhaps two years to complete. It should not be considered a private undertaking; on the contrary, all suggestions and assistance are welcome. Ask the surviving victims who have already participated!

WILL SIRI

The Piute Crags

By GEORGE B. HARR

IN THE afternoon of the 28th of August, 1947, George Bloom and I had just spent a pleasant two days in Humphreys Basin and climbing Mount Humphreys, and were on our way down the trail to road's end at North Lake. About an hour away from the car we paused to look about us and to take a few pictures. A slender white tower near the crest of the ridge to the north caught our attention. It loomed high above us and was surrounded by jagged, reddish crags, and I noted in my log that this tooth-studded ridge might offer interesting climbing. For a year the urge to climb in this area lay dormant, as a trip to the Canadian Rockies dominated climbing activities. But in July 1948 Bob Crosgrove, Glen Warner, and I packed up our gear and headed north for a week end to investigate these crags at close hand.

We camped just below Piute Lake and headed for the couloir which seemed most likely to lead to the white tower. Just as we were starting up the couloir, lightning crashed and a storm broke. I went a bit farther up the couloir; but as it narrowed to a four-foot-wide slot with vertical walls, discretion overtook valor and we all beat a retreat to camp. Continued bad weather sent us home the next day with only a general idea of the character of the ridge.

To the north and east of Piute Pass rises an east-west mountain massif, the highest point of which is Mount Emerson. Extending eastward from Mount Emerson is a spur which parallels the north fork of Bishop Creek. This highly serrated ridge, comprising the Piute Crags, owes its configuration to the intersection of an intrusion, three-quarters of a mile wide, of very complex rock, both igneous and metamorphic. The main mass of rock, primarily granitic, is highly stained with what appears to be iron oxide, giving the Crags a bright orange-red color. Numerous dikes and complex

faulting have produced an intricate, crisscross couloir system and have isolated many crags as summits. The major summits rise 300–400 feet above the notches terminating the couloirs, and the highest stands at approximately 12,300 feet. The north faces are nearly vertical and plunge down into the Buttermilk country. The south faces, though not so steep, are long and are girdled with "boiler-plate" slabs. The most logical approaches to the summits are up the east and west faces from the notches. The white tower, an eye-catcher, is but a minor summit, but it is set out from the ridge and unusually prominent. The assumption that these crags were perhaps unclimbed proved true, at least as far as can be ascertained.

In August 1949 Ray Van Aken, Ray Osoling, and I investigated the Crags further. We packed to our previous camp the afternoon of the 26th and early next morning set out for the white tower by a route to the east of the original couloir. Several hours of scrambling up class 2 and 3 ledges and couloirs brought us to its base. By circling to the rear, we got up with a short scramble to the summit of this very loose, decomposed white pinnacle. We could now get a real view of the red crags above and were determined to try one.

Ascending diagonally up a debris-choked gully we reached the notch and the west face of what we named Crag No. 2. A glimpse of the impressive, near-vertical north face quickly convinced us this was not a feasible route. Under a blanket of gathering clouds we roped up and started up the west face just south of the west arête. The first pitch, good class 4, ended at a belay spot requiring one piton for an anchor. From here I investigated a ledge running south and east underneath a large, smooth section. One hundred feet of traversing did not bring into view any obvious route upwards. I returned and Ray Van Aken attempted to lead up to the arête, but was stopped by a nasty overhang. He then started up the huge, smooth slab to the east. Using cracks and small ledges on hard, firm rock, Ray surmounted this Yosemite-like pitch after driving four pitons for protection. Ray Osoling and I followed to the large platform overhead. A scramble up the platform and one more class 4 pitch up the arête and around an impressive gendarme landed us within ten yards of the summit. No cairn greeted us on the summit and a quick look around convinced us this was not a casual hikers' objective, so we indulged in mild rejoicing at our probable first ascent. To the west rose another blade-like crag and to the east were many interesting summits. An obvious question arose, "How could all of this have been missed by other mountaineers?" Our trio had been constantly alerted by the rumble of thunder and by one or two snow flurries, so we built a cairn, deposited a note in a film tube, and took our leave, returning by the same route and rappelling down the long pitch.

Several weeks later Ellen and Chuck Wilts and I arrived at North Lake for another try. About a half hour up the trail we cached our camping gear, shouldered the ropes and ironware, and headed north up the slopes for Crag No. 4. There had been a breeze in the valley when we left, but as we ascended the couloirs the wind mounted in intensity until it literally shrieked and snapped through the teeth of the ridge. We attained the west notch, ate a tiny snack, put on the ropes, and I led off on the first pitch—easy class 4. Chuck led the next and was nearly blown off going around a buttress. A convenient alcove provided him a belay spot and Ellen and I followed. We traded leads again and my pitch took me onto a ridge where I sat astraddle and hung on for dear life. When the gust diminished, I drove in a piton and continued up the ridge to a broad sloping platform. Another piton for an anchor, and Chuck and Ellen ascended. We now found ourselves on a sharp knife-pointed crag west of

the main crag, our objective. The west face looked terrific—class 5, and 6—so we descended to the notch between the two crags and examined the north face. This face was nearly vertical, but could be traversed, so we climbed laterally eastward and for the first time were out of the wind. From a platform Chuck led straight up a delicate pitch, and with the protection of a piton surmounted the east ridge. I led an easy pitch-and-a-half and we were on the summit and in the gale again. We named our first ascent Hurricane Crag, built a cairn, left a note, and hurried a descent. Twelve hours after starting, we all agreed over a pot of tea that this had been a fine mountaineering venture.

Hoping to crowd in one more climb in the Crags in 1949, the three of us headed north again October 7. A check with the weatherman warned us of impending light snows and a cold north wind, a prediction confirmed as we drove up Owens Valley. Even below the 6,000-foot level there was snow on the road up Bishop Creek. Ultimately we put on chains, and considerable bucking was required to force a passage to North Lake. The sight of golden-leafed aspens mingling with the snow-clad firs was justification in itself for our trip. However, we soon left the shelter of the valley and started up toward the Crags. In the couloirs the footing was most foul, as twelve inches of loose snow covered the talus blocks. As we mounted higher the wind sweeping down the couloir became exceedingly bitter, and our faces and our hands and feet began to suffer the results. Presently we voted that October was too late and turned back. This preview of winter was enough for 1949.

In June 1950 Ray Van Aken and I were at it again. The couloirs were as long as ever and our lack of conditioning made us feel the altitude. At the notch east of Crag No. 5 we paused for lunch and recuperation. An easy stroll up the east flank of this crag took us to the summit and a cairn. This was first of all the Crags that we found had been climbed previously. No note had been left, so we cached a tube with appropriate contents. We then climbed a small, needle-pointed pinnacle in the middle of the notch, and surveyed the west face of the next Crag to the east. We climbed this steep, class-four face to the summit—a minor crag which we presumed was unclimbed, although the descent to the east was easy. A broad and interminably long couloir took us down to trail near the car, and exploration of the eastern sector of the ridge was thus concluded.

The most recent attack on the Crags was made on the week end of September 2–4. Charles Wilts and I had been considering for some time a planned bivouac high in the Crags to reduce the number of trips up and down the couloirs. Although we had not forgotten the discomforts of a forced bivouac high on the southeast face of Mount Whitney during a recent rescue operation, we made hopeful plans. I constructed a two-man Zdarsky sack of light cotton balloon cloth, put two zipper entrances on either side of this totally enclosed sack and treated it with a curing neoprene cement. The gross weight of our sleeping equipment was held to one pound, nine ounces, excluding some extra clothing. Two quarts of water, two cans of juice, soup, sausages, tea, cheese, chocolate, a heat-tab stove, cup, and some miscellany completed our "camping" equipment.

We left the trail about an hour from the car and ascended the cliffs and couloirs to the notch west of Crag No. 2. Here, about 100 feet below the notch, we found a bench sufficient for a bivouac. Caching the auxiliary gear, we headed for Crag No. 1, as yet unclimbed. En route we scrambled up several pyramids and obtained excellent views of the near-vertical north faces of Crags Nos. 2 and 3. Also, we could see that

Crag No. 1 might present some problems; the south face overhung, the knife-like east arête had an overhang, and the north face was impressively steep. We approached from the northeast and I traversed diagonally up the north face on a sloping ledge. Then Chuck led upward on a minimum Class 5 pitch to the summit ridge. The ladder-like holds eased the difficulty of the 70° face, and from here a traverse brought us to the narrow summit. Here we could observe at close hand two previously spotted towers behind the Mount Emerson ridge. One of these looked quite fantastic. It was connected by a web to the north face of the ridge and overhung on the connecting side. The two flanking sides of the tower appeared to be nearly vertical, and only the outside, rather inaccessible edge looked feasible. Owing to the lack of time and the difficulty of approach, these two large towers are still unclimbed.

It was time to make preparations for our overnight stay. A rapid descent brought us to our bivouac spot, and an area was leveled for sleeping. We warmed supper, wished we had more fluids, and crawled into our shelter.

The following morning we climbed from our bed site onto the south face of Crag No. 2. It had been climbed before and we were attempting a new route. A series of interesting pitches, some of which were class 5, brought us to the cairn on top. Up to this time it appeared that nothing less than a minimum class 5 route could be found to this summit, but we found a break down the east-northeast side. With exceeding care—there was much loose rock—we climbed down this long class 4 side to the notch. A heavy overcast had been developing and a few rumbles of thunder sent us trudging down the deep couloir, eventually to the accompaniment of rain.

The proximity of the Crags to road's end has encouraged our repeated excursions. This ease of access makes the area an excellent practice ground for gaining mountaineering and route-finding experience. There are still several impressive unclimbed crags below the summit ridge; one in particular will tax the rock climber to the utmost. Needless to say, this is on our agenda.

PIUTE CRAGS FROM THE SOUTH

A–1'–2, Harr–Osoling–Van Aken route; B–1–2–B', Harr–Wilts route; x indicates bivouac.

Reviews

Edited by HARRIET T. PARSONS

On the Vertical Wilderness*

WILDERNESS BOUNDARIES of peak and precipice, although not always unassailable—as demonstrated so clearly on Mount San Jacinto—have usually been the easiest to defend. Defended, the vertical wilderness within such boundaries, undeveloped save for emergency shelters which are all but indigenous, a fixed rope or two, and a few pathways, has enticed by its charm thousands upon thousands of explorers and mountaineers. The vertical wilderness has also evoked some of the pleasantest of travel literature, and some of the most exciting.

Just how many feet of shelving the compleat mountaineer should have to allow for his library is a statistic which should be arrived at by the American Alpine Club. Some indication of the extent of shelving—indeed an excellent indication—is to be found in three recent mountaineering volumes: one, a selection of some of the best writing; the second, a story of climbing through the years in the most climbed of all ranges; and third, the reminiscences of one of the most lucid mountaineers and the most lucid skier of all.

William Robert Irwin, who is Assistant Professor of English at the State University of Iowa, has compiled in *Challenge* the best anthology of mountaineering literature yet to appear. It might be added parenthetically that its peer is not likely soon to be compiled. Francis Farquhar, for example, had long intended to gather together such an anthology; *Challenge*, however, anticipated him with "a choice selection of . . . hidden treasures."

"Here for instance," Mr. Farquhar wrote in the *San Francisco Chronicle*, "is Winthrop Young's 'A Memory of the Mischabel' and Miss Gertrude Bell's 'Ordeal on the Finsteraarhorn,' which are among the most ably written accounts of intense mountaineering experience. C. E. Montague's 'Action' is a bit of fiction with more than ordinary overtones. Fiction in quite a different vein is found in John Buchan's 'How I Stalked Wilder Game than Deer.' The famous Matterhorn accident is handled in an unusual and effective way by excerpts from contemporary journalism. Ararat is here, and a bit from the Scottish Isle of Arran. The Alps and the Himalaya for once do not unduly dominate the scene; Norway, The Pyrenees, the Caucasus, Africa, and South American are represented, as are Maine (Thoreau), Wyoming (Fremont),

*Adapted from a review written for *The Living Wilderness* concerning three books:

CHALLENGE: AN ANTHOLOGY OF THE LITERATURE OF MOUNTAINEERING. Edited by William Robert Irwin. Columbia University Press, New York. 1950. xx + 444 pp. $4.75.

A HISTORY OF MOUNTAINEERING IN THE ALPS. By Claire Eliane Engel, with a foreword by F. S. Smythe. George Allen and Unwin, Ltd., London, and Charles Scribner's Sons, New York. 1950. 296 pp. with 26 illustrations. $6.00.

MOUNTAINS OF MEMORY. By Arnold Lunn. Hollis and Carter, London, and the Macmillan Company, New York. 1948. xxi + 248 pp. with color frontispiece and 26 half-tone illustrations. $4.50.

and California (King and Muir), not forgetting a delightful morsel from West Virginia. Even Americans abroad are given their spot, with Arthur Emmons and Terris Moore on China's Minya Konka. The biographical and bibliographical introductions to the selections are particularly well done and add greatly to the enjoyment of the book, as does its pleasing format."

Professor Irwin's own introductory statement, concerning how men have gone about climbing mountains and why they chose to do so, is admirable in every respect. Especially refreshing, these days, is a discussion of the why of mountaineering which does not once rely upon Mallory's cryptic explanation, an explanation that mountaineer-authors have felt compelled to quote ever since Mallory gave it. Instead, Irwin includes Mallory's analogy of musical experience and climbing, and goes on to say, "The reward which Mallory suggests is rich and wonderful. Fortunately, it can be shared, at least in part, by anyone who will read the literature of mountaineering in a spirit of emotional participation. Such a reader will discover information highly interesting in itself and the zestful recounting of adventure. He will discover also a remedy for dejection and a testament of human worth in record upon record of joyful experience, in which men achieved, perhaps but briefly, a harmony of the active and contemplative which most of us are toiling all our lives to find."

A History of Mountaining in the Alps is not, perhaps, a book which needed doing quite so much as *Challenge*. There are other histories of mountaineering, and delimiting a history to the Alps, where most mountaineering has been done anyway, does not suggest that any special contribution to the literature is at hand. Nor is it reassuring to note on the jacket that the author, a French climber and author of many books in her own language, has elected to write this one in English. And one who reads book advertisements regularly is also likely to shrink from the word "comprehensive," even when used by so great an authority as the late F. S. Smythe in his Foreword.

Having approached Mlle. Engel's book with these apprehensions, and fully intending therefore that I should no more than skim through it, it was pleasant to discover that my worries were uncalled for and that it was just not possible to skim. This is a book to be read and reread for itself, and to be readily available for reference as well. Perhaps it could have been a little more objective in the discussion of German and Italian mountaineers, but some subjectivity is certainly understandable. And mountaineers who have found the use of pitons quite compatible with an adequate appreciation of wilderness values are likely to feel some irritation at finding themselves described as bearers of ironmongery who look upon mountains as mere pincushions for pitons.

These, however, are trifling points. In the main, we may be thankful for the care with which Mlle. Engel has gathered and organized her material, and for the sensitivity and perceptiveness in her writing. Her conclusion will certainly strike the sympathetic chord in those who appreciate the importance of wilderness: "And so, by a roundabout way," she writes, "we are led back to the old interpretation of mountains as the 'cathedrals of the earth.' Most emphatically, it may be affirmed that they are not 'built for the human race.' Hence their unsullied beauty, their purity and their eternity. Men have only built to destroy, they have trampled their ideals underfoot and extended the sway of death. Yet, in spite of so many attempts upon their strength, the mountains have remained outside the dominion of man. They have not been tamed and never will be, and when men gain access to them, it is by paying homage

to them, consciously or unconsciously. Mountains are indeed 'the cathedrals of the earth,' but not the cathedrals of men . . . . They enable and even compel men to realize some aspects and implications of eternity and infinity, the fact that he is not absolute master of the world. And they also point to a hope that there is so much beyond him. The old prayer may still be answered: 'I will lift up mine eyes unto the hills . . . .'"

A few months ago the manuscript of a review of *Mountains of Memory* was submitted for the *Bulletin*; because I am sometimes more opinionated than an editor ought to be, I didn't use it. It was written by a young man who just possibly does think that mountains are to be used as pincushions, or for whom the Alps, to quote from Arnold Lunn's dedicatory page, "are nothing more than an arena of athletic achievement" (a page that is not dedicated to such men). Mr. Lunn's book, the young man thought, was rather too rambling. This is not a new criticism, as Mr. Lunn himself demonstrates: "A friendly reviewer in the *Alpine Journal* remarked that as Editor of the *British Ski Year Book* I was not 'hampered by any pedantic consideration of precise relevance.' My difficulty is that connections which seem obvious to me seem less obvious to many of my readers."

Years before *Mountains of Memory* was published (but long after the memories were placed on file) I started reading Arnold Lunn; I was on many occasions grateful for his lack of obviousness and his scope, for his keenness and good humor, whether he was expressing his appreciation of mountains and mountaineers, or his or their philosophy, or the correlation of all four to politics and religion, and whether he was expressing his thoughts in journals or in books or in conversation in Bestor Robinson's living room. In the present book my gratitude is renewed; and I am sure that the violence I did the young reviewer will be considered a good turn by him in good time.

By now it must be evident that I cannot review a Lunn book objectively; nor efficiently. It is too easy to be sidetracked by his prose, to agree with him, to chuckle with him, to forget the review and read a chapter aloud. Perhaps the best thing to do is to use a quotation or two—two which indicate that Mr. Lunn, were he to pause in this country long enough in the course of his travels, would serve Wilderness well. Of tramway building, for example, he writes, "The great heresy of our age is this habit of equating spiritual and mechanical progress." The mountains, he realizes, can be tamed and are being tamed. The vertical wilderness, too, is shrinking.

But in the Alps it has its defenders. I talked to one of them in faltering French—my Italian was far shakier—a few years ago in Valtornenza, on the Italian side of the Matterhorn. "Why do they keep building more *téléfériques*?" she asked. "We are trying to stop them. Already too much of the beauty of the Alps is destroyed." I believe I should have discovered, had my French been up to it, that she and others in the village were quite ready to go along with this observation of Lunn's:

"It is significant . . . that the foundation of the Alpine Club should have coincided with the Industrial Revolution, and that so many of the pioneers of mountaineering were men of great intellectual distinction. Intellectuals have a greater need than most people for that contact with Nature which provides a corrective to intellectualism. 'Today,' writes Palinarus, 'our literature is suffering from the death of poetry and the decline of fiction yet never have there been so many novelists and poets . . . .'

"It was the Industrial Revolution," Lunn continues, "and the divorce of man from

the land that was responsible for this cultural decline. Every great culture cycle begins within the economy of the village, the farm and the small town, and dies in the sterile climate of sceptical disillusion which characterises the urban civilisation. In the springtime of a culture art is nourished by the concrete realists of Homer's life-giving earth. In the winter of a declining civilisation art takes refuge from life in abstract concepts and in stunts such as surrealism. 'Surrealism,' as Cyril Connolly remarks, 'is a typical city-delirium movement,.a violent explosion of urban claustrophobia.'"

Lest the full rage of winter come too soon—the moral seems implicit—we need to cherish the life-giving wild places of earth. Perhaps rolling, horizontal wilderness will be enough to serve man's morning, when he is on four legs, and his evening, when he needs three; but he especially needs rugged wilderness to climb over in the vigor of his noon, vertical wilderness that will illumine his dawn as well, and color his dusk.

D. R. B.

HOOFBEATS ON THE TRAIL. By Vivian Breck[enfeld]. Doubleday and Co., New York. 1950. 238 pages. Illustrated by Hubert Buel. Price $2.50.

Many of us have heard with our own ears the hoofbeats on the trail Vivian Breck writes about, and to the old High Tripper the book offers a nostalgic orgy of recognition. The novel deals with a critical summer in the life of teen-age Cress Pomeroy who finds her sea-level bearings in the wilderness of the High Sierra—as many another has before her and as many will, we hope, after her. From the vantage point of high places and through her association with clear-thinking and mountain-wise companions—especially through her friendship with young Jon van Wyck, a college packer—Cress finds a possible solution to her problem as the non-intellectual ugly duckling in a family of scholarly swans. The background of the story is a "Sequoia Club" trail trip, which is unmistakably the High Trip, complete with early-morning wolf calls, chow lines, and singing packers. The scenes are familiar and occasionally the faces are too. Although the pleasure of recognition is limited to the High Tripper, the scope of Vivian Breck's book is by no means so circumscribed. In her novel Mrs. Breck has managed to communicate not merely the flavor and the tang of a High Trip, but—far more important—the philosophy which underlies the trip and the almost passionate conviction which keeps it going. The High Trip is not run just to provide some 300 people with an annual change of scene. It is undertaken as a means of introducing new people to the wilderness, for their enjoyment and refreshment of course, but also to show them how they may use the wilderness as kitchen, bedroom, bath, and living room, and still leave it as they found it. The trip has also another and more vital purpose—to make of these summer visitors life-long champions of the wilderness, who, having learned to use it and love it, will work for its survival. Mrs. Breck has succeeded in saying this, convincingly and deftly, without retarding her narrative. Her book will stimulate an interest in conservation in many young vicarious High Trippers, who will walk the trail with Cress or ride it with Jon. A young and still mercifully impressionable audience will be moved to see this high country for themselves. Mrs. Breck has made a very notable contribution to the cause of conservation in this book and in her earlier novel *High Trail*, and if the club has helped her a bit in providing her with some of her copy, the debt has been handsomely repaid. Required reading for all Sierra Club teen-agers who need to be nudged, not driven, along the high trails beloved by their parents.

Anne H. Brower

SEQUOIA NATIONAL PARK: A Geological Album. By François E. Matthes. Edited by Fritiof Fryxell. University of California Press, Berkeley and Los Angeles, 1950. 136 pages. Photographs and maps. Price $3.75.

Here is a unique and effective way of telling the geological history of a complex portion of the Sierra Nevada landscape. Adopting the technique of a number of popular weekly magazines, Dr. Matthes compiled for the National Park Service, with which he was long associated, a remarkable series of photographs profusely illustrating the geologic story of Sequoia National Park. The text consists of a few brief paragraphs at the beginning of each section of the book which discuss in a general way the features illustrated. The detail is contained in the legends of the pictures. This combination condenses a tremendous amount of information into a very small amount of space.

In 1938 Dr. Matthes prepared three folios which came to be called the "Sequoia Albums." These have been combined by Dr. Fritiof Fryxell into the present book. Their contents have been kept essentially unchanged except for a few revisions required to make the text consistent and concise.

The history of the uplifting of the great Sierra block is described first. Several photographs of the great eastern scarp of the Sierra and panoramas of the gentle western slope illustrate this. The erosional features developed in the quiescent intervals which broke the uplift into four distinct stages are next described. Pictures of remnants of the pre-Sierra surface as displayed on Mount Whitney and other peaks illustrate the landscape before uplifting began. The intermediate erosional surfaces are represented by the rounded surface of Cirque Peak, the Boreal Plateau and the Chagoopa Plateau flanking the great Kern River Canyon. Pictures of Kern Canyon itself bring the erosional story up to date.

This same use of photographs explains glaciation, avalanche sculpture, the action of frost in wedging apart rock fragments where the granite is closely jointed and fractured, exfoliated domes and cliffs, chemical weathering, and the folded strata of the original sedimentary and metamorphic rocks. The evidence of volcanic action is not overlooked.

At the end of the book there is a glossary of geologic terms which is very helpful in understanding the text in which these terms have, of necessity, been used.

This little book is not only of value to the interested visitor to the Sequoia National Park, but also constitutes a text book applicable to the geology of the whole Sierra. In addition, it illustrates almost all features of glacial action wherever they occur.

It is unfortunate that the process by which the many photographs were reproduced did not permit a better quality of picture in the book. However, they are adequate, and as such, fulfill their purpose. The book has been well edited by Dr. Fryxell, and is worthy of the tradition set by Dr. Matthes in his well-known *Geologic History of the Yosemite,* and his other contributions to the literature on the Sierra Nevada.

ALFRED R. DOLE

THE INCOMPARABLE VALLEY: A Geologic Interpretation of the Yosemite. By François E. Matthes. Edited by Fritiof Fryxell. 160 pages. Illustrated with 51 photographs (24 by Ansel Adams) and 11 diagrams. University of California Press, Berkeley and Los Angeles, 1950. Price $3.75.

François E. Matthes, a long-time member, and honorary vice-president of the Sierra Club, has made no greater contribution to the understanding of the geology of our

national parks than through his brilliant work in connection with the story of the Sierra Nevada, and in particular the geologic history of the Yosemite. It was his wish that he might some day write a book about the Yosemite for the layman. This was unfortunately denied by his death in 1948.

For all who knew him or were familiar with his work this was a great disappointment, and some way was sought to fulfill his wish. Accordingly, Fritiof Fryxell, associate of Dr. Matthes in the U.S. Geologic Survey and now Professor of Geology at Augustana College in Illinois, was chosen to assemble from Dr. Matthes' published works and many private papers the necessary data for the Yosemite book. This Dr. Fryxell has done, adding only enough of his own writing to provide the necessary introductory and connective passages.

Basic to an understanding of the Yosemite is the geologic story of the building of the Sierra Nevada itself. A considerable portion of the first chapters are devoted to this. Dr. Matthes tells how the present range was formed of a vast mass of jointed granitic rocks which acquired their present height by a series of four vast uplifts of the earth's crust. The first uplift caused the stream courses to be reoriented so that the major rivers flowed southwest, eroding away the ancient sedimentary rocks which overlay the granite and to form broad valleys. The subsequent uplifts developed a system of deep canyons with tributary streams entering high up on the walls.

Then, four times great seas of ice formed in the High Sierra, and sent long glaciers flowing thirty to fifty miles down the deep canyons. It was these glaciers that finally sculptured the range to approximately its present form and brought the Yosemite of today into being.

It is impossible to review in a few paragraphs all or even part of the wealth of data combined in Dr. Matthes' book. This is left for the pleasure of the reader, who, it is hoped, will read *The Incomparable Valley* for himself. Some detailed explanation has had to be sacrificed in this book to include a wider selection of topics, which leads to some confusion, particularly in the first chapter. Also, there is a certain amount of repetition, due probably to the fact that in selecting the original material of Dr. Matthes' own writing from different sources, it was impossible to avoid references to the same subject. This, however, is good, as it serves to impress on the layman certain fundamentals.

It is fitting that this book representing some of the best of the writings of Dr. Matthes should be illustrated with pictures by Ansel Adams. Twenty-four of his pictures have been included, with a few others by Dr. Matthes and other photographers. Together these excellent photographs illustrate the varying forms of mountain sculpture to be found within the confines of Yosemite National Park.

ALFRED R. DOLE

THIS MY VOYAGE. By Tom Longstaff. Charles Scribner's Sons, New York, 1950. 324 pages, illustrated. Price $5.00.

A record of a half century of climbing and exploring in many of the mountain regions of the world, this book is the work of an enthusiastic British traveler. The author, both a doctor of medicine and a naturalist, is an astute observer of the outdoor scene as well as a student of the expeditions which preceded his. He is responsible for defining, in 1908, the route followed by all the Everest parties.

The book contrasts climbing conditions in various parts of the world, not only technically, but also politically and socially. The economics of climbing is also intro-

duced—the author points out that it is cheaper to climb in the Himalaya or Karakorum than in the western hemisphere (fortunate for us, perhaps, since it has left most North American first ascents for North Americans).

The book is written with the curious British mixture of sophistication and naïveté. There is an excellent list of references and a good index. All in all, a valuable addition to a mountaineering library. JOHN P. SCHAGEN

WATER, LAND, AND PEOPLE. By Bernard Frank and Anthony Netboy. Alfred A. Knopf, Inc., New York, 1950. 329 + xi pages, illustrated, 4 maps. Price, $4.00.

The conservation problems of the United States provide an interesting paradox. The rapidity of our loss of natural resources may be our salvation. So rapidly have we despoiled a virgin continent that many of us can realize that the cause has been MAN'S errors, not inevitable destiny; whereas in Spain, the Near East, and China the people had passed the blame to nature for the tragic loss of forests, grasslands, and then the alternating droughts and floods that destroyed crops, land, and people.

We are indeed fortunate in this country that several books devoted to the basic problems of land and water conservation have appeared within the last year or two. The first two were shocking and frightening, awakening a storm of controversial but useful discussion. The latest comes at a time that will find more people than ever before aroused and anxious to learn. The presentation of facts is vivid and accurate, clearly depicting the serious national danger, but ending with full confidence in the ability of the people of the United States to solve the problems that are so clearly set forth.

Bernard Frank is the Assistant Chief of the Division of Forest Influences of the U.S. Forest Service with special responsibility for watershed problems. As a member of the Council of the Wilderness Society, he skilfully blends an intense love for the intangible values of the forests and their watersheds with his life-long study of the technical practical problems that exist there. Anthony Netboy is an experienced writer formerly with the Forest Service, making it possible for non-technical people to understand the basic facts of sound conservation of land and water which are so vital to our national existence. The book is well written and of great value to conservationists.

After 200 pages of facts excellently presented, the authors sum up:

"Finally, despite the expenditure of hundreds of millions of dollars annually for damming, dredging, cleansing, and otherwise stabilizing and normalizing our major rivers, we do not seem perceptibly to be reducing floods, siltation or contamination.

"The people of the United States have taxed themselves heavily to repair many areas, but they rarely force private landowners who have benefited from public expenditures to observe even the ABC's of good land use."

They then critically examine the principal "solutions" that have been suggested; the record of the Tennessee Valley Authority, and the proposed Missouri Valley and Columbia Valley Authorities. Each is found wanting. But nevertheless, the principal value of the book is that it does not attempt to present the horrifying dilemma of total destruction versus an Utopian social revolution with ecologists or soil conservation technocrats as saviours of civilization. A more rational future is anticipated.

The authors clearly label "Public Apathy and Ignorance the Main Obstacles." They conclude, however:

"The outlook for the future, although it may be dim, does not warrant pessimism. The welfare of the majority is more and more becoming the foundation stone of our judicial system—evidence that the cultural pattern is changing.

"It is logical to believe that, in time, the stake of the people in our land and waters will surmount the individual's right to exploit these natural resources as he sees fit."

In our complex cities zoning and building restrictions severely limit the "freedom" of the individual to harm his neighbors. A similar concept that rural land use is a social trust for the future is becoming more and more the view of the people through their legislatures. Recent decisions of the Supreme Courts of the several states and the Supreme Court of the United States give confidence that society can and will protect itself as the facts of conservation become general knowledge. That is the real hope of civilization.

RICHARD M. LEONARD

PRIORCNIK ZA PLANINCE (HANDBOOK FOR MOUNTAINEERS) by Dr. A. Brilej, State Printing House, Ljubljana, Yugoslavia, 1950. 310 pages, 31 maps, 70 drawings.

For those who read Slovenian here is an excellent guide to the whole Slovenian mountain area as well as a thorough handbook on mountaineering. As a guide the book is very complete. Aside from the 31 maps (in scales from 1:50,000 to 1:200,000) showing all the trails and the 80-odd shelters, lodges, and chalets supported by the central mountaineering club (Planinsko zvezo Slovenije), there is a list of all possible hikes with details concerning landmarks, points of interest, dangers, housing accommodations, and much more. As a handbook on mountaineering it contains chapters on geodetics and map reading, devices for orientation, and data on celestial bodies, the perils of mountaineering, first aid and rescue work, and general advice on food, drink, and gear. Most of the advice seems sound and fundamental, but some of it strikes one as being "European and conservative," e.g., "don't drink cold water in warm weather as you might break out into a sweat," "caution should be observed in drinking alpine milk, for many stomachs cannot tolerate it," or "remove all iron pieces of gear during a thunderstorm." Furthermore, being a basic handbook, it contains little information on such specialized subjects as skiing or rock climbing.

Of interest to the American is the intensity with which the Slovenes take up mountaineering. This northwest corner of Yugoslavia, heavily wooded and thinly populated, has 58 chapters of the central mountaineering club with a total of 35,000 members. Of the 80 lodges and shelters, some are permanently staffed by the central organization, others belong to the individual chapters, many of them dating back to mid 19th century.

Slovenia is little known to the outside world, but it has much to offer. Here are the Julian Alps, the Karavanken, the Sava Alps, the Polhograjski Dolomites; here also are the miles of subterranean streams and labyrinths of Postumia. It could become a leg of any tour of the Alps.

NOEL VOGE

OUR DESERT NEIGHBORS. By Edmund C. Jaeger. Stanford University Press, Stanford, 1950. 239 pages, illustrated. Price, $5.00.

This is a timely book on desert wildlife. The author is identified with our southwestern deserts in much the same way that John Muir will be forever associated with the Sierra Nevada. His writing lacks much of the lyric and imaginative quality found so notably in John Muir's books; nevertheless, it does reflect an unbounded enthusiasm

and an eager mind. The deserts comprise one of the most remarkable of California's many life zones, and this book conveys to the reader much of its beauty and the comedy and drama in the lives of its teeming population.

An earlier book, "The California Deserts," is an interpretation of the desert landscape, its geology, its unique plant life, and its wildlife. A later book is in the form of a fully illustrated popular botany dealing with desert wild flowers.

In reading this new book, one realizes that these denizens of the desert are in truth the author's neighbors and friends. He has spent a lifetime observing their ways of life. Most of the shy and elusive creatures of which he writes are seldom seen by the desert traveler, yet here their lives are revealed in intimate case histories—they have yielded their secrets to this patient and sympathetic naturalist. Much of the vitality of the book is due to a fascinating record of carefully observed incident and experience.

America needs more such interpretations of its splendid native landscapes. The illustrations, both photographs and line drawings, are in the main, good, although some of the latter are disappointing. The book should stimulate a broader and more understanding interest in our great desert empire and in the need for protecting its scenic treasures.

RALPH MOCINE

ROCK FOR CLIMBING. By C. Douglas Milner. Chapman and Hall, Ltd., London, 1950. 128 pages, photographs. Price, 25s.

Mr. Milner describes most pleasantly his favorite climbing rocks in Britain and the Alps. Choosing 97 excellent photographs, he points out various routes and obstacles on the climbs, and in some cases the climbing technique is illustrated—a feature very attractive to the mountaineer. The author gives not so much a collection of pictures as a collection of climbs. The introductory discussion reveals his commonsense approach to the sport of rock climbing, and gives some insight into British mountaineering ethics. He prefers climbs "on sound clean rock, always difficult enough to be interesting and repaying, yet never so hard as to wear an air of desperation." His quiet humor and obvious contentment in remembering his climbs are as much a part of the charm of the book as the photographs.

BONNIE CUSHMAN

LIFELONG BOYHOOD. By Loye Miller. University of California Press, Berkeley and Los Angeles, 1950. 226 pages, illustrated. Price, $2.75.

Lively curiosity about the world of living things is the keynote of this book. Loye Miller grew up in Southern California when Riverside was a one-street town in the desert—when, he says, " . . . the wild came to our very door." He came to the University of California in 1894 with fifty dollars and a determination to become a teacher of science. He gives a cheerful account of those hand-to-mouth years as a student. Of special interest are the glimpses he offers of such well known oldtimers as Joseph LeConte, John C. Merriam and the Ritter family. Dr. Miller's early love for birds remained dominant throughout a lifetime as teacher of biology in the schools and universities of Hawaii and California. His interest in bird life covered a wide range, and he became famous for his imitations of bird calls as well as for his studies on the comparative anatomy of fossil birds. He was one of the first to work on the fossils in the tar-pits of La Brea, excavating, cleaning, polishing and classifying his bones into a "paleontological dictionary—a room sized volume in which one can look up the meaning of any bone!" This book contains several of Dr. Miller's non-technical essays

as well as his autobiography; one of these essays is a LeConte Memorial Lecture, sponsored by the Sierra Club, which describes the ancient bird life of California.

Dr. Miller lived in the time of abundant wilderness, before the pressure of population threatened so much of our native wildlife. Conservation as we know it today does not appear as word or thought in this book. Yet he has a profound understanding of the interdependence of all life and of the instincts common to all living things. His amusing essay on the up-bringing of the baby linnets Nip and Tuck should be required reading for all parents. He unconsciously sums up his philosophy of education in his remark: "Enjoyment itself is a great teacher—it's chock-full of educational vitamins that are essential to a good intellectual metabolism!"

CICELY CHRISTY

THE LAND OF LITTLE RAIN. By Mary Austin. Houghton Mifflin Co., Boston, 1950. New edition, with an introduction by Carl Van Doren. 133 pages, illustrated with 48 photographs by Ansel Adams. Price, $6.00.

This classic of Mary Austin's needs no introduction to Sierra Club members. However, this new edition with Ansel Adams' photographs will be a delight to all. The pictures cover every aspect of the mountain-desert region east of the Sierra crest, and each is associated with an apt quotation from the text. The photographs are beautifully reproduced, and the type is large and easily read. There is a section on place names and photographic data. It is altogether a splendidly made book.

CHARLES T. TOWNSEND

MY CAMERA ON POINT LOBOS. By Edward Weston. Virginia Adams, Yosemite National Park, and Houghton Mifflin Co., Boston, 1950. 30 photographs. Price, $10.

This is another in the series of handsome books illustrating the art of photography. It contains 30 photographs reproduced on heavy glossy paper. The pages are 12 inches by 14½ inches in size, with stiff cardboard covers and a spiral binding.

The introduction deals with the history of the Point Lobos area and of Weston's association with it. There is an interesting description of its characteristic scenery, and of the flora and fauna. Following the photographs are several pages from Edward Weston's daybook. As the artist says, "Photography as a creative expression—or what you will—must be seeing plus. Seeing alone means factual recording." That he has well succeeded in satisfying his own outlook may readily be seen by a study of the prints in this book.

CHARLES T. TOWNSEND

OF MEN AND MOUNTAINS. By William O. Douglas. Harper & Brothers, New York, 1950. 338 pages. Price, $4.00.

This is a highly rewarding book for everyone who loves the out-of-doors. Even to those who never have known or who never will know the nostalgic quality of the incense of the high places of the earth, it will read as a book rich in human values.

In smooth-flowing, simple narrative, Justice Douglas gives us a warmhearted picture of his boyhood days in Yakima, Washington, and his early tramps and camps through the countryside. From the time when as a small boy he lost his father, he found a solace, a security, and a challenge in the hills and in the mountains that are the dominant factors in that Washington landscape.

All parents and those who deal with children will gain much understanding of the thought processes and emotions of boys from these honest pages. Fishermen may dis-

agree as to his fishing methods, rock climbers will shudder at some of his exploits on the cliffs, and camp cooks will dispute him regarding sourdough (using tame city yeast!) and the best methods of cooking trout, but they will all read the book with a feeling that he is the sort of man they would enjoy being with on the trail and in camp; a man who will carry his own pack wherever he goes and under whatever the circumstances.

HARRY C. JAMES

TREE TRAILS AND HOBBIES. By Ruth Cooley Cater. Doubleday & Company, Inc., Garden City, New York. 1950. xxii + 324 pages, illustrated. Price $3.50.

The trails one follows so adequately in this book are not the actual trails one takes through the forest nor the road one takes to reach some particular kind of tree, but rather the routes taken to learn about trees as well as the ways and means of telling the different kinds apart. The main trails lead one to a knowledge of the more common native American cone-bearing and broad-leaf trees, while side trails are indicated to stir the collector's instinct, to arouse one's curiosity about trees in his front (or back) yard, and to remind one of the part trees have played in fact and fable.

All is presented in a delightful, straightforward style that engages and holds the reader whether he is a student or beginner. The student will learn many facts about many trees, the beginner will find in this book a most useful and usable tool to introduce him to a new world. Mrs. Cater has seen to it that the scenic beauty, economic importance, and human interest of this world of trees, both native and cultivated, are presented alluringly, and the publisher has offered this wealth of material in a most attractive and yet inexpensive book.

JOHN THOMAS HOWELL

MY CAMERA IN THE NATIONAL PARKS. By Ansel Adams. Virginia Adams, Yosemite National Park, and Houghton Mifflin Co., Boston, 1950. 30 photographs. Price, $10.00.

Ansel Adams is accepted as a master of the craft, and therein lies such warranty of the quality of "My Camera in the National Parks" that no comment is required.

In that portion of the text captioned, "The Meaning of the National Parks," the poet Whitman is quoted in part: "I swear to you there are divine things more beautiful than words can tell." It almost seems that Adams had been inspired by that line to present the over-all picture of the beauties and wonders of the national parks in a clearer and finer way than any book done in words could hope even to approach.

I believe, and hope, that the book will make new friends for the conservationists and so help in the continual battle to preserve these fine parks and forests of ours.

I must add that very high praise is due for the wonderful job of plate making and printing that makes the book so desirable to own—a really marvelous job of reproduction.

JAMES MACBRIDE

CLIMBER'S TESTAMENT. By W. Kenneth Richmond. Alvin Redman Ltd., London, 1950. 246 pages, 36 photographs. Price, 12/6.

If the writer had not started off with rather scornful remarks about the usual books on climbing, and the climbers who climbed not only the hills of Britain, but also had the good fortune to climb in the Alps and the Himalaya, as if that were distinctly a detriment, the reader would have a pleasanter feeling about the book. The author justifies himself for writing a book only about the British hills—"Any adventures of which it has to tell are of the mind rather than those of a hair-raising variety, . . ."

but he protests too much. And when he speaks somewhat belittlingly of the great climbers, such as "the obsessions of Whymper and his cronies . . . " it irritates the reader (this reader anyway), even if he knows the great climbers had their faults.

However, if you can get through his argumentative first chapter, and the occasional cutting remarks, without so much annoyance that you throw the book aside, you will find a great deal of interesting and lively reading as you go along. Perhaps his crotchety-ness adds to the interest and though you want to throw the book aside you also want to go on reading to see what he's driving at, and whether the hills mellow him at all! They do, especially when he gets out of himself and describes the mountains themselves, or the animals and birds. Although he seems rather egocentric, you cannot help but be interested in his meanderings, and agree with him in many of his conclusions, especially those on what climbing should be, and what it should mean to the climber and to the walker.

He tells something of the development of interest in mountains, he philosophizes on climbing—"sport or religion?"—he tells of the growth of appreciation, of the personality of mountains, of solitary climbing—"virtue or vice?"—and describes the pleasures and pains of climbing in a chapter which will recall to the reader some of his own experiences. We all get into a fighting mood when we contemplate the desecration of our wildernesses; and so does Richmond. We would thoroughly agree with his remarks that the proposals of the North Wales Hydro-Electric Scheme in Snowdonia are a scandal and a shame, and not even based on sound economy.

A few supplementary chapters at the end of the main book serve as a useful descriptive guide to the different climbing districts of Britain—Wales, the Lake District, the Pennines and the Peaks, the rest of England, and the Scottish mountains. The many photographs throughout the book add greatly to its interest.

The book is "written in the conviction that the mountain-trail is a way to the good life and that it can be followed here in Britain as profitably as anywhere else in the world." Hills or mountains, there is much to be found on them (anywhere in the world) if one knows how to look for it, and anyone who lacks that ability can be shown a way (prickly though it is in spots) by reading this one climber's testament.

H.T.P.

THE STORY OF MOUNTAINS. By Ferdinand C. Lane. Doubleday and Co., Garden City, N. Y., 1950. 488 pages, photographs. Price, $6.50.

Mountains are large, and the story of mountains is a long, long story. Dr. Lane has brought between the covers of one book what the blurb on the jacket says is "everything there is to know about mountains." That is rather unfair, because Dr. Lane, I am sure, would be the first to say that would be impossible. It is a long, long story to put into one book. The preface says it is "not a romance for uninterrupted reading. Rather, it is a digest of the thousand romances which invest the most imposing features of our landscape . . . the whole an attempt to recount the Story of the Mountains: their origin, their structure, how they affect the global climate and the development of life, and their manifold influences upon human affairs . . . ." Dr. Lane has succeeded in bringing before the reader the outstanding facts about mountains—their formation and structure; the mountain ranges of the different continents; mountain flora and fauna; mountain habitations; and mountains in history, art and legend—illustrated throughout by many photographs. Mountaineering, and some of the more notable climbs and tragedies are also included, but why the chapter on "Climbing Thrills" is

not placed at the end of the book with that on "Crafts and Skills of Mountaineering," instead of appearing as chapter 3 between descriptive sketches of various mountain regions, and chapter 4 on "Our Unstable Earth," seems a bit inexplicable.

Indeed, the whole structure of the book seems erratic and rather poorly assembled, with too many isolated notes jotted down, so that one becomes confused as one jumps from Asia to Africa to America. The author has collected innumerable facts on every phase of mountains, but there are too many. It is full of information and interesting stories, but it is too full; for though it is a big book—too big for comfort—the story is too big for the book. H.T.P.

ROCKY MOUNTAIN NATURALISTS. By Joseph Ewan. University of Denver Press, Denver, 1950. 358 pages, portraits. Price, $5.00.

A Rocky Mountain naturalist himself, Joseph Ewan has been able through knowledge of the region to bring together a valuable group of biographical material on some of the naturalists most closely identified with the Rocky Mountains.

Beginning with a thumbnail historical preview to familiarize the reader with the background for collecting and research in these mountains, the author follows with biographical sketches of nine of the leading naturalists. Colorado's first botanist, Edwin James, and also the first white man to ascend a 14,000-foot peak in America (Pike's Peak), who came to Colorado as a member of Major Long's Yellowstone Expedition of 1820, is the subject of the first biography. There follow, somewhat chronologically (as there is a good deal of overlapping of dates), sketches of John C. Fremont, Charles Christopher Parry, Edward Lee Greene, Thomas C. Porter, Harry Norton Patterson, Marcus E. Jones, Eugene Penard, and Theodore Dru Alison Cockerell. The book is really a regional guide to the naturalists of the area; who they were, when and where they lived, and what they did to advance the biological sciences in the West. Following the biographies is a roster of natural history collectors, who were connected in some way with the Rocky Mountain region. It is both biographical and bibliographical, and should be of great use for reference. Mr. Ewan has done an invaluable service in gathering together this information, as some of these names are little known, and would be forgotten perhaps in another fifty years.

It is interesting reading, even for one unacquainted with the region and the men, as it gives a picture of the special work done by each one of these men, how he did it, and its relation to the scientific world of that day. A map would add to the interest and understanding of the region. H.T.P.

ERRATA

In his Mount Deception story, Bradford Washburn meant "lowery," not "lovely," in his description of a sunrise on page 98. He did not have a "double prime" rope on page 103; the double prime was a misunderstood communication from editor to printer, calling for a " instead of "-inch." And we learned eight hours after the form was off the press that a more recent survey has transposed ten feet in altitude from Silverthrone to Brooks (footnote on page 104). But all credit to the printer! Page proof of the article was airmailed to Boston seven hours after the manuscript entered the shop. Ed.