Glen Canyon, near Colorado River at Driftwood Canyon by Philip Hyde

Remembering Glen —
and the Last Great Canyons
of the Plateau Province

SIERRA CLUB BULLETIN

December
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Sierra Club Bulletin

The man who stayed behind
so that the traversing party might move faster,
tells an incredible story of his own.

The Traverse of Mount Everest

By Richard M. Emerson

Opening the *American Alpine Journal* several months ago, I began reading a detailed account, pitch by pitch, lead by lead, of a fine mountain ascent. But the words I read kept sending my thoughts back to Mount Everest, particularly to its West Ridge, where I had lived so long and so intently. My mind took off on disconnected sidetracks—into the confinement of the Western Cwm, to the free space of an unbounded view down the length of the Rongbuk Glacier, to the wind-cleaned rock that blended dark into yellow into gray, and to the serenity of Yak pastures and the ripple of Buddhist prayer flags. These are just a few of the many Everest sensations and experiences that still crowd into my mind. There are so many and they come so fast that I wonder if I can produce an organized account of them. But then, was the expedition itself an organized affair?

Many people have seen this multiple ascent as a masterpiece in organization, some with admiration and some with a touch of deprecation. We had supplies by the tens of tons, dollar value in the hundreds of thousands, and science as never before. Of course it was an organized affair! Without preplanning measurable in man-years we would still be sorting boxes in Katmandu! With such potential chaos resulting in such "obvious" success, some at home have pictured the climb as if it were

a concerto played by a full orchestra, with composer, conductor and all sections performing from a score.

This musical analogy may fit in part, but as a member of the ensemble it looked to me more like a jazz combo performing without a score, but creating music nonetheless. At times we were two groups playing different tunes. The ascent of Everest, much like any jazz performance, combined tradition with innovation without ever knowing how it would end or exactly how it would get where it was going. In short, it was mountaineering as any mountaineer would have it.

As always, there was the approach march. And, as always, there were pauses along the way. Maynard Miller sat on a rock (". . . schist, mostly, but notice the trace of crystalline gneiss. Now, if you look . . ."). A few yards downstream, Jim Lester sat on another rock, dusty socks in his lap, bathing his blisters in a pool. Sprawled out on the sand behind him, Dr. Gil Roberts relaxed in his own tense manner, as though waiting for Jim's blisters to get on with the healing. ("Don't knock it, man, moleskin is one of my best sellers.") Meanwhile, Corbet and Unsoeld were already in the pool, and Jake was undressing as we arrived.

We traveled at a personal pace in twos or threes, or alone if we pleased, along the Nepalese trails. By mid-day the army of burdened bearers, Sherpas, and sahibs had broken into many small bands scattered along miles of ancient pathways, or coiled up in the shade of traditional resting places. Hornbein and I were moving with a group of Thamang porters, two or three porters back from Dingman, when we saw a yellow pack beside the trail, then Miller on his rock and the poolside gathering below him. We dropped our loads and started removing our boots as Jake dove in. Our psychologist, Jim Lester, known affectionately as "Sigmund," looked a little beat, but he was on the job. I'm sure he "observed" that Dingman settled down beside Gil, and Hornbein joined Unsoeld (and Barry and Jake) in the pond.

After some time of merriment, an hour for some, a few minutes for others, we filtered back to the trail. Siri was pacing along under a load ("heavier than most," Gil observed), and we stepped in behind him. Maynard fell in behind me as the trail led us toward a shelf (". . . an old lateral moraine; the second glacial period, as indicated by . . ."). A quarter of a mile on we found Sigmund setting up to photograph a flower. His lens cap was on.

I remember that pool in sharp detail, but I can't say which day it was. The details change, but the theme was the same for a couple of weeks

See picture facing page 21 for full names of expedition members.

of marching. There is no reason to make a foot race out of the approach, for one is not likely to get a second chance to enjoy the people and the terrain of wilderness Nepal. Every twist of the trail brought a new experience. The mood was excitement, yet it was also the last word in relaxation.

On a high ridge top, bamboo shoots placed among the rocks reached still higher, each lifting up a prayer flag to dispatch its protective message on the breeze. Bishop and Breitenbach sat nearby with the binoculars. "See if *you* can spot a route," was Jake's challenge, handing me the glasses and pointing toward Gavrisankar. Others joined us, like little children excited by the game. After studying the splendor of Gavrisankar, I moved the glasses to the right along the Himalayan profile, but I couldn't see it. Like a phantom Everest stayed in hiding. Out of sight, but never out of mind, it gave our recreation an earnest tone.

When Bishop and I arrived at the breakfast stop later that morning, Corbet was, as usual, pioneering another route on a nearby boulder. Others stood by awaiting their turn, offering advice, encouragement, and amazement when he figured out the pitch. The play and games of children in all societies are an important preparation and rehearsal for real life, and so it was with us on these occasions. Few of us left such games-along-the-way until we had climbed every boulder route. I think Jim Lester could have studied these playtime antics and made some meaningful predictions about events to come.

NAMCHE BAZAR is a turning point: you leave the eastward up-and-down and are soon in the heart of Sherpaland. From a small hill, you look down to the left on this historic Sherpa village, a view in itself worth holding forever. But like a compass needle your gaze *must* swing northward and come to rest. You stand in the morning sun, and beneath you, cultivated terraces drop away abruptly into a shadowed blue gorge. If you lift your eyes slowly, the view sweeps away up the gorge, until at eye-level it comes upon the Thangboche Monastery, suspended over the dark ravine on a promontory high enough to catch morning light. Then, beyond and far above the monastery rises a massive white barrier; Lhotse and the great southern wall of Nuptse. Only the summit of Everest breaks the final skyline from behind that barrier, with its

Combat veteran of the U.S. Mountain Troops and long-time member of the Sierra Club, **Professor Richard M. Emerson,** social-psychologist at the University of Cincinnati, makes his fourth notable contribution to the *Bulletin*. World War II combat in the Alps, and climbs on the Mount Moran Buttress and Masherbrum were his earlier topics.

wind-plume streaming straight at the morning sun. Nuptse, Lhotse, and Everest! These are our announced objectives, and all three now rise before us. But there is another objective.

Months before leaving the U.S., Norman Dyhrenfurth was visiting Dick Pownall in Denver. Norm mentioned a far-out notion of an Everest traverse—up via the Col route and down the West Ridge. By the time our group assembled on Mount Rainier, many of us were buzzing with speculations about the West Ridge, but since open discussion had to be postponed, we made a point of keeping these ideas to ourselves. Our first official confrontation with the idea came in a strategy meeting early on the approach march.

A traversing descent of the West Ridge was rejected outright. Within a few hundred feet, a descent party would be irrevocably committed to totally unknown terrain. Furthermore, conventional techniques of alpine descent just don't apply to such a situation. It isn't possible to simply rappel out of difficulty. Hence, it would be suicidal to start a Western descent unless receiving camps were manned *very high* on the West. And if such camps were put there, why not ascend from the West? Why not traverse from West to Southeast? Only the mountain could say no to this plan, so we decided to give the mountain its say. Our plan: put a reconnaissance of the West Shoulder early on the agenda; make a solid effort on Everest via the South Col, including Lhotse in that effort if possible; attempt Everest from the West also, if the reconnaissance so suggested; and try a West-East traverse if the *timing* was right.

Overly ambitious? I had begun some preliminary logistic planning before we left the States, and Tom Hornbein and I continued to refine the figures, drawing others into the process as we went along. (One evening on the approach march, we were sitting in ourt tent: "O.K., four men for three days at Camp 5 (allowing for bad weather stand-fast); two bottles each for assault; one bottle per two-man-night for sleeping; four bottles 'emergency.' That gives $8 + 6 + 4 = 18$ bottles at about 13 pounds each."

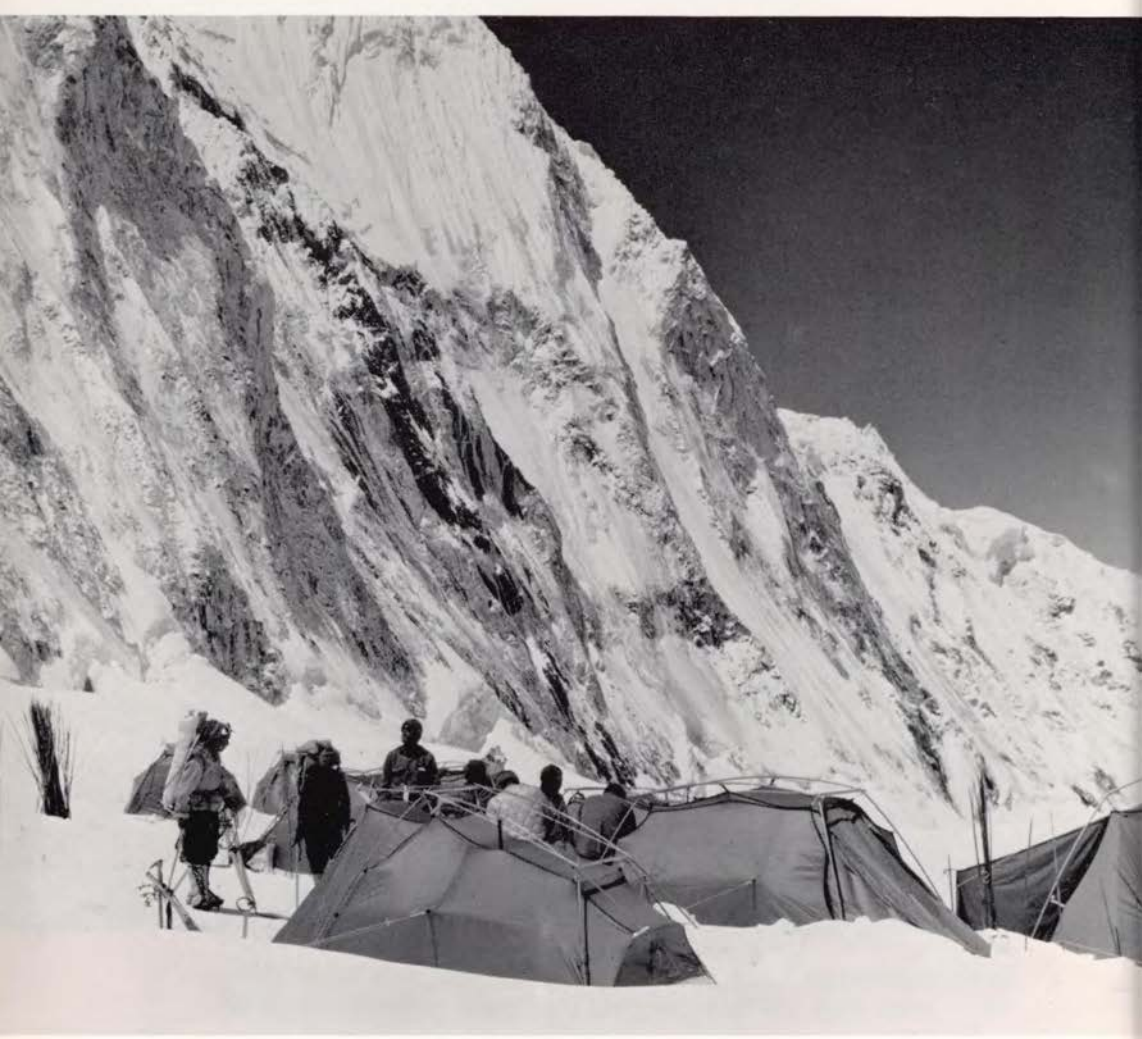
"Hold it! Three days of 'stand-fast' and those guys have had it! Add six more sleeping bottles for a second try. Then a traverse party will need O_2 if they get over the hill. Add two more, makes 26 bottles at 6.

"My God! You know how many carries that'll require from the Col? And the carriers on oxygen! And that means carries *to* the Col?"

"Man, that's exactly what we're figuring. . . . Keep going, and we'll work our way down to Base Camp. Then we can see if we have all the stuff, and the time and men to haul it."

Although they had climbed 7,000 feet from Base Camp to reach Camp IV (24,900 feet), members of the South Col team still had the most arduous part of their assault ahead of them. Perhaps they thought of this and what they had already climbed as they viewed the clouds and peaks spread out before them in the evening sun. Cho Oyu (26,750 feet) is in the distance, right-center. Pumori (23,410 feet) is the small pyramid in front of it. Photograph by Norman G. Dyhrenfurth

Mount Everest, 1963



Near the walls of Nuptse at the foot of the Western Cwm (21,350 feet), the expedition's Advance Base Camp, Camp II, was established. Through this vital nerve center, the efforts of the West Ridge and South Col teams were coordinated. Photograph by Norman G. Dyhrenfurth

In the shadow of Nuptse, an expedition member uses a wire ladder to climb a wall near the uppermost limit of the icefall. Photograph by Maynard M. Miller

The way to Advance Base Camp lay over the Khumbu Icefall, a frozen cascade that moves imperceptibly downward between the West Ridge of Mount Everest and the cliffs of Nuptse. Sherpa columns crossed and recrossed this treacherous ice terrain, each time risking death from a sudden avalanche or upheaval. It was here that Jake Breitenbach was killed. Telephoto by Richard Pownall.

Lingtren
(21,792 feet)

Khumbutse
(21,785 feet)

Changtse
(24,720 feet)

North Col
(22,916 feet)

From an altitude of 20,000 feet on the southeast spur of Pumori, Norman Dyhrenfurth took this panoramic sequence of Mount Everest and its neighboring peaks.

Everest
(29,028 feet)

South Col
(26,201 feet)

Lhotse
(27,890 feet)

The west shoulder of Everest is the snow-capped triangle beneath the summit peak. Between it and the summit lies the west ridge. Base Camp was at the juncture of the two arrows.

Nuptse
(25,850 feet)

At Camp VI (27,450 feet), the men who made it to the top of Everest by the South Col route had their last chance to bivouac and take a long and lofty look at the Himalayas. One such look was toward Makalu (27,790 feet) on the right, and Chomo Lonzo (25,788 feet) on the left. Photograph by Norman G. Dyhrenfurth

But the most desired view—the goal of a vision born many months before —was the summit pyramid of Everest. Camp IV-W (25,100 feet) was located at the end of the snow ridge near the base of that rocky pyramid. From it the West Ridge team went on 2,000 more feet to Camp V-W and then to the summit and the extraordinary traverse to the South Col. Photograph by Willi Unsoeld

Everest team; *back row,* left to right: Dan Doody, Norman Dyhrenfurth, Lute Jerstad, Jimmy Roberts, Gil Roberts, Jim Whittaker, Willi Unsoeld, Dick Emerson, Barry Prather, Tom Hornbein. *Front row,* left to right: Barry Corbet, Al Auten, Jim Lester, Maynard Miller, Jake Breitenbach, Jim Ullman, Dave Dingman, Dick Pownall, Will Siri, Barry Bishop. Photograph by Barry Bishop

Author Dick Emerson.
Photograph by Norman G. Dyhrenfurth

Meanwhile, the very British Jimmy Roberts, an old hand at this sort of thing, sat grinning softly, not saying much. We could almost read his thoughts: "Bloody ambitious, these young Americans. . . ."

We went on endlessly, adding in food and fuel; loads *to*, consumption *at*, and loads *from*, each hypothetical camp and dump. Just how valuable these calculations were is quite doubtful, for once we got started we just "sent stuff up the hill," guided by radio requests for the most part. But the calculations did have two important results: they gave us an over-all sense of where we stood in relation to our objectives, and they specified exactly what supplies to funnel off to the West Ridge—the necessary minimum and no more.

Such logistic forecasts, however, left an all-important question hanging: would it be feasible to push a Col ascent and a West Ridge effort simultaneously, without jeopardizing success on the Col route? Concerning supplies, the figures seemed to say yes, but what of manpower? Those of us most interested in the West side thought the figures said yes on manpower also—but the stakes were high, and the figures were based upon many untested assumptions. Assuming the Western reconnaissance turned out well, we could give the West Ridge an honest chance, "possibly" weakening the Col chances by doing so, and "possibly" ending up with across-the-board failure or double success. Or we could give ourselves maximum assurance on the known and tested Col route, and then shift our remaining strength to the West Ridge, where even a good reconnaissance would be a worthy contribution. We did not squarely confront this choice until after the recon, when it was resolved the cautious way.

Thus, the stage was set for a tantalizing shoestring climb on Everest's unknown side.

As expedition strategy crystallized, each of us now had to confront our own motives and aspirations and fit them into expedition plans. Of course, one can say "I'll go where I'm needed"; but can summit ambitions and mountaineering enthusiasms be written off that easily on a mountain like Everest? Many were asking themselves a question that Dave Dingman put candidly into words: "Would you rather fail somewhere exploring the West Ridge, or reach the summit by the South Col?" The question was oversimplified, for success was *far* from assured by the Col, and we did not *know* we would fail by the West Ridge. Even so, that was clearly the way the deck was stacked, from March 11 at Thangboche until May 22, when it all became part of history. As events unfolded during that time, I'm sure Jim Lester had a field day watching people wrestle or rationalize their way through Dingman's question.

By the time we reached Thangboche and began acclimatization, parties had temporarily formed. The Western contingent would include Willi Unsoeld as leader, Jake Breitenbach, Barry Corbet, Barry Bishop, Dave Dingman, Tom Hornbein, and me. The Col route would be led by Norman, with Jim Whittaker, Lute Jerstad, Dick Pownall, Will Siri, Gil Roberts, and Nawang Gombu. In addition, Norman provided over-all expedition leadership, with Will Siri's help and counsel. Al Auten, Maynard Miller, and Barry Prather might be tied up to an unknown degree in communication and glaciology. When freed from these demands, they could take part in one or the other climbing contingent. Finally, Jimmy Roberts and Captain "Noddy" Prabakher Shumshere J. B. Rana would handle (and handle well) the immense task of coordinating Sherpas and supplies for the entire endeavor.

ONE mid-morning at Thangboche, Al Auten, Jake Breitenbach, and I set out for a short warm-up climb on a little rock peak in the foreground of Kangtega. It would be "just a hike," but we took rope and axes anyway. We soon wished we had put hardware with our lunch.

Jake and I took the ends and Al the middle, when we roped up on snow-covered lichens on down-sloping rock. The climbing grew more delicate with each lead. With no protection, and with no means of fixing rappel points other than lucky improvisation, we chose to retreat while we still could. I was greatly impressed with Jake's combination of skill and caution. In a letter to Pat that night, I described the events in some detail, for the express purpose of reassuring her of "the careful attitude with which all of us approach this task." She received the letter a few days after the cablegram announcing Jake's death.

By March 20, one month from Katmandu, Base Camp was fairly well established. We chose to cut short our planned stay at Pheriche and acclimatize while working the icefall, giving us a valuable time jump on the mountain. In general, this plan paid off, but in my own case it was a mistake, for I acclimatize more slowly.

In the early afternoon of March 23, Corbet, Hornbein, Lester, and I were a few miles down from Base. Barry Prather was up on the moraine near us when he saw and heard an avalance near the icefall. He called down to us to tune in on the radio and see if there was any trouble. Tom picked up the walkie-talkie and tuned in on the middle of communication between Auten at Base and someone in a "rescue party." When Tom managed to break in, we were informed by Al that Jake was "missing—presumably dead." Barry and Jake had been lifelong and exceptionally close friends and climbing companions. As tears formed in Tom's eyes, Barry wandered off to be alone. I have no way

of knowing what my feelings were at the time, but in subsequent hours and days I became as much angry as mournful.

We had planned from the beginnning to put no permanent camp in the icefall for obvious reasons. An intermediate dump would be used until the route was secured, and then carries would go straight through to Comp 1 in the mouth of the Cwm. The day before, a route had been found through the lower icefall to the dump site. The next task was to consolidate that route for carries. Pownall, Ang Pema, and Breitenbach were the first rope; Gil Roberts and Ila Tsering the second. Near the crest of the first step in the icefall, the first rope was putting in a fixed line rising from under a huge sérac. Pownall was at the top, Ang Pema was joining him, and Jake was fixing the bottom end when the sérac fell, as part of a more general relocation of ice. Jake was immediately crushed and buried under at least 50 feet of very hard blue ice. Dick and Ang Pema came down with the sérac, but not fully under it. When the ice settled, Ang Pema was buried a few feet, head down, with a skull fracture, severe facial lacerations, and other more minor injuries. Dick was pinned under an ice block pressing heavily on his chest. Gil and Ila Tsering had been tumbled down in the general movement, but were unhurt. They climbed up and freed Dick, heard Ang Pema, and dug him out. But from Ang Pema the rope plunged full length down into the ice. Their immediate judgment was that Jake could never be reached, let alone saved, and this appraisal was confirmed by the rescue party that came up from below.

The next days in Base Camp were mournful ones. They began with a meeting, all members present, and the events were recorded in detail. Among the things Jake had particularly appreciated during the approach march were the huge glacial boulders engraved with Buddhist prayers. We decided that a proper memorial could be similarly engraved, and arranged to have local stone cutters fashion a monument in Jake's memory.

We had grief to cope with, and also fear. The first reaction of some was "Let's climb the thing the fastest way possible and get the hell home." Some voiced apprehension, localized to the icefall, "I'll go through it twice, once up and once down, and that's all." Others may have felt it, but didn't voice it. Some seemed to prefer solitude; others appeared to abhor it.

Sometimes, when by myself, I felt cheated. The more I knew of Jake the more I wanted to know; and it seemed so damnably unfair! The mountain hadn't played according to the rules. Surely, it should have allowed us to bury our own in our own way, but it left only absence for us to mourn. A few days before, Jake and I had somehow switched

air mattresses, and now his mattress, signed "Jake" with an ink-felt pen, was the only physical reminder. In the confusion of subsequent weeks, it moved to other hands, and I never saw it again.

But these were all first reactions. When it came to the expedition's purpose, Norman observed that unless he misjudged the caliber of the group, we were set upon proceeding.

What of the West Ridge? Could we climb it without Jake—and should we? Some felt we had not only lost a man, but many might have lost the will for such luxury climbing. Corbet told us that he was definitely recovering that will. Unsoeld did not view it as climbing the West Ridge *without* Jake—it was climbing it *for* Jake, and we were on our way! Jake had never been touched by that conflict regarding routes. For him, it was clearly the West.

A HIGH VERTICAL ice wall crossed the entire gap leading into the Cwm, marking the spot where the glacier made its major break to begin its tumbling descent. The base of this wall was a gaping crevasse. Thus the Cwm was guarded both by moat and by barricade. Twenty-four feet of aluminum ladder spanned the crevasse, and leaned against the wall halfway up, as in classic medieval warfare. Above the ladder, cut steps and a hanging handline rose steeply through a gap cut in the overhanging crest of the wall.

Camp 1 was twenty minutes and a zig-zag course beyond the wall. That morning, Dick, Tom, and I were going down to the wall to cut the upper gap deeper. It was too steep for burdened porters. Breakfast was over and we were ready to go when Dick asked for twenty minutes delay. Twenty minutes later we were roping up when the thunder started: as we watched, ice blocks tumbled, starting near the crest and moving back toward us in reverse domino sequence. We stood with crampons firmly planted and knees flexed, waiting for our block to join the chain reaction; it didn't even quiver, and our faith in Camp 1 was restored. But to Dick, this was terrifyingly familiar in sight and sound. He had experienced a trauma that only a climber can comprehend when he untied from the rope joining him with Jake. For the second time, an inexplicable fate had spared him, this time in the guise of a twenty-minute delay.

Portions of the route down to the ladder now lay in chaos. Tom and I spent the day rebuilding the route, and next day we moved up to Camp 2 at 21,300 feet, our nerve center far back in the Cwm.

Moving up the Cwm for the first time was like returning home. We had seen so many photos of this region that everything was familiar.

In a way, this was a disappointment, and I could well imagine the intense excitement felt by its first explorers. Only the north wall of Nuptse was strange and new, rising on our right—a fantastic series of rock and ice flutings that converged toward the late morning sun. The wall held no snow, and its ice had a silver luster in the sun as though rubbed with steel wool.

Approaching Camp 2, Tom and I paused to survey the West Shoulder of Everest. It confirmed what photos had suggested.

"Look at the couloirs emptying onto the shelf. Wonder how wide that shelf is? There'll be surface slides there for sure."

"Yeah, but they're predictable. We can't put a camp there, that's all. The intermediate dump we figured on was right."

"I wonder how we get off the shelf?"

"If we can, we have a clear shot at the West Shoulder. It *does* look as if a winch can be used about where we thought."

"But, my God, look how far that puts us from the main mountain! That arête must be two miles long. And it's high."

We hiked the last ten minutes to Camp 2, and took up life among the goraks, those strange black birds that followed our camps to scavenge. As Dan Doody put it, "They look like crows that didn't quite make it." Jim Lester conducted the highest opinion poll ever taken, finding that the group split down the middle on the goraks. Some thought they were a gloomy nuisance. Others, including myself, were on the gorak's side—they were the only creatures around, save Doody, who were clearly having as much trouble acclimatizing as I was. Their feathers were wildly disheveled, their eyes blurry, and they couldn't keep their wings from dragging. Their cry was a harsh "Gor-a-a-ck," and I knew exactly what they meant, for I couldn't keep our food down either. But it was all either of us had.

Along with the goraks, Lester and Gil Roberts were exceptionally loyal residents of Camp 2, living at 21,300 feet for five and six consecutive weeks, respectively. At this mountain nerve center, Gil administered to our physical needs (well, most of them), while Sigmund studied our emotions and put our minds at ease.

A West Shoulder reconnaissance was first on our over-all agenda, for major issues hung on its outcome. Tom and I had planned the movements and logistics for a seven-day recon in great detail. The required equipment had been earmarked at base and sent up to Camp 2 among the first carries. When we set it aside for that purpose at 2, Lute and Big Jim, who were about to begin work toward the Lhotse Face, thought we were hoarding material for the West, drawing it away from the Col route. I'm afraid our single-minded attention to the West Ridge

helped develop this impression. It was a small misunderstanding, easily straightened out. However, it was a first sign of a pattern that was to grow between the Col and the West Ridge groups. Almost unavoidably each group provided the other with a ready object for inevitable irritabilities, whatever their source.

Unsoeld, Hornbein, Bishop, and I were scheduled to make the reconnaissance. However, my strength was not returning fast enough from my acclimatization sickness, so Dingman took my place and I listened eagerly to their progress reports at the Base radio. For added entertainment there was the evening contact with Bill Gresham in Katmandu. Through Bill we had contact with Jim Ullman. We did not need to read between the lines to feel Jim's eager encouragement at the other end. He was truly with us, and we were very grateful; but it must have been very painful for him, even at age 57, to remain in Katmandu.

Trapped there at Base, I felt a little of the same pain, as did Maynard with his foot, broken by a falling boulder. The recon was not proceeding well. The party had reached the shoulder in two stages, stopping at 23,800 feet in a camp to be called 3W, but weather had blocked much further effort and nearly all visibility. I was feeling no better and no worse, so, with foolish impatience, I rushed back up.

By the time I reached 2 the recon party was about to give it up, but we could hear Willi, talking on the radio, gradually talk himself into one more try along the two-mile arête. There was just enough oxygen for it. The weather next day was good, and three of them reached 25,100 feet where the shoulder joins the main mountain. There they found a beautiful site for the future Camp 4W and returned to advance Base feeling better about prospects.

THE RECONNAISSANCE ended in an appraisal: the West Ridge was worth a good try, but it would be a tough task. The rock high up formed a huge question mark, and the whole thing would be logistcially difficult. Will Siri had felt all along that a 50-50 split of personnel between the two routes could jeopardize chances on the Col route. Policy had to crystallize at this point, and Norman decided to pour our carrying strength into the Col route first. When that attempt had been completed, we would swing our strength to the West Ridge. But would there be any strength left to shift?

Meanwhile, the reconnaissance was costly to the West Side effort in another way. Dave Dingman had not felt well during the recon and sensed possible difficulty getting along with Tom Hornbein. With admirable honesty and candor, he decided to shift to the Col route, where

he felt his services could be of greater value (and in subsequent weeks he proved it dramatically). Similarly, Barry Bishop was having second thoughts and came to our tent to confer with Norm. The West Ridge route, to him, looked like a slim possibility; he was feeling healthy, and he felt it was especially important that he reach the top with camera if possible; hence, he asked to join a summit team on the Col route. Norman agreed.

Thus, the West Ridge lost two men. Since my health was in doubt, we were down to three and a half of the original seven. Al Auten broke free from communications and came to our rescue, making it four and a half men.

The next two weeks were devoted largely to supply build-up on the Lhotse Face and the South Col. On April 16, Pownall and Jerstad forced their way into the Col, the first time this 26,200-foot wasteland had been reached before May. Thus time was clearly on our side, but we would need every second of it if hopes for the Western route were to be realized.

During this build-up on the Col route, the West Ridge party had to do what it could to stay in the act and prepare for a later push. But what could it do? Tom was particularly persistent in his single-minded devotion to the Ridge. I do not exaggerate: he devoted every ounce of his daylight energy (and he had a lot of it) to planning logistics, organizing loads, and cornering occasional spare Sherpas to make carries to the Western dump. At night he and others lay awake reviewing and revising camp requirements, oxygen minimums, and winch strategy on the West Shoulder. While most of the Sherpas were making carries toward the Col, we would have to rely on winches on the West Shoulder. Thus, the Western build-up was put in precarious dependence upon a gasoline winch engine and fall-line routes for winch sleds.

The engine was not dependable, and fall-line routes were most inconvenient. The result was unavoidable logistic confusion, frustration building upon frustration to crescendo proportions. The West Shoulder build-up was really a jazz performance. Tom's persistent planning and Corbet's capacity for sheer, unrewarding *work*, were mixed with Al's mechanical ingenuity and Willi's soothing voice. It took all of these and a big dose of innovation to pull it off.

The route formed a huge figure S. Starting from Camp 2, it moved up the Cwm, then doubled back on an avalanche-swept shelf. It traversed along this shelf in a down-Cwm direction back beyond 2, losing 300 precious vertical feet in the process; then it continued to traverse off the shelf with a fixed hand-line on steep ice and finally rose to a near fall-line climb to Camp 3W at the top of the S.

The Dump with temporary tents was placed on the shelf at the base of an avalanche cone. Only strong carriers could get their loads any farther. Supplies at this dump had to be moved to the New Dump beyond the fixed rope, where a winch line started. This winch would move supplies up to the New-New Dump, where they would be shifted to a second winch line ending 100 feet below Camp 3W, at 23,800 feet. Sounds very simple. Start the engine, and zip, up goes the sled with 1500 pounds of foods, fuel, and oxygen—at five linear feet per minute. Of course, the cable is not a true fall-line; if the sled drifts to the left it will be in that bergschrund; and if we lose a sled load we can turn around and go home like sane adults!

Corbet and Auten reached 3W exhausted and the next day started their winching operation in a blizzard. The self-winding starter cord failed first, and the whole damn engine had to be disassembled. After four days of prime—pull—pull—sunovabitch—pull—they were forced down. I fashioned a base for the cumbersome but reliable hand winch, and Willi and I went up with Tashi and Nima Tensing. We installed the base at the New-New Dump and confirmed that (*a*) it would work, and (*b*) it took four men in shifts to work it. Tom brought Corbet up and took Willi down, and Barry and I continued our work with Tashi and Nima.

Our task was to clean out the Dump by moving loads to the New Dump, hand-winch a sled load to the New-New Dump, move the winch, and haul a sled to 3W. As we returned to the temporary tents at the Dump the first afternoon, a heavy snowfall was beginning. We watched it for a bit and made our decision: pack up and start down before a surface slide built up above us. By the time we climbed the 300 feet up to start our swing down to 2, the snow stopped and we decided to stay. Old Tashi just shook his head—"These crazy Sahibs can't make up their occidental minds!"

Working with Tashi was a special pleasure. At 52, he was one of our oldest and most experienced Sherpas and was genuinely fascinated by the West Ridge idea. He had a large English vocabulary but put words together in incomprehensible combinations. He loved to talk, while absent-mindedly peeling skin from Tom's perpetually burnt nose, and we loved to listen to him. I think he took a genuine fatherly attitude toward some of us.

The four of us got one sled hand-winched to the New-New Dump, using an ice ax as a snatch block to avoid the bergschrund. When the sled was almost clear, the cable flung the ice ax off into space, but as the sled drifted over toward the true fall-line it looked as if it would come in above the 'schrund. As I watched it climb, it inched closer and

closer, then broke free and rolled in a pendulum-like swing right into the 'schrund, where it hung free. Barry and the Sherpas continued to winch, and I watched near the 'schrund, holding my breath as it rose to the lip, skis down, and went on its way. The only piece of good luck we had!

We reset the cable above and moved the hand-winch up to 3W, meanwhile informed by Willi that four more Sherpas had been obtained to give back carries from the dump. Great! Tomorrow we *would* get supplies to 3W! We would dig the engine out of the snow and clean it up. If the power winch didn't work we had the hand winch at 3W and four men to work it. Even better, as a final guarantee, we had four Sherpas bringing up loads.

We were to need more than a guarantee. Several hours of work, and still the engine wouldn't run. Nima Tensing fell ill that evening and three men could not work the hand winch long enough. The four Sherpas who were coming with supplies never arrived. They had reached the Dump tents at 3:00 P.M. the day before in a light snow fall that continued as they fixed tea. Around 4:00 P.M. the slope above gave way and a surface slide swept away the camp—tents, Sherpas, and all. The four of them came to rest tumbled up in a tent, and buried a foot or two beneath the surface. They cut through the fabric, surfaced, and then returned to 2 without axes or crampons.

Thus, Barry and I had our previous judgment dramatically confirmed. We all came down to 2 with very little to show for a week's work, while Al came up from Base with a new engine. This one worked.

MEANWHILE, things were happening on the Col. While Barry and I were on the West Shoulder, we listened intently to the radio contacts, for it was May 1, and the first assault party was in position. The weather had been marginal that day, and we assumed the assault party (Whittaker and Gombu, with Norman and Ang Dawa) would be in stand-fast at Camp 6. Then we heard that Jim and Gombu had pulled it off safely! Barry and I were elated, but when we conveyed the news to Tashi and Nima, they seemed unconcerned. I still don't know why.

The new winch engine worked once in a while, and with the Col effort complete for now, we had a little more Sherpa carrying power. Within a week or so, the lower Dump, New Dump, and New-New Dump were moved up to 3W and we were getting into position. Nine Sherpas had been found by Jimmy Roberts to help us out, and they were ready to move with Tom and Willi on a crucial carry, up the two-mile arête from 3W to 4W at 25,100 feet. Barry and Al would take a second carry the

next day. I was at Camp 2 at the time; I would move up to 3W and on to 4W with the last carry, while Willi and Tom (or someone) would look around above for a 5W site. The fifth camp would be supplied, and from there we would just have to find a sixth camp suitable for launching a two-man assault. The logistics were worked out in detail, but the route and terrain were a completely open question. It would be either up the "Hornbein Couloir," far out on the Northwest face and terminating somewhere in the Yellow Band; or it would be "Jake's Couloir," starting out on the face and rising back to intersect the true West Ridge.

We could send an assault on May 20, if the next week or so gave perfect conditions. If history were any precedent, the mountain itself might give us until the end of May. Bishop and Jerstad were at Base Camp readying a second Col effort, with Dingman and Girmi Dorje in support. Given proper timing, they might still find a traverse possible.

Time and timing were the critical issues. A radio contact recorded on May 10 demonstrates how events were converging.

2 (Gil Roberts): The thinking up here is that Bishop and Lute should postpone coming up by a day because the West Ridge is running a day behind, and Lester wants to shrink them before they leave . . . over.

Base (Prather): They're looking for a summit date of the 18th, possibly 19th. They can't delay any more. When is West Ridge planning summit attempt? Over.

2 (Gil): The 20th. Over.

Base (Prather): That's too late; and too bad! Barrel (Bishop) and Lute are just about going to have to go up tomorrow. Over.

2 (Gil): This means they won't form any support for the West Ridge party. And people are wondering *why!* Over.

Base (Prather): The porters are coming the 21st and we're leaving Base Camp the 22d. Over.

2 (Gil): Basically, I'm not in the mood to get in the argument. Why don't you talk to Hornbein? Over.

Base (Prather): They just say they're coming up tomorrow. Over.

2 (Tom): O.K. The only conditions under which we can hit the summit on the 19th or 20th are if we do not lose any more days because of weather. In other words, *perfect* conditions. Is this clear?

Base (Prather): Roger, Roger. Gotcha. It's just that the time is running out. Over.

2 (Tom): May I talk to Norman, please?

Base (Prather): Roger, he's listening. Go ahead. (Norman was suffering serious laryngitis and could not take the radio.)

2 (Tom): O.K. We realize time is running out, but we envisioned there were a few more days beyond the 20th or 21st, so far as summit

attempts by our route are concerned. And even though this might retard at least part of the exodus from Base Camp, we would hope that we could pursue our attempt beyond the 20th or 22nd of May. How do you read that? Over.

Base (Prather): Only comment is, there are 300 porters coming in here the 21st. Over.

2 (Tom): Well, I guess we'll see you in Katmandu then. Are we gonna have any support for our traverse, if we happen to get that far, and it happens to be later than the 20th of May? Over.

At this point Maynard Miller broke in at Camp 1, and talked about batteries and kerosene, as though to give people a chance to think. Then:

Base (Bishop): Ah, Maynard, stand by. Tom, do you read me? Over.

2 (Tom): Yes, I do, Barrel, fire away.

Base (Bishop): Right-O. Lute and I will delay another day, then spend one day at Camp 2, meaning that the first possibility of hitting the summit via the Southeast Ridge would be the 19th, and we may be able to give her a go on the 20th. How does that tie in with you, Tom? Over.

Discussion was resumed the next morning, May 11.

Base (Prather): Lute and Barrel don't want to delay too long. Also, it was brought out that they aren't going to be very much support, and only Dave and a Sherpa at the Col and that isn't much support. However, on the brighter side, we are going to delay until the 25th here, so go get her! Over.

2 (Tom): Very good! That sounds fine. We greatly appreciate the 25th and our chances by then are pretty darn good, barring monsoon between now and then.

Base (Dingman): The other thing, Tom, we were wondering, because of the oxygen situation in the Col, about the possibility of making the decision now that the traverse is unfeasible. Do you read? Over.

2 (Tom): I don't think we can make that decision, Dave. It's going to end up being a climbing decision at the time, I suspect.

Human communication is a fallible process even under the best conditions. Add fatigue and hypoxia, add issues which balance life and safety against the fruits of effort and aspiration, add the impersonalness of radio procedure—and a breakdown in team relations can surprise no one. The first human trait to be damaged at high altitudes is compassion. Fortunately, it comes back strong in thick air, where the mind can better tolerate shades of gray and function without the comfort of black-and-white pronouncements. The most astonishing thing to me, in retrospect, is that these men could accommodate each other so reasonably in spite of stress.

BISHOP AND JERSTAD left Base Camp to proceed into position for their assault, and Dingman and Girmi Dorje followed them up to provide support. Meanwhile, with eight Sherpas to help, supplies were being moved to Camp 4W. Willi and Tom had their look-see beyond 4W, finding their way to the base of the Hornbein Couloir, at 26,200 feet, far out on the Northwest Face. Camp 5W would be put near there, and if my health permitted, Corbet and I would try to locate 6W somewhere above that.

After conferring with Lute, Bishop, and Dingman at 2 about dates and timing, I had to start up for 3W, and there was no one to accompany me. Every inch of the route was known and it was completely safe (in good weather), but the figure S was a long haul and all intermediate tents at the dumps had been moved up. If I was strong I could have made it in a day, but I knew I would either have to bivouac en route or arrive exhausted.

Lute counseled me against exposing myself to frostbite in a bivouac. However, there was one bottle of oxygen and a convenient crevasse at what had been the New-New Dump at a little over 23,000 feet. I had been down in the crevasse before, retrieving a fouled winch cable, and knew it to be suitable. If I slept on oxygen there would be no frostbite. Next day I started up, carrying an air mattress, which I concluded would be more useful than a sleeping bag. With the crevasse as my objective, I took a slow and steady pace, and arrived at dusk, feeling very well. I debated continuing the last 700 vertical feet to 3W, but it would be totally dark, and I was confident about the bivouac. In fact, I think I wanted the bivouac, but I don't know exactly why.

It must have taken me almost two hours to get myself prepared for the night. I found the bottle half buried, put it in my pack, anchored a piece of rope to a picket, and rappeled into the dark hole as light was failing. About thirty feet down, the crevasse closed to four feet wide, plugged with powder snow. I tamped it firm, then started to inflate the mattress. I stopped. (Stupid, you'd better get those crampons off or you'll puncture it for sure.) As I fiddled with things in the dark, I could hear the wind rising. (No worry—but it's dumping a lot of snow in here.) I removed my down gloves to work with the oxygen gear. (Careful! Put the right glove in the right pocket—now left in left. Don't misplace one. Don't let snow sift into them. Hold the hose in your teeth. Now, work fast with the metal attachments—hose to regulator; regulator to tank—keep the snow away and hope the threads seat well. Good, gloves. Now down pants, over the boots, wind shell, mask in place, regulator in reach. Flow? . . . one liter. And now for sleep. Wait!

Let's review: Where's my ax? Upright, behind my head. Crampons? In the pack. Damn! I'll bet the flap's open. Goggles? Top left pocket.) This poor-man's countdown put my mind at ease, and I drifted into sleep in perfect comfort, never suspecting the storm I was creating at Base Camp.

Some time during the night I was awakened by cold around my eyes, where powder snow was sifting in. I was thoroughly warm otherwise, but slowly realized that I was totally buried. I rose to my feet, cradling the oxygen bottle like a baby in one arm. I pulled the mattress to the surface, remade my bed, and listening to the wind roaring past my cavern, immediately fell back to sleep.

At about that same time, the men at 4W were having difficulties. The wind had been tearing at their tent all night and finally it got under one edge. Lying in their bags, they felt it lift them from the ice, tear loose the moorings, and send them tumbling in a tangled mass of struts and fabric across level ground, over a crest, and down a slope. After some 150 feet, and in a partial lee from the wind, the two four-man tents and their occupants came to rest, none too soon.

All this time I enjoyed a cozy sleep, protected by snow and ice rather than man-made fabrics.

The second time I awakened, I brushed away snow and looked up. Soft light filled the crevasse, but I couldn't see the opening above me for the swirling snow. My watch said 7:00, yet the light suggested 4:00. (Radio contact is 8:15. Get on your way again by then so they can see you from Camp 2 and know all is well. But, no rush now.) So, I lay there marveling at the comfort of such a form-fitting bed, watching the snow sweep by above me with unbelievable velocity.

Eventually, I rose and started putting things in shape. (Will the weather block visibility from Camp 2?) I pulled the plug to let the mattress deflate and found that it had frozen up when only half deflated. I rolled it up under my pack flap and, using the front points of my crampons, started up the rappel rope to rejoin the elements.

It was 8:45, the sky was blue, and I could see the tents at 2, far below, yet I couldn't see my own feet in the blowing snow. I started up the home stretch for 3W, wondering if I could be seen in the ground blizzard. My route went straight up a 35° slope, scoured hard by the cross wind. Once, standing erect to see over the turmoil of moving particles, I was hit like a hammer by a wind change and did a self-arrest moving horizontally across the slope. I continued steadily, on front points and a pick. Soon, snow filtering through the air vents filled my goggles. Since there was no feasible way to clean them, nor any point in doing so, I put them away and continued, squinting out through the

wolverine fur of my hood. All I had to do was go straight up. I didn't have to see. The wind tore the partly inflated mattress from my pack and I last saw it gaining altitude westward.

Meanwhile, the morning radio, May 17:

4W (Corbet, from the remains of a tent): Let me fill you in. We've had a mishap during the night. Both Draw-Tite tents, the four Sherpas, and Al and myself blew 150 feet down the slope and we're lying in the sack, held down with oxygen bottles . . . (garbled) . . . at midnight when it happened . . . roped us to the slope and I guess we're safe.

4W (Willi, from the Gerry tent): Can you read 4 now, Bear? Over.

Base (Prather): I read you loud and clear, Willi. Did you get what Barry wanted? Over.

4W (Willi): I think I did. Yes. Right now it's going to be awhile yet, cause we're just barely holding on to the Gerry tent. Over.

(There followed a long exchange between Jimmy Roberts, at 2, and Ang Dorje at 3W. Purpose: no carries to 4W; bring down sick Sherpa, and look for Emerson in the process. At about that moment, they spotted me approaching 3W.)

4W (Willi, 8:55 a.m.): Question, Bear. How's the wind down your way? Over.

Base (Prather): It's blowin' a bit. Not very hard though. . . . What? 20 MPH? 25 MPH. Over.

4W (Willi): I see. We may not be able to hold out much longer here. Tent's taking a beating. Blowing about 100 here pretty steadily. Over.

Base (Prather): We can see a hell of a lot of wind coming off Nuptse, and it really sounds bad. There's a big roar we can hear from down here even. Over.

4W (Willi): Yeah, I can believe it! Over.

2 (Dingman): Willi, did you hear about Emerson? Over.

4W (Willi): No, I didn't, Dave. What's the latest word? Over.

2 (Dave): We looked out a few minutes ago, and lo and behold, we saw him between the new dump and the crest, still going up! Over

4W (Willi): And that was *this morning?* Over.

Base (Prather): Roger. That's this morning. Just a few minutes ago. Over.

4W (Willi): Holy Cow, I can't believe it. Over.

Base (Prather): Roger. You're not the only one!

4W (Willi): That's great news, Dave. Great News. Now, if we can get out of this mess, we'll be fine. Over.

Then a few minutes later:

2 (Dingman): Do you have a weather forecast?

Base (Prather): High winds, low pressure over Punjab, . . .
4W (Willi): 4 to Base! 4 to Base! Over!
Base (Prather): Roger, Willi. Reading loud and clear. Go ahead.
4W (Willi): O.K. Here's the latest report, Bear. O-o-v-e-e-r-r-r!
Base (Prather): You want the weather report? Over.
4W (Willi): God damn! The tent's blowing away!
Base (Prather): Roger. The tent's blowing away. We'll stand by.
4W (Willi): Standby? We're headed over the brink! (*Base:* Roger) Barry! OUT! OUT!

Shortly, I arrived at 3W, and found three Sherpas preparing to descend. A little later the men from 4W came into Camp, and I learned for the first time that things had been rough all over. I was surprised to learn about the turmoil I had caused at Base Camp—after all, I had taken great care. But I was the only one who knew that, and I slowly started feeling foolish. (Now, in retrospect, an interesting question occurs to me: why did I not think to clear my plans through Base Camp?)

EARLY IN AN EXPEDITION, unforeseen events may be troublesome or annoying, but they can be absorbed in a changing and enveloping strategy. In the final stages, however, when the operation is committed to a plan, every passing cloud carries the capacity to shatter the whole affair. That is, unless you have people like Hornbein on your team.

All five of us were now at 3W, assessing our position. The wind had wiped out our highest camp; it had blown away a day or two and destroyed our plan of ascent. A six-camp assault was now a logistic impossibility with the tents and time left to us. But isn't a five-camp ascent of Everest, on an unknown side, a mountaineering impossibility? There were only two things in our favor: First, at 4W, the oxygen was still in place, and the Gerry tent could be used. Second, and more important, five Sherpas had volunteered to stick it out with us. Their names are worth recording: Ang Dorje was senior among them. The other four, Ila Tsering, Tensing Nindra, Pasang Tendi, and Tensing Gyaltzo were young unknowns. They had not been used extensively on the Col assault, and they were eager for this chance to prove themselves.

Summing up these odds, Tom pressed the only possible plan, slim as it was: a five-camp attempt, without the luxury of reconnaissance, second assault party, or time for bad-weather stand-fast. Furthermore, the whole thing would have to be accomplished in three days from where we sat at 23,800 feet! Of course, we could descend right now and most people would applaud the decision as sane and rational. But we had

asked a question demanding a yes or no answer. We could hardly turn our backs to the West Ridge, and leave it an eternal *maybe* with a hundred question-begging ifs. This was the message in everyone's mood and manner, and there was no need to vocalize it.

Base (Norman): Willi, I'm delighted by your plan. This is exactly what we were going to suggest—that only two men make the attempt. And all I can say is, you've had a lot of tough luck. You've worked awfully hard and we're 200 per cent with you. Whether you make it or not, you will have accomplished miracles on a long and difficult and unknown route! Over.

On May 20, the ten of us moved along the two-mile arête to 25,100 feet, synchronized in a tight schedule with Lute and Bishop on the Lhotse Face. To our right, rockbound couloirs plunged downward, so beautiful from above, but so threatening from below. On the left, slabs fell away to the Rongbuk Glacier, carving its way into Tibet. Our view included the entire Northwest Face—down to the North Col and back into Everest history. With all this to occupy our attention, the trip seemed very short. Soon we were resetting Camp 4W and making preparations for the next day.

First thing in the morning Barry and Al set out, traveling light and heading for the Hornbein Couloir. Their mission was to kick and cut a route as far up this passageway as possible in one day and still return to 4W. Their highest point would be Camp 5W, wherever it might be. The five Sherpas set out with loads an hour later to follow in their tracks, and Willi and Tom and I brought up the rear. I went along for only two reasons: first, I carried extra oxygen for the long and late traverse back to 4, in case it was needed; and second, I wouldn't stay behind. It was a great irony, but in this last-ditch skeletal plan, we had, for the first time, extra manpower.

Everything would have to move without a hitch. At 1:00 P.M. we entered the bottom of the couloir at 26,200 feet. The Sherpas were just ahead, and Barry and Al were disappearing about 400 feet above. Willi and Tom had to overtake them, and although I was feeling better than I had during the entire campaign, they could move faster without me. Thus, at about 2:00 P.M., we said a tearful goodbye on a rock ledge. Trying to make light of it, I promised to save the oxygen in my pack for the traverse back, if they would promise to do nothing foolish. For the next hour I watched them move slowly up the couloir and disappear.

At 5:00 P.M. seven figures came back into view. They had left Tom and Willi on a less-than-adequate ledge where, at about 27,200 feet, the couloir entered the Yellow Band. There simply wasn't any other place for a two-man tent. We started the long traverse back across the North-

west face in a fading, eerie light, picking our way in darkness the last half-hour down to 4W. As I lay in bed that night I reviewed the possible work we might have to do in the next two days if Willi and Tom got into trouble. None of us talked about such matters.

The big shock came next day around noon, when Willi radioed that the going was tough, progress was slow, and if they could not start traveling soon without belays, time might run out; they had already covered ground that would make descent very hazardous—"so, I guess it's up and over for us today." As the day slipped by, things looked better. Willi and Tom emerged from the couloir. They had topped the Yellow Band! Their conservation of oxygen for the ordeal was in itself a testimonial to their mental mastery of the task—two or three liters while climbing, cut down while belaying. They gained the true Ridge and removed crampons for extended rock climbing.

At about 6:15 P.M. they attained the summit—their job marvelously done, but only half-finished. According to Tom, there was no ecstasy, no overwhelming sense of fulfillment. There was relief, of course, but new anxiety took the place of old as they turned to the imperatives of descent. Some hours before, they had committed themselves to the traverse, regardless of the whereabouts of Lute and Bishop. Now, crampon tracks said the Col party had been there, the tracks pointed the way down—as long as light held out.

What we did next violated a climber's basic instincts. We had planned to do what we did for months, and had fought for the chance to do it; even so, to put two of our companions on such a precarious perch, leave them to their own resources, and *descend, perhaps* to meet them on the other side? It all seemed very unreal, with or without hypoxia. If our parting on the Northwest face was sheepishly wet-eyed, our midnight reunion under the South face two and a half days later, was open crying. Hornbein was still very strong, even after the night out with Barry and Lute above 28,000 feet. Unsoeld was in good shape, but had come down on frozen feet. Bishop had frozen feet also and was totally exhausted. Lute was crying for his own reason—he was snowblind to the point of extreme and unrelievable pain.

Thirty-six hours after this reunion near Camp 2, the entire expedition was packed up and on its way out from Base Camp in bad weather, Willi, Bishop, and Lute being carried.

As we marched back through the Nepalese hills, I could feel the mountain staring down the back of my neck all the way. The last two thousand feet of Everest are still a mystery for me and hold me captive. If the six who reached the summit are now free from this mystery and, hence, from Everest—well, that's the price they have to pay.

L' ENVOI

After a six-month absence from home, my wife and I were confronted on our return with the expected mountain of second-class mail. Each envelope bore some reminder of the way of life awaiting our reëntry. The throw-away pile was outdistancing all others in the sorting, when I uncovered the 1963 issue of the *American Alpine Journal*. With resignation, Pat continued the sorting while again I was lost to mountain memory.

Yvon Chouinard's article finally held my attention. His thesis: the future of Yosemite climbing lies beyond that valley, in the great granite ranges of the world. True enough, but then I was reminded of an Austrian I met in the Yak and Yeti bar, in Katmandu. He and some companions were planning an expedition specifically for the West Ridge of Everest, but now he wondered what they would do. I suggested they try a short cut—the South Face of Everest. He thought I was joking, but I tried to assure him I was not. Reading Yvon's article now, after such recollections of the traverse, I hope that no American climber will overlook a challenge like the South Face simply because there isn't a square inch of granite anywhere on its 7,728-foot high-angle sweep from the Cwm.

Sequoias and Human Impact

By Richard Hartesveldt

The results of a five-year study of human impact on sequoias in Yosemite's Mariposa Grove are proving to be quite a surprise. Long-standing concerns are being dispelled in the light of new ecological understanding and new concerns are replacing them.

Major results of the study are twofold: first, the damage caused by masses of park visitors trampling the soil around the bases of certain time-honored sequoia trees is proving to be less serious than was predicted in the 1920's. Secondly, the relative absence of fires due to man's fire-suppression program has changed the course of normal plant succession and has created strong competitive conditions under which sequoia regeneration and early growth have been greatly impaired. Although the latter situation is not immediately serious, it has obvious and far-reaching implications for sequoia management. It is paradoxical that fire, a natural environmental factor in the Sierra Nevada, may have to be supplied artificially as a part of a sequoia management program to insure periodic regeneration of that species.

Certain phases of the sequoia-impact studies are being continued by the author in Sequoia and Kings Canyon national parks to both verify and strengthen the Yosemite findings and to search for other forms of impact not previously identified.

Part I: Mass Human Impact

Concern over the impact of masses of park visitors was first manifested by Frederick Law Olmsted in 1865 in his preliminary report on the Yosemite Grant Lands of which the Mariposa Grove was a part:

> An injury to the scenery so slight that it may be unheeded by any visitor now, will be of deplorable magnitude when its effects upon each visitor's enjoyment is multiplied by these millions. But again, the slight harm which the few hundred visitors of this year might do if no care were taken to prevent it, would not be slight if it were repeated by these millions.*

It is problematical that Olmsted had sequoias in mind in this prophesy. However, the early-day administrators of the Yosemite Grant Lands very definitely had sequoias in mind and repeatedly asked the legislature for funds to protect the trees against fire. Concern about mass human impact appeared first in 1912 when the military superintendent of Yosemite ordered an eight-foot wire fence erected around the base of the

* Frederick Law Olmsted. "The Yosemite Valley and the Mariposa Big Trees: A Preliminary Report, 1865." *Landscape Architecture*, 43(1):12–25, October, 1952.

Grizzly Giant to protect it from the trampling public. The fence posts were set about 30 feet from the great tree's trunk and encompassed no more than 30–35 per cent of its root system. Outside the fence and over the remainder of the tree's roots ran the main road through the grove, until 1932 when the National Park Service relocated it in recognition of the extensive spread of its roots.

Concern over the steadily increasing numbers of park visitors in the middle 1920's prompted the National Park Service to employ Dr. E. P. Meinecke, a pathologist, to investigate the effects of excessive tourist travel on the sequoias in the Giant Forest and the Mariposa Grove. His reports were pessimistic regarding the future of the trees located in the heavily visited areas. Since Meinecke was the only authority on the subject, the Park Service used his reports and subsequent letters as a basis for sequoia management.

Meinecke's greatest concern was that sequoias were becoming unhealthy and would eventually die because of the extensive layers of compacted soil around their bases. Yet, the loss of sequoia vigor to which he refers was not noticeable during the recent investigations. The growth patterns based on increment borings of trees growing within these areas of compaction indicated that there was no greater decline in their growth than in trees of the same size nearby whose soil was virtually untrodden. Nor was there any evidence of growth decrease in 1926 and 1927 that could explain his predictions in those years.

Excess trampling did affect associated plants in these areas, and in places the soil surface became a veritable desert because of the compacting force of the human body. That such a condition could develop is more understandable perhaps when one realizes that a 150-pound man exerts between 10 and 20 pounds pressure per square inch when he raises up on the ball of one foot. The repetition of this force has compacted the soil in places to more than twice its natural bulk density. Not only can few seeds germinate and grow in such a soil environment, but the new roots of those that do have great difficulty penetrating soil of such density. Herbaceous plants and some shrubs have simply been trampled out of existence leaving a desert that is unpleasant to the eye, dusty, and serves to speed runoff water and erosion.

A more serious effect of visitor trampling is the foot erosion which has occurred beneath the feet of millions of visitors. Small amounts of

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soil carried off on the shoes of individuals have added up to several inches of soil loss over a period of years. If this loss continues, certain sequoias, a shallow-rooted species anyway, could conceivably lose enough supporting soil to fall prey to their major enemy—toppling. Loss of soil nutrients by foot erosion is currently under investigation in Sequoia and Kings Canyon national parks.

The effects of certain road-building activities on sequoia growth-rates were also investigated. Pavement has been placed over large portions of sequoia root systems and extensive root pruning has been carried out to accommodate the construction of road cuts. The growth patterns of those trees with extensive root-pruning show an immediate but not necessarily striking reduction in the rate of growth followed thereafter by a gradual rise. Forest fires caused similar damage to sequoias at ground level, but these trees have not necessarily been killed by it. It seems probable, therefore, that the root-pruned trees will also survive with no more serious effects than can be observed now. Insofar as I have been able to determine, no sequoia whose roots have been pruned has ever toppled, died or appeared less vigorous because of it.

The placement of pavement over the root systems of sequoias may prove somewhat more serious. Investigations are now being conducted in two areas of the Giant Forest to determine the effects of such pavement, but the results will not be known for a year or two. The growth response of trees with as much as 30 per cent of their root system being covered with black-top is one of immediate increase due to the elimination of competing vegetation and of soil moisture evaporation. The increase in growth rate reaches a peak after a few years and then falls off, sometimes to a level lower than before the pavement was laid. Such a pattern may result simply from decreased aeration in the rooting zone or possibly to a pathogenic fungus attacking the feeder roots. Thus far, it is not known whether this growth rate reduction will ever prove truly harmful to the trees.

Fortunately, the number of sequoias affected by severely compacted soils is small, although those affected are usually the larger trees, some of which are world-renowned. Methods that could be employed to combat adverse effects of mass human impact are quite simple. In that soil does not often uncompact itself with time, it should be loosened by hand around the affected trees. Wherever visitor traffic can be channeled by means of well-defined trails, there can be some control of the "desert" areas and native vegetation can be encouraged to return. Wherever trails are impractical, a general application of wood chip mulch can be applied to the soil surface. These chips relieve the soil surface of some of the impacting forces, reduce soil moisture evaporation, and create a pleasant

dust-free surface upon which to walk. Its use has met with success in some of the California redwood state parks and in Yosemite's Mariposa Grove.

Little can be done to change the conditions of those sequoias whose roots have been severely pruned. It should be borne in mind, however, in all future road-building activities that such pruning could very well upset those trees which have already been weakened by large burn scars. It has been noted that more than 95 per cent of all sequoias which have fallen bear large burn scars on the trunks. Reasonable judgment in roadway planning can help avoid this eventuality.

A final thought to bear in mind is that man has been visiting the sequoia groves in increasing numbers for only about 50 years, less than 2 per cent of the life span of a 3000-year-old tree. We must accept the possibility that the slight effects of man's trampling that have shown themselves to date could conceivably become more serious over a much longer period of time. So, in addition to the simple safeguards suggested earlier, continuous vigilance and careful research studies must join to make sure these trees are permitted to live out their seemingly timeless natural lifespan without interference by man.

Part II. Fire and the Sequoia Paradox

The importance of fire in the life of the giant sequoia is emerging as one of the more surprising results of the sequoia-human impact studies because of its management significance. Actually, this fact should not have been so surprising in that many trees and other plants are known to depend upon fire for their perpetuation. As long ago as 1878, John Muir described this relationship for the giant sequoia. Since then his view has been shared and enlarged upon by others such as H. H. Biswell,† but its meaning has never been accepted as a basis for sequoia forest management. Recently, the full implications of this relationship have appeared as a paradox to our long-standing belief that forest fires are always and only detrimental to man's interests. Fire, it turns out, probably is the single most important factor contributing to regeneration and early growth of the giant sequoia.

With this realization comes the sometimes painful task of justifying this concept within our older ingrained notions about fire in the forest. We find that our long-enduring and successful campaign against fire has been based largely on economic value judgments that were stated or

† See "Do We Want Sugar Pine?" by Herbert L. Mason, October 1955 *SCB*; "Man and Fire in Ponderosa Pine in the Sierra Nevada of California" by H. H. Biswell, October 1959 *SCB*; and "Forest Encroachment on the Meadows of Yosemite Valley" by Emil F. Ernst, October 1961 *SCB*.

thought of only in the broadest generalities. As such, they have too often failed, as here, to recognize less tangible values such as the perpetuation of a species of tree that is world-renowned. As a result of this protection (of which we may be justly proud), a two-fold problem has arisen that must be met in some way by the sequoia management agencies. Increased fire hazard is the more immediate of the two problems; the other is one of insuring sequoia reproduction and early growth, each of which is seriously impaired by advanced plant succession.

In the absence of periodic fires, fuel concentrations are now at an all-time high in certain groves and pose the threat of severe fire damage to even the veteran sequoias as well as to their less fire-resistant associated species. There is good evidence that high intensity crown fires were uncommon in the past and that periodic fires burning through the groves every 10 to 25 years were of low intensity because of the lesser accumulations of fuel. Today, there are areas within the groves where fires have not burned for 100 to 150 years. In certain of these places both dead combustible material and dense climax growths of white fir threaten the life of the largest trees should an intense fire burn into the grove from outside. Fire suppression would be greatly hampered by the same tangle of fuels.

The second problem, which has long-term management implications, is that the advanced stage of plant succession (in the absence of fire) has created an environment untenable for sequoia regeneration and early growth. Natural leaf litter accumulations are now much too thick for the tiny sequoia seeds to penetrate. Moreover, it is now known that this litter has an inhibiting effect upon the germination process itself. The same litter, when burned, permits normal germination under the ideal soil moisture and weather conditions. These facts very likely explain why sequoias seed into disturbed soils most heavily within a year or so after the disturbance and then further seeding-in stops. The specific set of conditions for sequoia germination is indeed short-lived. Evidence may be readily seen in logged-over groves such as the Big Stump Grove in Kings Canyon National Park where the new sequoia stand is very evenly aged.

Once germination has occurred, the life of the tiny sequoia is still in jeopardy if insufficient sunlight reaches its crown. The species is physiologically intolerant of shade. In the past, periodic wildfires have eliminated much of the shading understory and provided adequate light for early sequoia growth. Once a sequoia has overtopped the general canopy level, its growth is no longer limited by light intensity and the tree continues upward rapidly.

In those areas longest deprived of fires, canopies of the more tolerant

white fir have created such dense shade that young sequoias have died in large numbers within recent years. A census of sequoias in the Upper Mariposa Grove made in 1934 was compared with the number existing in 1959. Within that 25-year period, approximately 86 per cent of the seedling and sapling sequoias shown as living in 1934 had died because of intense competition for light and soil moisture. It is to be expected that 25 years hence, only a few of the remaining 14 per cent will still be alive. Based upon such a trend and continued protection from all fire, it is conceivable that sequoias would diminish in number over a long period of time. Even though it is improbable that we could bring about their extinction, the prolongation of this situation seems undesirable. Is it not the birthright of Americans 1000 years hence to see sequoias 1000 years old?

In several of the groves, very few young sequoias have successfully germinated since the last fires except where man has otherwise disturbed the leaf litter and shade. Young sequoias are too plentiful on road banks and around buildings where their presence is not too desirable or where other conditions make their future doubtful. In the 175 acres of the Upper Mariposa Grove the sequoia resurvey in 1959 showed that not more than 25 sequoias had successfully germinated since 1934. All but two or three of these trees are to be found on the road berms and in the old picnic grounds near the museum. Elsewhere, dense patches of mostly dead young sequoias are to be found where earlier administrations had piled and burned dead debris to improve the appearance of the grove. In the Giant Forest these dense clusters represent disturbances by early cattlemen for cabins and stock compounds.

In the light of the above knowledge, sequoia administrators must sooner or later accept the fact that a hands-off management policy with full protection against fire will not fulfill the most idealistic goals of sequoia conservation. Fire, or some other form of disturbance by man, is requisite to the solution of the two problems just described. The alternative is to gamble with destructive wildfire. Considering the long fire-free period, neither method will be simple or inexpensive. Biding time will only accentuate the problems.

The use of prescribed burning presumes a good measure of safety to insure that the fire does not get out of hand and cause unsightly damage to large sequoias and other large important trees. Wherever white firs are tall and dense around sequoia trunks and dead debris has accumulated in quantity, physical removal to lessen the hazard by fire would be a necessity. It has often been suggested that little could be removed physically by raking it into piles and hauling it away. Consider, however, that for each acre of litter 2½ inches thick, the equivalent of between

four and five railroad gondola cars would be required for the handling. In that roads reach only a very small part of the groves, this approach is precluded by economic reality.

The concept of prescribed burning is not new; it is only new as a tool in managing sequoia groves. Inasmuch as fires have always been a natural phenomenon in the Sierra Nevada, we can assume that such burning, properly applied, could result in a situation approaching that found in past centuries when natural fires favored sequoia growth. The areas to be treated by cutting and burning could be small on a yearly basis. The program, however, should be more or less continuous to assure coordination of burning plans with such factors as the amount of bare mineral soil, good seed years, good soil moisture, and weather conditions for germination and early growth. Careful experimentation and refined management techniques will be necessary to insure sequoia reproduction and reduce the hazard of destructive fires. Even though this concept is new for sequoia management, the facts at hand suggest that use of fire as an effective and economic tool is essential to offset the imbalance created for the sequoias by a dedicated and efficient fire-control program.

A Day With Aldo Leopold

By Alfred G. Etter

"Our children are our signature to the roster of history. I hope to leave them good health, an education, and possibly even a competence. But what are they going to do with these things if there are no more deer in the hills, and no more quail in the coverts? No more snipe whistling in the meadow, no more piping of widgeons and chattering of teal as darkness covers the marshes; no more whistling of swift wings when the morning star pales in the east? And when the dawn wind stirs through the ancient cottonwoods, and the gray light steals down from the hills over the old river sliding softly past its wide brown sandbars—what if there be no more goose music?"

— Aldo Leopold
in Round River

We drove from cement to gravel to dirt to a narrow pair of ruts that wound their way past successively poorer farms. The first barn after the junction was red and round-roofed and large enough to store small crops of hay and to accommodate a fair herd of dairy cows. The second barn had once been red, but now there was only a faint glow to the old wood under the angled roof. As the road grew grassier between the sandy yellow ruts the barns gradually became nothing but bleached walls and sagging roofs, muddy yards, and tangles of old machines.

The river ran alongside the road, pinching in and out between low islands of willow, cottonwood, and elm, and steep banks of oak. Clumps of prickly ash invaded the grass of old fields. A hog pasture, pocked with upturned sod, blanketed a hillside. On its broken ground were corn ears recently spread for the hungry animals. On another hill were the remains of a meager crop of dwarfed corn, the shocks a hundred feet apart. Drifting sand piled in small crescents about each broken stalk.

Farther down the road, a boxlike house, a yard of litter, and a flock of chickens huddled together in a field of scrubby oak. Still the road declined, and in the low places silt and water made shallow puddles. After passing through several of these dips, Professor Leopold let his dog, Flick, out of the car to run the rest of the way to the "Shack." We had come to land that both of them knew intimately. Here the distractions of the bigger-and-better way of city life were shut out by expanses of sterile land, marsh, and meandering rivers.

Whether the Professor or Flick knew the farm more intimately was hard to say, for they knew it differently. Flick knew the ground, the smell of the soil. He knew the sedge in the marsh from the rustle of its keeled blades against his nose and the dry bluegrass for its tickle and maze of essential pleasure. He was familiar with the softness of moss, and patterns of tracks in the sand blow, and with the sensation of his own feet sinking into the sand. Flick liked to investigate the dark mystery of burrows and the black windows of brush piles. Each new patch

of scrub held the possibility of pheasant, woodcock, or grouse. The wind was his pleasure, and his companion, and his competitor. Flick was the first to investigate the morning dew, and from it learned a mass of facts important to his day's adventures.

To the Professor the farm was earth and soil too, and full of pleasant sensations. It gave him the satisfaction of planting a pine, of building a brush pile, of finding a deer track in the cool silt along the river. His eyes fed on the brilliant green expanse of spike rush that bordered the islands in early summer, and on the brilliant leaves of blackberry in the fall.

The farm was a place to satisfy a craving for beauty and simplicity, and yet it was much more than that. It was where the Professor worked out the subtle pattern that became his life. It was a place where he could gain information from the tallest tree or the most insignificant spring flower, from a casual squirrel or a cached fawn. Here he tried to piece together answers to the questions that nature so often tempted him to solve. From pads of moss or patches of quack grass he learned a bit of history. From a tangle of ash logs a suggestion of some prin-

ciple dawned upon him. From a broken pine a brief diagram of the balance of the forces in the environment was devised. Above all, this farm was a place where his children could learn the meaning of life and gain confidence in their ability to investigate small problems and discover things that no one knew.

I had heard Professor Leopold refer frequently to the "Shack" on his farm. When we made the last turn up the road I was surprised to find this familiar name a very descriptive one. At the time this property first felt the Professor's step there were two feet of stale cow manure in this building. It had been a barn and stable for many years. The energy and ingenuity of his family had converted it into a roughly yet comfortably furnished week-end home with a substantial fireplace, heavy iron pots, hewn wooden tables and benches, and a string of decoys for decoration. Bunk-beds spoke of the healthy robustness of this life, and suggested the repose of sleep in the silence of the misty Wisconsin River valley.

I had come to the farm on a field trip in company with the Professor's Wildlife Ecology class. This field trip was essential in his experience of spring. To assist a group of people in understanding nature was for him a yearly goal and a pleasant undertaking. He was proudest

of his pine plantations. Perhaps that is why our trip began there. Much effort of the Leopolds had been spent in planting pines, and already several thousand trees garnished the old fields. We dug up some young stock which had been "heeled-in" behind the Shack for future use. He showed how they were planted. Soon the class had enlarged the grove by twenty pines. We took the trail through the woods, and he made new discoveries as he walked. Crouching in the grass at the edge of the sand

blow, he searched for the first pasque flower. He found it, and in his face was the confidence of spring. On the open sand he smiled again as he described the experiences this sterile place knew when rains drenched the surrounding vegetation. Then it was that new grouse broods wrote long sentences in the sand.

By the river was the place where beaver had been two years before. A chiseled cottonwood testified to this. In the darkness among the river-bottom elms, black ponds lingered from the high water. Fox sparrows sang above them. A trip toward the lake brought a flock of wary geese into the air, barking, making the valley ring. Hundreds of them circled, then poured back like maple leaves into the marsh. Careless mallards passed overhead in courtship flight, craving to touch wings in mid-air.

In a lighter vein, we were shown the spacious no-hunting signs that the Professor had posted. In the center of each sign ample room was left for frustrated hunters to unload their shots without damaging the printed warning.

The day would not have been complete without the revelation of a favorite secret, a nesting woodcock. Here was a bird that made the ground itself look camouflaged. Certainly there were some students who, through sheer embarrassment at their blindness, at first claimed to see the female on the nest when actually they had discovered only a shadow on an oak leaf. But before they left, there were none who had not seen this small favorite of the Professor's.

I had no idea of not returning home that evening. But when the Professor offered to share his dinner with me, I lost all idea of leaving. I sent word home with those returning, and then relaxed in the silence that two men enjoy when the twilight finds them alone.

When the nearby bushes slowly merged and became difficult to distinguish, that was the time to take the path toward the gathering dimness of the marsh; for that was when the woodcock did his sky-dance. It was not long before we heard the peenting of the male bird from his stand on the bare moss. But not for long; for soon the calling stopped, and for a moment the whole marsh was silent. Then from some unknown height, a thin cascade of song turned down through the dusk. A long silence—then the peenting started again. The whole marsh came alive with the sounds of night, drawing one's spirit into the sleeping marsh grass.

We made our way back to the lamp-lit cabin and stirred up the fire. Flick drew himself close to it. The Professor entered the day's gleanings in his log and began to prepare our meal. The conversation took many directions. We talked of mouse cycles or deer habits, of nutrition, and especially of phenology. For Professor Leopold, every day in spring

marked some new happening—first skunk, first horned owl ears above a nest, first pasque flower—these were the events of life. I wondered if there were not some persistent owl about the farm which kept phenology on the Professor, recording when he cut his firewood, when he didn't go back to the city because of the floods, when he first shed his winter coat, or when he first lay down on the sand blow and watched the clouds bring geese into his farm.

The river mist was seeping into the room when the fire died down. The dog was asleep. We sought the comfort of our beds. I settled into a bunk and the Professor climbed into the old sleeping bag that had once belonged to his father. We slept, waking only briefly in the night to hear the geese call.

Morning for Professor Leopold did not begin with daylight: it began with the silence just preceding it. He was dressed when I awoke and was blowing on the coals. A fire crackled as I clambered into the room and coffee was ready for the flame. The Professor hung the pot in place, took his light meter and chart for recording bird songs, and went out the back door and listened. I watched him silently as I finished dressing. He looked closely at his watch and his light meter and made an entry in his book. "Cock pheasant was first again," he said, opening the door. The coffee was ready. He poured each of us a cup and returned to the wooden bench outside. Each waking bird voice became an entry in his book, and yet was more than just that in the Professor's morning. The orderly, predictable succession of birds' songs was implicit in his concept of a day.

When the voices of late-rising species began to confuse the early pattern, he came in, returned the coffee to the fire, and put eggs and bacon in the skillet. Soon we were having breakfast in the quiet, misty dawn, our conversation mingled with the honking of geese. We hastened through our meal, stacked the dishes, and left the cabin. The path through the river bottom led toward the old pines of the neighboring farm, passing the fenced-off garden plot along the way. It bore a crop of green winter rye, wet with dew.

We came out of the low growth of scented willow and ash and elm, and crossed a weak, wire fence. Ahead of us, hundred-foot pines, scat-

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The drawings for this article are by **Joseph G. Adams.**

tered and clustered, seemed to converse in an interminable monotone. These were what the Professor wanted, if not for himself, then for those who would follow in his spirit. He was heartsick with fragments and remnants of the beauties he had once known. Somewhere he wanted them restored to inspire his successors with the knowledge of what could be, what once was.

We continued through the pine woods for a little way, catching its wet resin scent, brushing our faces deliberately against the needles. The low motor of a drumming grouse halted us in our tracks. It was the first I had ever heard. The Professor was pleased. We then turned away from the woods into an opening, and came eventually to the same grassy ruts that had brought us into the farm the day before. There was something good about walking down a poor road like this, two ruts with a grassy strip between them. It was not a lonesome trail, nor a cosmopolitan thoroughfare. It was a pathway for two people who could share its peace.

The Professor took out his small black address book in which he kept his daily observations and pointed to the sky above the marsh. "Geese." He took the stubby pencil, a constant companion to the little notebook, and began recording flock counts. Flock after flock passed on its way from feeding. They were magnificent and loud as they swept down into the lake beyond the farm. The Professor was moved by their demonstration. "It is rare now," the Professor said, "to see any kind of wildlife like this in excess. There is something satisfying in it. There is some symbol of freedom here that we're losing rapidly elsewhere. I'm glad we have something in excess on this farm; we don't have to skimp on geese. They find something here that suits them." So did those who watched.

Perspective for the Colorado Canyons

By David R. Brower

Remembering Glen Canyon—and looking at the last of the great unspoiled canyons of what John Wesley Powell called the Plateau Province—we are confronted with many places no one knows, places many people need to know and protect if the canyons are to endure.

The canyon country isn't easy to know even when you live with it a while. Clarence E. Dutton understood this in 1882 when he observed that the lover of nature whose perceptions had been trained elsewhere "would enter this strange region with a shock, and dwell there for a time with a sense of oppression." The bold would seem grotesque, the colors too bizarre, the subtlety absent. But time would bring a gradual change, he thought, and the strength and majesty would come through. "Great innovations," he concluded, "whether in art or literature, in science or in nature, seldom take the world by storm. They must be understood before they can be estimated, and must be cultivated before they can be understood."

Eliot Porter, for one, began to know Glen Canyon and to interpret it with vivid words and with color photographs that are his genius. But technology stormed into the very best of the canyon world before the rest of us had hardly begun to cultivate our sensing of it, much less our understanding of it. Glen Canyon has died a wholly needless death, victim of a reclamationist drive to dam things, of a hydroelectric overkill. Porter's *The Place No One Knew* exhibits the scope of the world's loss and makes its needlessness painfully clear.

Elsewhere, beautiful places still live where things like the Glen Canyon tapestries are not stained yet, where the side canyons still shelter a fragile life line, where a river can go on, and all the exquisite things, whether animate or not, that depend upon the river's life.

We can do penance for having let Glen Canyon be destroyed, for being too busy or too timid to rescue the right of unnumbered generations to know its beauty: we can remove some of the stain by saving for the future, without fail this time, the best of the great places of the Plateau Province—Canyonlands, near the junction of the Green and the Colorado, and Grand Canyon itself, all that is left of it, including Marble Gorge, for the wonder of the world it is and deserves to remain.

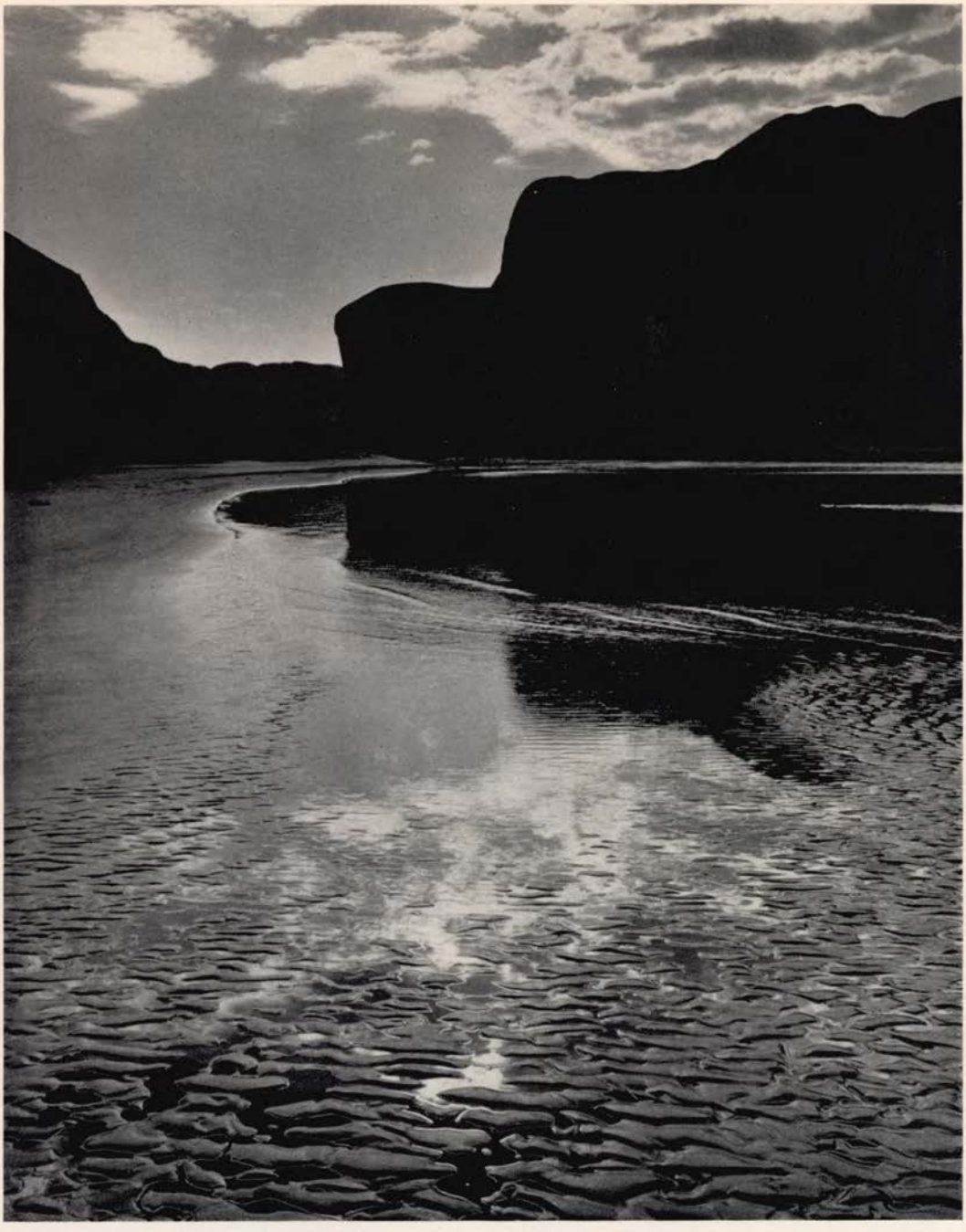
Those who know what the river means in this country will know also how important it is for others to share that meaning, always.

WITH FIFTEEN PHOTOGRAPHS BY PHILIP HYDE

Glen Canyon, where the culminating wonder of the Colorado began, had all the rhythm of the living river, a world of side canyons and "their sudden poetry of springs" that transcended all man had ever known. But what a fluctuating reservoir has not already destroyed it will soon destroy—leaving something colorful, something spectacular, something accessible to motors, but something ever so much less. Man is forever the loser—and has gained nothing that could not have come from somewhere else.

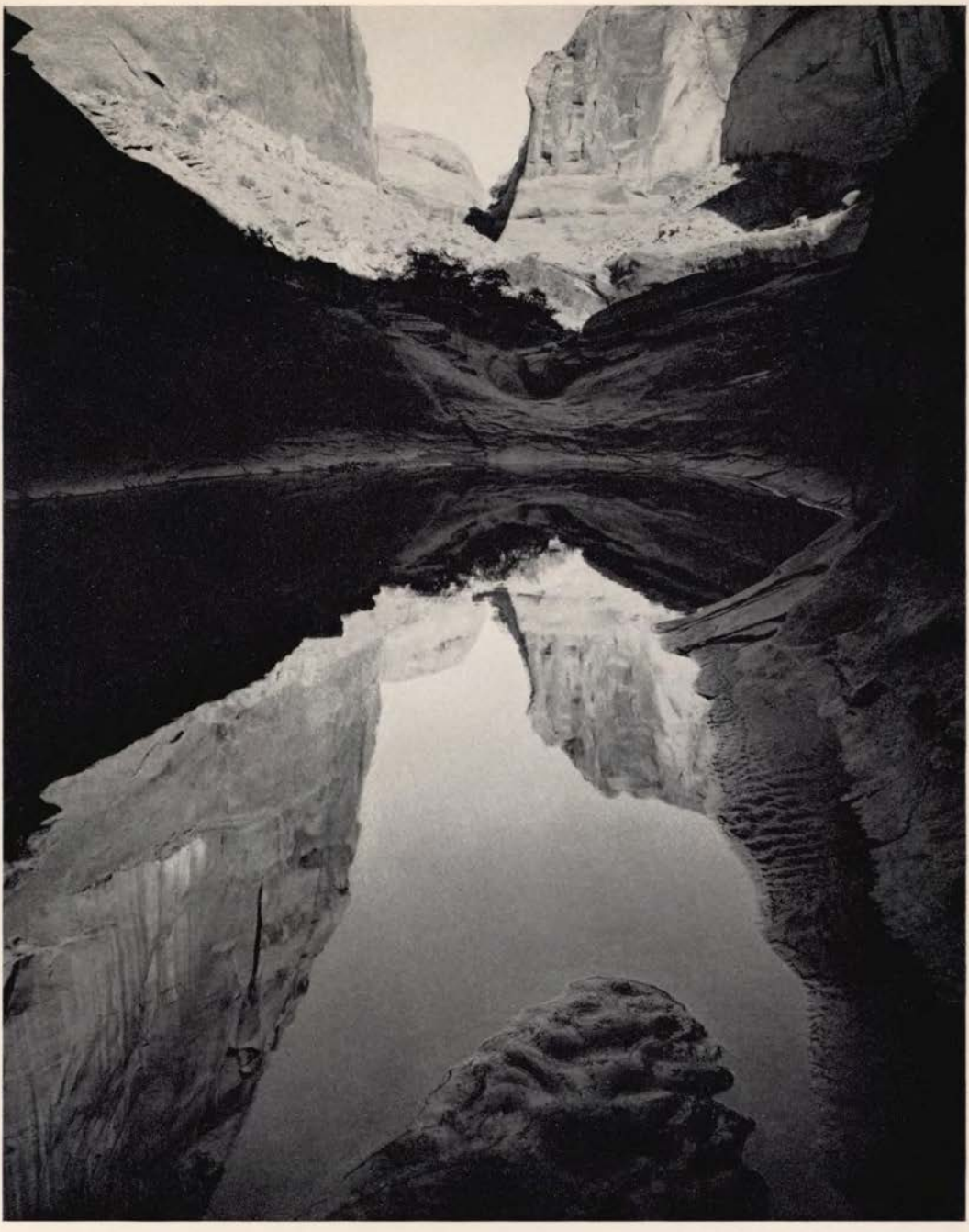
Eliot Porter, in *The Place No One Knew*, visualized what was to happen: "The waters impounded by this plug of artificial stone spread back through Glen Canyon . . ., inundating the sparkling river, swallowing its

Tapestry in Navajo sandstone, Aztec Creek



Colorado River from Klondike Bar

luminous cliffs and tapestried walls, and extinguishing far into the long, dim, distant future everything that gave it life. As the waters creep into the side canyons, enveloping one by one their mirroring pools, drowning



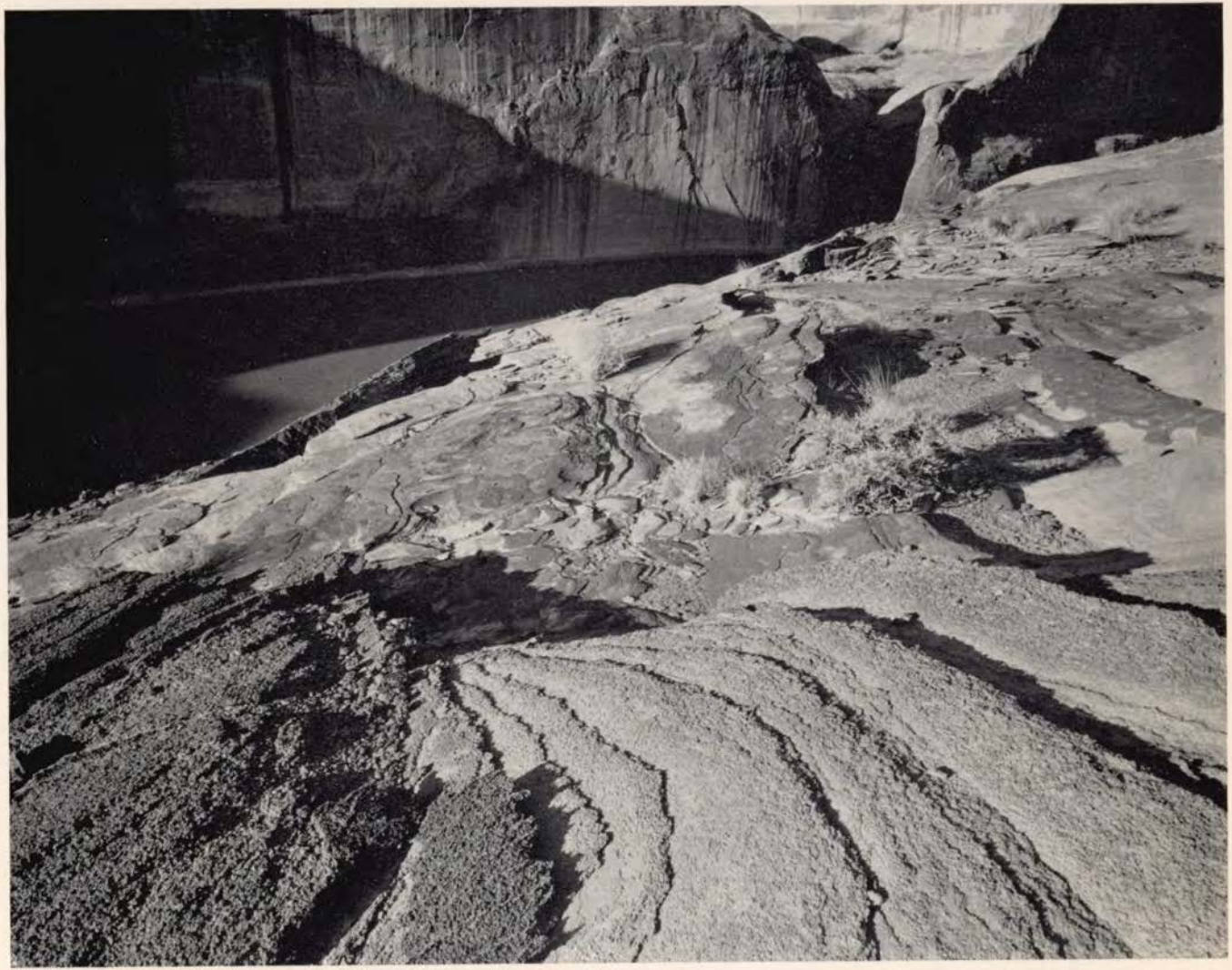
Spring Canyon plunge pool

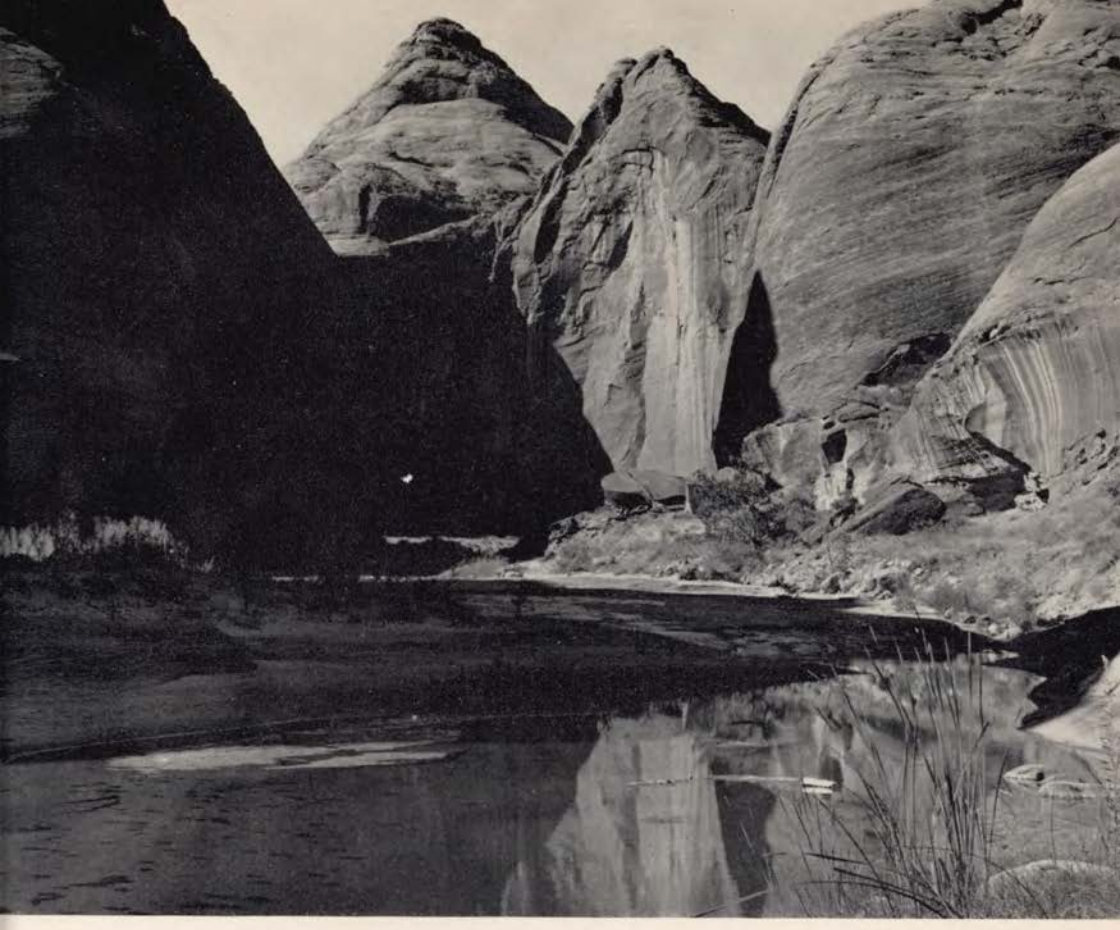
their bright flowers, backing up their clear, sweet springs with stale flood water, a fine opaque silt settles over all, covering rocks and trees alike with a gray slimy ooze. Darkness pervades the canyons. Death and the thickening, umbrageous gloom take over where life and shimmering light were the glory of the river."

Klondike Bar and entrance to Cathedral Canyon

Spring Pool
Canyon Bar

Wind-eroded rock above Klondike Bar





"The Corridor" Aztec Creek one turn below the Narrows
The stale reservoir water reached this corridor late in 1963.

What made Glen Canyon live is dead. Its magic was killed so that people could push more buttons, multiply their conveniences, complicate their leisure, encapsulate themselves, and hopefully allow themselves more time to travel to the great places of the earth. But in the process fewer and fewer places were spared for more and more people—people who would name their divestment Progress.

GRAND CANYON still has almost all the water of the Colorado (although enough to supply the largest city is to be lost annually to pointless evaporation from Lake Powell); but it will have the water only according to man's pleasure in operating the outlets of Glen Canyon dam. Grand Canyon is a stone world of its own, entirely unlike the sculptured side canyons and amphitheaters of Glen Canyon and the living things they sheltered. Theodore Roosevelt knew what was important in Grand Canyon when he stood beside it May 6, 1903.

Storm over Grand Canyon, from Point Imperial, Grand Canyon National Park

Grand Canyon from
Bright Angel Point
North Rim

Dunes at
Granite Creek Rapids

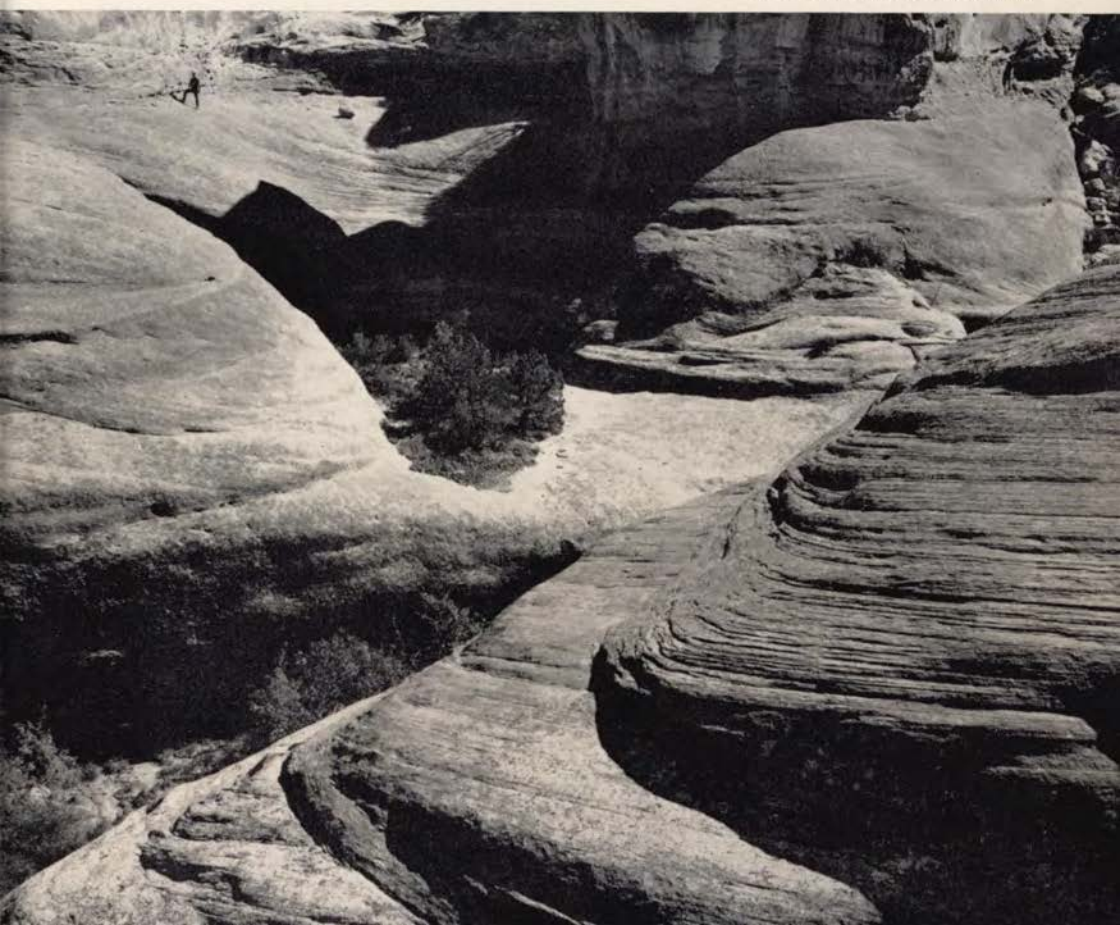
Standing Rock Basin, Hatch Point, from Grandview Point, proposed Canyonlands National Park

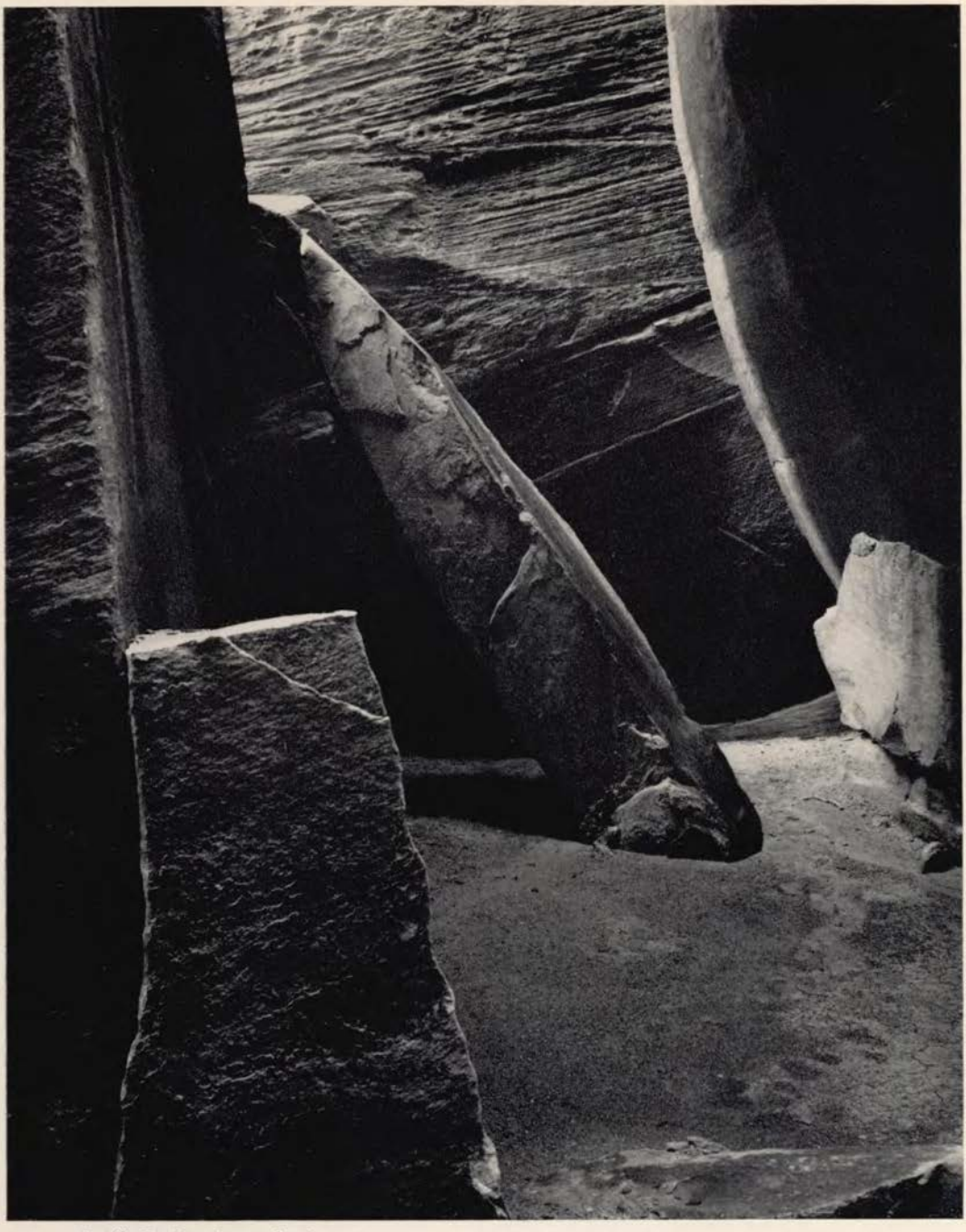
¶ "I want to ask you to do one thing," Theodore Roosevelt said to Arizonians that day, "in your own interest and in the interest of the country—to keep this great wonder of nature as it now is . . . I hope you will not have a building of any kind, nor a summer cottage, a hotel, or anything else, to mar the wonderful grandeur, the sublimity, the great loneliness and the beauty of the canyon. Leave it as it is. You cannot improve upon it. The ages have been at work on it, and man can only mar it."

One of the things man now proposes to do here is to remove the canyon's heartbeat—the river—with more dams and tunnels on an already overdeveloped river, and the name of the very Roosevelt who decried such desecration is used to justify it.

Canyonlands, a discrete region of the Plateau Province, has its own splendor, full of the kind of excitement a national park should rescue; but the region is not really to be compared with Glen Canyon or Grand Canyon, nor they with it. Each has its own attributes, or as in Glen, *had* its own. Each is helpless before man's urge to pave or to dam or otherwise to vitiate. These places have meaning for what they are, for what is in them now and what will be in them generations from now through natural change, through an evolution even yet hardly comprehended. In these places the expensive toys of grown man—his concrete mixers and bulldozers and chainsaws, and his lapses when he assumes that these can do no wrong—should be roped out. Only man can defend from himself the little that is left. This defense is the spirit of the national park idea, a concept born of enlightened men: in places like this, what *is* there *belongs* there, to be sensed but not to be tampered with.

Near Druid Arch, Canyonlands





Devil's Pocket, Canyonlands

¶ "The finest workers in stone," wrote Henry David Thoreau, "are not copper or steel tools, but the gentle touches of air and water working at their leisure with a liberal allowance of time."

From Deadhorse Point, Canyonlands

¶ Joseph Wood Krutch puts the problem well in his book, *Grand Canyon:* "The world grows more crowded year by year and at an ever-increasing rate. Men push farther and farther in their search for 'resources' to be exploited, even for mere space to occupy. Increasingly they tend to think of the terrestrial globe as *their* earth. They never doubt their right to deal with it as they think fit—and what they think fit usually involves the destruction of what nature has thought fit during many millions of years."

And Wallace Stegner, in his superb letter which Secretary of the Interior Stewart L. Udall read to the Seventh Biennial Wilderness Conference, summed up the requirement: "We simply need that wild country available to us, even if we never do more than drive to its edge and look in. For it can be a means of reassuring ourselves of our sanity as creatures, a part of the geography of hope."

Cracked mud near Kane Creek. For a few hours in 1962 the nascent Lake Powell rose, then receded—to reveal what fluctuation will mean in Glen Canyon. Photograph by Richard Norgaard

Colorado River at Driftwood Canyon

Whether you will or not
You are a King, Tristram,
for you are one
Of the time-sifted few
that leave the world,
When they are gone,
not the same place it was.
Mark what you leave.

—Edwin Arlington Robinson

Mysterious Origin of the Yosemite Park Bill

By Holway R. Jones

The "legend and the mystery" of Giant Forest's reservation in the 1962 Annual Bulletin *is a fascinating example of the enrichment of conservation history through the thorough sifting of original documents.*[1] *Evidence is carefully collected to prove that the Tulare County newspaper editor, George W. Stewart, and his friends, good conservationists though they were, were not responsible for the inclusion of Giant Forest in Sequoia National Park. They were, in fact, opposed to its reservation; they did not ask Congressman Vandever to include it in his original Sequoia Park bill (H.R. 11570); nor did they suggest its addition in any of the amendments to the bill or assume any responsibility for its appearance in Section III of the Yosemite Park bill.*

That this fact should have been overlooked so long is astounding. Yet, even so recent and scholarly a book as John Ise's Our National Park Policy *perpetuates what earlier writers have accepted:*

> Thus a few men, led by Colonel Stewart, succeeded in making one of the most important contributions in the history of conservation—the saving of the ancient and mighty sequoia in the Giant Forest and other groves. But for Stewart and his men this forest might not have been saved.[2]

Assumptions of this kind in history are, of course, not unusual, especially when the writer's major concern is broad policy rather than specific detail. Yet this is precisely how intriguing mysteries are often relegated to the backwash of history. Oscar Berland opened research avenues into one such mystery. From scanty evidence available to this writer an equally interesting problem surrounds the Yosemite Park bills of the same summer.

The meeting of New York editor Robert Underwood Johnson with wilderness lover John Muir in a San Francisco hotel and their subsequent travels together in June, 1889, to the Yosemite has been told and retold.[3] Out of this well-known journey an idea was born—why not establish a magnificent new national park of the high country about Yosemite? *Century Magazine*'s associate editor asked Muir to write two articles on the proposed park, and in the spring of 1890 the naturalist fulfilled that request.[4] Correspondence indicates that Muir also sent Johnson a map marking in colored ink the boundaries he proposed for the new park.[5] This beautiful tracing in Muir's own hand, now in the

Bancroft Library, University of California, is the map the *Century's* engraver copied to illustrate Muir's articles.

The natural assumption from these facts is that Johnson, a frequent visitor to Washington and on intimate terms with a number of Congressmen, was responsible for the Yosemite Park bill that General William Vandever threw into the House hopper on March 18, 1890.[6] H.R. 8350 did not, however, propose the Yosemite National Park envisioned by Muir and Johnson. It did not include the Soda Springs campsite that helped inspire them to their "tireless campaign" for the reservation. Further, it did not include even the south portion of the Tuolumne River watershed, nor, in fact, a good deal of the north side of the Merced drainage—Lake Tenaya, for example. Vandever's bill asked that Congress set aside "for the purpose of preserving the forest and as a recreation ground for the people as a public park," a block of eight townships, approximately 288 square miles, immediately surrounding and including the state-controlled Yosemite Valley grant, and extending eastward to Mt. Florence.[7] Yet a *second* Yosemite bill, H.R. 12187, substituted for H.R. 8350 and passed through both houses of Congress on the last day of the first session without the customary bill printing, created a park more than five times the one described by Vandever—a huge district of 1,512 square miles![8] The haste with which the substitute bill was rushed through both houses of Congress in the same day strengthens speculation that those in charge of this legislation feared opposition if the bill had to be put over to the second session of the fifty-second Congress, then several months away. Did Johnson or Muir ask Vandever to introduce the first Yosemite bill? If so, why did it not include the territory desired by Muir? And why was the bill introduced by a Congressman whose district did not include Yosemite or the home of its principal champion?

A possible answer, of course, is that one or both of these men did ask the General to sponsor the Yosemite bill, but that the Congressman or whomever he asked to provide the legal description was not familiar with the area. However, by 1890, portions of the region were relatively well mapped and Vandever could have had easy access to such maps. Furthermore, he could scarcely have been unaware of John Muir's advocacy of the park. A more likely answer is that the Ventura Congressman introduced the bill at the instigation of other interested parties.

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There are three possible suspects. The first are the California Commissioners to Manage Yosemite Valley and the Mariposa Big Trees.

For forty-two years, beginning in 1864, the Yosemite Valley was managed by a board of eight commissioners appointed by the Governor of California, the chief executive himself serving as a ninth member and ex-officio president. The period of state control was marked, first, by an era of consolidation in which private claims to the Valley, after long litigation, were extinguished, and, second, by an interval of increasing commercial pressures upon the Valley, cutbacks in state appropriations, and appointment of commissioners more for their political and business acumen than for their dedication to scenic preservation. The full story of these commissioners, maligned and discredited in the popular view, has never been told and, unfortunately, may never be known in its entirety due to the careless way in which the state cared for its archives prior to the 1940's.[9]

The controversy over the commissioners' management policies in the Valley, fanned by sincere advocates of differing preservation ideas and by malcontents whose privileges were abridged or denied by the commissioners, became particularly severe in the late 1880's and early 1890's. Seeds of discontent sown at that time eventually resulted in the recession of the Valley to the federal government, an action in which John Muir, William Colby, and other leaders of the Sierra Club played a leading role.[10]

The facts just recounted are known to historians; what is not well known is that the commissioners actively promoted the enlargement of the Valley grant at least as early as 1881. At a San Francisco meeting, called by the Commission Executive Committee, a resolution was unanimously adopted that "it is the deliberate judgment of the undersigned Commissioners and other citizens, that important purposes of Health, Pleasure, Education, and Science would be subserved by . . . an extension of the Yosemite Valley and Mariposa Big Tree Grants . . ."[11] One of the commissioners, William H. Mills, a Southern Pacific agent, assisted in securing signatures favorable to enlargement. This petition, as well as some letters, were left by the secretary of the commissioners in Washington when he visited the Capitol in June; he also had an interview with President Garfield on the subject just three days before the latter's assassination.[12]

There is some evidence that Muir, in spite of his criticism of the commissioners, cooperated with them in the framing of a bill that was passed along to Senator Miller.[13] In December, 1881, Miller introduced a bill to create an enlarged grant, but an apathetic Congress took no action when local opposition, castigated later by the commissioners in

their *Biennial Report*, suddenly became aware of what was happening.[14] Similar bills were promoted in the next two Congresses, again without success.[15] The commissioners were not discouraged, however. The report of the Committee on Legislation, adopted June 2, 1887, set forth the Board's convictions:

> . . . A considerable extension of the limits of the Yosemite Grant to the eastward is essential to the preservation of the water supply in the streams meeting in the Valley. In our judgment the territory embraced in the watershed of the Valley proper, or in other words the entire basin of every stream leading into the Valley, should be under the control of the Commissioners to the end that the timber, shrubbery, and grasses thereon may be preserved to retain the snow and rain upon which the grandeur and beauty of all Yosemite streams depend.
>
> . . . We recommend that the Executive Committee be instructed to prepare a bill to be introduced in the next Congress having for its object the extension of the Yosemite Grant in accordance with the foregoing suggestions, that said Commitee also cause to be prepared and mailed to every Representative and Senator in Congress a memorial address setting forth the necessities of the proposed extension; and that said Committee after the introduction of said bill in Congress, take such further steps as may seem likely to secure the passage of said measure.[16]

Again, in 1888, the report of the Committee on Preservation of the Valley, Grove, Morals, and Good Order, favored "the most active efforts to secure an early and material extension of the boundaries of the Yosemite Grant so as to place the watershed of the Valley within the control of the Commissioners."[17] Finally, the State Legislature itself, following its investigation into the affairs of the Commissioners, asked Congress to extend the Grant.[18]

At their June 4, 1890, meeting in the Valley the Commissioners discussed the Vandever bill (H.R. 8350). John P. Irish, secretary and treasurer, reported that he had visited the U.S. Land Commissioner in Washington, William M. Stone, who promised to inspect the Yosemite "this summer 'with a view to reporting such administrative and legislative action as he would deem necessary to protect the surrounding forests and the water courses which supply the falls of the Valley.' "[19]

From the foregoing evidence, it seems clear that the commissioners actively worked for an extension of the Yosemite Valley grant at least ten years prior to the 1890 legislation. Their *Biennial Report* of 1889–90 states that Representatives Vandever and Holman of Indiana "collaborated in a bill" to save the Yosemite watershed from deforestation.[20] In a letter that the Executive Committee addressed to the Secretary of

the Interior in 1893, the flat statement is made that the commissioners "moved first in the matter of requesting Federal Reservation of the watershed of the Yosemite Valley" and that the bill was introduced "at our request."[21] In a letter to the commissioners, later reprinted in the *Biennial Report*, Vandever himself denied that *Century Magazine* had anything "whatever to do with my introduction of the bill in Congress. . . ."[22]

Should the commissioners' statements be taken at their face value? From what we know of the controversy between some of the commissioners and John Muir; from an assumption that the commissioners must have been acquainted with Muir's desire to have a federal reserve surrounding the Valley; and from a complete absence of any corroborative evidence in support of the Executive Committee's statement to the Secretary of the Interior, it seems improbable that the commissioners could have asked Vandever to introduce a bill that in its second section placed the proposed park under the "exclusive control of the Secretary of the Interior," thus denying to the commissioners authority over an extended land area and management of the Merced watershed. However, the commissioners were sincere in their desire to extend the grant, and it is entirely possible that they may have asked the General from Ventura to sponsor such a bill; it is even possible that the commissioners, or a majority of them, recognized that federal control of the fountainheads of Yosemite's falls would be better than no control.

THE SECOND suspect is the Southern Pacific Railroad. The role of this powerful transportation monopoly in the establishment of the California parks is one of the most intriguing conservation questions yet to be explored by the historian. Did this corporation support the state commissioners in its public pronouncements only to lobby secretly in Washington for federal control of the Yosemite area? Direct evidence is lacking, but circumstantial evidence is fairly strong that this may have been the case.

One indefatigable critic of the commissioners' management policies, George G. Mackenzie, whose well-phrased letters to the editor were published in *The New York Times*, was strong in the belief that if any opposition developed to the proposed enlargement of Yosemite such opposition would be "likely to crystallize into a cry that [it] is a scheme in the interest of the Southern Pacific Company and a monopoly said to exist in the business of accommodating travelers."[23] Mackenzie lived near the Valley a part of each year and knew the hotel and transportation concessionaires; he believed that they were not in favor of enlarg-

ing the grant under state administration. This may be an indication that they felt their leases might be better protected if there was divided jurisdiction in the Yosemite region.

Muir himself is authority that the "soulless Southern Pacific R. R. Co., never counted on for anything good, helped nobly in pushing the bill for this park through Congress."[24] Ten days after the creation of the park, the *San Francisco Bulletin* published the first news of the new reservation, reporting, "The Southern Pacific people, who are much interested in the project, [are] taking steps already to make these reservations known as attractive resorts for tourists."[25]

The prompt mapping on Southern Pacific Company stationery of Sequoia National Park's extension only ten days after the President signed the Yosemite Act; the subsequent alluring railroad tourist folders on Yosemite, Sequoia, and the Big Trees; and the appearance of *Sunset Magazine*, first published in 1898 by the Southern Pacific to publicize California's attractions—all these are concrete evidence that the Railroad took a fast interest in the parks and their promotion as soon as the legislation creating them had been signed into law.[26]

Further evidence is the significant role the railroad played when the recession of the Valley to the federal government became a political reality in the early 1900's. The head of its Land Department, a former state commissioner himself, aided in drafting the bill that passed the California Legislature authorizing the United States government to take back its trust upon acceptance by Congress. During the campaign in 1904 and 1905, William Herrin, the Southern Pacific's counsel, was of inestimable service to the Sierra Club, the State Board of Trade, the Native Sons of the Golden West, and other groups that desired unified federal administrative control in Yosemite. And again in 1906, when difficulties arose in Washington over the acceptance bill, the president of the railroad, Edward Harriman—a warm friend of Muir's—came to the aid of the conservationists when he intervened with Speaker Cannon of the House.[27]

MOST MYSTERIOUS of all is the third suspect—an Arizona pioneer! According to Robert Underwood Johnson, who, along with Muir, deserves much of the credit for the establishment of Yosemite, a Mr. Charles D. Poston (1825–1902) drew up "a bill for the reserve . . . on the lines laid down by Muir."[28] This statement appears in an article that Johnson wrote for *Outlook* in 1905, nearly fifteen years after the events in which he took part. There is no doubt that Johnson's reference is to a Congressional bill that he and Muir were promoting, but John-

son fails to record a bill number, date, or any information about Poston. It does not seem possible that it could have been the first Yosemite bill, but could it have been the second? Johnson's mention of Poston is indeed casual. Furthermore, nowhere in the Muir or Johnson correspondence available to this writer is there any mention of Poston. Neither biographer of Muir mentions the man.[29] And Johnson, in his own autobiography, does not name the Arizonian.[30] Who, then, was Charles D. Poston?

The only man of historical note in American history with this name is the former territorial delegate to Congress from Arizona. Certainly the entry of an Arizonian on the Yosemite stage is incongruous—until the life of this colorful pioneer is more closely examined.[31] Several factors point to the possibility of his authorship of a Yosemite bill. He was trained in the law. He was in Washington, D.C. in 1889–1890. He was friendly with many Congressmen and apparently had their "ear" on questions in which he was interested. It is not unlikely that he was known to Johnson, ever mindful of material for *Century Magazine*, since Poston had achieved some literary prowess.[32] On the other hand, it is not entirely clear what Poston was doing in the nation's capital during this period. He held a minor position with the Department of Agriculture for a part of 1890. Later that year he obtained an appointment as "Statistical Agent" in Arizona and left Washington on September 23, arriving in the West at the end of the following month. There is no record that Poston ever visited Yosemite, although he roamed through the western states quite freely and liked to think of himself as an explorer. There is little to indicate that he was conservation-minded, although he did urge the preservation of Indian ruins in Arizona under the sponsorship of the government. With no corroborative evidence of Poston's Yosemite role, one would be inclined to dismiss Johnson's statement as a confusion over names, except that Johnson's close connections with the events of 1890 and his remarkable memory for detail, demonstrated by his autobiography published in 1923, contradict such dismissal.

The official records of Congress are so meager on the Yosemite bills that the true story of why Vandever introduced a bill so totally unlike the one which became law may never be uncovered. There is no entry for H.R. 12187 in the *Minute Book* of the House Committee on Public Lands. And although there were supporting statements on the floor of Congress, both in the House and in the Senate, the *Congressional Record* is silent on what occurred in the House Committee prior to H.R. 12187's substitution for the Vandever bill on the last day of the first session, Fifty-Second Congress. Whatever happened in the latter

two weeks of September, 1890, there can be no question that the second Yosemite bill was rushed from Committee at the last possible moment and that it contained, in its first section, an incorrect legal description of the proposed boundaries for Yosemite Park. These boundaries encompassed, almost section by section, the townships recommended for preservation by John Muir.[33]

ON THE BASIS of exceedingly inconclusive but nevertheless tantalizing evidence that others may have been involved in the legislative establishment of Yosemite National Park, it seems unwarranted to assume, as most writers have, that Muir and Johnson were responsible for the introduction of the Vandever bill of March, 1890. Having said this, however, does not in any sense dim their vital contribution. Once the Vandever bill had been introduced, Johnson worked hard to convince the House Committee on Public Lands that H.R. 8350 did not go far enough. He wrote to Muir twice in April, 1890, asking him to write an "emphatic" letter supporting the suggestion to extend the Vandever limits so that Johnson could present this testimony to the Committee.[34] Armed with the Muir correspondence and his own convictions, Johnson appeared before the Committee on June 2, 1890—slightly less than two weeks before Muir sailed for a summer in Alaska.[35] He urged that the Committee extend the boundaries of the proposed park to include the Tuolumne River watershed and the Ritter Range on the east. That Johnson seemed satisfied with Committee intentions is indicated by the footnote he appended to Muir's map, reproduced in the September, 1890, *Century Magazine:*

> The above map represents the limits of the park as proposed by Mr. Muir and as advocated before the Committee on Public Lands. . . . As we go to press, the Committee seems disposed to extend the north and south limits eastward to the Nevada Line, thus adding an equal amount to the area indicated.[36]

In the end, of course, Muir's ideas for Yosemite prevailed. Also incontrovertible is Johnson's part in informing Secretary of the Interior John W. Noble and in "educating" members of the House Committee.

But obscured by the petty jealousies of some of the state Yosemite Commissioners who were unwilling to give up their personal sinecures, and others who sincerely believed that no real benefit could accrue from federal administration of the Valley, is the fact that the commissioners did recognize the importance of preserving the watershed of Yosemite's grand waterfalls and, further, that against considerable odds, they did try to win an extension of the grant from Congress.

The circumstances of General Vandever's interest in Yosemite, the quiet maneuvering of the Southern Pacific Railroad, the mysterious introduction of Poston into the Yosemite picture, and finally, the reasons for the speedy Congressional action on September 30, appear to be lost in the passage of time and insufficient documentation.

REFERENCES

[1] See Oscar Berland, "Giant Forest's Reservation: The Legend and the Mystery," *Sierra Club Bulletin,* 47 (Dec. 1962), pp. 68–82.

[2] John Ise, *Our National Park Policy; A Critical History* (Baltimore, Published for Resources for the Future, Inc. by Johns Hopkins Press, 1961), p. 105.

[3] See Robert Underwood Johnson, "Personal Impressions of John Muir," *The Outlook,* 80 (June 3, 1905), pp. 303–306; also his *Remembered Yesterdays* (Boston, Little, Brown and Company, 1923), pp. 279–280; and Linnie Marsh Wolfe, *Son of the Wilderness; the Life of John Muir* (New York, Knopf, 1945), p. 244.

[4] John Muir, "Treasures of the Yosemite," *Century Magazine,* 40 (August, 1890), pp. 483–500; and "Features of the Proposed Yosemite National Park," *Century Magazine,* 40 (September, 1890), pp. 656–667.

[5] The map was enclosed with Muir's letter to Johnson dated March 4, 1890, or two weeks prior to the introduction of Vandever's bill. The letter is reproduced in full in "The Creation of Yosemite National Park; Letters of John Muir," *Sierra Club Bulletin,* 29 (October, 1944), pp. 49–60. See also the account and quotations from Muir letters in William Frederic Badè, *The Life and Letters of John Muir* (Boston and New York, Houghton Mifflin Co., 1924), II, pp. 233–245. The Muir-Johnson correspondence preserved in the Bancroft and Sierra Club Libraries are the chief sources for information about Yosemite Park's establishment.

[6] *Congressional Record,* 51st Cong., 1st sess., 21:3 (March 18, 1890), p. 2372.

[7] A township is theoretically equivalent to 36 square miles. The Park as created by the substitute bill, H.R. 12187, contained 42 townships.

[8] *Congressional Record,* 51st Cong., 1st sess., 21:11 (Sept. 30, 1890), p. 10752. The author has been unable to find a copy of H.R. 12187. The Library of Congress, which is the official microfilm repository for Congressional bills, declared that there is a gap in their records for this number. The valuable compilation of reproduced bills, resolutions, and other legislative material related to the national parks and monuments by Edmund B. Rogers (*History of Legislation Relating to the National Park Service Through the 82nd Congress.* Washington, D.C., National Park Service, 1958. 16 vols.) substitutes for the bill a copy of the act as printed in the *U. S. Statutes at Large.*

[9] According to a notation found among the commissioners' miscellaneous records all the *Letter Books* and *Minute Books* were shipped via Wells Fargo to the Governor for deposit in the State Archives following the closing of the San Francisco office in 1906; that the materials arrived in Sacramento seems evident from the long list of documents prepared by the outgoing Secretary for the shipment, which is extant. No minutes of the Executive Committee exist prior to 1881, although there are minutes for the Board, with gaps, from 1867. One *Letter Book* remains, that for 1902–03.

[10] Colby's own account of recession is told in "Yosemite and the Sierra Club," *Sierra Club Bulletin,* 23 (April, 1938), 11–19, and "The Recession of Yosemite

Valley," *Sierra Club Bulletin,* 47 (December, 1962), pp. 23–28. For a more complete recital of events, see the author's forthcoming book to be published by the Sierra Club, *John Muir and the Sierra Club*, especially chapters II and III.

[11] California Commissioners to Manage Yosemite Valley and the Mariposa Big Tree Grove (hereafter cited CYVM), "Minutes of a Meeting . . . Called by the Executive Committee in the Office of the Secretary, San Francisco, March 22, 1881," *Minute Book,* p. 24, California State Archives.

[12] "Biennial Report CYVM, so Extended as to Include all Transactions of the Commission from April 19, 1880, to December 18, 1882," *Appendix to Journals of Senate and Assembly, 25th Session* (Sacramento, 1882), doc. 6, IV, pp. 10–12.

[13] Wolfe, *op. cit.*, p. 227.

[14] *Congressional Record*, 47th Cong., 1st sess., 13:1 (December 12, 1881), p. 68.

[15] *Ibid.*, 48th Cong., 2nd sess., 16:1 (December 15, 1884), p. 230; and 49th Cong., 1st sess., 17:2 (February 15, 1886), p. 1443.

[16] CYVM Committee on Legislation, "Report," Exhibit K, *Minutes of the Board*, pp. 214–215 (Book 3053, California State Archives).

[17] CYVM Committee on Preservation . . . , "Report," Exhibit D, *ibid.*, p. 300.

[18] *Journal of the Assembly*, California Legislature, 28th sess., 1889, p. 787.

[19] Remarks of John P. Irish quoted by George C. Mackenzie in the latter's letter to the Editor dated July 13, 1890, *New York Times*, July 20, 1890, p. 3.

[20] CYVM, *Biennial Report for the Years 1889–90* (Sacramento, 1890), p. 7.

[21] Executive Committee, CYVM, San Francisco, to the Secretary of the Interior, Washington, D.C., June 15, 1893, Records of the National Park Service, National Archives, R. G. 79.

[22] Letter of William Vandever to John P. Irish, September 9, 1890, quoted in CYVM, *Biennial Report for the Years 1889–90* (Sacramento, 1890), pp. 7–8.

[23] *New York Times*, January 26, 1890, p. 10.

[24] "Proceedings of the Meeting of the Sierra Club Held November 23, 1895," *Sierra Club Bulletin*, 1 (January, 1896), p. 275.

[25] *San Francisco Bulletin*, October 11, 1890, p. 3. It is interesting that the *Mariposa Gazette*, the only newspaper which could be called a "hometown" paper for the Valley, carried no mention of the Congressional action until its issue of October 25, and then it was a reprint of the *Bulletin* story. Even less notice was taken in the nation's great dailies of the day; the *New York Times* and the *New York Daily Tribune* did not report on the Yosemite Act, although the former had published editorials in favor of the park and a number of letters from Johnson, Mackenzie, and others.

[26] The original of the Southern Pacific Company map of Sequoia National Park is in the National Archives, Records of the Interior Department, R. G. 79; it is reproduced in Berland, *op. cit.*, p. 79. In an attempt to discover if any Southern Pacific records survived the 1906 fire, the author wrote to the railroad's Public Relations Department and received this frustrating reply: "We think there must be some validity to your belief because we did turn up a file index with notations referring to files 'covering correspondence and agreements on the establishment of Yosemite Park.' When we checked, though, the files had been destroyed in 1938 . . ." (Letter from William Phelps, San Francisco, to author, Oakland, June 21, 1962).

[27] Colby, "The Recession of Yosemite Valley," *op. cit.*, p. 27.

[28] Johnson, "Personal Impressions of John Muir," *op. cit.*, p. 304.

[29] Wolfe, *op. cit.*, and Badè, *op. cit.*

[30] Johnson, *Remembered Yesterdays, op. cit.*

[31] See A. W. Gressinger, *Charles D. Poston, Sunland Seer* (Globe, Arizona, D. S. King, 1961), 212 pp. I am indebted to Miss Phyllis Ball, Special Collections Librarian, University of Arizona (Tucson), and Mr. B. Sacks of Baltimore (Md.), Consultant to the Arizona Historical Foundation, who is preparing a biography of Poston, for this information. (Letters to the author, June 9 and June 18, 1962.)

[32] Among his published works are *Europe in the Summer Time* (Washington, D.C., 1868); *The Sun Worshippers of Asia* (San Francisco, 1877); *Apache-Land*, a long narrative poem (San Francisco, 1878), and a pamphlet, *Irrigation* (Chicago, 1887).

[33] The ambiguity in the legal description was caught later by William Vandever who had asked Secretary of the Interior John Noble if he would furnish him "a description and a plat of the whole reserve showing the Townships and range" (Letter from Vandever, Fort Washington, Pa., to Noble, October 30, 1890, National Archives, R. G. 49). Noble complied with the request, and on December 20, 1890, Vandever, in another letter to the Secretary, pointed out the error. In describing the north boundary of the reservation, the phrase, "to the corner to townships two and three north," between the words "north" and "ranges" in the sixth line of Section I, had been omitted. It could have been interpreted that the north boundary line ran indefinitely eastward.

[34] Johnson, New York, to Muir, Martinez, April 25 and 29, 1890, author copies.

[35] U. S. Congress. House Committee on Public Lands. *Minute Book*, June 2, 1890, National Archives, Legislative Division.

[36] Editor's footnote in Muir, "Features of the Proposed Yosemite National Park," *op. cit.*, p. 666.

Is an organization with a conservation policy but no population policy fooling itself?

How Dense Can People Be?

By Daniel B. Luten

I. Genesis, Numbers, Exodus: Man Against the Land

Men have lived on this earth for a long time: 600,000 years is a tempting guess, if only because a one-hour lecture can cover this period at 10,000 years per minute. Thus, thirty minutes on learning how to make and use tools, fifteen minutes on learning how to use fire, fourteen minutes on the early stages of domesticating plants and on exploring the earth. Then, in the last minute, the invention of agriculture, villages, herding, writing, and the great outpouring of technology starting with the use of irrigation by civilizations of the Middle East, through Greece and Rome. With a gasp for breath in the Dark Ages, we rush on into the torrent of the Renaissance and, in the last seconds, give detailed examination of the Industrial Revolution and the present science-led technological revolution.

Accompanying all this is a crescendo of population growth. Imperceptible to the wisest of men until perhaps the time of Christ, now it can hardly escape the attention, in California at least, of the sparrows nesting in the eaves.

The curve for the world's population growth resembles that of a chemical explosion, starting with the decay of a few molecules in a receptive environment and leading quickly and progressively to a big bang. Somewhere the analogy ceases to be fruitful but let me use it here to make one more point: an explosion is transient. It stops—for lack of fuel, from contamination by its products, or from some other inhibition. A population explosion is transient, too.

Growth of the world's population at the time of Christ was perhaps 0.04 per cent per year; today it is almost fifty times as great. What happened in a century back then happens in two years now.

Can we really be sure that today's growth is novel? Yes. Had population from the time of Adam and Eve always grown at today's rate, the inhabitants of Eden would have had to appear at 800 A.D. A population starting then with two individuals and increasing at 1.8 per cent per year would have reached 3.1 billion people by now.

Can this growth continue indefinitely? No. Today's population, growing at today's rate, would require 800 years to reach the SRO, the stand-

ing-room-only population, 10^{15}, with five square feet per person, land and sea. If this doesn't appeal to you as a limit, take Harrison Brown Day, perhaps 2,000 years from now, when the earth's mass of humanity would be expanding outward at the speed of light.

My only purpose in playing with these numbers is to convince you utterly and irrevocably, finally and remorselessly, mathematically and logically, that the growth so familiar to us today was unknown to all but the most recent of our ancestors and that it must be unknown to all but the most immediate of our descendents.

Of all these 600,000 years, in less than 6,000 has man had to contend with appreciable growth, and most of that growth can be limited to the 600 years beginning with 1500 A.D. Its peak probably will lie in a 60-year period centered in this century. We live in a unique age. It will not continue; it probably will never recur.

DOES THIS MEAN there is a population problem? Not necessarily. Whether we think there is a population problem depends on our purpose.

If our concern is only for the present, not for the future, then we have no real problems. If our concern is only for the immediate future, then we may envisage a population problem in the overcrowding we feel today and expect to feel more strongly tomorrow. Ghenghis Khan and Adolph Hitler thought to attack such immediate population problems but we have ethical constraints which forbid us from employing their methods. So, if our concern is for today or for a myopic tomorrow—say for an amortization period of twenty years—then we might as well forget about population. Practically, there is no problem because there is nothing we can do about it.

If our concern is to maximize the number of souls passing through the gates of Heaven, our only population problem is to see that they do not come crowding into this worldly anteroom too fast. We need not care for the manner of their existence on this earth, and perhaps it is best that they pass on quickly.

If we believe, with Lord Keynes, that a capitalistic economy must

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Dr. Daniel B. Luten is a Lecturer in Geography, University of California, Berkeley, having retired recently as research chemist for Shell Development Corporation. During the rebuilding of Japan he served for two years as conservationist with the MacArthur forces. The two parts of this article continue an enquiry that began in the *Sierra Club Bulletin* in 1959 and in the club book, *The Meaning of Wilderness to Science*. Part I derives from a paper presented before the California Democratic Council in Bakersfield, California, March 30, 1963. Part II comes from a paper given at a California Conference on Growth held at the University of California, Riverside, October 7–8, 1963. Dr. Luten joined the club in 1953.

grow to survive then we will perhaps seek a society with an ever-growing population. Keynes foresaw a Judgement Day when growth must end, but did not accommodate it. Few of us, I think, would regard such a society as optimum. It has no criterion for excellence except a high material living standard. Whether any of the arts will flourish is not guaranteed. Whether there will be any room for wilderness, whether man can have the degree of contact with nature requisite for sanity is not specified. Even leisure, apparently, will not be an objective, except that it does take time to be a consumer and such a society cannot testify to its highest productive power unless it insists on high consumption. It will be affluent, but perhaps not rich. In particular, this criterion carries with it a most serious threat: that a society will come merely to serve its economy.

If a country's purpose is nationalistic aggrandizement and competition with other nations, then it will seek a population optimum for that purpose—vast for China, while much less in this country.

If we believe that man profits only from contact with other men and has nothing to gain from the natural scene that was his habitat for all but the last minute fraction of his existence, then we might seek the SRO population.

A friend, a distinguished scientist, once argued for universally dense populations because, he said, he had observed the earth is best cared for when people live close together on it. He is a soil scientist and was pulling my leg, but the point he made was well taken. What one will seek to do about population depends on his purpose.

Suppose that our purpose is a world in which men will not be materially deprived, a world where they can seek out their individual values, where they can lead lives of dignity. Imagine a diverse world, hot and cold, hard and soft, civilized and wild, naive and sophisticated, proud yet humble, competitive as well as cooperative, a world of such variety that the intensification of consciousness can never be dulled for lack of new experience, a world with more things under the sun than any man can know. Consider a world in which black and white can live together but also one in which they can live separately yet ungrudgingly; where rural life can compete effectively with urban life; where you have, perhaps, societies on asphalt, but also societies in grass huts and glad of it; a world in which men can still perceive their genetic heritage of wildness in lands still wild. If our purpose is to achieve these goals, then indeed we have a population problem.

Perhaps, though, if you ask an ordinary sort of guy what his purpose is, he will say only to lead a long life, to have a large family, to be secure. Throughout most of the world, security means a large family. But there

is an inescapable constraint in this, for we have already argued that growth must cease; and growth can cease only when the number of births equals the number of deaths, and accordingly, someday, in all the world, and even today in parts of it, if many children are born to each family, most of those children must die without having families. Few will lead long lives. In the long run, man must choose between a long life and a large family.

In Japan, this choice has been made almost explicitly. Following a sort of nationwide debate, with the government carefully remaining aloof, the Japanese birth rate fell by half between 1949 and 1957. If the current rates are maintained, Japan's population will start to decline slowly late in this century. In Japan, the best wish is no longer "Many Children" but "Long Life."

Elsewhere, rather than to make the choice between long life or large family we evade it, and either deny that the earth has limits or speculate in great detail on what the limit is. How many people can the earth support, we ask. Then we make estimates ranging from the six billion we must expect by the end of this century to many more, to easily as many as 80 billion.

The estimate depends on what we demand in the way of living standards and what we assume in the way of technological capability. Most debate of this sort is pointless. The earth can support the number of people it does, and these days it can be made to support 2 per cent more each year, with perhaps slightly better or slightly worse living conditions than last year. If this growth continues, however, inevitably the time will come when steadily and remorselessly the entire earth will support each day a few less than the day before. This has already happened in some regions.

IF WE CONTINUE to insist that there is no population problem, it is still unlikely that our fate will be universal starvation. More likely we will see collapse of our administrative machinery, social chaos, failure of the extraction and processing and fabrication industries, and destruction of the network of supply and communication upon which urban beings are so dependent. None of us appreciates fully the intricacy of this web.

But all this debate on how many men can live on earth evades the issue, which really is the quantity of beings versus the quality of living. If we neglect to choose, the choice, perhaps an unpleasant one, will be forced upon us.

The ultimate question is moral and ethical, not technological at all. In terms of my purposes, the world is already supporting too many people

and it should, for some time to come, support progressively fewer and fewer in almost all of its regions, including the United States.

But, you may counter, surely in this economy of surpluses we would not be better off with fewer people. True, ours is an economy of surpluses, but still a society of deteriorating education, of inadequate public facilities. An economy of *private* surpluses, yes, but how about the one-third still ill-housed, ill-fed? How about the complaints that we cannot afford parklands, or decent medical care; that we cannot afford to support our aged, or care for our delinquents, or dispose of our wastes properly? What is the state of our resources when our major oil, mining, and lumber companies say that if we set aside a mere one-hundredth of our land so that it can remain wild, it will jeopardize our resource base? What you see here is a society that won't admit that it exists to serve its economy but that has no way of evaluating social qualities except to price them. Such a market-place mandate is madness and can lead only to disaster.

The ever-growing population drives us to it. So there is a population problem. What should we do about it?

Should we give birth-control information to other nations? Should the United Nations do the same? Yes, if other nations want it, we should, and the United Nations should. But let us not imagine that the population problem is always there and never here. If there is one illusion we should disabuse ourselves of, it is the notion that other countries should limit their numbers but not we.

The problem is here, too. It will be, so long as the average American family wants to have the number of children it can afford—3.2 in 1955 and still 3.2. We have been brought up *not* to understand how, if every family has the number of children it can afford, the nation can end up with so many people that it cannot fulfill its purpose. We have known only how to use economic criteria in our decision-making—without necessarily being aware of it.

Would a cheap, universally available pill solve everything? Fairfield Osborn cut this notion down to size at the Eighth Wilderness Conference when he observed that in 1936, with no pill and without a lot of stuff drugstores are full of today, the American population grew at the rate of 13.6 births per thousand. Today, with pill and all, the rate is 24.7 per thousand. Japan, for two centuries before Westernization, had a static population of 28 million. They had no pills, no contraceptives. But they had incentive to control their numbers and they controlled them.

So let us not imagine that we need only tell a society about birth control to cause its birth rate to fall. Incentive and technique are probably both needed. Technique, though we shun some of it, has always been at hand when incentive was present. Incentive is essential, but

Highway 64, Arizona

PEOPLE NEED LAND...

PEOPLE NEED POWER...

Contra Costa County, California
Photographs by Rondal Partridge from *God's Own Junkyard* by Peter Blake; Holt, Rinehart and Winston; New York, 1964

Benches, north of Fort Bragg
Photograph by California
Division of Highways

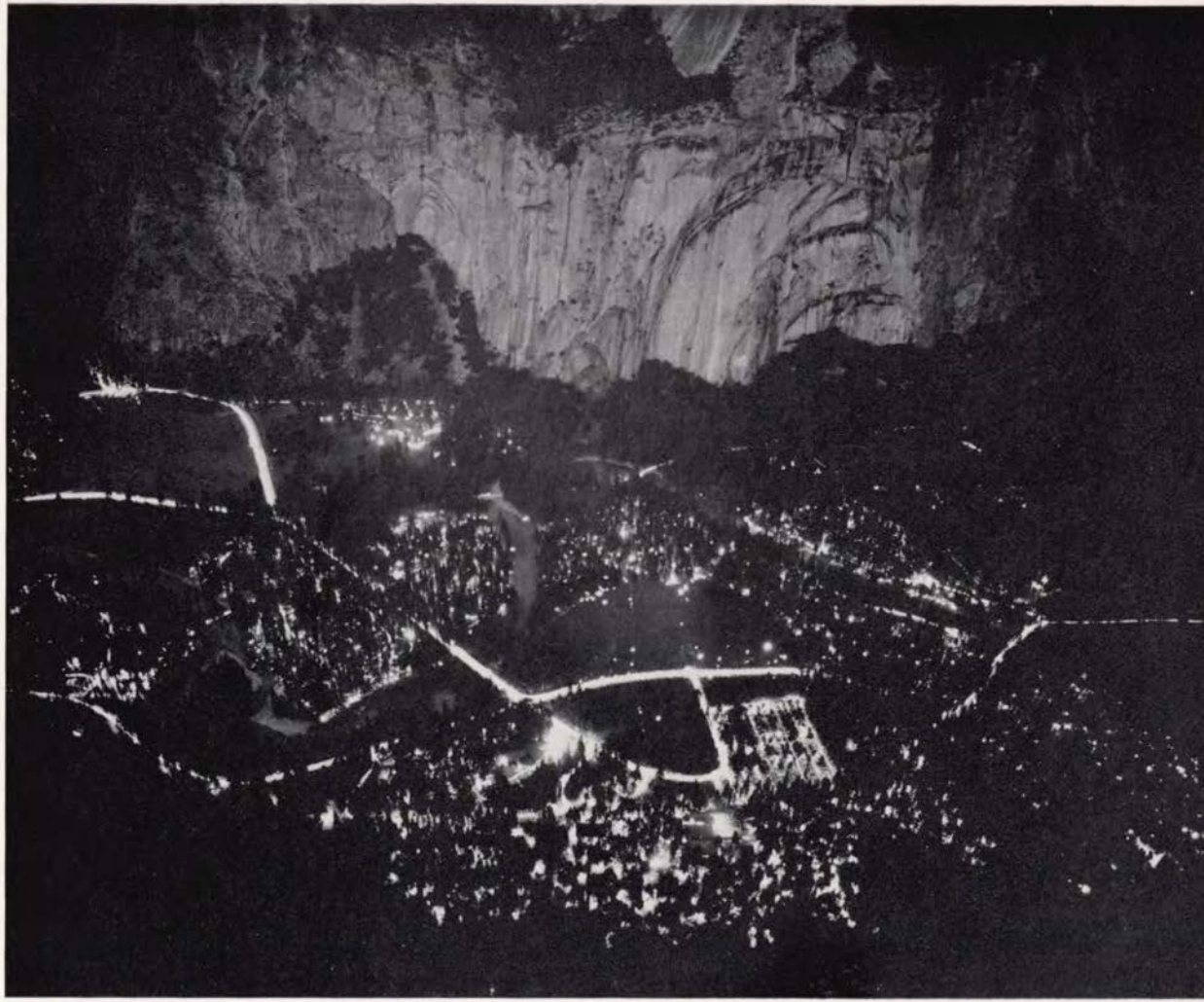
PEOPLE NEED ROADS . . .

PEOPLE NEED HOMES . . .

Subdivision near Los Angeles
Photograph by William A. Garnett

PEOPLE NEED PARKS...

These needs, however, cannot be met by the circular solution: more people, more products, more people, more products . . . The day has arrived, Dr. Luten believes, when we must stop evading the issue, ". . . which really is the quantity of beings versus the quality of living. If we neglect to choose, the choice, perhaps an unpleasant one, will be forced upon us."



Yosemite Valley from
Glacier Point, July 28, 1963
Photograph by Jonathan Blair
Seasonal Photographer,
National Park Service

increased humanity of technique can bolster it. The pill, when it becomes cheap, may mark the turning point for India, provided that we do not nullify their incentive by our bad example. The pill, by the way, should cost less than 1/16 of what it costs now when its production is expanded a thousand times. Perhaps a dollar for a year's supply.

In the United States all that is lacking is incentive. We are blinded by the glitter of growthmanship. We have been sold the monstrous bill of goods that our prosperity depends upon growth—as vast a piece of nonsense as was ever foisted on a presumably literate people!

I suggest that our social scientists put their heads together and devise a way to make this society work not to serve its economy but to be served by it, so that the basic virtues of individual enterprise are fostered and maintained. But not in a way that lets decision-making become so fogged by economic criteria that one of our most serious debates is whether economically we can afford disarmament!

We still have time to choose. Ours can be a world of long lives, of individual opportunity, of low birth and death rates—or it can be a crowded world of misery, of short lives, of high birth and death rates; a world where every grain of dirt must be squeezed of all its nutrient, where every wild thing must bend its will to man or die. We still have the choice, but as the late Aldous Huxley wrote recently, "On the stage of international politics, a whole orchestra of Neros, some consciously malevolent, but most of them full of good intentions and high ideals, insanely fiddle, while all around them, at an ever accelerating rate, Rome burns."

II. How to Grow Repulsive: California Case Study

Because he had to be in Washington, the Sierra Club's executive director asked me to appear at a Riverside Conference on Growth in his stead. I did not speak for the Sierra Club, and I do not know that the club would have said exactly what I said, but my comments were consonant with club objectives. This was easy for me because I usually sympathize with the club's views.

California's wildlands are jeopardized by California's growth. Wildlands conservationists have traditionally tried to look the other way or to keep this skeleton in the closet.

Only last spring, at the Wilderness Conference, in considering the future of America's wildlands, the program seemed to avoid rather than to focus on the issue of population growth. But times are changing, because the question arose again and again during the Conference. In September, at a meeting of the Federation of Western Outdoor Clubs, no mention of this problem appeared in the program. However, after

one of the discussions, a young man spoke up to insist that all that had been advocated was treatment of symptoms, that the cause was population growth, and that no hope for the future of wildlands can be realistically held until growth ends. The audience listened, but no one picked up the matter. You won't find it in any of the resolutions voted.

But the problem is growth—growth compounded by rampant land speculation by the California land lottery. It is growth which has led wildlands conservationists to say despairingly, "What we save in the next ten years is all that will be saved."

Now I must say that I am against growth. As I have said often, I am against a society which exists merely to serve its economy. I have been for progress, but if someone proves growth is essential to progress, then I'll oppose progress.

THOUGH GROWTH may have helped progress historically in the United States, we have come to the point today where growth is a simple evil. We should be learning how to get along without it. To permit it to continue is to admit that we are not masters of our own destiny. To permit growth to continue is evil in added ways: we are not only passing on to our children a problem that we fear and that they will have to solve; we are also compounding it. Admittedly, it cannot be solved overnight or in one generation. But if we continue to say it is not worth solving because the results will not appear for a generation or more, then we must remember that some day a solution that no one would have chosen will be imposed.

Some day the problem must be solved. As I have said earlier, the universal growth that is so familiar to us cannot continue forever or even for very long. The sooner we get away from it, the better off we will be.

In California, growth has a special attribute in that the bulk of the State's increase is due to immigration. California is not having a population boom; it is just growing as steadily and remorselessly as it has grown for a century. It increases 3.75 per cent per year, doubling every 18.5 years. But such growth cannot continue indefinitely; it will end when California becomes as repulsive to its immigrants as the places they have left. It would be pleasant to have it end sooner.

I want to cite one attribute of California's growth and ask if we can find a way to eliminate it as a factor. But to do this, I must point a finger at the engineers, the technologists, the scientists, at all of us, because we are all partners in the matter. And the matter is, essentially, that California continues to grow because we all believe it *will* continue to grow. If we didn't have this belief, its growth would dwindle. More-

over, growth might cease altogether, and to many some aspects of such stability are frightening.

To get a feeling for the way California's growth is maintained, let us remember how we attack resource problems. Mostly they are problems in land use. It doesn't much matter what kind of land use; it may be the location of a power plant, the development of a park, the management of open space, the multiple use of forests, the use and preservation of wildlands, the survival of an ecosystem, the pollution of a lake, or the transport of water.

In our approach to such a problem, a common weakness exists. It stems from our feeling that once we have laid down certain specifications, the problem can be viewed as a problem in technology, in engineering, and in applied science. The notion gets abroad that our purposes may be specifically defined and that engineers can meet them precisely. The weakness is accentuated by our willingness to itemize objectives even when we are really quite uncertain of our purpose. But what else can we do?

The engineers seek and usually find solutions. Whether they are the best solutions is a matter of human strength and human frailty. But they do two things that are not in our best interest, or theirs. The first is perhaps unavoidable. Because the problems of engineering are becoming indescribably more intricate by the year, engineering is becoming a most difficult profession. Its practice would be well nigh impossible but for the use of simplifying assumptions. Some of these assumptions are sound. Others, however, have dangerous fallacies. A phrase that comes to mind as best typifying the misleading nature of the fallacious assumption is the "foreseeable future."

It is perfectly clear that our ability to foresee diminishes with increasing remoteness. Most of us know well where we will be next month, have a fair notion about next year, and know very little about where a decade will find us. It is qualitatively the same with a business venture, but the confidence in the future reaches out a bit further.

So, regardless of scale, our knowledge of and confidence in the future steadily diminishes as its remoteness increases. But instead of recognizing this we seem to believe that we have full knowledge up to a certain unique day, and none thereafter. This is manifest nonsense. The concept of the foreseeable future as a cutoff point should be abandoned. Let us see, instead, if we can devise a way of planning for the future to the extent that we need to plan for it, so that our plans will retain a flexibility. I don't want to be put on record here as suggesting we build rubber aqueducts. All I wish to do is to undermine confidence in the immutability of the foreseeable future.

A twin of the foreseeable future is the "ultimate demand." Secretary of the Interior Stewart Udall has recently outlined a water plan to meet ultimate demands. But if this is the demand at the far end of the foreseeable future, anyone who believes in growth will admit that the demand on the first day of the unforeseeable future must exceed the "ultimate demand" of the last day of the foreseeable future. If we can foresee this—well, why don't we abandon these terms?

The second thing engineers do against our interests is more serious. This is a predicament wherein the effects they try to produce influence the situation they start with. It is akin perhaps to the Heisenberg uncertainty principle, where the act of measuring the speed of an electron changes its speed.

In the matter of California's growth, they have taken the predictions of growth through, of course, the foreseeable future and estimated, of course, the ultimate demands. I should not misrepresent the demographers who forecast California's population. These numbers are given with a good deal of confidence up to perhaps 1975, with a great deal of uncertainty to the end of the century, and no further. Other people, though, have built around the projections an aura of infallibility, and have said that this is going to happen, that there will be 25 million people in California in 1975, that there will be 40 million people in California at the end of the century. As a result, the future population of California is commonly regarded as an independent variable, beyond the power of man to influence. This has been sold so persistently that the engineers tend to believe it. It is as if people had nothing to do with reproduction or migration.

But California's growth is not an independent variable. It depends on a confidence that California will continue to grow. Suppose today someone of great influence and reputation were to say, "California's growth is at an end. Not merely will immigration cease tomorrow, but the natural increase of births over deaths will be nullified by emigration." The consequences would be dramatic. With no more growth we could quit building housing right now, freeways soon, schools in a few years, and water development about as soon. If we were to need no more houses, neither would we need the new business establishments to do business with their new occupants, and so on. No more gas taxes, fewer and lower other taxes, a veritable elysium. But how about the people who have been building those highways and the materials suppliers? Would gas taxes provide enough unemployment insurance?

Now, look at the converse. When predictions of growth for 1975 are

received as if they were utter certainty, then the effects are opposite. We see the need for more housing, for more freeways, for more schools, for that ultimate demand for water, and, even in a passing moment's reflection, for more parks. What does it take to construct all these facilities, to man the industries which supply and transport the needed materials, to create the service industries, to house their personnel and educate their children, and so on? Well, it appears that it takes just about the number of people which, it was predicted, would be found in the State in 1975.

The predictions of growth for California are self-fulfilling predictions. I have speculated to myself on the possible interplay of competing forecasts, of these short-range, self-fulfilling types and also of long-range, self-defeating types, but I must confess it is beyond me; I can't get much of a feeling for the consequences. Two impressions are left with me, though. One is that California's century-long history of precise exponential growth may be prerequisite to the self-fulfilling quality of the prediction of growth. The other is that though universally believed predictions of no growth for the State seem apt to lead to economic collapse, in actuality the State's economy may be so stable that it can thread its way through the difficulties of the termination of growth.

At any rate, all of us must hope so, for the forecasts of the State's growth begin to fall away from the exponential curve after 1975. The 40 million suggested for the year 2000 is far below the 72 million a continued exponential growth would produce. The signs that exponential growth cannot be maintained are multiplying. In California, this vortex of growth in this age of growth, doubts are beginning to appear. I don't know how San Diego reacts, but San Francisco finds little pleasure in our being the first state. Daily the doubts are voiced. The artifacts of growth are questioned, and San Francisco has gagged on and rejected an Embarcadero Freeway caught crossways in its throat.

In short, growth prevents us from fulfilling our purpose. The full interpretation of this purpose is beyond me, but I believe it must include the determination to keep our children out of traps, to build a society that will serve its people and an economy that will serve such a society, and to keep enough wildness in our surroundings to insure the preservation of a good world for people to live in.

"It is a fragile thing, this natural wilderness, consisting of the material for poetry and art and music and vigorous, clean living. It is easily degraded or destroyed by heedless men."[1]

Olaus Murie and the Quality of Wilderness

By George Marshall

An ecologist, Olaus Murie saw life whole. He saw it as a continuous interrelationship that included not only animals and plants and their inanimate environment, but also man and his culture and his ideals. This concept of life, developing from years of technical biological work in mammalogy, grew to encompass the esthetic, cultural, and ethical values of wilderness. It became a belief that these values have a world-wide and enduring importance to man. He considered that the relationship of man to wilderness is an essential part of an integrated view of life.

Olaus J. Murie was born in Moorhead, Minnesota, March 1, 1889. He first saw the mountains of the West on his way to Pacific University in Oregon from which he was graduated in 1912 and from which he received an honorary degree of Doctor of Science 37 years later. He spent many years doing field studies in Labrador, Hudson Bay, British Columbia, New Zealand, the Alaska and Brooks Ranges, the Yukon, the Aleutian Islands, and many western states. His research on wildlife and its habitat was conducted on four continents.

He was field biologist for the U.S. Biological Survey, 1920–1951, and from 1946 until his death this past Fall had served at various times as President, Director, and Chairman of the Council of The Wilderness Society. In 1927, he and his wife, Mardy, settled near Moose, Wyoming, at the foot of the Tetons. This was the base for his major elk studies, and where the Muries brought up their three children. There, he hospitably received and inspired countless friends and visitors, conducted the western headquarters of The Wilderness Society, wrote most of his articles, and did most of his paintings and drawings.

His best known scientific work was in mammalogy and included basic studies of caribou and North American elk. He published only a few books, but numerous scientific papers, and about a hundred popular articles on natural history and wilderness.

He was an educator in the deepest sense. Not a teacher at an institution, he reached people instead through his writings and lectures, and through informal contacts at conferences, field trips, and at home. He was

especially interested in opening the eyes and minds of young people. Unlike many scholars who talk to their disciplines or to themselves, Olaus spoke directly to people and they understood and loved him—even many who disagreed with him. At one of the many public hearings at which he testified, he made it clear that the outcome would "depend on the attitude, the motivation of the one who makes the decisions. The viewpoint of the decider is the crucial thing."[2] And in his factual, philosophical, and forthright way he tried to persuade "the decider."

Wilderness meant many things to Olaus, among them adventure and exploration. Once, at the age of 23, he swam the cold waters of Hudson Bay to recover his "wayward canoe" and save his collecting expedition for the Carnegie Museum. He explored many parts of Alaska on foot, by boat, or by dogsled; banded wild geese on slippery mud amid swarms of mosquitoes; and climbed along breath-taking animal trails on a variety of wild mountains. Although wilderness often held dangers and hard work, it primarily meant to him stimulating and joyous experiences.

Probably the most joyous of these experiences was his marriage to Margaret E. Thomas. They met for the wedding at an appointed place on the Yukon River, to which he travelled upstream from studies in the delta, and she travelled downstream from her home in Fairbanks. Their honeymoon was a trip by boat and dogsled up the Koyukuk.

As AN ECOLOGIST, Olaus discussed, in a variety of ways, the interrelationships of nature. Through careful investigation and analysis of facts, he countered old wives' tales, deep-seated hates and prejudices, and superficial reports. His study of wolves, for example, revealed their true relation to caribou, pointing out the wolves' value as living members of an ecological system and, consequently, their significance to wilderness and mankind. Such interconnections of wildlife, its environment, and the conditions of its survival are complex, but as the following words of Olaus show, it is a complexity that is necessary and rewarding to understand.

"The butterfly and the flower in rugged country seem a long way from the song of the wolf in the wilderness night, but all the attributes of wild country are related—the birds, the caribou in the northern plains and mountains, mountain sheep among cliffs, tracks of a wolverine, a glimpse of a wolf, or his chorus at night, the northern lights, the exhilaration of being among them—all these and more are ours on this earth if we under-

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George Marshall has been a Director of the Sierra Club since 1959, and is a charter member of both The Wilderness Society and the Adirondack Mountain Club. Since 1936, he has been a member of The Wilderness Society Council, and from 1957 to 1961 he served as managing editor of *The Living Wilderness*.

stand facts and have the wisdom to retain these vanishing intangible resources."[3]

And again, commenting on observations he made on his 1934 trip into the Olympic Peninsula, he expressed both a delight at being in wilderness and perceptive ecological understanding.

". . . I found that dead trees, and down logs, had a part to play in the lives of animals here. . . . All through the rain forest . . . the wildlife, the vibrant life that had evolved through millions of years had produced an ecological situation with adjustments to all the elements of the whole. In nature's economy there are no 'mature' trees to be gotten rid of. It is this whole ecological picture that has so much to offer to the sensitive person. . . . To put a commodity value . . . on any product of such a forest is contrary to the best human motives in designating a national park."[4]

Olaus developed further the idea that wilderness values cannot be equated with commodity and money values in the 1953 Hillman Lectures, "Wild Country as a National Asset," his most extensive discussion of wilderness.

Whenever he discussed wilderness, Olaus stressed the importance of appreciating and preserving its quality and of understanding it as a whole. "The wilderness philosophy," he wrote, "is a broad thing. People are interested in plants and animals, and not only in scenery. We are in danger, I think, of getting a single-track way of looking at things. If we want to have some wilderness we must look at it whole. Legislation, yes, but (also) as you said once, what takes place within boundaries."[5]

Olaus believed that a democracy must provide diversity and choice of recreation and the continued existence of the "original beauty of the American wilderness." He pleaded that "the opportunities for enjoying our land be not reduced to a dead, leaden uniformity, levelled to an engineer's formula."[6] He posed the question, should all people who are sensitive to the beauty of ". . . original canyons through which runs a live river . . . now and in succeeding generations, be barred from the choice of such places by mandate of a bureau whose particular assignment is practical engineering?"[6] He believed firmly that "it is not for a single agency, or a single commercial organization, to make ruthlessly a decision which affects the future."[1]

As a scientist, Olaus always insisted on complete honesty, and thought one should give one's true reasons for enjoying and preserving wilderness. The following recollection illustrates this attitude.

"I had remarked casually as I left camp that I was interested in whether there were mountain sheep up there. I really was interested, but chiefly, I knew in my own mind, I simply wanted that mountain!

"Some have succeeded in saying, at least partly, why they climb moun-

tains. Perhaps it cannot be simply told, except that it is fun. . . . I felt the exuberance as I stood there at the top of my climb and plotted my return . . . across the landscape as if I wore seven-league-boots! And you have a seven-league-urge on a mountain top."[7]

In another context, also trying to express his true feelings, he said, "Actually our concern about these animals is that we find them interesting and attractive, they seem to belong to the environment of nature that we too enjoy—the natural environment that would be something less without them.

"So why don't we make this our plea? If this is our reason for wanting to keep these wild creatures, why don't we say so? It is the only basis on which a victory could be permanent."[8]

OLAUS WAS WELL AWARE of the forces tending to destroy wilderness and its wildlife, but he was optimistic at expressions from "the people throughout the world" who "have come to cherish those areas of wilderness which we still have left."[9] He looked on this desire for wilderness as ". . . a most promising sign of progress, comparable to our reaching for higher levels in religion, art, literature, and music."[2] Hope for the future, he believed, depended in large degree on greater efforts at understanding and at discarding hate.

It is difficult to say which aspects of Olaus Murie's life will be regarded as of greatest significance ten or a hundred years hence. Perhaps it will be his definitive studies of elk or his defense of wolves; or the way he raised ecological understanding to new levels by relating the future of wildlife to the future of habitat; or his leadership in establishing the great Arctic Wildlife Range; or his lifelong efforts to give to humanity a deeper understanding and appreciation of wildlife and wilderness and their abiding values; or his work towards preserving these values.

Perhaps it will be his enjoyment of life, of people, of useful work; of the example of his extraordinary courage in effectively continuing his activities during the last nine years of his life, punctuated as they were by illness and operations that would have caused most men to surrender.

Perhaps, above all, it will be his love of wilderness, its wild creatures, and mankind, and the importance he gave to their interrelations and the maintenance and development of each.

To us who knew him, he was a gentle, modest, non-combative man who, through facts, idealism, and kindly persuasion, educated and moved aggressive, tough-minded people. A man of the highest integrity, with a fine sense of humor, he appreciated people of all races and backgrounds and constantly searched for new discoveries or understandings. In doing

so, he often taught us to see and think in ways previously unknown to us. Each time we left Olaus, we left with a sense of having had a joyous and spiritual experience.

For those who were not as lucky as we to have known Olaus at first hand, there are his published works and drawings, and, I hope, more to be published from his manuscripts, journals, and letters. His place is high among the great ecologists and advocates of wilderness values.

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Mountaineering Notes

Edited by Richard K. Irvin

WESTERN ALPS

The year 1962 heralded a real breakthrough for American climbing in Europe. Henry Kendall and Gary Hemming climbed the Walker Spur of the Grandes Jorasses in superb style; Royal Robbins and Gary completed a difficult new route on the West Face of the Petit Dru; and John Harlin ascended the Eiger Nordwand with his German companion, Konrad Kirch.

Generally speaking, however, 1963 was a poor climbing season in the Alps, the worst in many years. Rain fell continually during August and early September, leaving only two short weeks in late July during which successful climbing could be done in Chamonix-Mont Blanc. But 1963 saw a continuation of efforts by the American climbers who had remained in Europe during the year and by other American climbers who had more recently arrived there.

Two of the most significant new routes in the Alps were done by climbers from Yosemite Valley. Technical routes of this kind are now being established by American climbers because three necessary conditions have been met. The first condition is semi-residency in the Alps, for a climber must become familiar with local weather and with the climbing conditions of the walls. It may also be necessary to learn ice techniques. Hemming has spent the past three years in the Alps and Harlin considerably more time. To these two must go the bulk of credit for getting Americans off the ground in the Alps. The second condition involves application of Yosemite techniques. In every case, the successful American alpinists have trained in Yosemite, the most advanced big-wall, pure-rock area in the world. To the alpine environment these climbers have applied their knowledge of new hardware, their efficient artificial techniques, and their climbing philosophy. In doing so, they have established high technical standards. Expenditure of great effort and time is the third condition. The climbers realize that alpine routes do not come easily. For instance, Harlin persevered for five attempts on the Fou before he attained the summit.

L'Aiguille du Fou, Face Sud

This face, tucked away among the Aiguilles of Chamonix, is comparable in steepness, in size (300 meters), and in climbing problems encountered, to the smooth North Face of Sentinel Rock in Yosemite Valley. The face had been attempted almost annually by continental climbers for the past ten years, and had been reconnoitered by Gary Hemming and John Harlin at least once. I joined Gary, John, and an impressive Scotch climber, Stewart Fulton, in waging full scale war against the Aiguille du Fou. Our first group siege began on July 15 as we staggered beneath heavy loads from Chamonix up the Mer de Glace to the Refuge d'Envers des Aiguilles, a five-hour trek gaining 5,000 vertical feet. Our equipment was superb. We took with us 75 pitons, mostly the hardened American kind of Chouinard manufacture, and 80 carabiners. We were warmly clothed in heavy woolen knickers, many shirts, sweaters, the essential hard hat, and good climbing boots. For the bivouac, we carried socks and jackets of down, cagoules, waterproof trousers, mittens, and dry socks, plus the most important items of all—two-man bivouac sacks.

At 12:30 A.M. on July 17, under questionable skies, we left the refuge, intent

on negotiating before daybreak the short Glacier d'Envers de Blaitière, the *rimaye,* and the steep eight-rope-length snow couloir below the face. The remainder of the day was spent completing four steep pitches, the most challenging of which was the overhanging wall of an open book that required 26 pitons. By nightfall, in worsening weather, we had reached a prominent diagonal crack on the face that we planned to follow during the next day of climbing. This was the point of no return. After an uncomfortable bivouac, the storm-clouded sky unfortunately dictated a retreat. Leaving the fixed ropes, we rappelled down the diagonal crack and with rain imminent, escaped to the side of the wall.

A second effort failed on July 23 when Stewart, trying to lead a delicate lieback in a rainstorm, was injured in a fall. So once again we retreated to the refuge.

On the morning of the 25th, our final attempt began under an ominous red sky. We prusiked to our previous high point, and climbed the strenuous liebacks and narrow chimneys leading to the region beneath the crux roof. There, a rurp in the wall followed by a four-inch bong and six *coins de bois* behind the roof slab brought us to a belay in slings from a chockstone in the widening crack. Then a 150-foot pitch requiring 28 pitons continued left up the diagonal and right over knifeblade cracks to the sole bivouac ledge on the face. We were all on the ledge by dark, just before the lurking storm exploded and stoutly bombarded us with hail, followed by rain and snow. Fortunately, the difficulties were now below us and the following day, four more enjoyable but cloud-gulfed pitches brought us to the summit of l'Aiguille du Fou. For protection and direct aid during three days of climbing, 150 pitons were placed. This climb ranks as the most technically difficult done so far in the western Alps and is in the same class as the Direct North Wall routes on Sentinel Rock.

Pilier Dérobé du Frêney

John Harlin and I had the good fortune of being the American participants in the Rassemblement International d'Alpiniste held at the Ecole National de Ski et d'Alpinisme in Chamonix. Sponsored annually by the French government, this international gathering of mountaineers provides excellent opportunities for meeting, living, and climbing with alpinists from 20 countries. It also provides food for the bivouac, refuge fees, and téléferique passes for any climb one wishes to come to grips with. Immediately, John siezed this opportunity to travel by téléferique over the mountains to visit Grivel's shop in Courmayeur. Using questionable logic, it was then decided by a process of elimination to return to Chamonix over the summit of Mont Blanc (15,873 ft.) after climbing there via the Frêney face on the Italian side. Our *tour de force* would be a new route up the recessed pillar adjacent to and to the left of the Central Pillar. This is essentially a fourth pillar of Frêney and has been named by John, the Pilier Dérobé—the Hidden Pillar.

After wild organization and packing maneuvers, we caught the morning téléferique for the ride of our lives. In a flash we had gained 9,000 vertical feet and were standing atop the Aiguille du Midi with the vast white, crevassed snowfields of the Vallée Blanche, Mont Blanc, and her surrounding host of granite spires and massifs glistening in the morning light. That evening John and I arrived at the Gamba Hut at 9 P.M. We fried our steaks in a small Meta (solid fuel) stove, slept 45 minutes, ate brekfast, and were off at 1 A.M. on the longest approach I had ever imagined.

In darkness and in daylight, for 14 hours, we ascended the Col de l'Innominata, the crevassed Glacier de Frêney, the Rock Gruber, and the final soft snow slopes

and live couloir leading to the base of the Hidden Pillar. By late afternoon, we had climbed the first half of the pillar and reached a good bivouac ledge below the difficult section, the Mur Rouge. As the evening shadow crept over our pillar, the temperature plummeted and running water froze on the rock. High above us we could see tell-tale cirrus sailing in over Mont Blanc. We bivouaced at 14,000 feet, trying to push from our minds thoughts of the tragedy that befell Bonatti's party on the Central Pillar two years previously when several men died as rescue was at hand. Clouds enshrouded our pillar in the morning and movement was slow. The weather was worsening; the main technical difficulties were still above; and below lay one of the longest and most difficult retreats to shelter and safety found anywhere in the Alps.

The red granite of the Mur Rouge was so smooth that two direct-aid pitches were required to pass it. Above, the monolithic granite coarsened slightly and allowed narrow-crack climbing between aid pitons on the vertical wall; demonstrating the real importance of fiffi hooks in these mountains.

We topped the pillar and the clouds late in the afternoon, struggled up to the Italian and main summits of Mont Blanc in sometimes waist-deep, rotten snow, and then descended via the tourist-beaten "super highway" of the normal route to the Goûtêr Hut, which in true Mont Blanc style was solidly enveloped in alto-cumulus.

TOM FROST

THE SOUTHEAST FACE OF MOUNT PROBOSCIS

The Logan Mountains (*not* Mount Logan in the St. Elias Range) are located along the border of the Yukon and Northwest Territories in Canada. Though the altitude of the higher peaks is only 8,000 to 10,000 feet, the relief is great; many of the mountains rise from valleys only three or four thousand feet above sea level. Very alpine in aspect, the Logans contain numerous fine peaks and much snow and ice, with glaciers covering large areas.

The pearl of the Logan Mountains is the "Cirque of the Unclimbables," a name loosely designating a group of magnificent and awe-inspiring peaks near Brintnell Lake. These peaks are formed of huge granite blocks and are similar in form and size to the great rock masses in Yosemite National Park. A rock climber's wonderland, this area also contains interesting snow and ice problems.

The "Cirque" has been visited several times since the Harry M. Snyder expedition first noted it in 1937, and all the summits have been reached. The most inaccessible of these summits is Proboscis, first climbed in 1960 by William Buckingham, Stuart Krebs, Mason Hoadly, and Stan Shepard.

Proboscis is strangely sculptured, shaped like a thin box but joining other mountains by ridges. Its rectangular appearance is particularly strong when one views the southeast face or the northwest face. The ridge running down between these faces is an incredibly thin arête formed by the tilted edge of huge granite blocks. This ridge, the route of the first ascent, is broken into giant steps which provide successive obstacles in the form of blank faces. Proboscis is perhaps the most difficult rock peak in North America.

Of all the walls in the Cirque of the Unclimbables, the 1,800-foot southeast face of Proboscis, though not the highest, is the most impressive. In 1963, four Americans, Jim McCarthy, Layton Kor, Dick McCracken, and I, became interested in scaling this wall. Our party, sponsored by the American Alpine Club, had a national aspect: Jim was from New York, Layton from Colorado, and Dick and I from California. Our imaginations had been pricked by descriptions and photo-

graphs given to us by Bill Buckingham and Arnold Wexler (who had led a party to the area in 1955). So, in July, 1963, we drove to Watson Lake, and then flew with the Yukon-B.C. Air Service 150 miles north to the milky waters of Brintnell Lake.

After landing on the lake we spent two days transporting supplies to base camp on Tombstone Meadow, at the base of the north face of Mount Sir Harrison Smith. Soft grass, meandering streams, and scattered blocks of granite make this meadow an idyllic campsite. For the first six days, all climbing was frustrated by intermittent rain. This was curious, as other parties had fared much better. Wexler reported the weather in 1955 as too hot and dry for his taste.

On August 3, 1963, under threatening skies, we climbed over "What Notch" and bivouacked at the base of the southeast face of Proboscis. The next day, following an early morning rain, we started up the wall. After ascending a ramp for 400 feet, we traversed a short blank face to a corner beneath a black, dripping overhang. We surmounted this overhang and began nailing cracks on the right that would eventually bring us back to the left to an apparently commodious ledge. The unexpected difficulty of the climbing, the wet rock, and a bitingly cold wind, slowed progress to a crawl. We passed a cold, miserable night in seats suspended from pitons, one above another, 600 feet above the ground. Happily, the August nights at that latitude are only six hours long. We continued upward at 3 A.M., spending 14 hours climbing 300 feet to the elusive ledge that had looked so good from below. It proved narrow and inhospitable, so we named it "Disappointment Ledge." To this point, McCracken and I had been doing the climbing, while Kor and McCarthy had been bringing the supplies as they prusiked up fixed ropes placed by us. We switched roles at this halfway point, and with Kor and McCarthy leading, quickly ascended 300 feet to the "Ramp," where we spent a comfortable night.

Next morning, Kor raced up the first pitch through a light snowfall. Then, after bringing McCarthy up to belay in slings, Kor began the next lead. Suddenly his second pin popped out and he dropped 15 feet, pulling McCarthy up out of his slings and against a ceiling with stunning force. Only a hard hat kept McCarthy from serious injury, cushioning the impact that would have knocked him senseless. Nonetheless, one of his hands was badly burned and mashed, so I took his place as Kor's partner.

On through the day we climbed up the continuously steep wall. Looking over the summit ridge at 6 P.M., we were awe-stricken by the astoundingly beautiful panorama of great snowfields and glaciers, crags and peaks. After reaching the summit we descended a short way along the knife-edge arête and crowded together on a small ledge to bivouac. At dawn, we laboriously brewed tea, both to warm ourselves and to divert our attention from the bite of the frosty air. A strong wind continuously drove clouds from the Northwest toward the rock, cold and white with a thin layer of fresh snow. At 5 A.M. we continued the arduous and difficult descent. McCarthy, handicapped by his injured hand, impressed us with his stoicism and the sureness and coolness of his techniques, both on rock and snow. We were dangerously fatigued, and Kor, well known as a dynamo of energy, was shockingly gaunt. We finished the descent at 10 A.M., August 7, 1963. The round trip had taken three and one-half days.

We rated this climb a grade 6, with the hardest pitches 5.8 and A4. We placed 250 pitons and two bolts, and carried three 2-inch, four 2½-inch, and three 3-inch bongs.

ROYAL ROBBINS

CLIMBING IN THE BROOKS RANGE OF ALASKA

Neither the Franklin nor the Romanzov groups of the Brooks Range in Northeastern Alaska have been the scenes of frequent mountaineering because of their inaccessibility. George Barnes, Dennis Burge and myself made the first ascent of Mount Chamberlin, which lies just east of Lake Peters. After gaining the Chamberlin Glacier from the northwest we approached the mountain from a ridge on the northwestern side that in its upper reaches turns into an ice wall. As seems normal for Alaska, a sleet and snow storm greeted us as we started up the wall of ice. After ascending straight up this wall for about 200 yards we made a traverse to the west just under an ice cornice where the angle of declivity was about 50 degrees. As the angle gradually decreased we climbed to the head of the wall on the west ridge of the mountain following it to the east and the summit. The summit was easily approached and identified by a point at which three ice cornices meet. With absolutely no view of anything but each other, we returned to camp at the foot of the glacier at about the 5,000-foot level.

On August 2, after another ten days of rain, sleet, snow and strong winds, we left the Schrader Lake and Peters Lake area and crossed over the Hula Hula Valley, setting up a high camp in the Romanzov Mountains. Bill Lentsch and George Barnes made a first ascent on a peak somewhat south of Mount Michelson, approaching it by the north ridge. It was snow climbing on a slope about 40 to 50 degrees with visibility of not over 50 feet. The summit proved to be a north-south running knife ridge. With continuous snow and fog, both returned to camp at 3 A.M. On the same day Dennis Burge, Richard Jali and Larry Gail made a first ascent of a peak just past the headwall of Mount Michelson.

The entire area contains much virgin territory for climbing with most mountains entirely unclimbed so far. All of the area is uninhabited, the nearest civilization being on the other side of the Arctic National Wildlife Range at Barker Island on the Arctic Coast of northern Alaska. Snow and ice climbing was found in the area with conditions varying from wet melting types to dry powders and solid ice walls. Logistics, transportation difficulties, river fording, and tundra travel can all be serious regional problems, although the mountains are worthwhile in light of the area's beauty.

GRAHAM STEPHENSON

SOUTHERN PURCELL MOUNTAINS, BRITISH COLUMBIA

From a camp at about 7,300 feet on the stream draining southeast from Mount Dorothy into Horsethief Creek, Barbara Lilley and Rich Gnagy made the apparent first ascent of the unnamed 10,320-foot peak located one mile north of Mount Dorothy and one mile west of Mount Stockdale. The ascent was made via the east slope and south ridge. They also climbed Mount Dorothy by the southeast ridge, and Mount Stockdale by the west ridge.

The rock on all these climbs was mainly loose shale and the climbs were non-technical. Ice axes were used and some good glissading was enjoyed.

BARBARA LILLEY

LONG'S PEAK—THE DIAMOND

Long's Peak, situated in Rocky Mountain National Park, Colorado, has one of the finest rock walls to be found in the higher mountain areas of the United States. This wall lies on the east face of Long's Peak and is called "The Diamond." The Diamond is 1,000 feet high and vertical, with several overhanging sections up to

400 feet long. It is composed of generally firm granitic rock, but the overhanging sections are rotten.

After a long history of climbing restrictions by the Park Service, the first ascent of the Diamond was made on August 3, 1960, by two members of the Sierra Club, Bob Kamps and Dave Rearick. Their route is a fine one and ascends the most direct line on the face.

In August, 1962, Layton Kor and Charles Roskosz, both Coloradans, established a new route left of the original one and called it the "Yellow Wall."

In July, 1963, Kor and I made the second ascent of the Kamps-Rearick route on the Diamond. A few days later, July 13, 1963, we climbed a new route that rises in a very direct line to the top of the face, staying always within 30 to 50 feet of the first route. This new route, which we named the "Jack of Diamonds," is similar in many ways to the Kamps-Rearick, but requires a smaller amount of difficult nailing. However, the "Jack" does contain two pitches of difficult free climbing. I led the first and found myself at the top of a strenuous foot-and-fist jam crack, 30 feet above my piton and straining to hold on. I jammed a hand and foot and hurriedly hammered a piton into a rotten crack. The pin was poor, but took the partial support of one foot until I could get a better piton higher. Then, moderate nailing led out of the jam crack. The other difficulty was the last pitch on the climb, a long unprotected jam crack led rapidly and without hesitation by Kor. Indeed, we had no time to waste and barely squeezed this climb out in one long day. After the descent I literally stumbled into camp and Kor had difficulty sleeping that night because of leg cramps.

All three Diamond routes are grade V's, and the hardest pitch ratings for the Jack of Diamonds are 5.9 and A4 (6.8). We placed 161 pitons but no bolts. A detailed route description is available at the Long's Peak Ranger Station.

ROYAL ROBBINS

WIND RIVER CLIMBS

During the first two weeks in August, 1963, some 22 members and guests of the Rock Climbing Section of the San Diego Chapter, Sierra Club, packed into the lower Titcomb Valley in the northern Wind River Range, Wyoming. Base camp was established at a point east of the lowest lake in the Valley where the dimly marked Indian Pass trail leaves the Valley.

Cairn Peak, Northwest Buttress

From base camp Cairn Peak was seen as a square-topped massif to the southwest. On August 7, two new routes were climbed on its north face. The first of these, the Northwest Buttress, is immediately west of the prominent North Snow Couloir which can be seen from the Indian Pass trail or from Fremont Peak. The buttress was climbed by John Hooper, Milo Prodanovich, Steve McKinney, and Jerry Hooper. The first two pitches were class 4; the third pitch was a class 5.1 mantle and was followed by another class 4 pitch. At this point a corner was traversed (class 5.4) to the east to a point overlooking the snow couloir; and a lieback led up to two pitches of class 5.0 climbing that were followed left to the flat summit plateau. Fourth class variations of the upper pitches are possible. NCCS classification: II, 5.

Cairn Peak, North Snow Couloir

The second new route on Cairn Peak was the North Snow Couloir itself, which was climbed by Bill Thomas, Ann Paul, and Stephanie Poland. A thin layer of

snow overlaid ice requiring crampons throughout; a few steps were also cut. Belays were established along the sides of the couloir with slings, pitons, or ice screws. About halfway up, the snow was broken by a short waterfall that was passed on the west by a 30-foot class 4 rock pitch. The snow led nearly to the summit plateau; this was gained by class 3 scrambling. NCCS classification: II, 4.

Fremont Peak, Southwest Face

The usual route on Fremont Peak starts on the southwest buttress from a high col that separates the drainage of the lakes west of Indian Pass from that of the main Titcomb Valley. Several hundred feet east of this col is a prominent orange nose of granite. The face immediately to the west of this nose was first ascended August 8 by John Hooper and Steve McKinney. The first two pitches were class 4. These were followed by three class 5 pitches over mantles and overhangs in the back of a V-shaped crack system. Two long class 4 pitches led to easier scrambling and the summit crest. NCCS classification: III, 7.

Fremont Peak, South Face Variation

Another new route was placed on Fremont August 8 by Jerry Hooper and Milo Prodanovich. They climbed a ridge just to the left of the prominent snow couloir on the south face; it was class 4 throughout. NCCS classification: II, 3.

Other Climbs

From base camp, Cairn Peak was ascended by the southwest side, Fremont Peak by the usual southwest buttress, Jackson Peak by the west face and southeast ridge, and Mount Lester by the north slopes.

A high camp was placed above the upper Titcomb Lake for climbs in the upper Valley. Mount Woodrow Wilson was climbed by the south couloir and by the west face snow gully. The west face party avoided a long descent over rotten rock by descending the northern snow slopes to the Dinwoody Glacier and returning to camp via Bonney Pass. Sphinx was climbed from the Wilson-Sphinx col; Dinwoody Peak from Bonney Pass; and Sacajawea from the Helen-Sacajawea col.

To the west of high camp a fine wall of water-stained granite rose directly out of the Titcomb Valley; this wall attracted John Hooper and Steve McKinney as a possible first ascent. They completed three pitches of class 6 climbing before being thwarted by a minor injury to the leader.

Despite the fact that the party was plagued by rainstorms nearly every afternoon and evening (tents were essential), we found climbing to suit a wide range of ages (6 to 65) and climbing abilities. Nearly all peaks and minor pinnacles in this area have been climbed and are well-documented in Bonney's guidebook. However, there are still ample opportunities for new routes of a high standard. The country is very similar to the High Sierra with many lakes and open valleys, but more technical snow and ice climbing is also available. BILL THOMAS

MOUNT SHASTA FROM THE NORTH

At noon on September 1, 1963, Bob Rears and I completed what is to the best of our knowledge a new route on the north side of Mount Shasta.

Approach to the north side is best made by taking Highway 97 from Weed for approximately 18 miles to the Military Pass Road. Turn right and follow the Military Pass Road about seven miles to a jeep trail which turns right and takes you to within two miles of timber line. The jeep trail is nearly four miles long and is, for the most part, impassable to a passenger car.

The climb Bob and I made went as follows: at the end of the jeep trail, we proceeded southeast to the top of a ridge. We followed the ridge into a high valley and went up the valley to about the 9,000-foot level. Here we made camp near a break in the ridge that formed the south side of the valley. Directly opposite our camp on the north side of the valley was a rock butte about 500 feet high.

We left camp around 3 A.M. and headed south up the draw to a wide ice ridge paralleling the right side of Hotlum Glacier. We followed this spur to the 13,500-foot level where the ice terminated at the base of a rock wall 50 feet high. One pitch of class 4 climbing brought us to the top of the wall and an easy scramble to the summit. We descended by the same route and arrived at base camp by 5 P.M.

JACK P. DAVIDSON

LOVERS LEAP DIRECT

On June 8 and 9, 1963, Ken Edsberg and I completed the first direct ascent of the north face of Lovers Leap. Lovers Leap is a 1,000-foot granite escarpment located on Highway 50, approximately 14 miles southwest of Lake Tahoe. Access to the face is best gained by turning right off Highway 50 at the Strawberry Lodge, taking the road over the bridge past a large pond and a few cabins for about a quarter mile. At this point the road ends. A hike of an additional quarter mile along the creek bed will bring you to the base of the Great North Wall.

Our direct north face route started with a scramble up the talus slope which is centered between the two prominent buttresses on either side of the face. One pitch of class 4 climbing brought us to a wide ledge where we traversed east for 150 feet to the foot of a 175-foot-high vertical wall, broken at four- to six-foot intervals with shelf-like horizontal ribs. Although the two pitches up this wall were extremely exposed, the protruding shelves afforded excellent holds and only four class 5 pins were required for protection.

At the top of the wall, a wide sloping ledge led us to the base of a slightly overhanging open book, 100 feet high and colored with orange and green lichen. From this ledge, twenty class 6 pins were used to take us to the top of the open book and a small ledge underneath the first ceiling.

The next pitch started up and to the right, underneath a roof. This section was very difficult and required nearly three hours of fitting pitons into tiny bottoming cracks. In surmounting the overhang, the crack system completely ran out, and it was necessary to place one bolt while standing high in slings hung from a knife blade piton. This pin was driven upside down into a tiny bottoming crack and tied off to a rurp which was used as a shim. Although the placing of the bolt was very awkward and uncomfortable, the author considered the pin he was standing on and the last three below it (all doubtful as to their ability to arrest a fall) and managed to place said bolt in record time.

From the bolt, the route went up to a narrow, rounded ledge which traversed left to the base of an eight-inch-wide chimney about fifty feet long and filled with black moss. Here, Ken took the lead while I belayed in slings and cursed the falling dirt and moss which had to be cleared away to expose a series of bottoming cracks in rotten rock.

The next pitch was class 5 and ended at a sloping water-soaked ledge approximately 16 inches wide and occupied by an inhospitable bush. Darkness had overtaken us, so we settled down for the night. At this time, we became enveloped by a cloud and lightning started exploding directly north of us. Around midnight, however, the sky cleared and we spent our frequent periods of wakefulness watching

the traffic on Highway 50. Morning finally came and three pitches of class 5 climbing in wet, cold clothing took us to the summit and the welcome sunshine so scarce on north faces.

The ascent was finished at approximately 9 A.M. on June 9, 1963. It involved one pitch of class 4 climbing, five pitches of class 5.3 to 5.8 and three pitches of 6.0 to 6.7 difficulty. One bolt and 54 pitons were used—several of which were left in place. The ascent took about 28 hours and included one bivouac.

JACK P. DAVIDSON

SUGAR LOAF EAST FACE OVERHANG

On August 18, 1963, Ken Edsberg and I climbed a new route on Sugar Loaf Rock. Sugar Loaf is located on the north side of Highway 50, one-half mile west of Kyburz, California, and approximately one-quarter mile from the highway. The rock is visible from the the road thereby making the trailless approach obvious.

Our route goes as follows: climb the east face via the Harding Chimney route to the summit box. Then, traverse right for about 20 feet and climb up a 5.8 lieback for 30 feet. At this point an obvious balance pitch to the right leads directly to the sloping ledge under the east face overhang. The overhang is an upside down open book with a deep crack in the vertex. The pitch rises at an average angle of 135 degrees for a distance of 50 feet and requires about 18 class 6 pitons. From the lip of the overhang, one pitch of free climbing leads to the summit.

Our ascent took about five hours. Several of the direct-aid pins could not be removed, so future climbs can be made in less time and will require only a few assorted bong-bongs and one-inch angle pitons for the class 6 portion.

JACK P. DAVIDSON

SILVER MAIDEN

In July, 1955, the Loma Prieta Rock Climbing Section was on its annual "Big Trip" in the Gorge of Despair, Kings Canyon National Park. While on a climb of Silver Turret, I noticed a very impressive rock tower in Silver Creek Canyon about 500 feet below the notch between Frang and Silver Turret. I knew it was unclimbed, but time did not permit an attempt on it.

Seven years later, on August 3, 1962, while on another RCS trip to the Gorge of Despair, Bruce Edwards, Howard Lewis, James T. Smith, Ed Sutton, and I hiked over to Silver Creek Canyon to attempt the climb. The tower was about 250 feet high, and sheer on all sides. The northeast side looked feasible except for the vertical wall just below the summit block. This later proved to be the crux of the climb.

We started the climb on a broken wall on the northeast side, and went up on large holds for about 30 feet to a sharp arête. A traverse on the exposed north side of the arête led to a platform, a comfortable belay position. From here a descent south was made for about 50 horizontal feet to the base of a prominent rib. The route followed this polished rib using lieback to an alcove under a large block. This position had to be used as a belay point although it was precarious. From here the route went directly up the wall, the first part in a chimney that disappeared into an almost vertical classic lieback crack. This pitch continued for about 70 feet, ending on the shoulder just below the summit. In a superb lead of this pitch, Bruce used one bolt and three pitons for direct aid, and two pitons for protection. From here an easy class 4 pitch led to the summit on large solution knobs. We tied the register to one of those knobs.

ROBERT L. SMITH

THE THREE SIRENS

In 1960, while descending the Enchanted Gorge, Martial Thiebaux and I noticed that the three pinnacles East of Mount Scylla were well worth climbing. A first attempt to climb them ended at the Muir Pass Hut with two days of steady rain. Over the July 4 weekend of 1963, Jon Shinno and I made a second attempt. We crossed the Ionian Basin to the Base of Scylla and after much step cutting and loose rock climbing reached the notch between the middle (highest) and west peaks. After two more pitches we decided to return later, due to lack of rappelling equipment, Jon having been hit on the leg by a rock.

On August 3 and 4, Don Wilson, Mike Raudenbush, and I packed into the Muir Pass Hut for a final effort. After crossing the Basin we cut steps up the snow to the Notch between Scylla and the west peak. From there broken rock and a class 4 chimney led to the summit of the west peak. Two rappels and some scrambling brought us to the notch below the middle peak. Again the climbing was class 3 and 4 as a system of ledges led around to the right and upward. A short steep pitch led to easy scrambling and the 12,700-foot summit. The descent from the notch onto the small glacier to the north was the most hazardous part of the climb. The east peak is lower and less accessible than the other two; it remains unclimbed.

Considering that these peaks are located in the Ionian Basin, we suggest that they be named "The Three Sirens." GEORGE WALLERSTEIN

MOUNT SILL—EAST FACE

The 1200-foot east wall of Mount Sill was first surmounted by Tom Condon and a companion about 1959. A parallel route further south was ascended by Burt and Gen Turney, Rick Gnagy and John Mendenhall September 1, 1963. It starts at the highest reach of the glacier just north of the middle of the cliff's base, and goes almost directly upward, ending 200 feet south of the summit.

The first pitch is up a class 4 chimney to a huge, overhanging chockstone. Fortunately, one can climb behind this obstacle and mount a thin crack in smooth rock, class 5.7. Next comes a 5.6, then a 5.7 pitch. Easier climbing follows, ending in a gully.

The gully becomes quite steep, but the wall to the right affords reasonable 5.2 climbing. It is finally possible to head for a steepening chimney that ends 200 feet left of the summit. Snow in the chimney made it necessary to mount the rocks to the right with 5.4 to 5.7 pitches. An exposed traverse left to the very top of the chimney completed the ascent. JOHN D. MENDENHALL

NORTH PEAK OF TEMPLE CRAG: NORTH FACE DIRECT

First ascent August 18, 1963, by John and Vivian Mendenhall, Roy Coates and Ed Lane. From Third Lake, on North Fork of Big Pine Creek, ascend talus to base of couloir that is just west of Temple Crag. Twelve hundred feet above is the North Peak (about 12,000 feet). Climb left, up easy ledges on the north face. Rope up and traverse left two pitches. The steep cliffs above are suddenly broken up, and class 5 climbing leads to class 4 work. Traverse right, then ascend one of the parallel class 4 cracks in the reddish, broken column that is visible from Third Lake. The North Peak and the North Buttress are both visible from the platform above the cracks. Ascend the easy gully above the platform. The left-hand crack above is vertical and class 5.4, but well-protected by piton, or by a sling over a knob. Gain the north

ridge and turn right. The North Peak's final summit is class 4 from the west and class 5.3 from the east. From the notch, south of the North Peak, Temple Crag's summit is class 3 and 4.

JOHN D. MENDENHALL

FIRST ASCENT OF PEAK 13,370

Sy Ossofsky and I spent Saturday morning, August 10, on the long backpack up the Symes Creek-Shepherd Pass trail, arriving at Anvil Camp at 11 A.M. After lunch we started up the gullies and ribs on the southeast side of Mount Keith, then traversed along the west side of Peak 13,370 to its north side. The last 20 feet of the peak required a *courte Echelle* from which a piton was placed for protection. A mantel was needed to reach the top of the slightly overhanging summit monolith.

ARKEL ERB

BEDAYAN MINARET, NORTHEAST FACE

First ascent July 6, 1963, by Rich Gnagy and Barbara Lilley. The route starts at the glacier's high point, between the watercourse seen descending the middle of the northeast face and the deep couloir leading to the notch between Dawson Minaret and Bedayan Minaret. Ascend 100 feet on a series of ledges, gradually working left. A short traverse left and up leads to a sloping "sidewalk" ledge that is followed left to the watercourse. Ascending the right side of the watercourse for two pitches leads to a steep, 200-foot seasonal snowfield. Above the snowfield 300 feet of class 3 and class 4 climbing leads to the summit ridge that is followed west to the summit.

BARBARA LILLEY

MOUNT LYELL: WEST FACE

First ascent August 24, 1963, by Les Wilson, Dennis Schmitt, Tim Gerson, and Peter Haan. From the glacial cirque at the top of Hutching Creek the west face of Mount Lyell appears to be a wide, steep face culminating in a vertical nose. The route commences with two fourth class pitches starting directly beneath the nose in a decaying chimney and proceeding up and then to the left on better rock to an excellent ledge at the start of the broken middle section of the cliff. The next two pitches, both class 4, continue straight up over cluttered ledges until the cliff steepens into the base of the nose. Here tend left, still class 4, up a shallow open book until able to traverse left horizontally around a bulge and almost to the prominent diving board visible from the valley, then climb up and around an overhang, class 5, to a ledge above the bulge. Another full pitch of easy class 5 goes straight up the face and leads into the fractured summit blocks, whence a short class 4 pitch up and to the right gains the ridge a little northwest of the nose. This climb covers almost one thousand feet of cliff, most of it very broken but still very steep.

LES WILSON

CATHEDRAL PEAK: NORTH FACE

Cathy Warne and I did a short (about 175 feet) and fairly difficult, but enjoyable class 5 climb up the north face of Cathedral Peak in July, 1961.

There is a broad (about eight feet wide at the bottom) chimney-like depression on the face, with an overhanging rock jutting out at the top. The route starts at the bottom of the chimney, moves out to the right for a few feet, then back into the chimney as far as a crack leading diagonally up to the right. The diagonal crack was followed to a point even with the top of the projecting block, then a traverse was made past the top of the block. The route continues back above the projecting rock and straight up to the notch just to the left of the summit block.

If one could find a way to avoid the danger of a loose looking rock that was directly over the belayer, a better and more direct route would pass to the left of the projecting block. This more direct route was climbed with an upper belay.

WALLY REED

CATHEDRAL PEAK: SOUTH FACE

When Cathedral Peak is viewed from the south, a prominent crack, which is five or six inches wide and just to the right of the summit ridge, can be seen extending downward about 50 feet. A further crack system below this extends in a nearly straight line to the ground. On July 20, 1962, Don Harmon and I did a climb following almost directly up these cracks. Much of the climbing was done on the face near the cracks and an exit was made from the east side of a small alcove over a brushy ledge, 75 feet up. This was followed by a short traverse to the left about 15 feet higher. The crack at the upper part is on an 80 degree face but is well provided with holds.

The climb is class 5, about 300 feet long, and, though it is not excessively difficult (about 5.6), some of the upper part is fairly strenuous. It is the hardest over-all, and the most enjoyable of the seven routes I've climbed on Cathedral Peak.

WALLY REED

FAIRVIEW DOME: NORTH FACE

A second route on the north face of Fairview Dome was climbed by Glen Denny and me in July, 1962. The route starts in a somewhat broken area about 150 feet to the right of a broad arch on the lower left part of the face, and proceeds up and a little to the left for one pitch. After the first pitch, the route followed an inch-wide crack over a small overhang, then went more or less straight up for a ways, veering somewhat to the right higher up and finally reaching a wide ledge some 500 feet up from the start and below a smooth face. A few feet down from the west end of the ledge a narrow rib of rock extends out from the face. By using a pendulum from a bolt placed near the end of the rib we were able to reach a small broken area and continue upward. A little higher up two more bolts were used in getting up to a roof. After a traverse to the right beneath the roof, the climb continued up for about 200 feet to a fairly broad ledge that slopes down to the right. After following the ledge down for a short distance, we came onto the route previously climbed on the north face. We followed that route to the summit. This last part involved an additional traverse of about 100 feet to the right, then a climb up to a pine tree. From the pine tree it is mostly class 3 to the summit.

WALLY REED

FAIRVIEW DOME: INVERTED STAIRCASE

In 1962, Glen Denny and I climbed a route to the east of the regular North Face route on Fairview Dome. I am giving it the name "Inverted Staircase" to distinguish it from other North Face routes, though it was not named in the first description.

I climbed this route again on August, 1963, with Bob Kamps. On this ascent Kamps eliminated all the direct aid by very difficult (5.9–5.10) class 5 climbing. Also, instead of traversing to the right of the ledge that intersected the regular route, we climbed up and to the left this time. The last roped pitch led straight up from a whitebark pine, left on a sloping ledge, and right again higher up to a point nearly straight up from the start of the pitch. From 30 or 40 feet above this point, the summit can be reached by class 2 or 3 climbing. WALLY REED

DAFF DOME, EAST FACE DIRECT

We have called the 9153-foot dome, which is 0.8 miles northwest of Fairview Dome, "Daff Dome," in order to have a reasonably short way of referring to it. The word "Daff" was derived from the initials of the words "Dome across from Fairview."

In July, 1963, Frank Sacherer and I climbed a crack that extends nearly all the way up the west face of the dome. This crack, which is over 400 feet long, is on the unbroken appearing part of the face to the left of a large open book that curves to the right.

The climb was done class 5, was about 5.7 in difficulty, and involved considerable jamming on the last pitch. In addition to other smaller pitons, one or two 2½-inch or 3-inch pitons would probably be desired for the climb.

WALLY REED

RÉSUMÉ OF YOSEMITE VALLEY CLIMBING—1963

The old standard climbs in the Valley, such as the Cathedral Spires, Lunch Ledge, Overhang Bypass (on Lower Cathedral Rock), and the Royal Arches, are still as popular as ever. But newer climbs, such as Arches Terrace, Monday Morning Slab, and Pat and Jack Pinnacles are climbed more and more often, and will, in the future, become "standards" themselves.

The super-climbs of the early 1950s, Yosemite Point Buttress, the East Buttress of El Capitan, Phantom Pinnacle, the East Buttress of Middle Cathedral Rock, the north face of Sentinel Rock, and the Lost Arrow, are done several times each year now. Yosemite Point Buttress, in particular, is very popular, having been climbed about forty times since its first ascent ten years ago.

The Chouinard-Herbert route on the north face of Sentinel was repeated three times this year: by Bob Kamps and Jack Turner, by Frank Sacherer and Steve Roper, and by Royal Robbins and Tom Cochrane.

Sacherer and Roper made the second ascent of the northwest face of the Lost Brother in eight and a half hours.

The second ascent of the direct north buttress of Middle Cathedral Rock was made in June by T. M. Herbert and Bob Kamps. Layton Kor and Royal Robbins climbed this route a short while later.

Only a few of the fifteen grade VIs in the Valley were climbed this year. The northwest face of Half Dome remains the favorite with four ascents in 1963. Sacherer and Charlie Raymond made the sixth ascent in early June, followed later by Robbins and Lito Tejada-Flores, by Mark Powell and Roper, and by Al Steck, Dick Long, and John Evans.

Kor and Jim Baldwin took one and a half days to make the third ascent of the west face of Sentinel, bivouacking in hammocks 600 feet above Tree Ledge.

The third ascent of the south buttress of El Capitan (The Nose) was made in late May by Kor, Roper, and Glen Denny. This fine route, climbed in stormy conditions, took three and a half days.

Without doubt, the greatest achievement of the 1963 season was the three and a half day ascent of the west face of the Leaning Tower by Royal Robbins. This surely ranks with the great solo ascents done in the Alps.

STEVE ROPER

* * * * *

Accounts of the year's Yosemite Valley climbs usually found in these notes have been included in the Sierra Club's 1964 publication, *A Climber's Guide to Yosemite* by Steve Roper. For reference, there follows a list of those climbs.

Climbs near Ribbon Falls: The Slabs, West Portal, Rappel Chimney, Hidden Chimney; El Capitan, Dihedral Wall; El Capitan, Third Ascent of the Nose; Limbo Ledge; Rixon's Pinnacle, South Face Direct; Rixon's Pinnacle, Far West Face; Selaginella Wall; Black Wall, A New Route; Upper Yosemite Falls; North Dome, West Face; Half Dome, Northwest Face Direct; Sentinel Rock, Direct North Wall Left Side; Lost Brother, Northwest Face; Lower Cathedral Spire, Northeast Face; Bridalveil Falls, East Buttress; Rostrum, North Face; the Worst Error, Right Side; The Crack of Despair.

Statement required by the Act of Congress of August 24, 1912, amended by the Acts of March 3, 1933, July 2, 1946, June 11, 1960 (74 STAT. 208), and October 23, 1962, showing the OWNERSHIP, MANAGEMENT AND CIRCULATION OF *the* Sierra Club Bulletin, *published monthly (except May, July and August) at San Francisco, California — for October 1, 1963.*

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(Signed) BRUCE M. KILGORE

Sworn to and subscribed before me this 1st day of October, 1963.

(SEAL)

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(My commission expires January 22, 1967)

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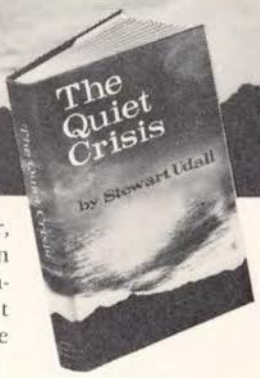

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