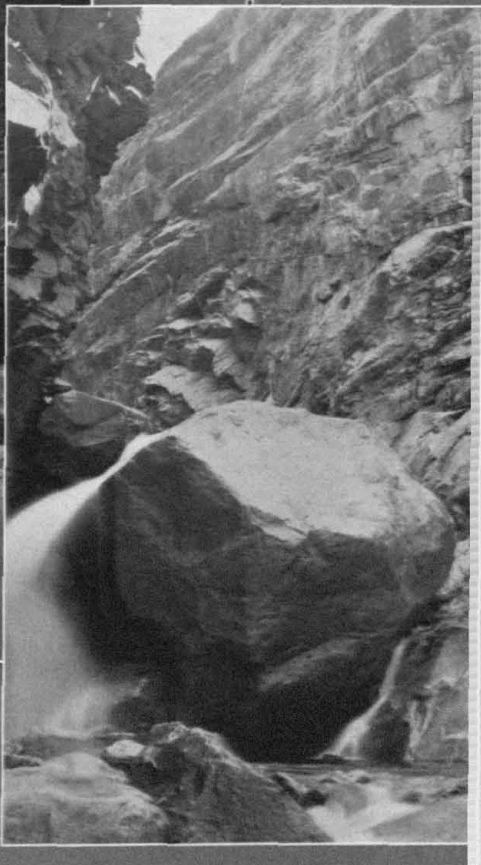
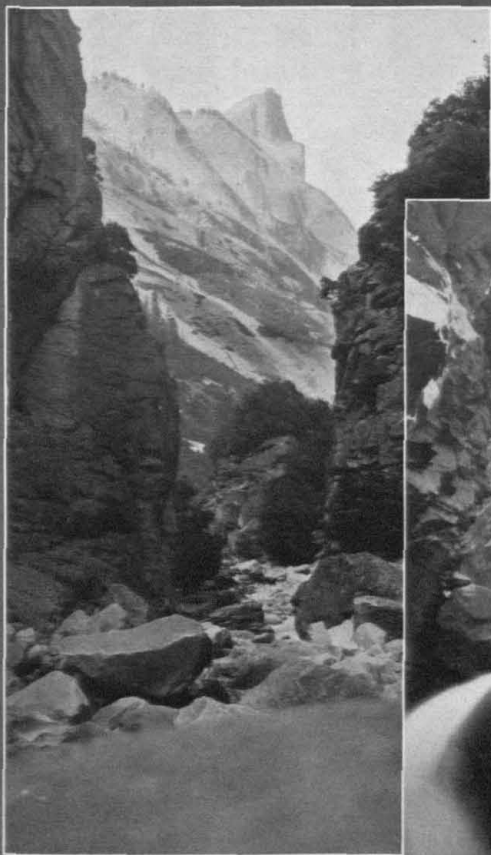


Tenaya was sent to bring in his tribe, but only a part came, mostly the old and the very young. The aged chief, when charged with deception, promised to go on with his people to the soldiers' camp. Major Savage, he said, might go to the valley with one of his youths as a guide,

but he would find no one there; the younger men from Mono and the Tuolumne who had married into the tribe had gone back to the mountains. "My tribe is small," he declared,

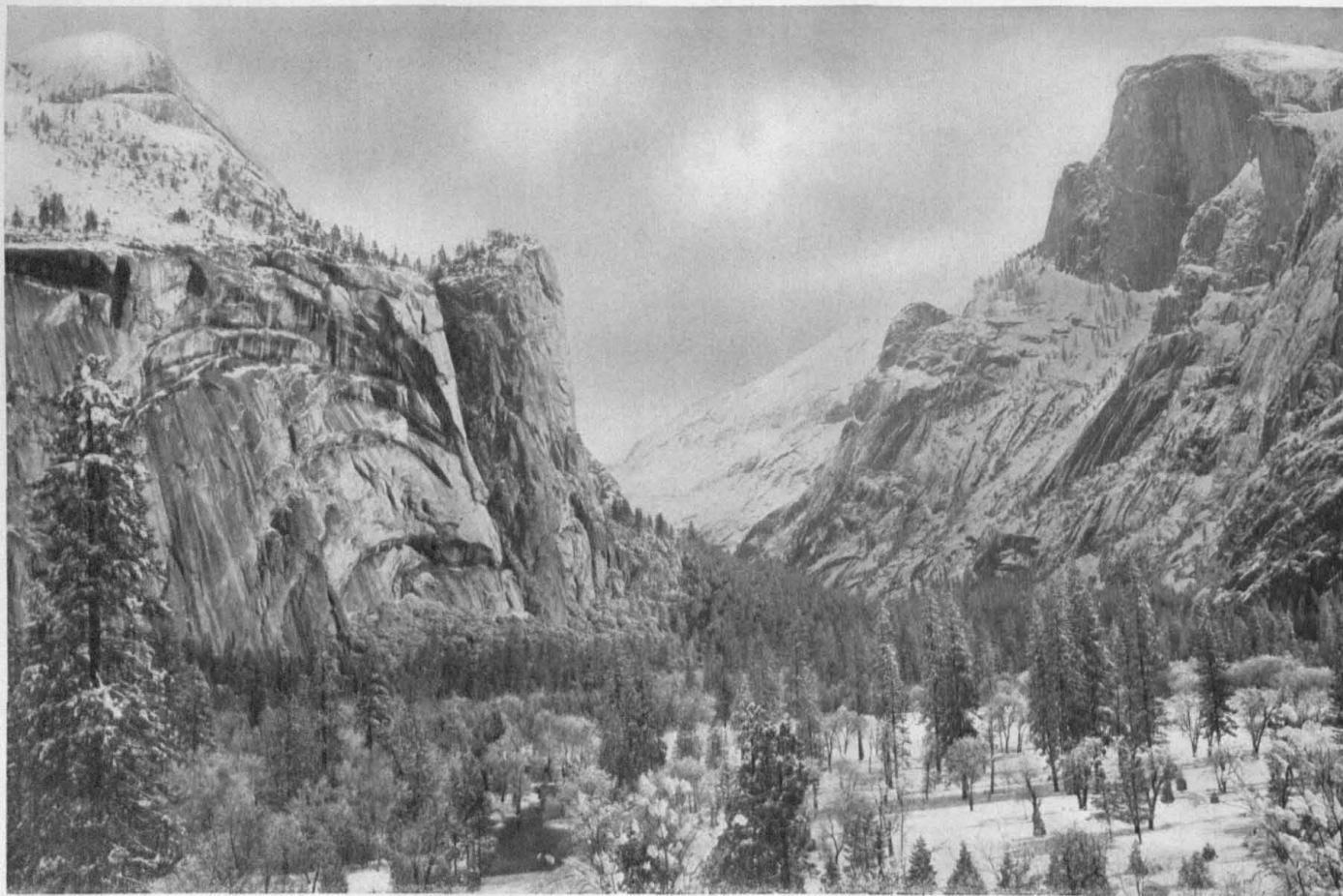


In Tenaya Cañon. The upper view looks back to the Half Dome; the lower one shows the gorge blocked by a huge boulder. The steep south wall, swept by avalanches every spring from the side of Clouds Rest, is seen in each picture. This cañon offers great difficulties to the climber.

"not large as the white chief has said. The Piutes and Monos are all gone. Young and strong men can find plenty in the mountains; why should they go to see the white chiefs, to be yarded like horses and cattle? I am willing to go, for it is best for my people."



Lake Tenaya, at the head of Tenaya Creek Cañon. The remarkable domes and polished granite hillsides surrounding this beautiful lake vividly recall its comparatively recent glacial history.



Gates of Tenaya Cañon in Winter—North and Half Domes, Royal Arches, and Washington Column. In beauty of detail, the photograph here reproduced is the finest ever made of these commanding cliffs and peaks. Note the overhang of the arches, the water-etched rock, and the snow-laden trees and chaparral. The vast span of the concentric strata may be inferred from their elevation: the upper arch is 1,500 feet above the Valley. North Dome rises 3,530 feet; Half Dome, 4,850 feet. Clouds Rest, the snowy slope of which is seen beyond, overtops the Valley by almost 6,000 feet.



South Merced Valley, seen from Lookout Point, on the road from Wawona to Yosemite.

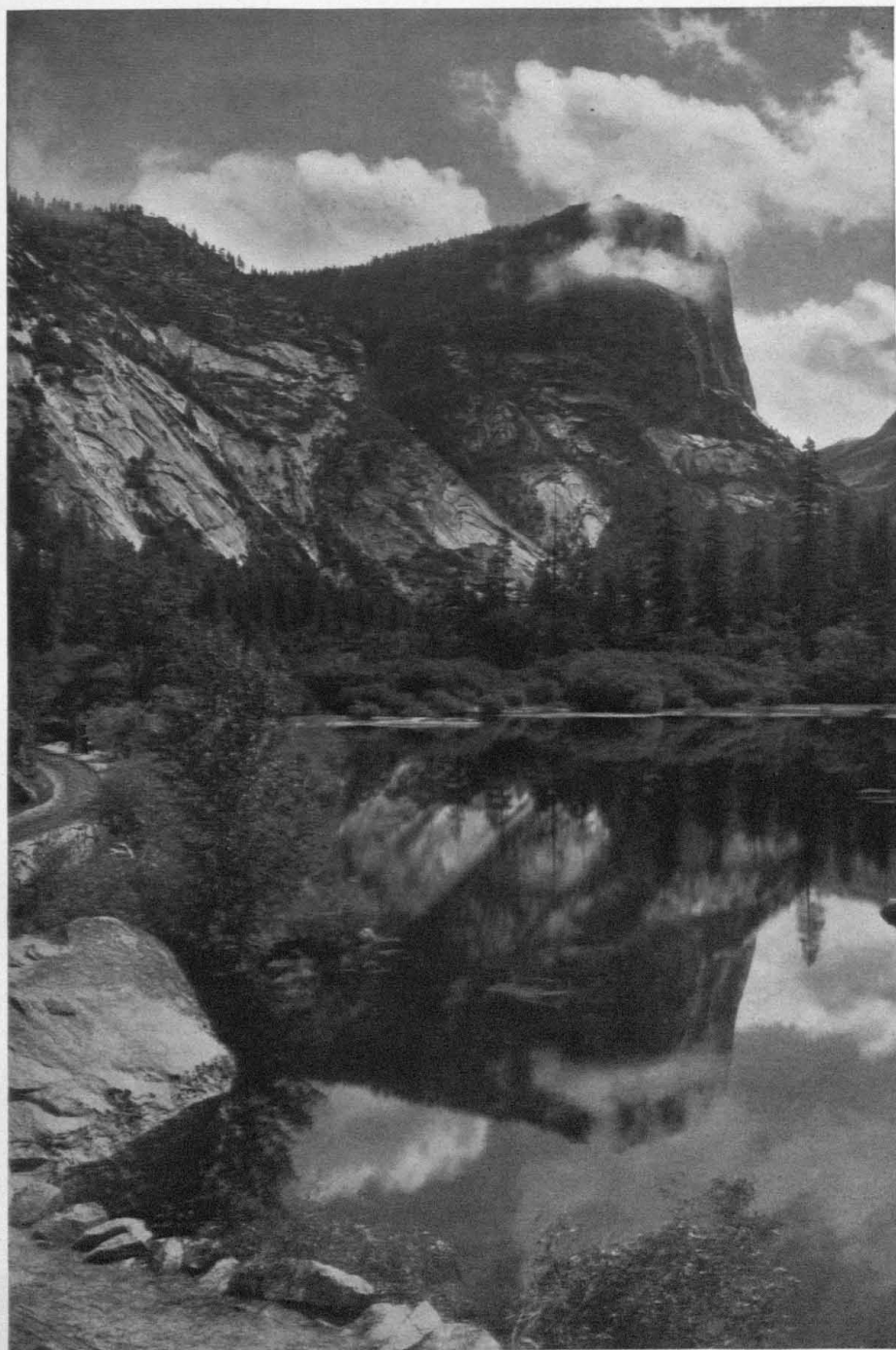
Sending Tenaya and his band on to the camp, upon the South Fork of the Merced, Savage and his men proceeded across the upland through deep snow, and on March 21, 1851, descended to the mysterious valley. There they found only an aged squaw. It was as Tenaya had said; the young men and their women had disappeared, and after a brief survey the disappointed whites recrossed the hills to their camp.



A Yosemite Wood-Gatherer.

During this first visit to the valley, Dr. Bunnell proposed naming it Yosemite, after its Indian inhabitants; and the beautiful name was adopted, though not without the usual opposition from men who saw in the Indian merely a savage to be despoiled of his lands. But the Indian name of the valley, as I have said, was Ah-wah-nee. Its ancient tribe had been almost exterminated by disease many years before, and the valley home abandoned, until Tenaya, son of an Ahwahneechee father by a Mono mother, had led back the few survivors of the race, re-enforced by renegade Monos, Piutes from the Tuolumne, and fugitives from the lowland tribes. The mongrel clan of several hundred members proudly adopted a new name given it





**Mirror Lake, at mouth of Tenaya Cañon, with reflection of Mt. Watkins, rising more than 4,000 feet above its surface. Perfect reflections such as this are seen only in the early morning interval between the downward currents of the night and the warm winds that draw up the Sierra slope as soon as the sun strikes it.**



Yosemite Indian Basket-Maker, weaving a burden basket. The large basket to the left is for cooking.

by others, Yosemite, or Grizzly Bear, for the animal which the Indians most feared and emulated.

Savage never got his captives to the Fresno reservation. When nearly there, alarmed by runners from the hostile Chowchillas on the South Fork, and taking advantage of the relaxed vigilance of their guards, they fled in the night, and were not again to be tempted away from their valley. Inducements successful with other tribes were rejected with

contempt. Gaudy clothing and cheap presents Tenaya declared no recompense for loss of freedom in their mountain home. Even the offered beef was refused; the Indians preferred horse-flesh. Hence, after the Chowchillas had been subdued, and the other tribes had made treaties, Savage sent a second expedition, under Captain Boling, to bring in the stubborn Yosemite. Bunnell again was of the party, which expected to have little difficulty in persuading Tenaya to surrender. But on reaching the valley in May, Boling found only deserted wigwams and smoking ash-heaps telling of hasty flight. Three of the chief's sons were captured at the foot of the great rock then named, in memory of the capture, "Three Brothers." One of these youths was killed in trying to escape, and shortly afterwards Tenaya himself was caught by Boling's Indian scouts on a

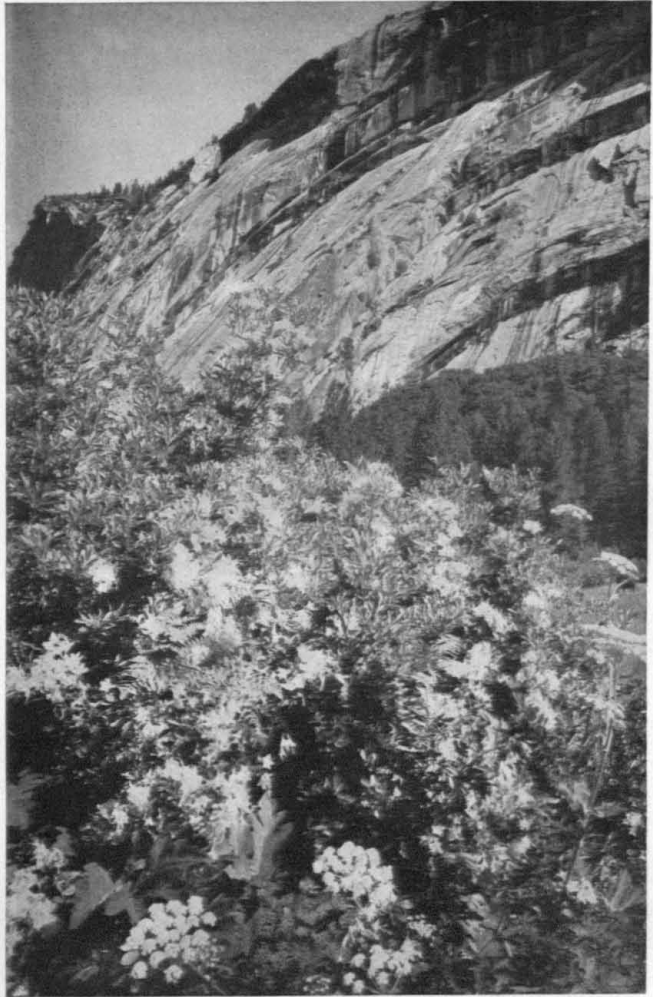


"Umbrella Tree," a snow-flattened pine at head of Nevada Fall.

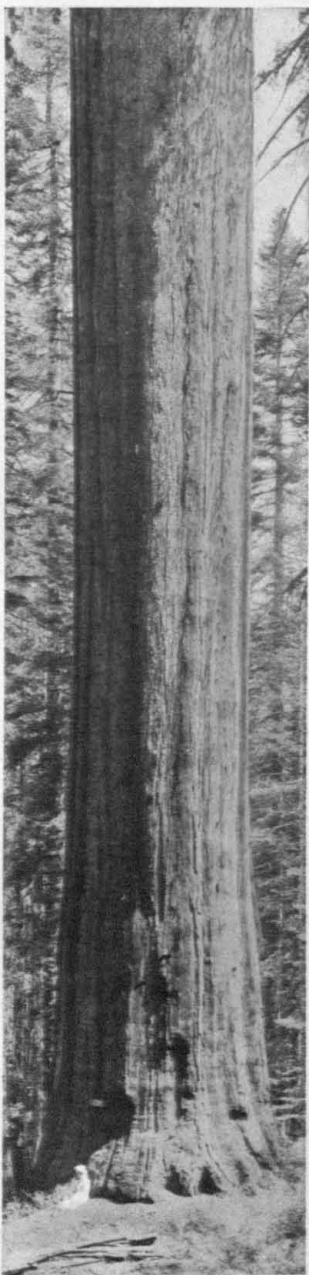
high bench east of the "Big Falls," whence he had been watching his enemies below. When he saw the body of his son, his grief found vent only in a look of hatred that Boling well understood. No word could be coaxed from him in reply to the captain's regrets for the youth's death. A day or two later, he made an unsuccessful attempt to escape across the swollen Merced. Then at last his grief and rage poured out in characteristic speech.

"Kill me, Captain," he cried, "as you killed my son; as you would kill my people, if they were to come to you. You have made my life dark. But wait a little. When I am dead, my spirit will make trouble for you and your people. I will follow in your footsteps, and be among the rocks and waterfalls, and in the rivers and winds. You will not see me, but you shall fear the spirit of the old chief, and grow cold."

Tenaya's appeal to the unknown was as futile as eloquence generally is. The white conquest paid no heed to his threats. Steadily rounding up the savages, Boling's party captured the last of their band at a rancheria or village a few miles above the valley, on a beautiful lake walled by polished granite cliffs and domes, which they at once named Lake Tenaya. "But it already has a name," Tenaya protested,—"'Py-we-ack,' Lake of the Shining Rocks." The naming of a lake in his honor seemed to him a poor equivalent for the loss of his territory. Another chance was given him.



Wild Flowers beneath the Royal Arches.



The "Forest Queen," in the Mariposa Grove,—an exceptionally straight trunk, without the usual buttresses at the base.

Taken at last to the Fresno, he soon begged for leave to quit the heat and dust of the reservation; and on his pledge of their good behavior, he led back his people once more to the cool spaces of the Yosemite. The aged sachem himself kept faith, but he could not control his young men. The killing of prospectors in the valley the next summer quickly brought a third visit from the soldiers, and the final dispersion of the Yosemite. It hardly detracts from the pathos of Tenaya's losing fight for his wild home that he and his last handful of followers were killed by Monos whose hospitality they had repaid by stealing their horses. The Indian's code did not recognize other people's rights in livestock.

Present-day visitors to Yosemite are often disappointed that their first impression of the height of the valley walls falls short of published accounts. Yosemite magnitudes are not quickly realized. Even Dr. Bunnell was ridiculed by Captain Boling and others when he estimated the superb granite cliff opposite their camp as at least fifteen hundred feet high. Some guessed five hundred, others eight hundred. Not even Bunnell himself dreamed that El Capitan actually towered more than three-fifths of a mile above the silent Merced.

Its Indian inhabitants gone, Yosemite soon came into public notice. As early as 1855, the first tourist parties visited the valley. Trails were quickly opened, rude inns established, and, in 1864, John Conness, a senator from California, introduced and Congress passed an act granting to the state "the 'cleft' or 'gorge' in the granite peak of the Sierra Nevada Mountains . . .

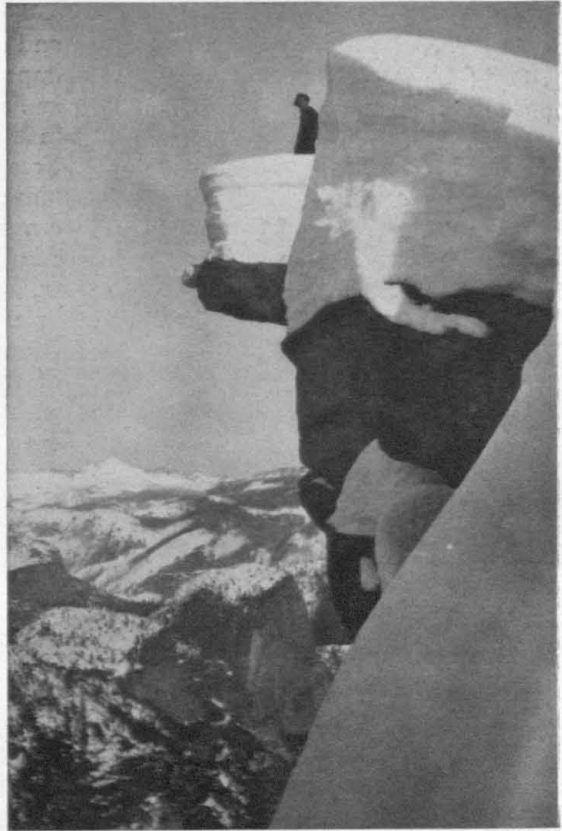


COPYRIGHT, J. T. BOYSEN.  
"Watch Me!"



known as the Yosemite Valley, with its branches or spurs, in estimated length fifteen miles, and in average width one mile back from the main edge of the precipice, on each side of the valley, with the stipulation, nevertheless, . . . that the premises shall be held for public use, resort, and recreation." To this grant was added the "'Mariposa Big Tree Grove,' not to exceed the area of four sections." In 1890, Congress created the Yosemite National Park, subject to the grant of 1864. Its lines have since been modified considerably by acts of 1905 and 1906, excluding the head basins of the north and middle forks of the San Joaquin, and embracing more completely the watersheds of the Tuolumne and Merced Rivers. Its area, as already noted, is now 1,124 square miles.

The dual administration established by the creation of the National Park surrounding the State Park was soon found impracticable and disastrous. The state commissioners did the best they could with the ten or fifteen thousand dollars annually voted by the legislature, but these inadequate appropriations were largely consumed in the salaries of park guardians and the traveling expenses of the commissioners; little was left for needed improvements. Much of Yosemite Valley was fenced in, and let to private contractors. Conflicts occurred between the state and federal authorities. A forest fire, for example, was sometimes left to burn while the officers debated as to which jurisdiction was responsible!

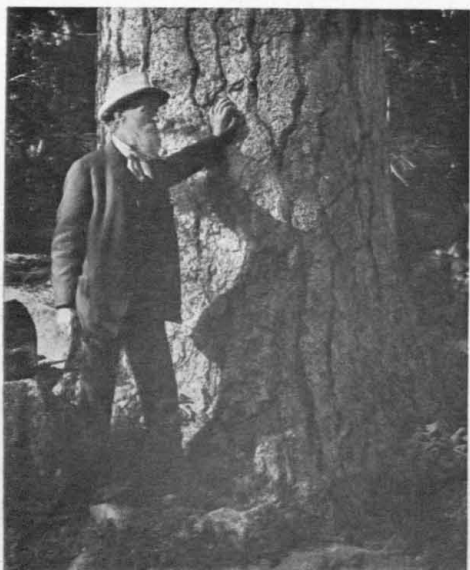


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On the Overhanging Rock at Glacier Point, with eight feet of snow.



Blue Jay, in Merced Cañon below Vernal Fall.



John Muir in Hetch Hetchy. The tree shown here is a fine example of Yellow Pine.

John Muir was one of the first and most active in pointing out the importance of ending this *imperium in imperio*. His opportunity came in 1903, when he was invited by President Roosevelt to accompany him on his visit to Yosemite. Governor Pardee, President Benjamin Ide Wheeler of the State University, and other well-known men were in the party, which received Mr. Muir's arguments for the recession of the valley and Big Tree grove with unanimous approval.

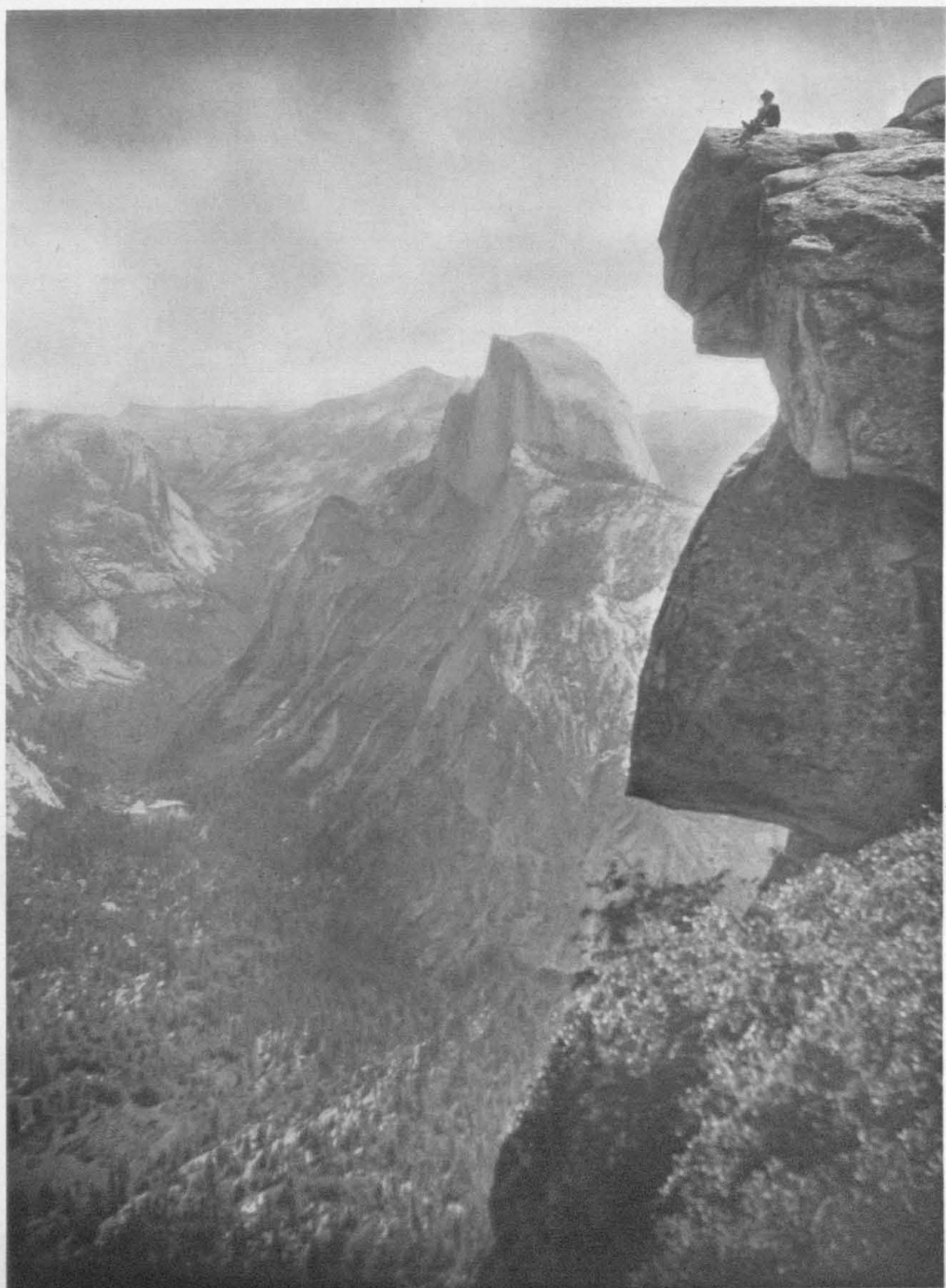
A vigorous state-wide campaign was started by the Sierra Club, the strong California society of mountain-lovers of which Muir was president. The plan won generous support from the newspapers of the state, as well as from the

Native Sons and other large organizations; and was eventually successful, though its advocates had to overcome bitter opposition, both at Sacramento and at Washington, from certain politicians and favored concessionnaires whose private interests conflicted with the public advantage.

The recession has been justified by its results. Better order has been established, and in every way the rights and convenience of the public have been promoted. The federal management, while sometimes open to criticism, has devoted annual appropriations exceeding \$50,000, besides an increased income from concessions, mainly to improvements that would still be lacking under the clumsy dual system. Several hundred thousand dollars have been spent in building good roads and permanent bridges, and in leading trails into all parts of the Park. No one who views the matter impartially can now be found to advocate a return to the old régime.

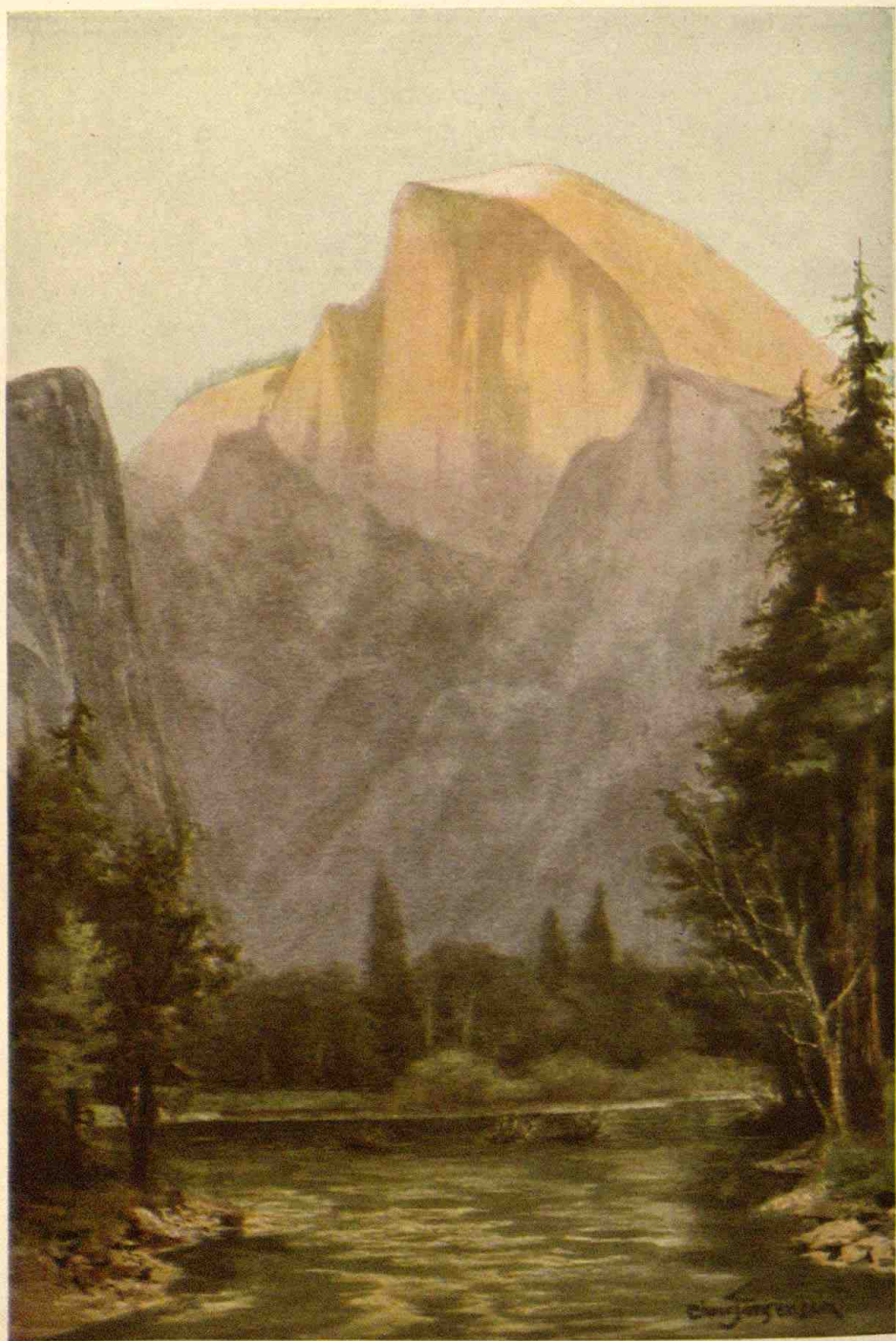


Ready for the Trails.



Tenaya Cañon, from Glacier Point (3,250 feet), with the late Galen Clark at the age of 94 on "Photographers' Rock." The perpendicular cleavage of the Half Dome by weathering is well shown in this view. Mirror Lake lies below in the cañon, and beyond rise Mt. Watkins on the left, Clouds Rest on the right, and Tenaya Peak in the distance at the head of the cañon.





Half-Dome in the Alpen-Glow.

Now, while a farewell gleam of evening light  
Is fondly lingering on thy shattered front,  
Do thou, in turn, be paramount; and rule  
Over the pomp and beauty of a scene  
Whose mountains, torrents, lake and wood unite  
To pay thee homage.

—Wordsworth.





Merced River and the Forest in Yosemite, with Half Dome in distance.

## II.

### THE CAÑON OF YOSEMITE.

"Of the grandest sights I have enjoyed,—Rome from the dome of St. Peter's, the Alps from Lake Como, Mont Blanc and its glaciers from Chamouni, Niagara, and Yosemite,—I judge the last named the most unique and stupendous."—*Horace Greeley*.

"The only spot I have ever found that came up to the brag."—*Ralph Waldo Emerson*.

Early visitors to Yosemite paid well for its pleasures. To reach the valley by any of the old routes meant a hot and dusty ride of two or three days, in a primitive vehicle, over the roughest of mountain roads. In common with thousands of others, I painfully recall my first trip. We quit the train from San Francisco at Raymond, to endure a day of misery in a crowded "stage," which jolted us up from the low country into the noble valley of the South Fork at Wawona. That ride made the friendly little inn there, when we finally reached it, seem more luxurious than any metropolitan hotel. The next day was spent among the Mariposa Big Trees. The third carried us across the broad Wawona ridge to Inspiration Point and the hard-won vision of Yosemite itself. We were bruised and happy.

Hundreds of tourists still come and go by the



Lost Arrow Trail, east side of Yosemite Creek, leading to Camp Lost Arrow.



Chilnualua Falls, near Wawona; one of the most beautiful series of cataracts and cascades in the Park.

Wawona route, leaving or returning to the railway at Madera or Raymond. Automobiles, good roads, and improved hotel service have robbed the trip of its terrors. The traveler is able to enjoy fully the increasing interest of a wonderful ride, as his motor climbs swiftly back among the great, forested hills of Wawona. It is a country which, even without Yosemite or the Mariposa Grove, might well draw him to its own splendid outlooks, deep valleys, and fine waterfalls and lakes,—a sportsman's paradise that should form part of any extended Yosemite outing.

The Wawona route, like the Big Oak Flat road north of the Merced, is recommended by the fact that it gives the incoming visitor his introduction to Yosemite Valley from the heights. Few things in this world can exceed the surprise and pleasure of that view. Nearing the rim of the plateau, the road suddenly leaves the forest for a turn far out on a rocky promontory. Nearly two thousand feet below, the river lies, a white thread, at the bottom of its gorge. The foreground is wild and unformed,—an abyss fringed by projecting crags and pinnacles, and barren save for a few rugged and adventurous pines clutching the ledges. But eastward opens the famous valley, always more impressive than imagination has conceived it. Its nearest cliffs tower as far above as the river lies below, while, miles beyond, the great picture closes with domes and peaks lightly silhouetted against the softest blues and whites of the Sierran sky.



"New England Bridge," at Wawona, built by Galen Clark in 1870.



**Bridal Veil Meadow, on the route of the ancient Pohono Glacier. Such sunny glacial flats, large and small, telling of old lakes long since transformed by stream-wash, are come upon everywhere below timber line, on forest trails or among the upland granite domes. Homes of flowers and deer, musical with the song of birds, they are one of the surprises of the Park.**

It is a picture one can not afford to miss, and if he comes to Yosemite by rail, as most visitors now do, he will lose much of its beauty if he fails to see the valley from Wawona road. I do not wonder that every artist wants to paint his interpretation of Yosemite's message from the sublime outlooks on or near this road, as it rises out of the cañon; or that the scene inspires such admirable work as we have in Mr. Jørgensen's Bohemian Club painting. But all nature-lovers will indorse Mr. Chase's protest against the cheap, bromidic names given these view-points. It does not add to the inspiration of the scene to be told, "This is Inspiration Point!" There is both good humor and good sense in what Chase says:

Inspiration, in any case, is a timid bird, which appears without advertisement, delights not in sign-boards, and



**On Wawona Road, near Inspiration Point.**

the louder it is whistled for is the more apt to refuse to come. I have heard the spot spoken of by warm and jocular young gentlemen as Perspiration Point; and although that species of witticism is, generally speaking, distasteful to me, I find that I suffer no pang when it is practiced at the expense of this piece of pedantry.—*Yosemite Trails*, p. 28.



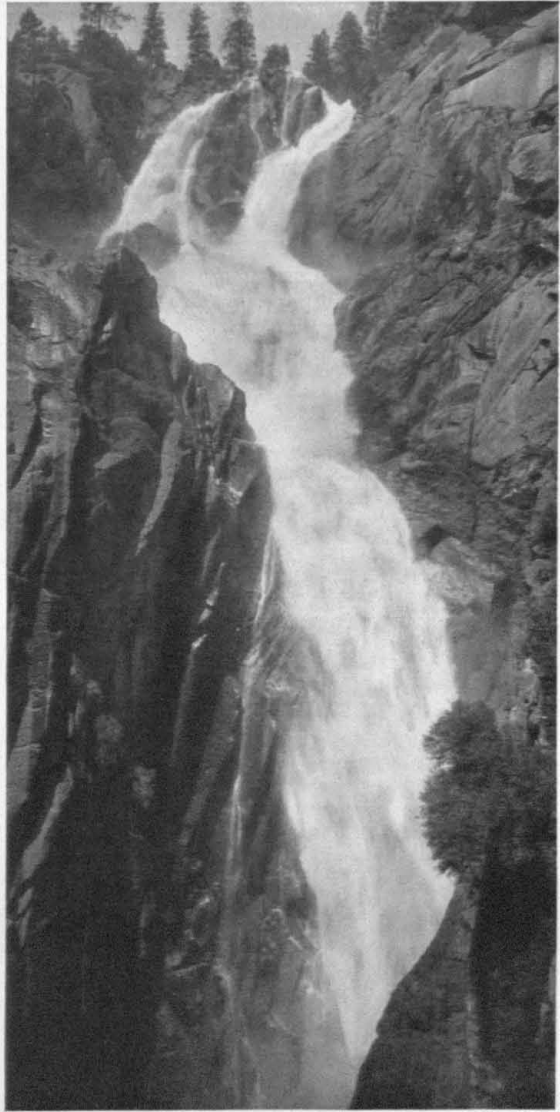
The Merced River, three miles above El Portal. The sharp V-shape of the gorge indicates that it was probably cut by stream erosion, rather than by the glacier which carved the U-shaped cañon of Yosemite above. Along this wild trough, filled with boulders from the cliffs, an excellent automobile road has been built at great cost.

The majority of Yosemite visitors to-day prefer the quicker service of the railway, even to automobiles on the roads into the Park which have recently been opened to those vehicles. Leaving the Southern Pacific or Santa Fé system at the pleasant town of Merced, their through cars from San Francisco or Los Angeles carry them over the Yosemite Valley Railroad to El Portal, its terminus, just outside the Park boundary. This road is a noteworthy piece of railway building. A few miles above Merced, it enters the Merced River gorge, which it follows for the rest of its seventy-eight miles, as the cañon sinks deeper into the range. For most of this length it was blasted out of the granite or cleated upon the wall of the gorge. Below it the Merced winds in a narrow, tortuous channel, which is dammed here and there to supply power for quartz and lumber mills. Gold mining is in progress at many points.



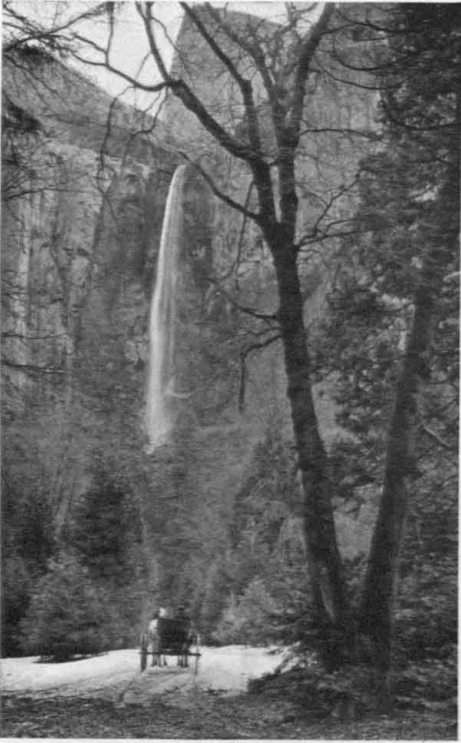
At El Portal, the railway maintains an excellent hotel. From here automobile stages run not only to Yosemite, but also to the Merced and Tuolumne Big Tree Groves. These small areas contain many fine trees, and the journey to them is one of great interest. The road, as it climbs the hills, unfolds magnificent views of Yosemite and the lower Merced valley. Even if there were no Giant Sequoias in prospect, the ride would be well worth while, for the forests of fir, pine and cedar through which it passes are among the most interesting in the state.

A ride of twelve miles over a good automobile road of easy grades brings the visitor to Yosemite Village, at the center of Yosemite Valley. This highway is one of the most picturesque mountain roads in America. From El Portal to the very gates of the valley, it had to be cut out of the granite hillsides. All about it is a scene of colossal disorder, the work of avalanche and earthquake, filling the cañon with mighty boulders from the cliffs



Cascade Falls, four miles west of El Capitan.

above, over which the river foams in continuous cascades. One great waterfall is passed before we reach Yosemite, though among the multitude of cataracts hereabout it is so inconspicuous that the automobile driver may rush by it without calling his passengers' attention to its beauty. This is Cascade Falls, seen on the left, where Cascade Creek pours from the north wall of the cañon, five hundred feet, in a deep recess close to the road. So fine a sight should not be overlooked. It prepares one for the



Bridal Veil Fall, seen in early Winter from the south-side road.

that he may well deem it the noblest setting Nature has given to any of her famous waterfalls.

Here, too, at the very gates of the valley, we find an invaluable key to the problem of its origin. As we followed up the Merced, we have thus far seen it everywhere a turbulent cañon stream. But at the base of Cathedral Rocks its character changes. For seven miles above that point, it is the most peaceful of meadow-bordered rivers, with only a few feet of fall as it meanders indolently down the level valley floor from Happy Isles. A little easy investigation, for want of which, however, some eminent scientists have gone far astray, explains the change.

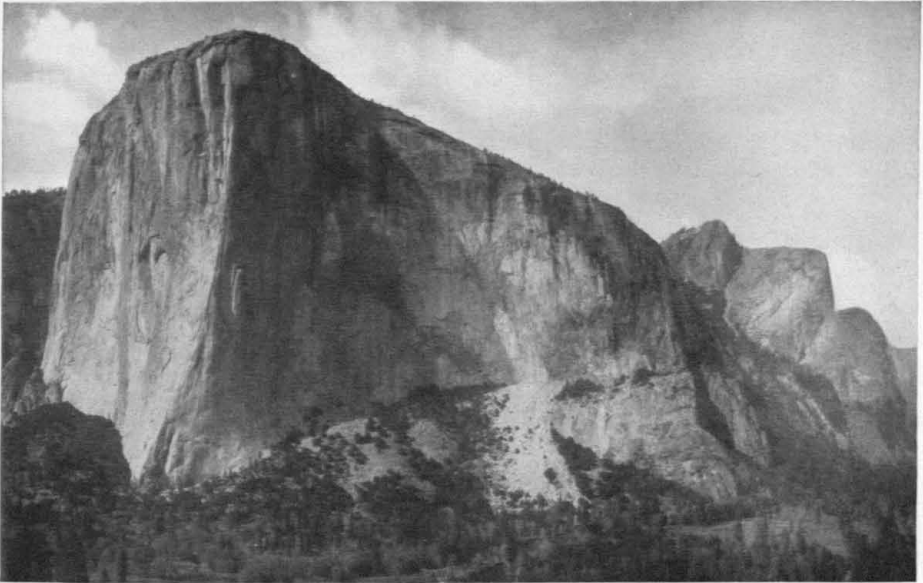
At the place just mentioned, where El Capitan bridge formerly

greater magnificence of Bridal Veil Fall ahead.

Soon, quitting the narrow, cluttered wildness of the lower river, the newcomer is face to face with the ordered peace and glory of Yosemite itself. Gratefully, silently, he breathes the very magic of the Enchanted Valley. For here, fully spread before him, is that combination of sylvan charm with stupendous natural phenomena which makes Yosemite unique among Earth's great pictures. He sees the cañon's level floor, telling of an ancient glacial lake that has given place to wide, grassy meadows; fields of glad mountain flowers; forests of many greens and lavenders; the fascination of the winding Merced, River of Mercy; and, gleaming high above this world of gentle loveliness, the amazing gray face of El Capitan, while Pohono drops from a "hanging valley" superbly sculptured, and so beautiful



Winter Sports in Yosemite. Skiing and snow-shoeing draw many parties to the Valley each winter.



El Capitan and Three Brothers, seen from the moraine at the foot of Cathedral Rocks. Tourists of the class that finds its chief out-door interest in discovering zoological resemblances in natural objects have dubbed El Capitan "the Crouching Lion of Yosemite." This is a misnomer, as the splendid huge rock is obviously an elephant!

stood, and where its piers may yet be seen, a broad ridge of glacial debris, now covered with young forest, and notched by the river channel, stretches from the talus slope below Cathedral Rocks a quarter of a mile across to the rock slide, or earthquake talus, west of El Capitan. It is largely buried in silt and river gravel, but about twenty feet of its height is visible on the upper side, and twice as much below. So solid and level an embankment of soil and boulders, some of which have been freighted down from the sea-beach strata still remaining back on the highest peaks, is unmistakably a glacier's record. Had Prof. J. D. Whitney seen it when, as state geologist, he conducted his famous Yosemite survey, fifty years ago, he would



A Glimpse of North Dome, from one of the beautiful forest roads in Yosemite Valley.

El Capitan.

Eagle Peak.

Yosemite Falls. Yosemite Point. Indian Cañon.

North Dome.

Half Dome.



Yosemite Village.

Merced River.

Royal Arches.

Tenaya Cañon.

**North Wall of the Valley, seen from the talus back of Yosemite Village. The trail to the top of Yosemite Falls and Yosemite Point climbs out of the Valley over the wooded earthquake talus seen in this view below Eagle Peak, follows the second bench eastward to the foot of the upper fall, and then, by many zigzags, ascends the small glacial cañon west of that cataract.**

Mt. Watkins.

Clouds Rest.

Little Yosemite.

Mt. Clark.



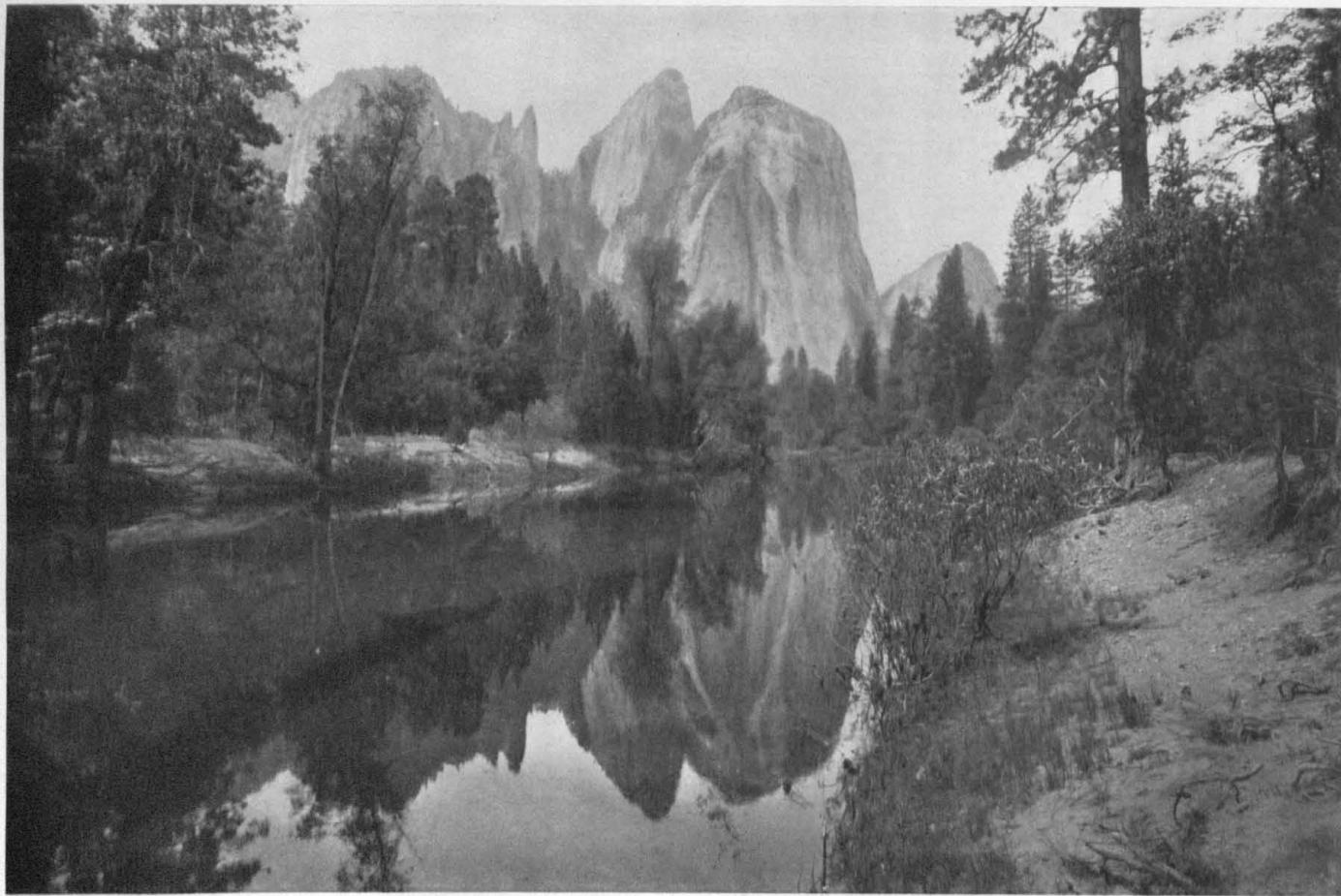
Tenaya Cañon.

Half Dome. Mt. Broderick. Liberty Cap. Vernal and Nevada Falls.

Mt. Starr King.

**Panoramic View East from Washburn Point, above Glacier Point.**





**Cathedral Rocks and Spires, from the Merced River near Rocky Point.**



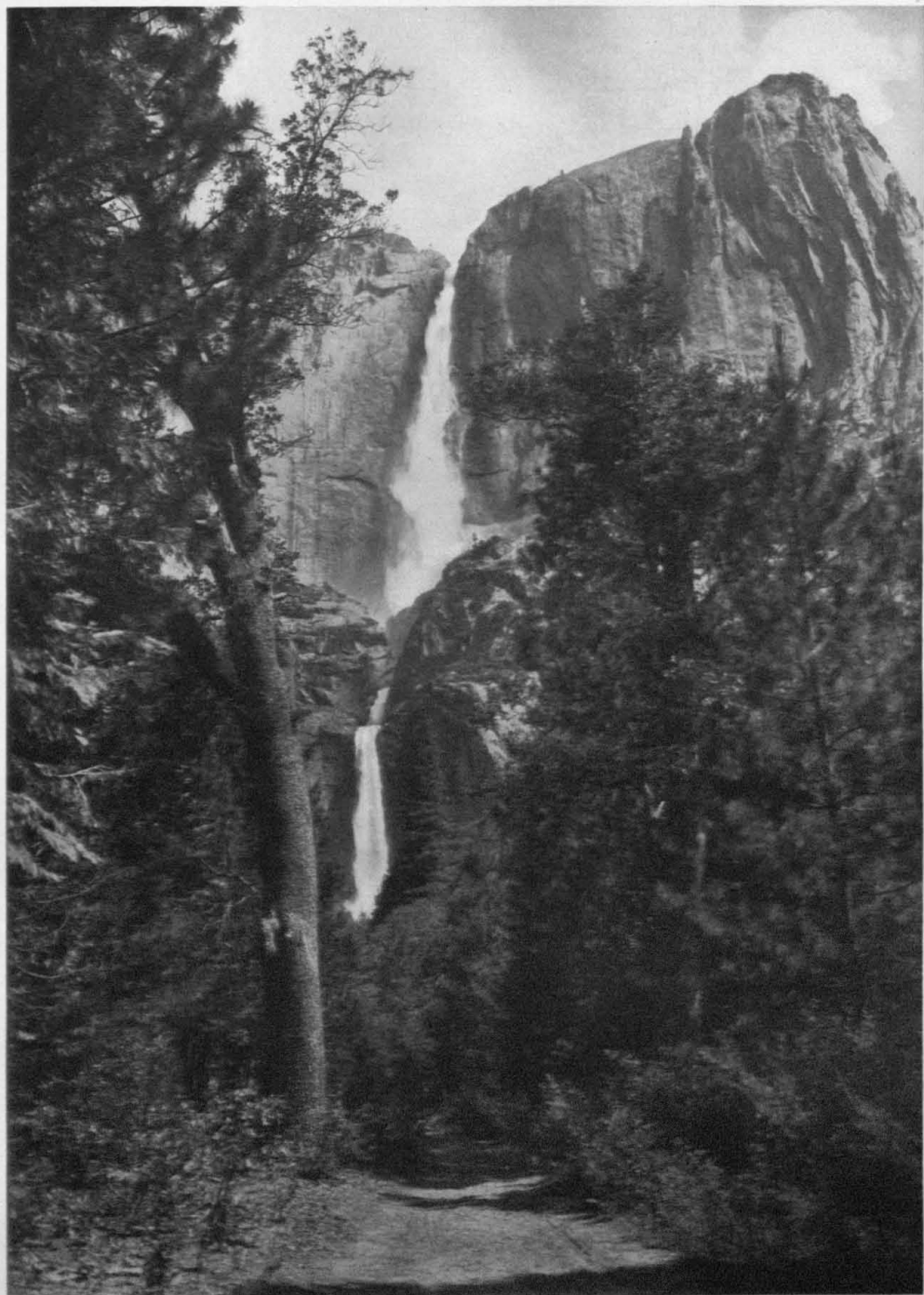
The "Back Road," on the south side of Yosemite. The trees shown are chiefly California Black Oaks (*Quercus kelloggii*), a deciduous species that does much to beautify Yosemite and Hetch Hetchy. Its acorns supply bread to the Indians, and are prized by squirrels and woodpeckers.

not have made the blunder of his life by denying that the valley was due to glacial action, or said: "There are below the valley no remains of the moraines which such an operation could not fail to have formed." For in fact this ridge is simply a terminal moraine, deposited by the great valley glacier at the point where the last of its repeated advances stopped, and from which its final slow retreat began.

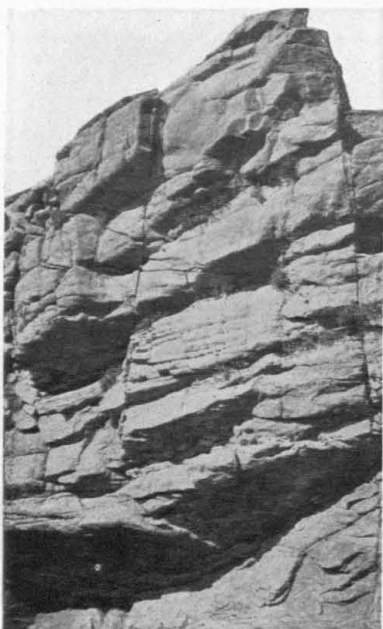
The line of the moraine, geologists tell us, practically coincides with, and covers, a granite bar, or sill, which formed the dam of the ancient Yosemite Lake.

This body of water had the same history as hundreds of other cañon lakes still to be found in the High Sierra, occupying the depressed treads of the huge glacial stairways. Deep basins were quarried by the glaciers wherever inflowing branch glaciers greatly augmented their mass and weight, with a corresponding increase in digging power. Glaciers alone produce these rock-basins. Lakes such as Merced and Tenaya, above Yosemite Valley, and filled lake-beds such as Yosemite and Hetch Hetchy Valleys, are found only in the tracks of the vanished ice-streams. River erosion never cuts such hollowed steps in water-channels. It requires the long scouring of incalculable moving ice-masses, armed with vast rocks plucked from their beds, to prepare the cañons for the lakes and level valleys of the later time.

Thus the sudden change in the Merced River, from a quiet meadow stream to a brawling mountain torrent, recalls vividly to the modern student that distant day when the receding glacier left behind it a beautiful lake, seven miles in length and probably four or five hundred feet deep,



Yosemite Falls, seen from trail through the beautiful oak and pine forest that skirts the north wall of the Valley. The upper fall, beginning 2,565 feet above the Valley floor, drops 1,430 feet; the lower fall, 320 feet, with several smaller falls between. Yosemite Point, 2,975 feet, is on the right, and the tall granite spire in front of it is the "Lost Arrow" of Indian legend.



Cliff at Head of Yosemite Falls, showing the vertical cleavage joints which have guided the glacial sculpturing and made possible the sheer walls of Yosemite, Hetch Hetchy and similar cañons.

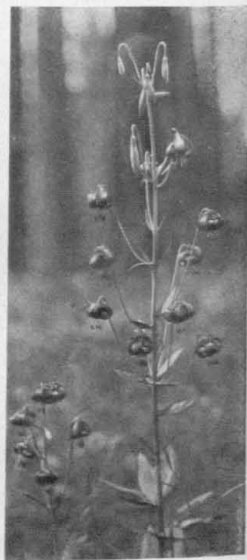
walled by perpendicular cliffs rising more than three thousand feet, and dammed by a rocky moraine overlying a granite dike. Where the lake ended, the Merced cut a pass for itself through the moraine. This is also used by the road to-day. The lake itself, probably within the last two or three hundred years, if we may judge by the trees growing where once was only water, has filled up with rich alluvial soil, brought down mainly by spring freshets from nearby heights, rather than by the larger river, and giving us the fertile valley floor, with an inestimable part of the beauty of Yosemite.

That Yosemite Valley is due mainly to glacial action, which deepened and widened a river gorge existing before the glacial epoch or epochs, is now generally accepted by the geologists; they differ only as to the length of the main Yosemite glacier, some believing that it extended little below El Capitan, while others find

evidence that convinces them it reached the foothills. Government geologists are now making a minute examination of the region, and the publication of their work will throw light on many such minor problems. But the main question is no longer disputed.

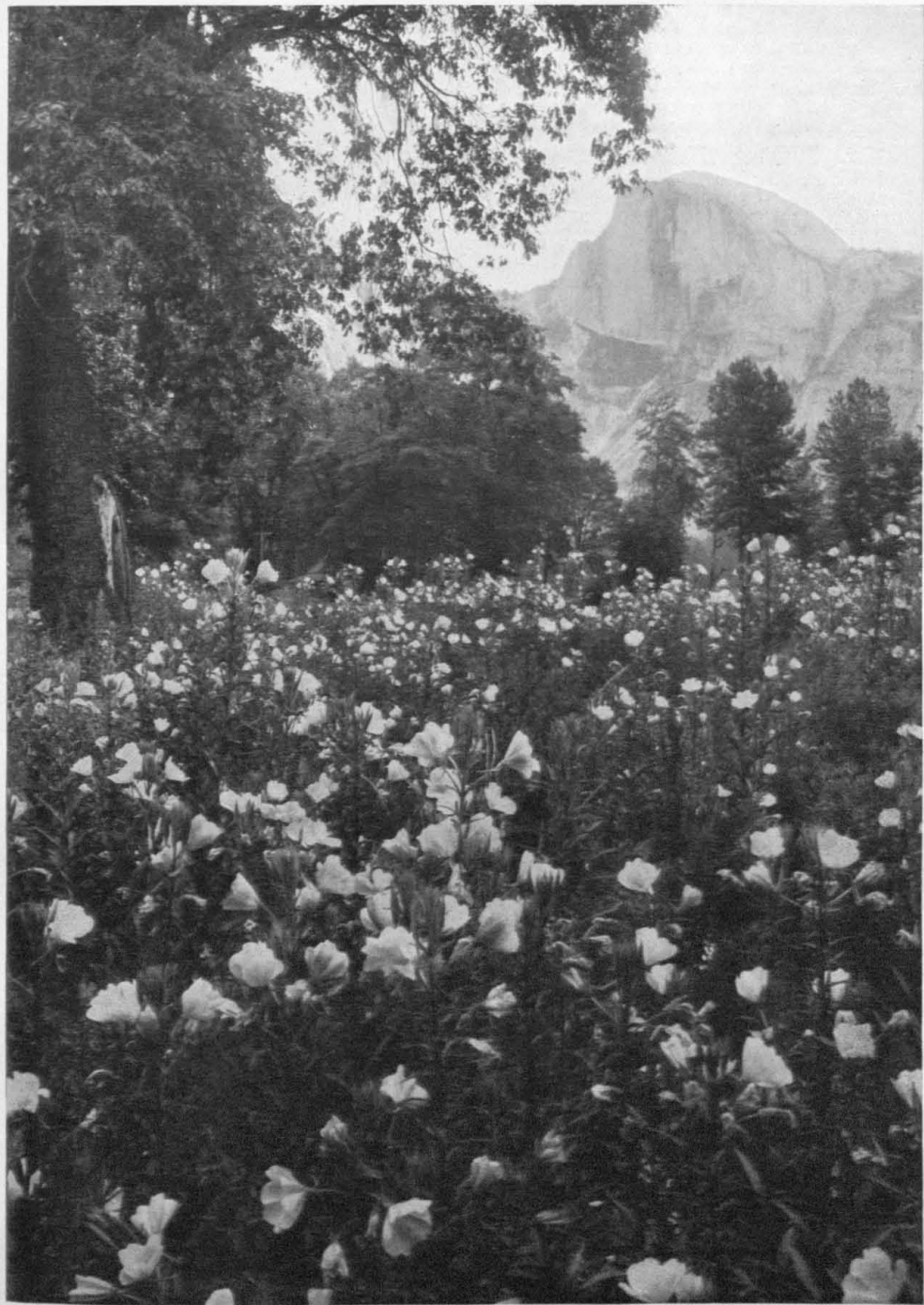
Such agreement, however, is of comparatively recent date. There have been many theories as to the making of the great cañon. The most interesting of these, because of the eminence of its author, and the violence with which he mistakenly denounced the glacial hypothesis, was the famous fault-block contention of Prof. Whitney. Said he:

A more absurd theory was never advanced than that by which it was sought to ascribe to glaciers the sawing out of these vertical walls and the rounding of the domes. Nothing more unlike the real work of ice, as exhibited in the Alps, could be found. Besides, there is no reason to suppose, or at least no proof, that glaciers have ever occupied the valley, or any portion of it, so that this theory, based on entire ignorance of the whole subject, may be dropped without wasting any more time on it. . . . We conceive that, during the upheaval of the Sierra, or, possibly, at some time after that had taken place, there was at the Yosemite a subsidence of a limited



Leopard Lily (*L. pardalinum*), a gorgeous orange - and - purple member of the Lily family, which frequents the lower valleys of the Park.

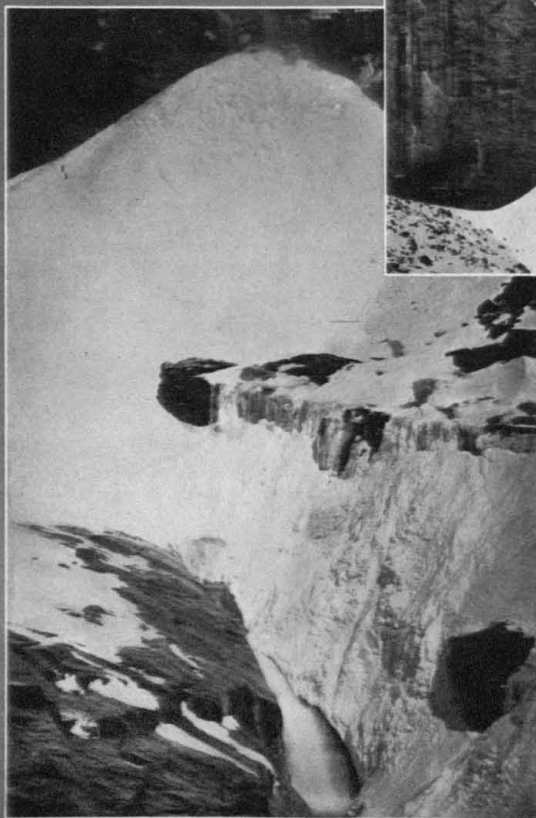
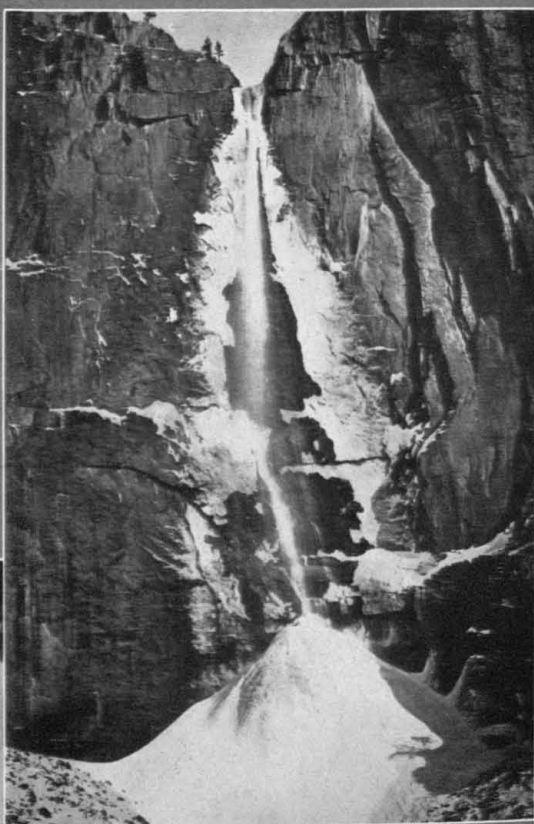




Evening Primroses and the Half Dome. These beautiful luminous yellow flowers are a familiar decoration of Yosemite, Hetch Hetchy and other valleys in the Park during July, when their buds "pop" open noisily at sunset for a single night of fragrant revelry.

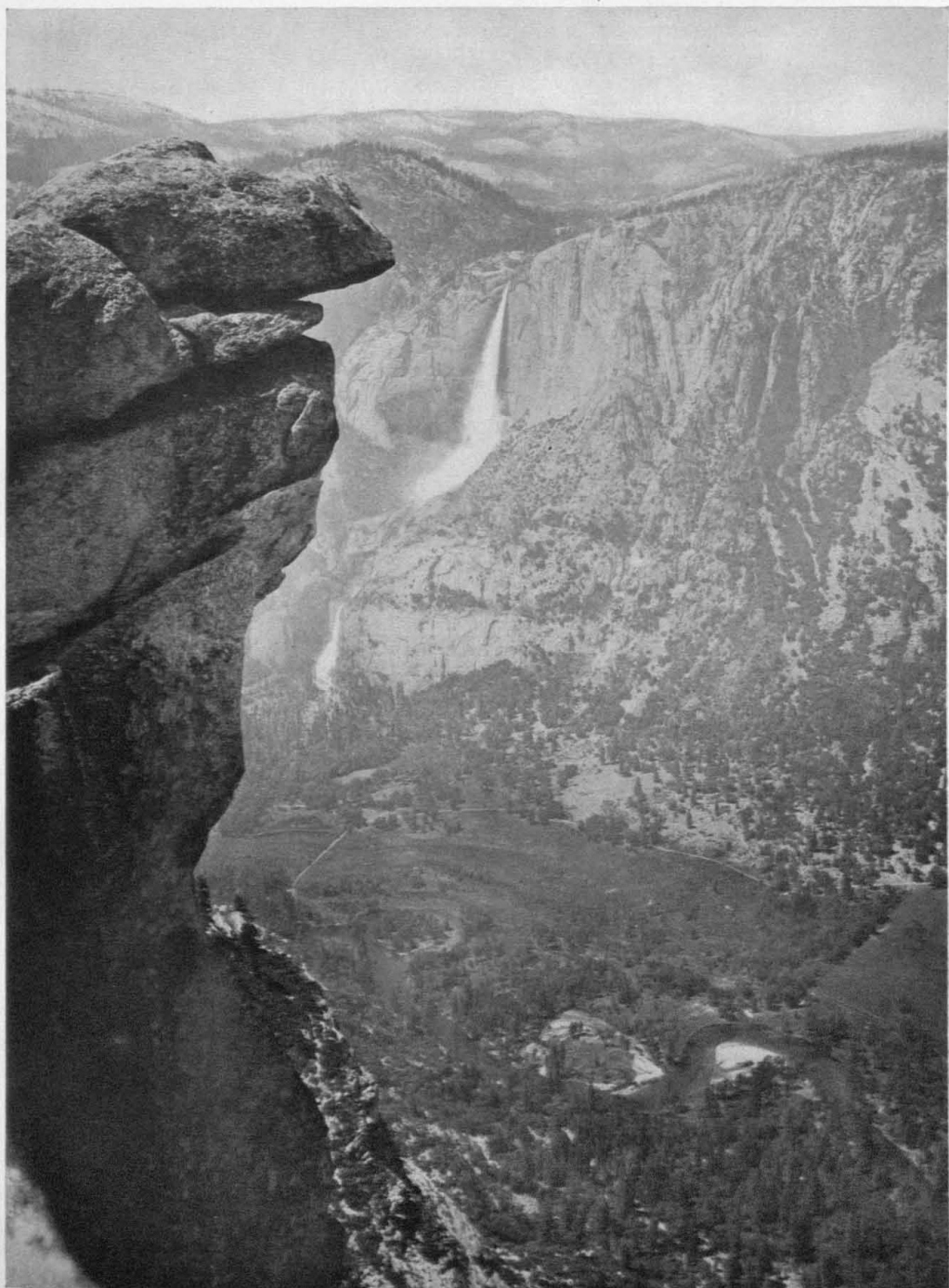
area, marked by lines of "fault" or fissures crossing each other somewhat nearly at right angles. In other and more simple language, the bottom of the valley sank down to an unknown depth, owing to its support being withdrawn from underneath. — *The Yosemite Guide Book*, 73, 74.

Had Whitney's examination of the valley been thorough enough to take note of the old moraine below El Capitan, it is probable he would not have written those words. And yet he had other evidence that should have prevented his error. El Capitan Moraine and the old Yosemite Lake which it helps us



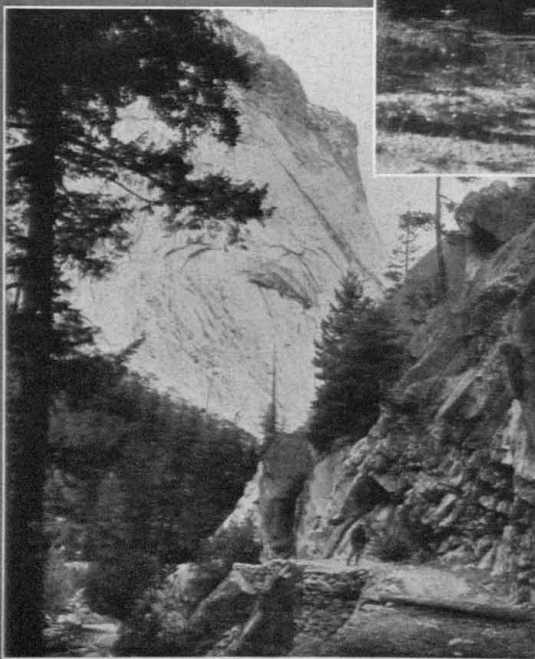
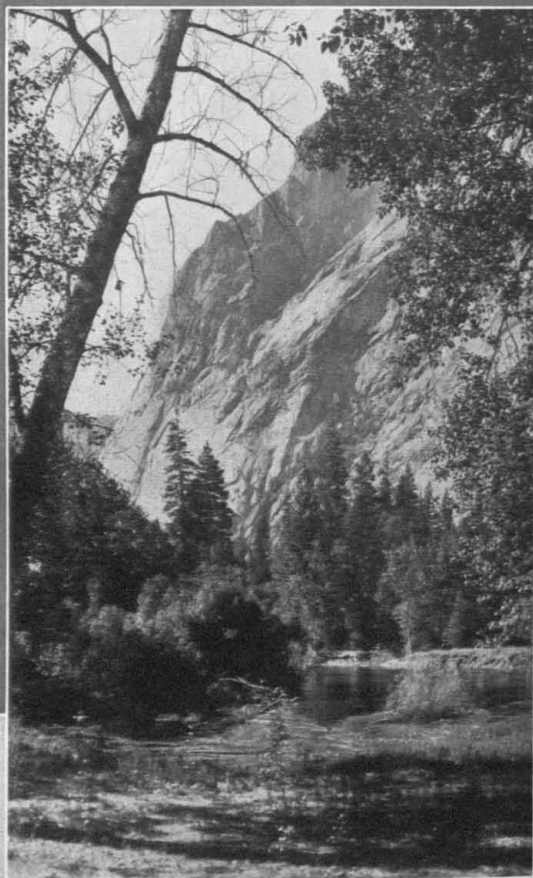
Ice Cone at the Foot of Upper Yosemite Fall. This volcano-like hill rises each winter to a height of four or five hundred feet, formed by the freezing spray and by blocks of ice fallen from the face of the cliff. The mouth of the cone is about 200 feet in diameter, says Muir, who has looked down into it from the ledge seen on the right in the upper picture. The two small specks on the side of the cone in the lower view are the late Galen Clark and a companion, who climbed it to get a look into the "crater."

to reconstruct are far from being the only reminders of the valley's glacial history. Most striking of all, the hanging valleys on its walls are no less clearly of glacial origin.



Overhanging Rock at Glacier Point, the most famous and important viewpoint on the rim of Yosemite. From it the spectator looks down 3,250 feet sheer to the Merced, winding among the forests and meadows of the Valley floor, and across to the beautiful Yosemite Fall, dropping half a mile out of its own hanging valley.

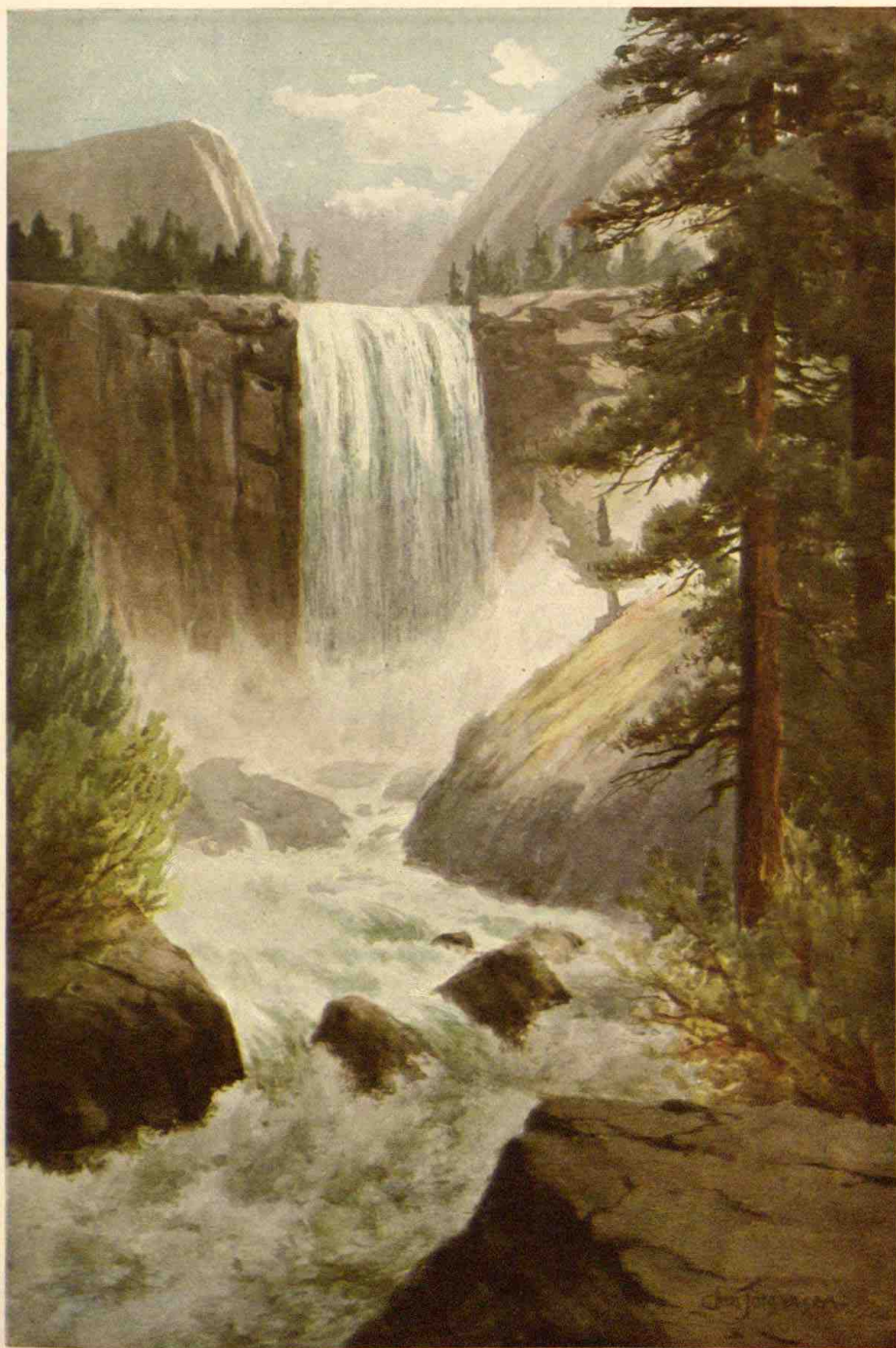
As we pass Bridal Veil Fall, we note that it drops, not from a flat plateau above, nor from a narrow cleft in the wall, but out of a high side-valley, which in turn is framed by lofty cliffs. The U-shape of this broad valley is so clear that we at once perceive that it, too, must have been scoured out by a glacier, rather than by Pohono Creek, which could have cut only a V-shaped gorge. Its sculptor, in fact, was a minor glacier, mighty enough to dig a splendid wild valley, more than fifteen hundred feet deep, but not powerful enough to sink it to the bed of the main valley. Hence, as the larger



**Glacier Point, jutting into Yosemite Valley at its junction with the Merced-Millouette Cañon. Seen either from the Valley floor or from the trail to Vernal Fall, this massive cliff is the stateliest headland of the south wall. Its precipitous faces are due to glacial quarrying along vertical joint-planes.**

glacier shrank in bulk, and ceased to fill the great cañon of Yosemite, the Pohono glacier was left "hanging" on the side, to drop its ice and rock in avalanches upon the trunk glacier below. Finally, both glaciers vanished,

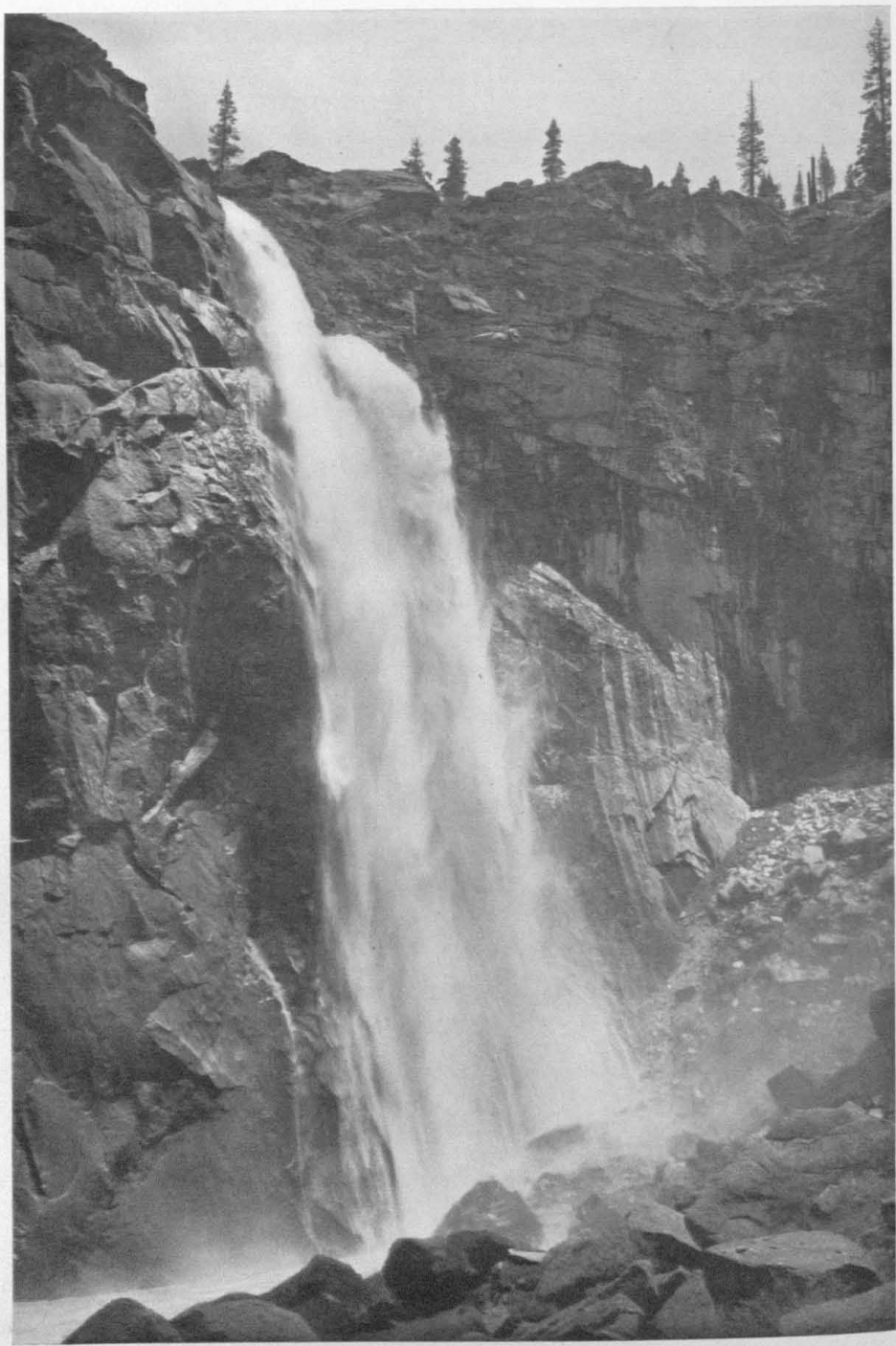




Vernal Fall.

Thy springs are in the cloud, thy stream  
Begins to move and murmur first  
Where ice-peaks feel the noonday beam,  
Or rain-storms on the glacier burst.

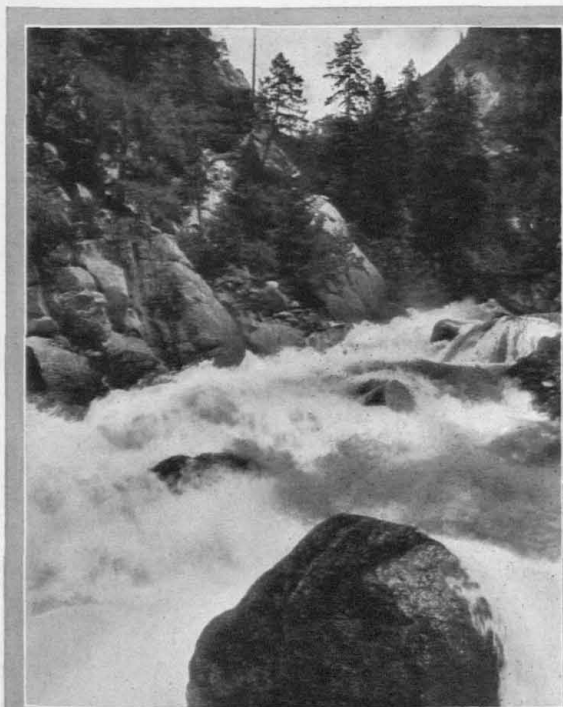
—Bryant.



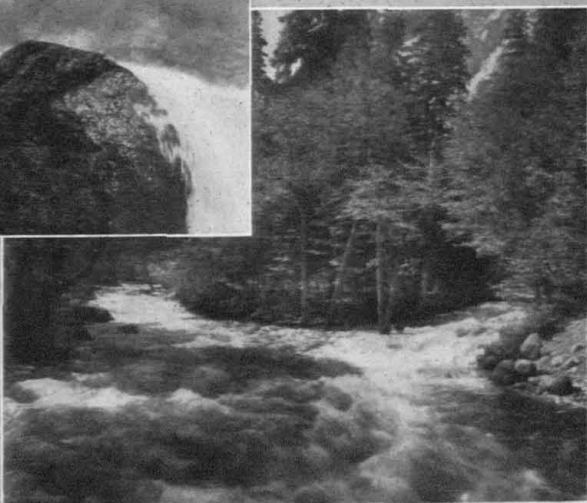
Illilouette Fall, viewed from its cañon below. This fine waterfall has a drop of 370 feet. It is a hard climb up Illilouette Cañon from the Merced River to the foot of the fall, which may be seen more easily from above, on the Long Trail to Glacier Point.

with increasing mean temperature and decreasing snowfall. Of their cañons one was occupied by the typical glacier-made lake of Yosemite, nearly four thousand feet above sea; while the other, for want of icebergs to drop into the lake, just as plainly declared its origin by flinging out a glacial banner, the most graceful and musical, though far from the largest, of the Yosemite waterfalls.

Other famous cata-racts hung high on the valley walls repeat the story of Bridal Veil. Yosemite Falls, at the center of the north wall, and Illilouette, on the south wall at the head of the valley, are the most important in volume and length of season, telling by their well-defined hanging valleys and fan-like amphitheatres, set deep in the highlands, that they,



**The Merced at Happy Isles**  
—two beautifully wooded islets at the upper end of the Valley, where the river rushes out of its narrow cañon below Illilouette and Vernal Falls.



too, are glacier-born. No more enjoyable occupation can be found for part of a Yosemite

vacation than to trace their old glaciers to their sources in the Hoffman and Merced spurs of the main Sierra.

If one follows up Yosemite Creek, above its falls, and beyond the old Tioga Road, he discovers a fine cluster of glacial cirques, stretching around from the north side of Mt. Hoffman, along the southern slope of the Merced-Tuolumne divide, and forming a mountain-walled basin, almost





**Le Conte Memorial, at the foot of Glacier Point; erected by the Sierra Club in honor of the late Prof. Joseph Le Conte, the famous geologist and author, of the University of California, and maintained as the Club's Yosemite headquarters. Here a library of out-door literature is accessible to the public.**

circular, and five or six miles in diameter. In outline it is like the spreading crown of one of the cañon live-oaks that beautify the upland roads and trails. This characteristic abandoned home of a minor glacier no longer holds its permanent névé. It is to-day merely a temporary reservoir. There the annual

snows are held until it pleases their parent, the Sun, to transform them again into summer floods, and send them, singing, down the valley to join the Yosemite chorus. Yosemite Creek now flows to its fall amidst a wild panorama of gray, barren domes and fir-covered moraines. But here for centuries a shallow glacier, fifteen miles in length and several miles wide, crept slowly from the Mt. Hoffman Range to meet the great ice-stream of the Merced; and when the larger glacier sank low in its vast cañon, the north-side feeder dug back its section of the wall until it had quarried a deep branch cañon, in which Yosemite Upper Fall now thunders its own



**The "Fallen Monarch," with troop of cavalry. This great Sequoia, standing, was one of the largest in the Mariposa Grove.**





Vernal Fall, from Clark's Point, on the horse trail. This famous cataract is eighty feet wide, and has a drop of 317 feet. Although the most conventional of the great falls in Yosemite, Vernal offers a magnificent picture, both in its setting and in its wealth of color. The golden greens and blues of the steadily falling stream, its shooting "comets," clouds of spray, and circular rainbows, make it an ideal study, well worth many visits.



**Vernal Fall in Winter, when the Merced's fountains in the High Sierra are frozen, and curious ice-forms are built by the spray at the foot of the shrunken fall.**

verging moraines, the whole walled by snowy mountains that rise to elevations of eleven thousand feet. Some idea of it may be had from the illustration on page 22. But its wonder and beauty are beyond the power of photography. The best general view is to be had from Mt. Clark or the east slope of Mt. Starr King, whence one carries away a lasting picture of what a glacier can do as a landscape architect.

Differing from these three important cataracts in their manner of birth, but none the less proclaiming a glacial origin, Vernal and Nevada Falls, at the head of the valley, are the largest in volume of all the Yosemite group. Instead of falling from their own hanging valleys, backed by independent basins, they are part of the Merced itself, and drop from giant steps in the river's glacial stairway. These steps, like the outstanding sheer cliffs of

chapter of the glacial story, king of all the waterfalls in height and stateliness.

How easily the Yosemite cliffs were undercut and torn away by the blows of avalanches from the glacier above may be guessed from the picture on page 72, showing the wall so deeply fissured by vertical and intersecting cleavage planes that it is merely a standing pile of huge rectangular granite blocks, ready to be tumbled over by any power that can.

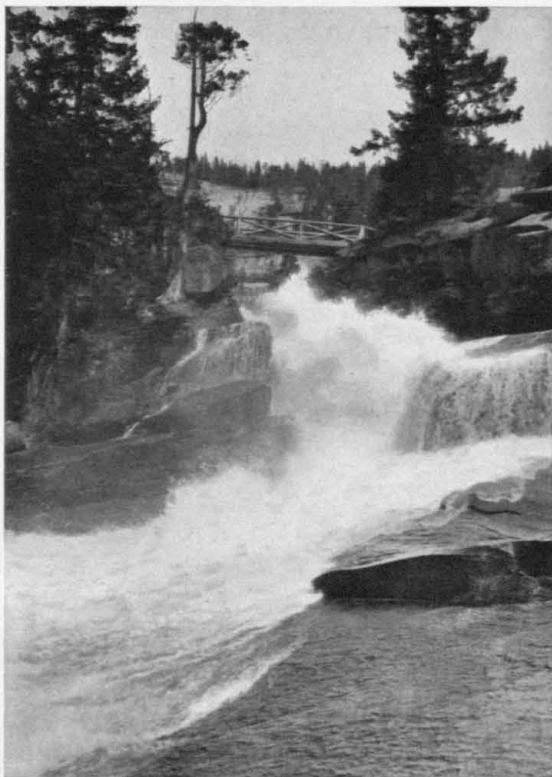
The Illilouette watershed is larger, and even more interesting, as rimmed by higher mountains. From the "Long Trail" approaching Glacier Point, we get a good view of its deep lower valley, encircling Mt. Starr King, and inviting us back to its fountain basins sunk in the west flank of the Merced Range. There Mt. Clark, and Gray, Red and Merced Peaks, accent as noble a ring of cirques as we shall find below the very crest of the Sierra. This watershed, once occupied by a broad river of ice, is now a land of sunny meadows, shining domes, and densely forested con-



**At the Head of Nevada Fall. Here a projecting ledge, guarded by an iron rail, enables visitors to study the wild flood at close range.**

Yosemite, owe their remarkable height and perpendicular faces to the alternation of practically solid granite ridges, lying across the path of the ancient Merced glacier, with areas of looser rock, vertically jointed, and therefore readily disintegrated by the ice.

Glacial cañon steps as high as these are exceedingly rare. Hence cañon waterfalls of the height of Vernal and Nevada are elsewhere almost unknown, while cliff cataracts of even greater fall, dropping from hanging valleys on the sides of trunk-glacier cañons, are a familiar feature of every important alpine district. But the two renowned falls of the Merced stand quite alone among cañon cataracts in their union of large volume with great altitude, Vernal falling 317 feet, and Nevada 594 feet. Not only are they thus exceptional in magnitude, but the glacier used the local rock formations to make them different. Each has its own special character. Vernal meets all the requirements of an ideal cataract,—a solid sheet of clear water bending easily from the brink of a



The "Cataract of Diamonds," between Vernal and Nevada Falls.



Little Yosemite, with its bare granite slopes, seen from summit of Liberty Cap, with Half Dome on the left. Here, too, a Jeffrey Pine, more symmetrical than that on Sentinel Dome, has established itself. Mt. Clark is in distance (left).

broad, level granite platform, and offering all the colors of its own delightful rainbows, as the flood changes swiftly from golden green at its brow to broken grays and flashing snows in the sunny cañon below. Nevada presents a striking contrast to such conventional, if surpassing, beauty. Already churned to foam in a



Nevada Fall (594 ft.), seen from the cañon below and from Zig-Zag Trail, half-way to the top. In display of power, this great fall ranks first among the Yosemite cataracts.

steep, crooked trough, it shoots far out from its narrow cleft, a passionate cloud, seemingly made up of millions of distinct, pearl-like drops; and midway in its descent it strikes the sloping cliff, spreading into a wide "apron" of

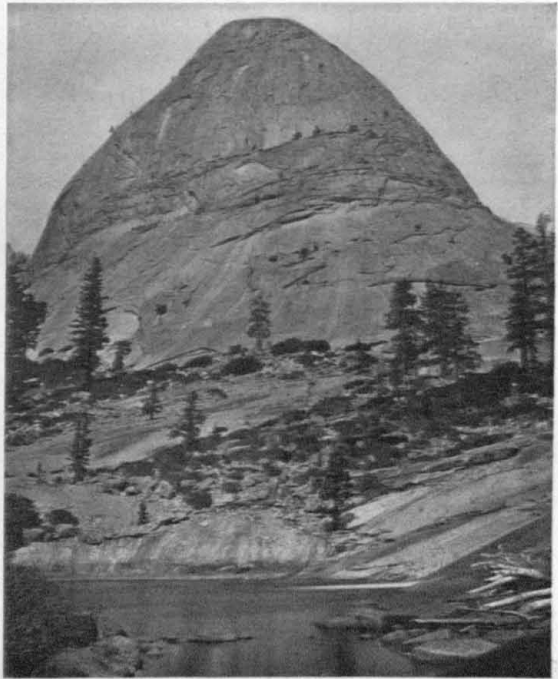




Little Yosemite, with Clouds Rest in the distance.

still more dazzling whiteness. So splendid are the children of the glaciers.

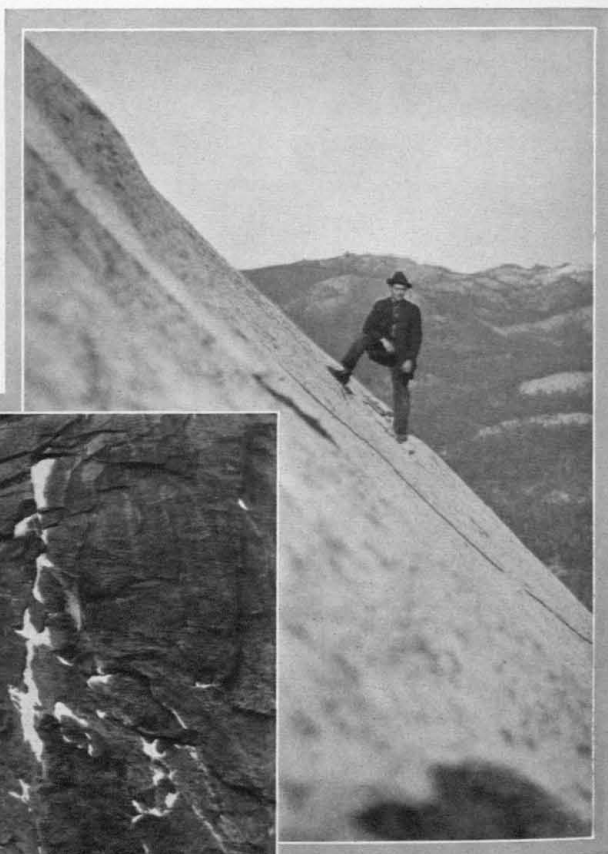
The record of these waterfalls is corroborated by the rock-basins which the glacier scoured out on their plateaus, just as it hollowed the basin of Yosemite Lake itself. Emerald Pool, the little tarn immediately above Vernal Fall, is hardly a stone's throw across, but unmistakable. River erosion could never have fashioned so perfect a bowl. A mile higher up, beyond Nevada Fall, the basin was three miles long, holding a lake that has now given place to the charming vale of Little Yosemite. Here bare cliffs and domes frame another level valley of meadow, forest and lazy river, all on about one-half the scale of the greater Yosemite below. Other yosemites lie beyond, until we reach the splendid glacial lakes, Merced and



Sugar-Loaf Dome, at the head of Little Yosemite.

Washburn, far up the cañon. These, too, in time will fill with detritus from the hills, and become delightful valleys. Nature abhors barren waters.

Glacial history is also written plain on the two "domes" that rise just north of Nevada Fall, called the Cap of Liberty and Mt. Broderick. These are simply masses of unfissured granite, too large and solid for the glacier to plane away, though it gouged out the vast beds of jointed rock in which



**Climbing the Half Dome.** This feat was first performed in 1875 by George Anderson who drilled holes and set eye-bolts in the northeast slope, the only practicable route. The ascent is now made by occasional adventurers, aided by Anderson's spikes and a rope. The lower view here shows a climber making his way up across the projecting layers of granite.

they lay; and as it swept over them, it shaved

down their east slopes so that one may easily scale them, and find glacier boulders on their tops that have traveled far.