THE CINDER CONE AND LAVA FLOW, WITH BUTTE LAKE IN FOREGROUND

"LASSEN GLIMPSES"

The Lassen Park Guide Book

LASSEN GLIMPSES

PUBLISHED BY COLLINS & LIND

MINERAL, CALIFORNIA

PRICE 50 CENTS

To STEPHEN T. MATHER
first Director of the
National Park Service

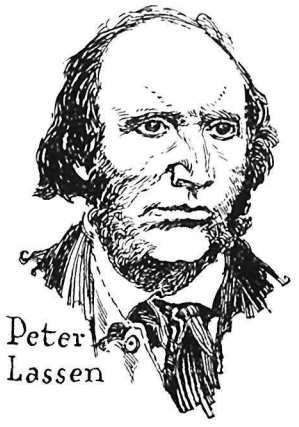
Introduction

IN NORTHEASTERN CALIFORNIA, at the very heart of that magnificent mountain region of the southernmost Cascades, lies Lassen Volcanic National Park. In the minds of most potential visitors there is a natural tendency to consider the area as embodying but a volcano (perhaps a very dangerous one) and a mass of barren lava flows. This because Lassen Peak, during its period of comparatively slight activity from 1914 to 1917, received world-wide attention. The other important features that form a splendid setting for the peak itself had little of news value at the time, so were not given publicity. Some description of the Lassen Edifice as a whole and the park area in particular may therefore afford a more comprehensive view of just what is contained therein.

An area surrounding Lassen Peak and extending from it roughly for fifty miles east, south and west, and for some hundred miles north, was, back in geologic history during a period of strenuous volcanism, covered by lavas several thousands of feet in depth. These lavas issued principally from a main volcanic cone. By this action the terrain was wrought into the general shape of an immense dome, with the cone near the center and marking the highest point. Thus it may be seen that the Lassen Edifice, as this district is called, comprises a rather large section of country, owing its formation to the activities of a once tremendous volcano of which the present Lassen Peak is remaining evidence.

Time, and Nature in her further processes of creation, caused decomposition of the lavas by which soil was formed. Forest growth commenced—to hold in storage moisture from the rains. Gradually in outward appearance this barren lava field was softened by the beauty of lake and forest, pleasant brooks and lovely flowers. The work of the old volcano was done, yet it has continued from time to time in less significant bursts of present-day activity, as though, like some old gentleman impelled by vanity, to voice in later generations the importance of past accomplishment.

At the summit of the great dome, fringing the volcano and in reality part of it, though of secondary nature, were other lesser cones and lava vents whose discharge amplified the huge lava flows from their



parent. As the main volcano went into decadence so did these others; and as glaciation, weathering and erosion followed, they were in part ground away. The result of this was the appearance of a unique area—a mass of remnant volcanoes interspersed with meadows, valleys, lakes and streams. In part a fertile land of Nature's agriculture, contrasted by bits of present-day volcanics; all combined to make more interesting the magnificent spectacle of the old volcano rising in the midst. Perhaps nowhere in the world is the work of Nature in relation to physical geography evidenced more clearly or more interestingly. Here is a museum—a rather special treasure chest of Nature's varied handiwork. The visitor, tired from the cares of modern life, may refresh his mind and his heart by exercising among these treasures that inherent love of Nature possessed by all of us. They require nothing but this regard to be seen and in some measure understood. It is this unusual district at the summit of the great dome that has been set aside by the federal government as a national park.

The park is twelve by seventeen and a half miles at its greatest dimensions. The average open season is from June 1 to October 1. Considerable variation in altitude is presented; an average of 7000 feet above sea level obtains, though Lassen Peak rises 10,451. Brokeoff Mountain, Mount Harkness, Chaos Crags and Prospect Peak at their summits are above 8000 feet. No insurmountable features are existent; various points may quite easily be reached by horse or afoot and in some instances by automobile. It is the plan of the National Park Service to keep this park as a wilderness area; that is, to withhold development not directly involved in making it accessible. Along the several approach roads and within easy distance of the park various resorts offer adequate accommodations for present tourist needs. Satisfactory one-day trips into the park interior can be made from any of these stopping places. Within the park itself suitable grounds are provided for those who wish to camp.

The park may be reached by auto via excellent highways throughout California and other West-

ern States. The Pacific Highway and the Lassen Volcanic Highway; also the Redding-Alturas Lateral Highway, all offer a ready means of access. The Western Pacific Railway approaches from the south, connecting with stage lines running into the park. The Southern Pacific Railroad connects with stage lines at Red Bluff and Redding to the west of the park and at Westwood to the east. The Lassen Transit Company, with headquarters at Westwood, operates stages to all resorts; also over the entire length of the Lassen Volcanic Highway between Red Bluff, California, and Reno, Nevada. Horses and guides are available at Drakesbad Resort—situated within the exterior boundaries of the park—at Kelly's Resort, Lee's Resort, and at Mineral. At Viola, to the northwest of the park, a short distance, a fine hotel is maintained for the convenience of visitors arriving from the north. Juniper Lake Resort also affords tourist accommodations. The National Park Service maintains Lassen Park headquarters at Mineral, which is at the junction of the southwest park approach road and the Lassen Volcanic Highway. The foregoing is by way of being but a brief introduction. The following pages are devoted to notes, sketches and photographs. They are presented in the interests of a wider diffusion of knowledge pertinent to this very remarkable National Park.

Peter Lassen's Compass. An odd lava projection jutting from the side of Saddle Mountain and pointing toward Lassen Peak in the rearground.

Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop away from you like the leaves of Autumn.—JOHN MUIR.

A Word About Lassen Peak

LASSEN PEAK is important in the geology of North America as a landmark denoting the fusion of lava Cascades with granite Sierras. It is natural to think of it as being of the Sierras, but in truth it is not. The top of the mountain is a porous lava plug through which steam is continually escaping, often in sufficient quantity to be observed from several miles away. In the accompanying drawing one will notice a dark mass between two points at the summit. This is lava from an eruption of 1915 and is the only remaining evidence of lava flows that occurred during this most recent activity. One other small flow is known to have pushed through an eastern notch of the peak, but this was carried away by an avalanche to be spoken of later.

Mr. B. F. Loomis in his Pictorial History of the Lassen Volcano has given a thorough account, well illustrated with action pictures, of the 1914-17 volcanism. The volcano is now quiescent, though whether it will continue so is, of course, problematical. A government observatory fitted with seismographs for the purpose of recording earth movement in the Lassen region was established in 1926 at Mineral, near the park. Records from this station give some basis for supposing that a recurrence of more violent activity is not imminent. From a distance Lassen rises in calm beauty with which one cannot associate its periodic debauches. When climbed and studied intimately, the mountain does fill its visitors with a sense of unrest—as in witnessing a gripping prologue with some drama beyond imagination soon to follow.

The peak serves as a memorial to Peter Lassen, outstanding pioneer of Northern and Eastern California. His vision and courage, combined with his adventurous spirit, won him high honor in the history of California through deeds of upbuilding for the common good. In his latter years Lassen spent much time in the then almost unknown region of St. Joseph's Mountain, which name early Spanish fathers had bestowed upon the volcano. It was through association of his name with tales of exploration about the group of peaks at the summit of the great dome, as seen from a distance, that the name Lassen's Buttes came into use. Later, as others ventured into the district and individual designation was applied to different peaks, Lassen's Buttes was changed to Mount Lassen. The late Dr. J. Silas Diller, of the U. S. Geological Survey, officially established the name as Lassen Peak.

A tree frozen solid with ice, 9000-foot level, south slope of Lassen Peak. Photo taken in January, 1927.

The symmetrical cone—Lassen Peak, rises for a thousand feet above any other mountain within the Lassen Edifice. Pilot Pinnacle, a black point in the foreground, is also prominent. The sketch is from Mount Diller.

A Glimpse at Lassen's Hot Springs

The Boiling Pool of Willow Creek Geyser.

SCIENCE tells us that by drilling far enough through the surface of the earth at any random spot, we would eventually come in contact with residual heat of a primitive earth. No one knows just what conditions obtain in the purported infernal regions; yet it is true that man has found an average increase of heat as he has penetrated in that direction. This leads to an assumption that at some distance beneath the surface one would encounter a livid, plastic mass, which apparently is held together by gravitational force. Wherever the earth crust is shattered or faulted to a sufficient depth we find an escape of heat, usually in the form of gases. Sometimes, if the faulting be great enough, material from the hot mass described above may escape to the surface—such action would probably result in a lava flow such as occurred on a small scale at Lassen Peak in 1915. Surface water percolating through a shattered spot meets with hot rock and is forced back either as steam or boiling water. As it is ejected outward through the crust it may pass through strata containing minerals and chemicals such as gold, silver, copper, iron or sulphur and its gaseous compounds, alum, etc. These, being more or less soluble, are carried upward toward the surface in this steam or water; some are deposited on the surface—hence the coloring and odor attendant to solfataras, or as they are commonly called, "hot springs." Many visitors decide naturally but not quite correctly that there are great super-

Below, mud pot and miniature steam vent or "stork's nest" at Bumpa's Hell.

Above is one of the many boiling pools in the same region.

A glance at Bumpa's Hell. One must be careful in walking about, as to step through the thin crust overlaying parts of this steaming cauldron would mean to scald a foot or limb. The dog finds her bare feet uncomfortably warm.

ficial layers of lime, soda, sulphur, etc., underlying the park region which are mixed with water from nearby lakes and streams, thus creating gases responsible for the action as witnessed at the Sulphur Works, Bumpa's Hell, The Devil's Kitchen and the Boiling Lake.

One may spend hours or days of enjoyment in wandering about these park hot springs. The brilliant crystalline colors and not unpleasant odor are first noticed. At Bumpa's Hell, the largest solfataric specimen and representative of all the others, we find bubbling mud pots, splashing geysers, queer miniature formations built up around vents and an all-pervading atmosphere of weird, intangible force.

Looked across from some higher vantage point, this area seems about three acres in extent — of a cream-white, saline and sulphur encrusted, heat-baked earth; weathered into dune-like mounds between which spouts of steam emerge. There is no great volume of sound, yet each earnest fumarole lends its voice to a steady humming note in general. It is Nature in an experimental mood. One approaches timidly lest his presence provoke an anger that may rend the whole district and engulf him bodily.

Local tradition, and well founded, traces the name Bumpa's Hell to one Bumpa or Bumpass (it is not certain which spelling is correct), an early-day miner who had the temerity to sink a shaft at the very edge of this sacred laboratory. Over a little rise southerly from his well-named inspiration traces of his work are still existent.

Some distance southeast of Bumpa's the Boiling Lake simmers as would a giant tea kettle. This wonderful exhibit, located near enough to be a part of the Devil's Kitchen at upper Warner Valley, is some two hundred yards across. Along its oddly painted shores many hissing vents rejoice in liberty. At a cool, crisp sunrise, as light is filtered through the fringing fir and pine, one witnesses a symphony of golden light and shade that plays upon huge, twisting masses of milk-white steam. Later, as the sun's warm rays dispel the steam almost as it rises from the lake, he wonders if this sight were real or just a ghostly dream.

Visitors may drive their cars through lovely Warner Valley to Drakesbad, which is within easy hiking distance of both the Boiling Lake and the Devil's Kitchen.

The coniferous forest within Lassen Volcanic National Park consists in the main of Western Yellow Pine, Jeffrey Pine, Sugar Pine, Lodgepole Pine, Incense Cedar, White Fir and Douglas Fir; at higher elevations the conifers are less varied; we find Red Fir, Western White Pine and an occasional Juniper, until when the heights near timber line are reached only Western Black Hemlock and tenacious White Bark Pine exist.

The Boiling Lake. A giant, steaming hot spring near the Devil's Kitchen.

Trails Afoot or by Horse

IF ONE has but a limited time, yet wishes to visit several of the more important features of the park, his most satisfactory manner of travel is by horse. Riding parties are started every day throughout the summer at various resorts; some are bound for Lassen Peak, some for Bumpa's Hell, Cinder Cone and other points as visitors desire. Parties are headed by competent guides, though if one wishes to and is a capable horseman, he may roam the country alone.

Perhaps the best way to see things is by hiking. Afoot one moves more slowly, missing nothing of beauty or interest as he travels. Every feature of the park is within an easy day's hike of some auto road. Lassen Peak can be approached by car from the northwest by way of Manzanita Lake to within approximately two miles by trail of its summit. The Park Highway, open in 1930, admits autos to within a mile of this summit. The Cinder Cone is a short two miles from Butte Lake Ranger Station, at the terminus of the northeast approach road. Features can be located in relation to existing roads and trails from the sketch map on pages 18 and 19.

It is a happy privilege to spend a day riding or hiking the trails. Excessive effort is uncalled for, as for the most part gentle grades obtain. Starting from the outer reaches of the park, we pass through a magnificent forest of pine and fir—which lends a somber quietude and brings a thoughtful mood. Now and then deer bound across the path, then stop behind some sheltering bush to stare wide-eyed in wonder. Streams are crossed and recrossed and dainty meadows appear unexpectedly behind screens of Lodgepole Pine.

Flowers grow in profusion wherever protection is afforded. Most frequently seen, in early summer, is the green and golden Sunflower which abounds in open flats we often cross. Indian Paintbrush, Penstemon, Peonies, Scarlet Gilia, Tulips, Gentian and Larkspur bring other lovely colors to our notice. In damper spots, protected by some willow bush or Alder, we may be fortunate to find a Leopard Lily along with Scarlet Columbine, Monkshood or other fragile beauties. As we travel higher, occasionally in open brush fields the Washington Lily sends its tall stalk surmounted by a cluster of sweet-smelling, trumpet-like white blossoms above the Manzanita. All these and many others grow here so beautifully for all of us that no one of us can feel a right to pick them.

Higher toward Lassen Peak, the very summit of the great dome, our friendly Yellow Pine and Fir give way to scattering White Bark Pine and Hemlock. The trails wind on past massive lava hills that melt insignificantly with the general landscape as the final height is reached. Spread before us, then, is a vast pattern of dwarfed hills and ridges with meadows and mirroring lakes. Lava dikes appear as scars and bold points stand out above the timber line.

Crossing King's Creek on a trail to Cinder Cone.

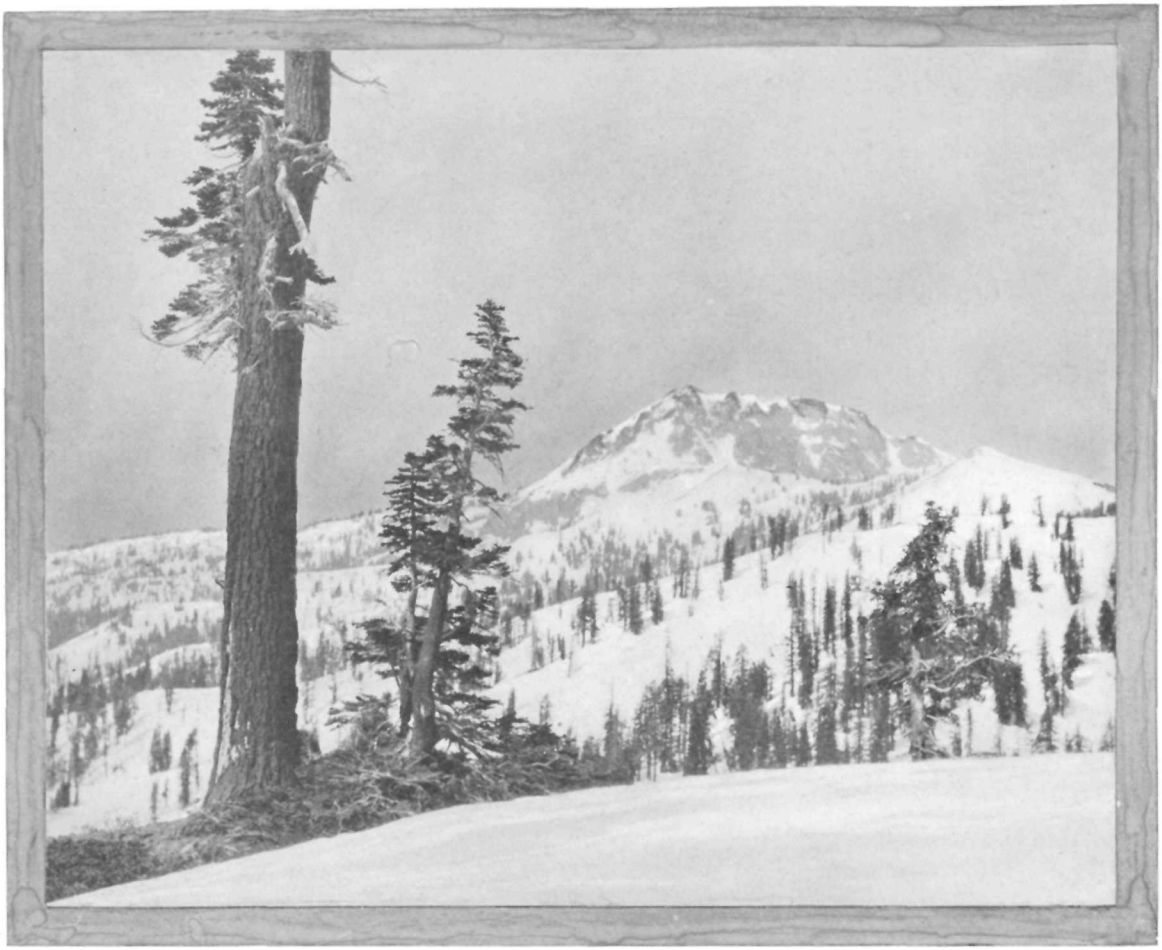
The Rugged West Side District

THE PARK is somewhat divided in its topography. From the east boundary westward for two-thirds (roughly) of the entire area the terrain is rather even in its undulation. Farther west a rougher, deeply troughed district, supporting considerably less forest growth, continues on. Several prominent peaks along with Lassen itself are situated in this region; also a number of smaller lakes. Brokeoff Mountain, rising to a height of 9232 feet, is the most important secondary peak aside from Chaos Crags. (See page 15.) When one visits Brokeoff he finds the name obviously correct, for the whole north side is a jagged cliff some 1200 feet high—it is in reality only half a mountain, the other portion having been torn or ground away. The south side is a graceful slope that may be easily climbed by way of the Lookout Trail. The angle of this slope leads some to think that Brokeoff was once a mountain many hundreds of feet greater in elevation. Geologists believe it to be the remnant of a larger cone and that it is of more ancient origin than Lassen Peak. Mount Diller, Pilot Pinnacle and Eagle Peak are prominent features of a high, northward circling ridge some three and a half miles long which connects Brokeoff with Lassen. An excellent hiking trip can be made by taking the Pilot Pinnacle Trail (see map) to the crest of this ridge and following around to Brokeoff Lookout.

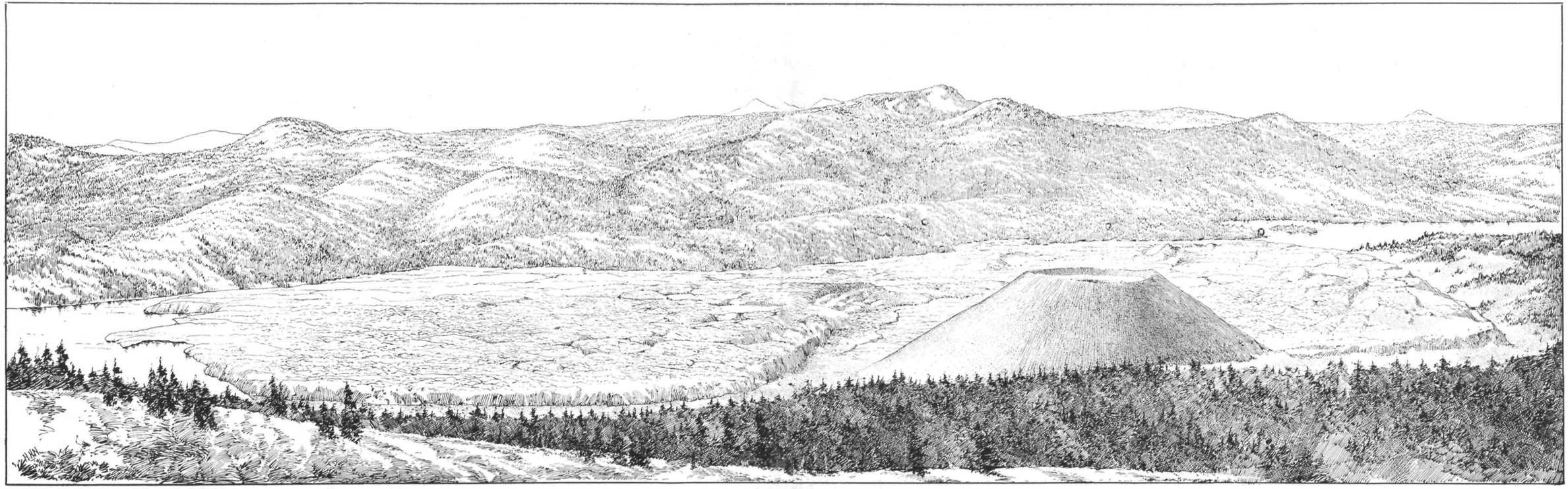
Mill Creek Canyon, the huge trough between Brokeoff and Black Butte — this last named another large peak of the west side group—heads in the circle of the ridge and extends gradually wider and deeper for some eighty miles to the Sacramento Valley. The canyon is generally considered as being quite steep and rough, though its upper extremity, which is the part of it within the park, is more in the nature of a cove, lined around by a mixture of steep and gently sloping ridges. Little Hot Spring Valley and the Sulphur Works, both solfataric regions, Diamond Peak, Ridge Lakes, etc., are points of interest within the cove, or as it has been nicely

Below is shown the forest observation station at Brokeoff summit.

Above is Brokeoff Mountain from the park highway at a point where highway rounds Diamond Peak, at the head of Mill Creek Canyon.



Brokeoff Mountain as it appears in early spring from the high country at the south base of Lassen Peak.



Cinder Cone and lava field viewed from the slopes of Prospect Peak. To the left of the lava field lies Butte Lake and to the right Snag Lake. Mt. Hofman rises highest on the skyline. This sketch from U. S. Geological Survey, Bulletin number 79, entitled "A Late Volcanic Eruption in Northern California," by Dr. J. Silas Diller.

Fishing at proper times guaranteed as good as in any stream whatever

No poisonous reptiles or other unwholesome creatures are found wifhin Lassen Park

The lookout points Brokeoff, Prospect and Harkness are easy climbed and from fheir summits offer views most as uncommon good as from Lassen Peak itself.

The Devils kitchen rightly named, would make an honest cook ashamed. Henever washes out a pot, but leaves a smelly mess to rot

Lassen Peak and Cinder Cone were landmarks serving to guide emigrants across fhe wilderness between Honey Lake Valley and fhe upper Sacramento.

SKETCH MAP OF LASSEN VOLCANIC NATIONAL PARK ~ LOOKING NORTH PARK HIGHWAY TRAILS OTHER ROADS

Park Highway as shown, complete and open for general travel in 1930.

called, "The Scenic Bowl." Manzanita Creek heads at Crescent Cliffs at the foot of Mount Loomis and drains northwest to Manzanita Lake. Along the Manzanita Creek road are many good camping spots. A spine running west from Mount Diller separates the heads of north and south Baily Creek Canyons, which, though rough, are very interesting to investigate, for they carry an air of wildness—in truth they are visited but infrequently. Many visitors are reluctant to explore the beauties of the west side district for fear of becoming lost, yet there is no danger of this if one will but keep account of his surroundings, his directions and his position in relation to various features. For those who have some time to spend within the park an initial trip to the summit of Lassen Peak, from which point a picture of the whole park region can be firmly fixed in mind, will result in a knowledge that enables one to travel unerringly. A very fine topographic map of Lassen Park may be secured at slight cost from the National Park Service. A copy of this map is a valuable addition to one's hiking equipment.

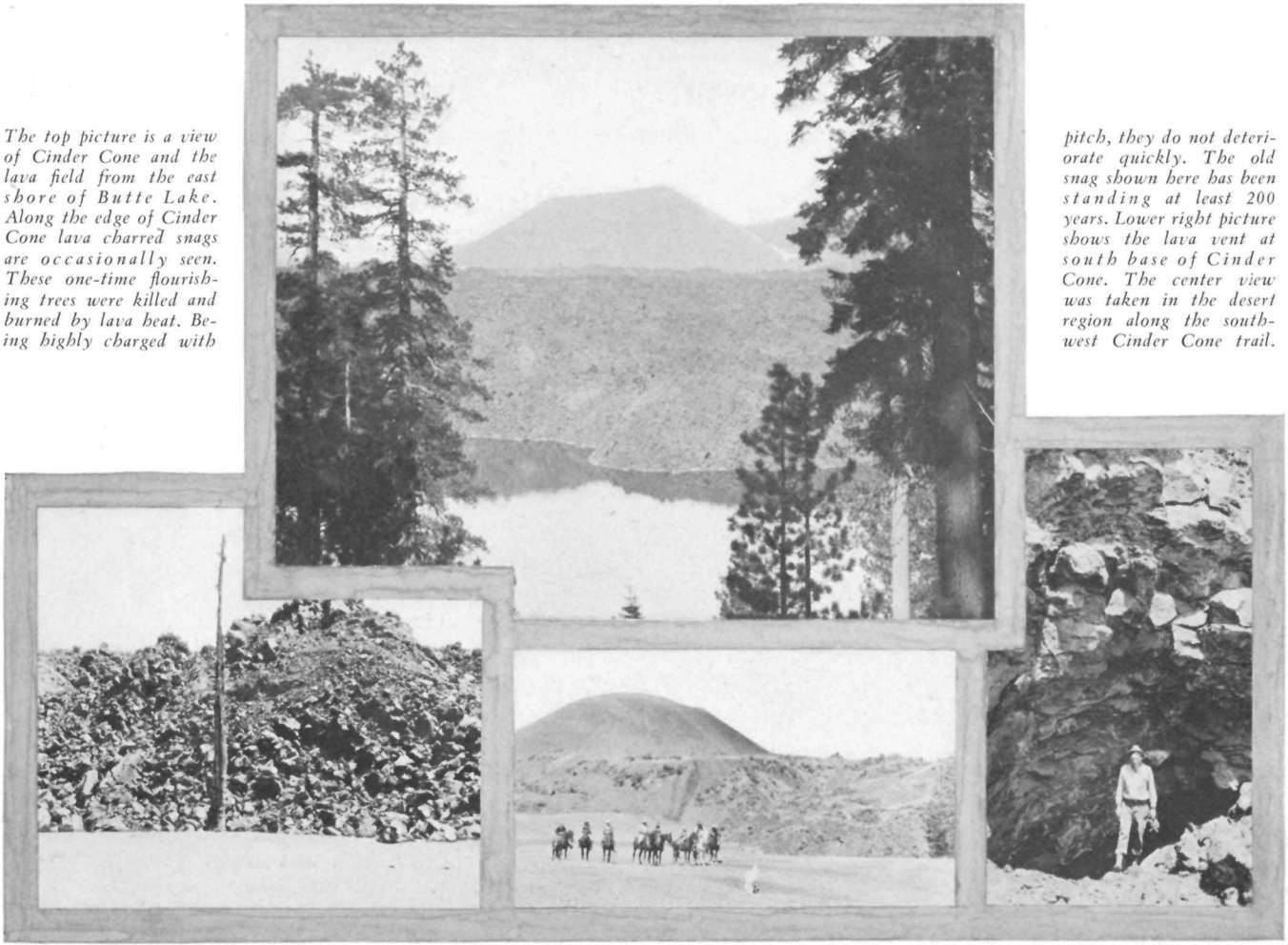
The Cinder Cone Region

FORMERLY Lassen Peak and Cinder Cone were classed as national monuments and were visited by only a few hardy mountaineers, as the Lassen country until recently was quite inaccessible to the average tourist. Recurrence of activity at the volcano in 1914 aroused an interest and attention on the part of public-spirited citizens toward the whole region, which resulted in a realization of its national park possibilities. After necessary government investigation had been effected, the two monuments with additional territory were recommended to Congress as being of National Park standard, and an act of that body approved in August of 1916 established the area involved as a National Park.

Lassen Peak has, by virtue of its own voice, held first place among all the wonderful aggregation of features exhibited, but Cinder Cone and its surroundings is perhaps just as great a presentation, certainly as impressive.

The Cinder Cone country is a small district so startling and beautiful in an unusual way as to seem freakish. Almost a complete circle of ridges from six to eight thousand feet in height above sea level enclose a basin some four miles long and averaging one and a half miles in width. Evidence has been found to show that an ice pack over one thousand feet thick filled this basin during glacial times. Later it was the site of a rather large mountain lake. Still later Nature picked the basin as a suitable place for a workshop or scrap heap—it isn't certain which. At any rate, she started a succession of volcanic eruptions that must have surprised the peaceful lake indeed, for a cone of volcanic sand 663 feet high and slightly over a half mile in diameter at its base was built up—as a sort of nozzle from

The top picture is a view of Cinder Cone and the lava field from the east shore of Butte Lake. Along the edge of Cinder Cone lava charred snags are occasionally seen. These one-time flourishing trees were killed and burned by lava heat. Being highly charged with pitch, they do not deteriorate quickly. The old snag shown here has been standing at least 200 years. Lower right picture shows the lava vent at south base of Cinder Cone. The center view was taken in the desert region along the southwest Cinder Cone trail.



which layers of sand and pumice were spread over the country roundabout for a distance of nearly eight miles in each direction. A vent was also opened at the south base of the cone, allowing several lava flows to push their way out and cover most of the basin floor. This action filled in the lake, except for two comparatively small sections—one along the north shore and another to the south. Thus two smaller lakes came into being where one large one had existed—we call them Snag and Butte. *(See color illustration on front cover.)*

Interest in the Cinder Cone district increases when it is known that the last lava flow on the mainland of the United States (aside from the very small flows of Lassen Peak in 1915) occurred here about 1851. Dr. H. A. Harkness, early investigator of the Cinder Cone country, left a record stating that lights were observed east of Lassen's Buttes from time to time between 1850 and 1854. Because of hostile Indians, no attempt was made to ascertain the cause of them by local people. A party of miners, however, who arrived at Georgetown, Eldorado County, during the summer of 1851, reported passing an active volcano and a formation of hot rocks in a locality that agrees from their description with the Cinder Cone district. Late scientific investigation bears out the historical evidence of Dr. Harkness. One is not to assume, however, that all of the volcanics seen here were produced as late as the 1850's, for we find that the history of Cinder Cone volcanism dates back hundreds of years.

The falls at point where Bumpa's Creek joins Mill Creek, in Mill Creek Canyon.

As we descend the rim of Cinder Cone Basin by way of the southwest approach trail, we encounter first an arid, desert region of sand. A few weather-beaten snags stand desolately about, and the lava dike rises to one side abruptly as a wall 50 to 75 feet high. In the distance the cone stands phantom-like; it seems out of harmony with the surroundings, to have no third dimension and at first glance of a dead brown color. On traveling closer, detail becomes apparent; we note the contrast between soft, green-blue of forest-covered slopes that end against the blue-black, jagged lava. Spots of brilliant color and weird formations attract the eye. The cone looms as a giant dune, barren of vegetation, smooth and soft as velvet, perfectly symmetrical and full of changing color.

Climbing the cone is easily accomplished. We find a double-rimmed crater two hundred or more feet in depth. It seems that the loose sand structure would be constantly shifting to obliterate the pit, but this apparently is not the case, for the whole

Juniper Lake as seen from the trail to Cinder Cone.

cone is so well preserved that it appears to have been created but yesterday. The entire region has this aspect of freshness to a marked degree.

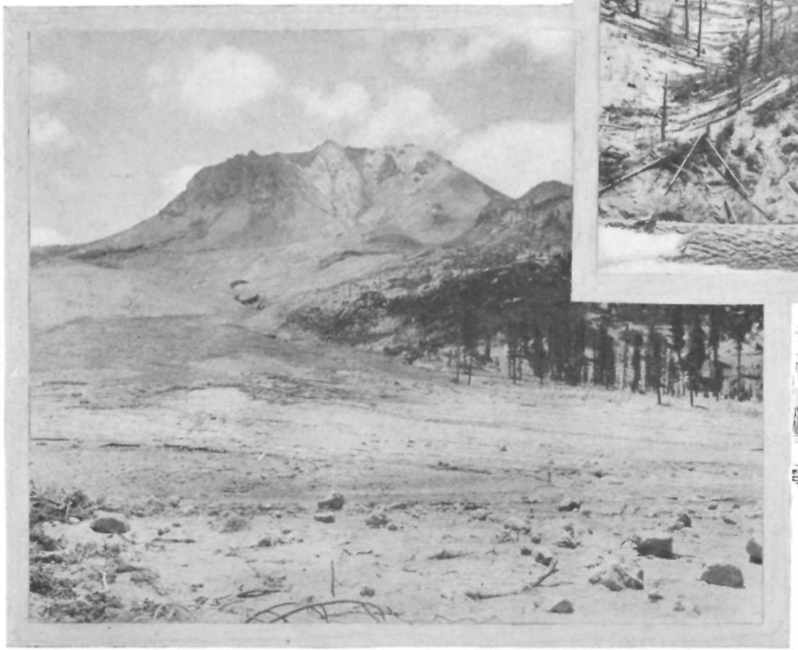
What an interesting picture is disclosed as we study our surroundings. The lava flows run south to Snag Lake, then circle back down the basin across a wooded flat to encounter the waters of Butte Lake and form its inner shore; they stop against the slope of Prospect Peak. We note that the main course of lavas meandered for some three and a half miles about the basin, but ends just a short distance from the starting point. Butte Lake lies in the form of an L; one arm is a mile in length, the other about a half mile. Nearly half the shore line is formed by the barren lava dike, otherwise it is bounded by sandy, forest-covered slopes. Queer lava islands project from the lake at various places and a play of beautiful reflected color is in evidence with each changing hour of the day. Snag Lake is bounded only at its northern end by Cinder Cone lavas. It is much larger than Butte and lies in a different setting at the foot of Mount Hofman.

The Cinder Cone region as a whole represents a most fantastic exhibit. The abundance of different formations and the contrasting colors against a background of more conservative hills is most appealing. It has been said on good authority that nowhere in the known world is there a display of as well preserved volcanic products combined with other natural features in such an interesting manner.

Why the Devastated Area?

AN EXAMPLE of the destructive possibilities of even comparatively slight volcanism is presented by the Devastated Area. Toward evening on May 19, 1915, lava began to overflow through an eastern notch of the Lassen Crater. As this came in contact with a heavy blanket of snow covering the peak, melting ensued, causing a waterflow to course down the steep mountain slope. As the flow continued it increased in size and absorbed loose surface material until in the main it was a thick mud in which were mixed huge rocks and explosion debris. The flow spread fan-like as it proceeded, tearing a huge swath through the peaceful forest and meadow land below. Lost Creek heads far up the north slope of Lassen, and Hat Creek heads just east from there. The two creeks, at the foot of the mountain, are separated by a ridge of high ground running north between Lassen and Divide Peak. The mud flow charged down and in its terrific force was in part carried over the high ground, through Jasen Meadow and on down Hat Creek in great volume for some 12 miles. Another portion of the flow ran north along Lost Creek, demolishing the Adams Meadow and cattle camp. Other places along Lost and Hat Creeks suffered; great

The photo below conveys an idea of the Devastated Area as it converges toward the summit of Lassen Peak. Lost Creek gulch may be traced far up the steep slope. Photo at right shows detail of mud flow destruction along Hat Creek. White Mountain in the distance. Note rather abrupt line of unharmed timber along edge of flow.



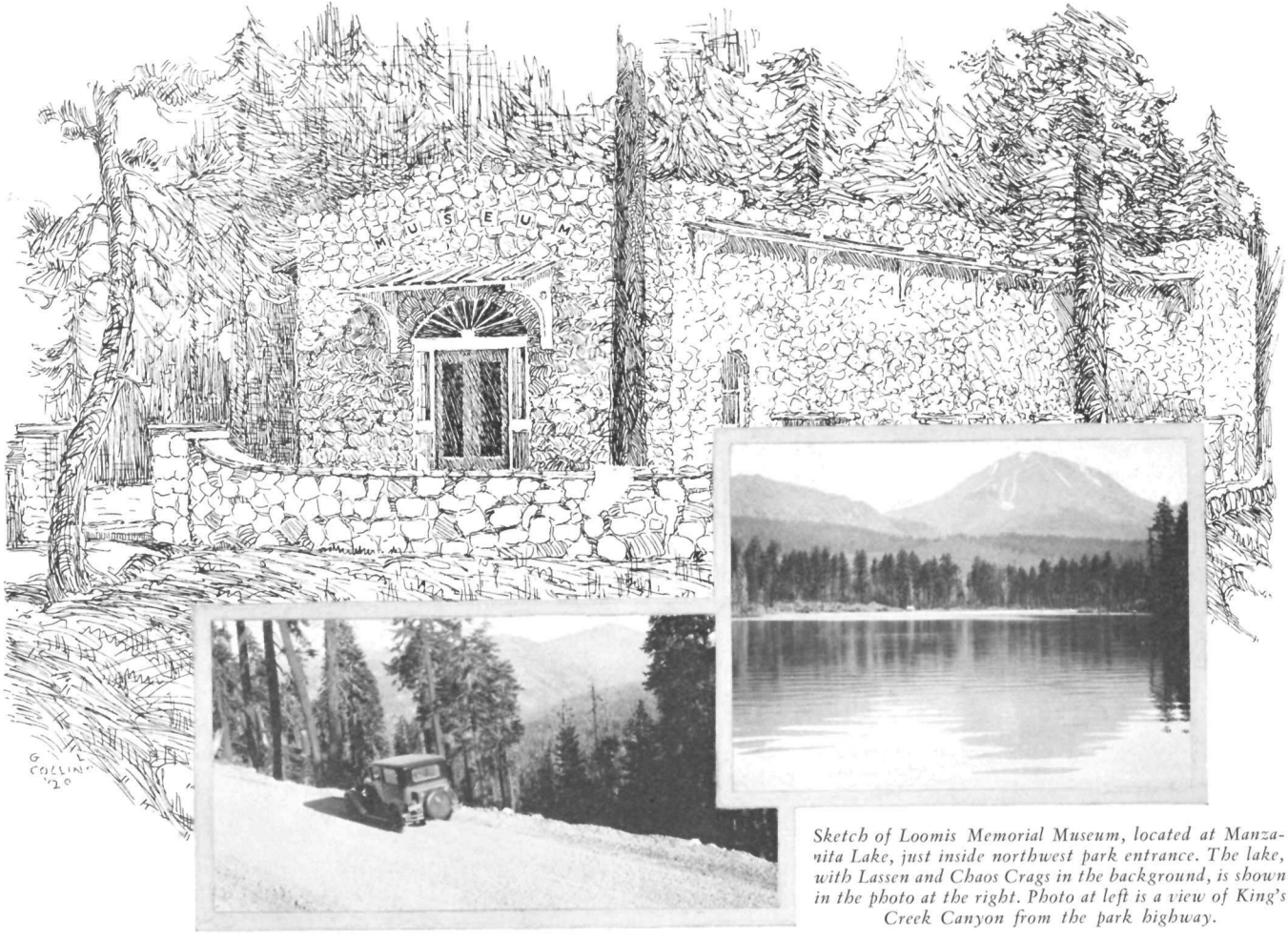
God help us all to kindly view
The world that we are passing through!
—L. M. CHILD.

damage was done at the Hall place, where the flow came as a wave some ten feet high that covered everything. The ranch house was moved off its foundation and carried along until it lodged against some solid obstruction, where it remained, battered and half full of mud. Residents were forced to move away, as nothing remained with which to effect a living.

Mr. B. F. Loomis, long-time local resident and leader of many expeditions to the volcano in those exciting days of the Lassen activity, was perhaps as surprised a man as ever lived when he journeyed up Lost Creek to the mountain on May 22. He found a strange area of mud—several miles across and an average of 14 feet in thickness—full of torn and twisted trees; huge rocks, some of them very hot, protruded from the mud flow surface. Along the edge of the flow he saw standing trees that had withstood the flood with piles of rock and timber lodged against their battered trunks. All this he saw in a district he had known well as an ordinary wooded upland. It was well that he turned back that day, for evening brought another explosion from the volcano; this in the form of a horizontal blast of gas, attended by smoke clouds and explosion material. The blast swept the mud flow tract, tearing away all timber still erect. Through its heat a second, smaller mud flow was caused. Mr. Loomis witnessed this eruption from a point some distance along his homeward route and declares it to have been the most spectacular of the whole 1914-1915 series. During the years since the mud flow, we have observed the work of Nature in restoring the Devastated Area to its former wooded state. A great glaring scar remains and will for many years, yet reproduction is gradually being accomplished. Along the edges we see stands of young timber extending timidly into the barren flow. Wild flowers bloom happily and the two creeks flash their crystal waters as before.

One cannot view this ragged place without feeling a certain resentment toward Nature for destroying where there seemed not the slightest need. We are most impressed, however, by the tremendous power evidenced, and turn away glad that Nature's infinite force is applied mainly to make a better world for us rather than in such heavy-handed destruction.

What matter if I stand alone?
I wait with joy the coming years;
My heart shall reap where it has sown,
And garner up its fruit of tears.
—JOHN BURROUGHS.



Sketch of Loomis Memorial Museum, located at Manzanita Lake, just inside northwest park entrance. The lake, with Lassen and Chaos Crags in the background, is shown in the photo at the right. Photo at left is a view of King's Creek Canyon from the park highway.

Chaos Crags and Chaos Jumbles

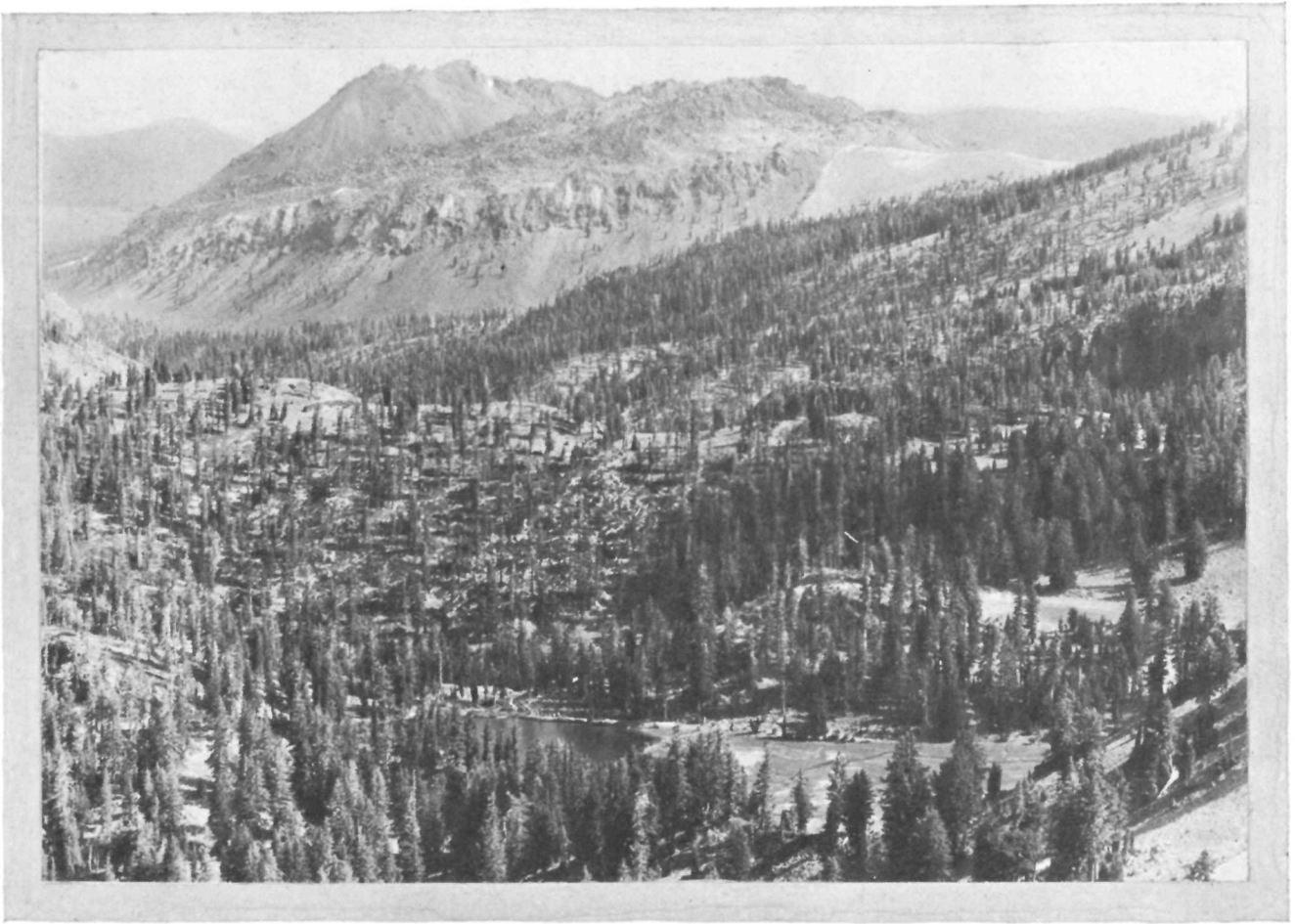
ANOTHER striking feature of the park is Chaos Crags, a rugged, almost treeless mountain rising to a height of 8545 feet just to the north and slightly west of Lassen Peak. *Dr. Howel Williams, eminent geologist, has described the area so well that the liberty of quoting him is taken: "The southern end of this tract comprises a broad, serrate ridge, about a mile and a half long and almost a mile in width. On account of the extreme irregularity of its surface, occasioned by a dense cluster of peaks and by piles of loose blocks, this ridge is aptly termed the Chaos Crags. From the northern base of these crags a gentle slope descends toward Manzanita Lake and Lake Reflection, situated in a broad east-west trough which is limited northward by Table Mountain. Upon this slope rests a deposit, two and a half square miles in extent, made up chiefly of angular dacite boulders. It is difficult to convey in words an adequate idea of the surface of this deposit. Except at its margins, it supports little or no vegetation and appears as a barren, stony wilderness, resembling the bare moraine of an Alpine glacier. Indeed, locally, this moraine-like character of the deposit is so pronounced that some have accepted the theory of a glacial origin. Although not wholly without order, the accumulation of loose blocks seems, at first sight, so confused and haphazard as to have merited the emphatic name of the Chaos Jumbles. There is some evidence that the deposit cannot be much more than two hundred years old, and that it may be even younger."

Probably the first phase in the creation of the crags was an explosion unattended by lava flows. At their southern end, in a cleft separating them from Lassen Peak, is a well preserved remnant of a large cone of volcanic sand, which may be observed in the accompanying illustration. The cone has been cited as the source of much material contributed to the formation of these crags. As a secondary phase we are told that a protrusion occurred — this a welling up of a great lava plug that formed part of the crags as seen today. As a third phase we find evidence of another protrusion, an explosion and a landslide, the landslide being responsible for creation of the jumbles. All this can be listed as present-day activity—meaning that it has occurred within recent historical time.

The most beautiful view of these crags is perhaps obtained at sunset, from the Devastated Area, a few miles eastward. Their height then seems magnified, and a queer, light, yet colorful glow pervades them. As the foregoing description might suggest, traversing this tract is done not without some difficulty, though it is not at all impossible for the more adventurous hiker and the effort is well worth while.

---

* See "A Recent Volcanic Eruption Near Lassen Peak, California," by Howel Williams. University of California Press, Berkeley, 1928.



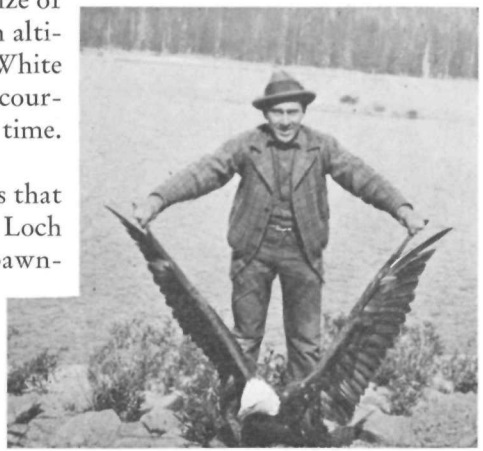
Chaos Crags from Mount Diller. Soda Lake, in the foreground, nestles in a picturesque cove at the head of Baily Creek Canyon.

Wild Life and Some General Thoughts

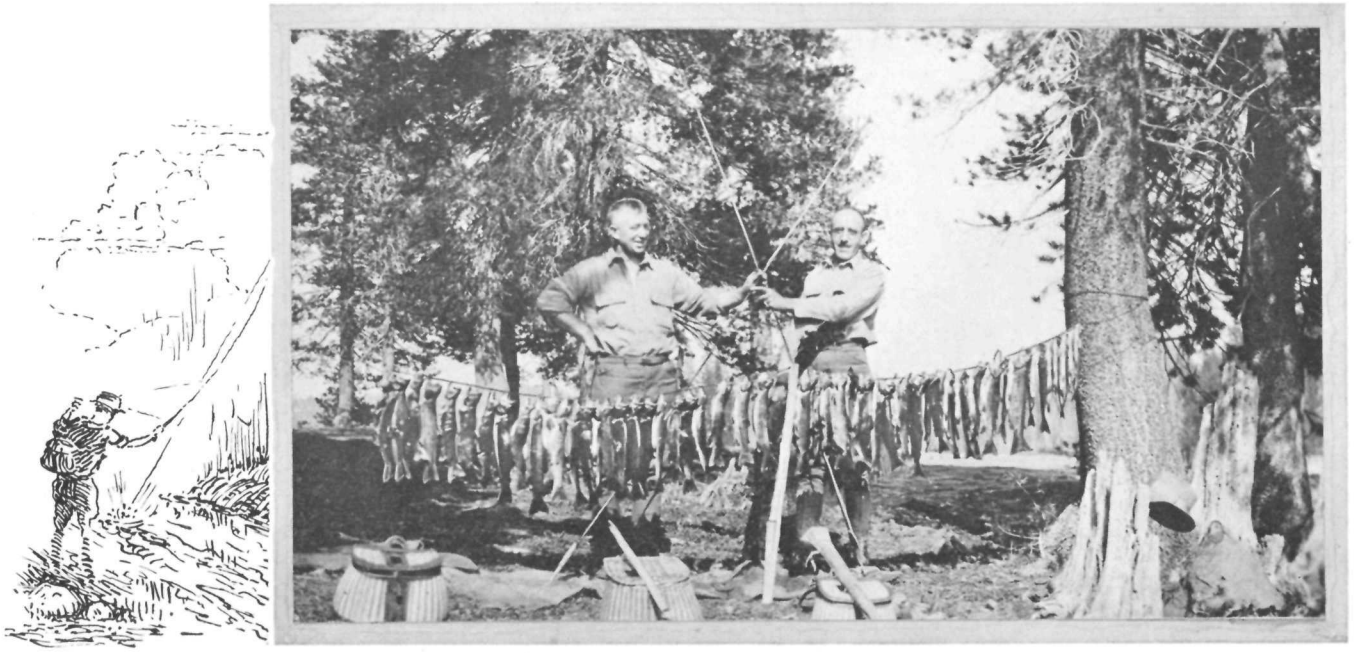
THIS PARK, like all other national parks, is not open for hunting. It is an absolute game sanctuary wherein all wild life is encouraged to friendliness. Because the park offers no winter range, most of the larger animals and birds are forced to migrate, with a result that they do not become as tame as one finds them in some parks that offer year-long habitation.

Black tail deer are seen most frequently, though the mule tail deer ranges throughout the eastern and central park sections. Bear are occasionally seen. Less frequently, because of extreme wariness, the mountain lion is found. A large variety of smaller animals inhabit the area. The coyote, bob cat, lynx cat, badger and marmot are present. Much more frequently seen, however, are pine squirrels, ever-active and most friendly little chipmunks and the sleepy porcupine. The foregoing merely lists a few of the animals ordinarily seen by park visitors. Grouse and quail breed within the park — especially numerous are they since active administration and protection were effected. Grouse are apt to rise startlingly from along the trails in any section one may be traveling. Quail seem to congregate around the brush fields and open flats of the lower levels. Perhaps the most interesting park bird is the pine crow or camp robber. This handsome black and white fellow (about the size of a wild dove) is found usually in company with a half dozen others, at high altitudes. He is continually noisy and is most inquisitive. Parties camped at White Lakes or Kings Meadows find him a pleasant companion who, with little encouragement, rapidly adjusts his affairs in order to be most in evidence at meal time. Ducks rear their young in the secluded coves of Butte and Snag lakes.

There are some fifteen lakes within the park, as well as six main streams that are well stocked with trout; numerous other lakes are found. Rainbow, Loch Leven, eastern brook, German brown and black spotted are taken. The spawning season for all park trout is irregular, due to variation of climatic conditions at various altitudes. The best fishing is had during the late summer, although good catches are occasionally taken earlier in the season from Hat Lake, Manzanita Lake, Grassy Lake and from Hat Creek and Warner Creek. No special license is required for fishing park waters, although the regular California State license must be carried.



Young Bald Eagle caught at Snag Lake.

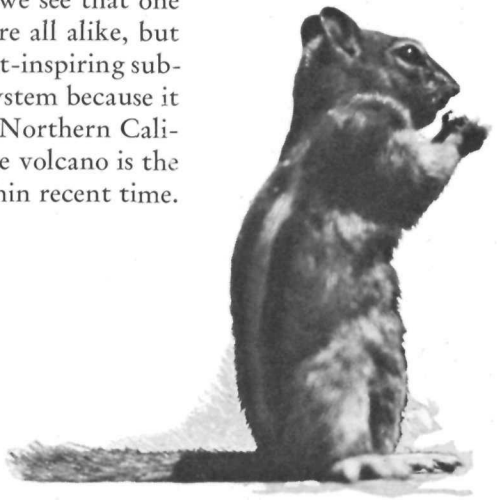


Five-man catch during a day at Grassy Lake.

A very interesting collection of specimens of park wild life are housed in the Loomis Memorial Museum. This beautiful building is situated on a lovely site between Manzanita Lake and Lake Reflection. Not only a collection of animal specimens is kept there, we find a collection of Lassen lavas and other objects native to the park. The finest group of photos taken during the 1914-17 series of Lassen eruptions have been enlarged and arranged about the walls. Near the museum, along Manzanita Creek, fine natural camping grounds exist. They are accessible earlier in the year than any other popular camping spot in the park, and contrast with their Alpine atmosphere the other most important park assembling point for visitors, which is at Drakesbad, at the head of Warner Valley.

NATIONAL PARKS are not primarily for use merely as recreational centers. Vast areas of national forests are to be found throughout the country that are more specially to be enjoyed by people who wish recreation alone. National parks do afford recreation, of course, yet their chief purpose in being held and developed as special tracts is because of their particular significance in relation to the education of people to fundamental truth—which is based on understanding and appreciation of Nature. National parks are selected for scenic beauty and for expressiveness—they embody the most expressive, significant and beautiful group of natural features that happen to be near each other in a district that, taken as a whole, is of marked distinction. A park is expressive because it exhibits clearly processes of Nature. It is significant because it gives us a key to the story of creation. It is beautiful to us because Nature's artistry is our only standard of beauty.

All of our national parks offer this lesson in appreciation of Nature, but each one in its own way, according to individual character. For instance, Lassen Park differs from all other national parks only physically; in spirit it is the same. Thus we see that one national park cannot be compared with another because in spirit they are all alike, but physically they are all different. Lassen Park offers a wide range of thought-inspiring subjects. It is particularly important as a member of the National Parks System because it exhibits a volcano that has played an important part in the creation of Northern California, which part can be clearly traced to great extent, and because the volcano is the only one in the United States of which we have evidence of activity within recent time.



Those who love Nature can never be dull. They may have other temptations; but at least they will run no risk of being beguiled, by ennui, idleness or want of occupation, "to buy the merry madness of an hour with the long penitence of after-time." The love of Nature, again, helps us greatly to keep ourselves free from those mean and petty cares which interfere so much with calm and peace of mind. It turns "every ordinary walk into a morning or evening sacrifice," and brightens life until it becomes almost like a fairy tale.

—JOHN LUBBOCK.

PRICE 50 CENTS