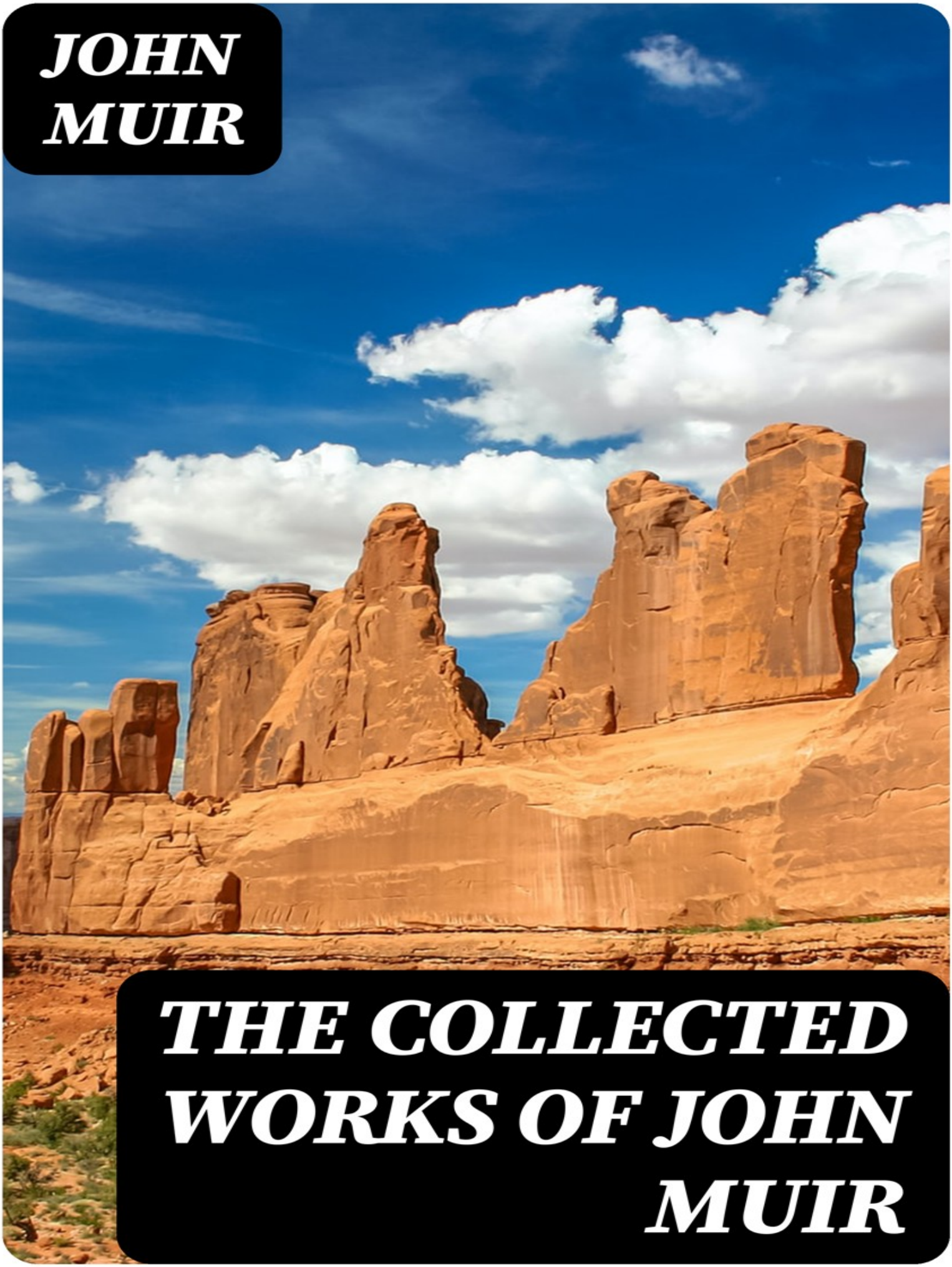
JOHN MUIR
THE COLLECTED WORKS OF JOHN MUIR

John Muir

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EAN 8596547391906

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I. Peaks and Glaciers of the High Sierra

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Looking across the broad, level plain of the Sacramento and San Joaquin from the summit of the Coast Range opposite San Francisco, after the sky has been washed by the winter rains, the lofty Sierra may be seen throughout nearly its whole extent, stretching in simple grandeur along the edge of the plain, like an immense wall, four hundred miles long and two and a half miles high, colored in four horizontal bands; the lowest rose-purple of exquisite beauty of tone, the next higher dark purple, the next blue, and the highest pearl-white--all delicately interblending with each other and with the pale luminous sky and the golden yellow of the plain, and varying in tone with the time of day and the advance of the season.

The thousand landscapes of the Sierra are thus beheld in one view, massed into one sublime picture, and such is the marvelous purity of the atmosphere it seems as near and clear as a painting hung on a parlor wall. But nothing can you see or hear of all the happy life it holds, or of its lakes and meadows and lavish abundance of white falling water. The majestic range with all its treasures hidden stretches still and silent as the sunshine that covers it.

The rose-purple zone rising smoothly out of the yellow plain is the torrid foothill region, comprehending far the greater portion of the gold-bearing rocks of the range, and the towns mills, and ditches of the miners--a waving stretch of comparatively low, rounded hills and ridges, cut into sections by the main river canyons, roughened here and there with outcropping masses of red and grey slates, and rocky gold gulches rugged and riddled; the whole faintly

shaded by a sparse growth of oaks, and patches of scrubby ceanothus and manzanita chaparral. Specks of cultivation are scattered from end to end of the zone in fertile flats and hollows far apart--rose embowered cottages, small glossy orange groves, vineyards and orchards, and sweet-scented hay fields, mostly out of sight, and making scarce any appreciable mark on the landscape in wide general views; a paradise of flowers and bees and bland purple skies during the spring months--dusty, sunbeaten, parched and bare all the rest of the year. The dark-purple and blue zones are the region of the giant pines and sequoia and silver-firs, forming the noblest coniferous forests on the face of the globe. They are everywhere vocal with running water and drenched with delightful sunshine. Miles of tangled bushes are blooming beneath them, and lily gardens, and meadows, and damp ferny glens in endless variety of color and richness, compelling the admiration of every beholder. Sweeping on over the ridges and valleys they extend a continuous belt from end to end of the range, only slightly interrupted at intervals of fifteen and twenty miles by tremendous canyons 3,000 to 5,000 feet in depth. Into these main river-canyons innumerable side-canyons and gorges open, occupied by bouncing, dancing, rejoicing cascades, making haste to join the rivers, which, grey with foam, are beating their way with resistless energy to the lowlands and the sea. All these waters sounding together give glorious animation to the onlooking forests, and to the stem, rocky grandeur of the canyon-walls. There too, almost directly opposite our point of view, is the farfamed Yosemite Valley and to right and left on the same zone many other valleys of the same type, some of them, though but little known as yet, not a whit less interesting, either in regard to the sublimity of their architecture, or the grandeur and beauty of their falling waters.

Above the upper edge of the silver-fir zone, the forest is maintained by smaller pines and spruces, that sweep on

higher around lakes and meadows, and over smooth waves of outspread moraines, until, dwarfed and storm-bent, the utmost limit of tree growth is reached at a height of from 10,000 to 12,000 feet. While far above the bravest climbers of them all, rises the lofty, snow-laden, icy Sierra, composed of a vast wilderness of peaks, and crests, and splintered spires, swept by torrents and avalanches, and separated by deep gorges and notches and wide amphitheaters, the treasuries of the snow and fountain-heads of the rivers, holding in their dark mysterious recesses all that is left of the grand system of glaciers that once covered the entire range. During many years of faithful explorations in the Sierra, sixty-five glaciers have been discovered and studied, and it is not likely that many more will be found. Over two-thirds of the entire number lie between Lat. 36° 30' and 39°, sheltered from the wasting sunshine on the northern slopes of the highest peaks, where the snowfall on which they depend is most concentrated and abundant.

Nothing was known of the existence of active glaciers in the Sierra until October, 1871, when I made the discovery of Black Mountain Glacier and measured its movements. It lies near the head of a wide shadowy basin between Red and Black Mountains, two of the dominating summits of the Merced Group. This group consists of the highest portion of a spur that straggles out from the main axis of the chain near Mount Ritter, in the direction of Yosemite Valley. Its western slopes are drained by Illilouette Creek, a tributary of the Merced, which pours its waters into Yosemite in a fine fall bearing the same name as the stream.

No excursion can be made into the Sierra that may not prove an enduring blessing. Notwithstanding the great height of the summits, and the ice and the snow, and the gorges and canyons and sheer giddy precipices, no mountain chain on the globe is more kindly and approachable. Visions of ineffable beauty and harmony, health and exhilaration of body and soul, and grand

foundation lessons in Nature's eternal love are the sure reward of every earnest looker in this glorious wilderness.

The Yosemite Valley is a fine hall of entrance to one or the highest and most interesting portions of the Sierra the head or the Merced, Tuolumne, San Joaquin, and Owens rivers. The necessary outfit may be procured here, in the way of pack animals, provisions, etc., and trails lead from the valley towards Mounts Dana, Lyell, and Ritter, and the Mono Pass; and also into the lower portion of the Illilouette Basin.

Going to the Black Mountain Glacier, only a few days' provision is required, and a pair of blankets, if you are not accustomed to sleeping by a camp-fire without them.

Leaving the valley by the trail leading past the Vernal and Nevada falls, you cross the lower end of Little Yosemite Valley, and climb the Starr King Ridge, from which you obtain a fine general view of the Illilouette Basin, with its grand array of peaks and domes and dark spirey forests--all on a grand scale of magnitude, yet keenly fine in finish and beauty. Forming one of the most interesting of the basins that lie round about Yosemite Valley, they pour their tribute of songful water into it, swelling the anthems ever sounding there.

The glacier is not visible from this standpoint, but the two mountains between which it lies make a faithful mark, and you can hardly go wrong, however inexperienced in mountain ways.

Going down into the heart of the basin, through beds of zauchneria, and manzanita chaparral, where the bears love to feed, you follow the main stream past a series of cascades and falls until you find yourself between the two lateral moraines that come sweeping down in curves from the shoulders of Red and Black mountains. These henceforth will be your guide, for they belonged to the grand old glacier, of which Black Mountain Glacier is a remnant, one that has endured until now the change of

climate which has transformed a wilderness of ice and snow into a wilderness of warm exuberant life. Pushing on over this glacial highway you pass lake after lake set in solid basins of granite, and many a well-watered meadow where the deer with their young love to hide; now clanking over smooth shining rock where not a leaf tries to grow, now wading plushy bogs knee deep in yellow and purple sphagnum, or brushing through luxuriant garden patches among larkspurs eight feet high and lilies with thirty flowers on a single stalk. The lateral moraines bounding the view on either side are like artificial embankments, and are covered with a superb growth of silver-firs and pines, many specimens attaining a height of 200 feet or more.

But this garden and forest luxuriance is soon left behind. The trees are dwarfed, the gardens become exclusively alpine, patches of the heath-like bryanthus and cassiope begin to appear, and arctic willows pressed into flat close carpets by the weight of the winter snow. The lakes, which a few miles down the valley are so deeply embedded in the tall woods, or embroidered with flowery meadows, have here, at an elevation of 10,000 feet above sea level, only thin mats of carex, leaving bare glaciated rock bosses around more than half their shores. Yet amid all this alpine suppression, the sturdy brown-barked mountain pine is seen tossing his storm-beaten branches on edges and buttresses of Red Mountain, some specimens over a hundred feet high and twenty-four feet in circumference, seemingly as fresh and vigorous as if made wholly of sunshine and snow. If you have walked well and have not lingered among the beauties of the way, evening will be coming on as you enter the grand fountain amphitheater in which the glacier lies. It is about a mile wide in the middle, and rather less than two miles long. Crumbling spurs and battlements of Red Mountain bound it on the north, the sombre rudely sculptured precipices of Black Mountain on the south, and a

hacked and splintered col curves around from mountain to mountain at the head, shutting it in on the east.

You will find a good campground on the brink of a glacier lake, where a thicket of Williamson spruce affords shelter from the night wind, and wood for your fire.

As the night advances the mighty rocks looming darkly about you seem to come nearer, and the starry sky stretches across from wall to wall, fitting closely down into all the spiky irregularities of the summits in most impressive grandeur. Then, as you lie by your fireside, gazing into this strange weird beauty, you fall into the clear, death-like sleep that comes to the tired mountaineer.

In the early morning the mountain voices are hushed, the night wind dies away, and scarce a leaf stirs in the groves. The birds that dwell here, and the marmots, are still crouching in their nests. The stream, cascading from pool to pool, seems alone to be awake and doing. But the spirit of the opening, blooming day calls to action. The sunbeams stream gloriously through jagged openings of the eastern wall, glancing on ice-burnished pavements, and lighting the mirror surface of the lake, while every sunward rock and pinnacle bums white on the edges like melting iron in a furnace.

Passing round the northern shore of the lake, and tracing the stream that feeds it back into its upper recesses, you are led past a chain of small lakes set on bare granite benches and connected by cascades and falls. Here the scenery becomes more rigidly arctic. The last dwarf pine is left far below, and the streams are bordered with icicles. The sun now with increasing warmth loosens rock masses on shattered portions of the wall that come bounding down gullies and couloirs in dusty, spattering avalanches, echoing wildly from crag to crag. The main lateral moraines, that stretch so formally from the huge jaws of the amphitheater into the middle of the basin, are continued along the upper walls in straggling masses wherever the declivity is

sufficiently low to allow loose material to rest, while separate stones, thousands of tons in weight, are lying stranded here and there out in the middle of the channel. Here too you may observe well characterized frontal moraines ranged in regular order along the south wall of Black Mountain, the shape and size of each corresponding with the daily shadows cast by the wall above them.

Tracing the main stream back to the last of its chain of lakelets, you may notice that the stones on the bottom are covered with a deposit of fine grey mud, that has been ground from the rocks in the bed of the glacier and transported by its draining stream, which is seen issuing from the base of a raw, fresh looking moraine still in process of formation. Not a plant or weather-stain is visible on its rough unsettled surface. It is from 60 to more than 100 feet in height and plunges down in front at an angle of 38°, which is the steepest at which this form of moraine material will lie. Climbing it is therefore no easy undertaking. The slightest touch loosens ponderous blocks that go rumbling to the bottom, followed by a train of smaller stones and sand.

Cautiously picking your way, you at length gain the top, and there outspread in full view is the little giant glacier swooping down from the sombre precipices of Black Mountain in a finely graduated curve, fluent in all its lines, yet seemingly as rugged and immovable as the mountain against which it is leaning. The blue compact ice appears on all the lower portions of the glacier sprinkled with dirt and stones embedded in its surface. Higher, the ice disappears beneath coarsely granulated snow. The face is still further characterized by dirt bands and the outcropping edges of blue veins, that sweep across from side to side in beautiful concentric curves, showing the laminated structure of the mass; and at the head of the glacier where the névé joins the mountain it is traversed by a huge yawning bergschrund, in some places twelve to fourteen feet in

width, and bridged at intervals by the remains of snow avalanches. Creeping along the lower edge holding on with benumbed fingers, clear sections are displayed where the bedded and ribbon structure of glaciers are beautifully illustrated. The surface snow, though everywhere sprinkled with stones shot down from the cliffs, is in some places almost pure white, gradually becoming crystalline, and changing to porous whitish ice of varying shades, and this again changing at a depth of 20 or 30 feet to blue, some of the ribbon-like bands of which are nearly pure and solid, and blend with the paler bands in the most gradual and exquisite manner imaginable, reminding one of the way that color bands come together in the rainbow.

Should you wish to descend into the weird ice-world of the 'schrund, you may find a way or make a way, by cutting steps with an axe. Its chambered hollows are hung with a multitude of clustered icicles, amidst which thin subdued light pulses and shimmers with ineffable loveliness. Water drips and tinkles among the icicles overhead, and from far below there come strange solemn murmurs from currents that are feeling their way in the darkness among veins and fissures on the bottom. Ice creations of this kind are perfectly enchanting, notwithstanding one feels strangely out of place in their cold fountain beauty. Dripping and shivering you are glad to seek the sunshine, though it is hard to turn away from the delicious music of the water, and the still more delicious beauty of the light in the crystal chambers. Coming again to the surface you may see stones of every size setting out on their downward journey with infinite deliberation, to be built into the terminal moraine. And now the noonday warmth gives birth to a network of sweet-voiced rills that run gracefully down the glacier, curling and swirling in their shining channels, and cutting clear sections in which the structure of the ice is beautifully revealed, their quick, gliding, glancing movements contrasting widely with the invisible flow of the glacier itself

on whose back they are all riding. The series of frontal moraines noted further down, forming so striking a picture of the landscape, correspond in every particular with those of this active glacier; and the cause of their distribution with reference to shadows, is now plainly unfolded. When those climatic changes came on that broke up the main glacier that once filled the amphitheater from wall to wall, a series of residual glaciers was left in the cliff shadows, under whose protection they lingered until the terminal moraines under consideration were formed. But as the seasons became yet warmer, or the snow supply less abundant, they wasted and vanished in succession, all excepting the one we have just seen; and the causes of its longer life are manifest in the greater extent of snow in its more perfect shelter from the action of the sun. How much longer this little glacier will last to enrich the landscape will of course depend upon climate and the changes slowly effected in the form and exposure of its basin.

But now these same shadows reaching quite across the main basin and up the slopes of Red Mountain, mark the time for returning to camp, and also hint the ascent of the mountain next day, from whose summit glorious views are to be seen far down over the darkening woods, and north and south over the basins of Nevada Creek, and San Joaquin, with their shining lakes and lace of silvery streams, and eastward to the snowy Sierras, marshaled along the sky near enough to be intensely impressive. This ascent will occupy most of your third day, and on the fourth, sweeping around the southern boundary of the Illilouette Basin, and over the Glacier Point Ridge, you may reach your headquarters in Yosemite by way of the Glacier Point trail, thus completing one of the most telling trips one can make into the icy Yosemite fountains.

The glaciers lying at the head of the Tuolumne and North fork of the San Joaquin may also be reached from Yosemite, as well as many of the most interesting of the mountains,

Mounts Dana, Lyell, Ritter, and Mammoth Mountain--the Mono Pass also, and Mono Lake and volcanoes on the eastern flank of the range. For this grand general excursion into the heart of the High Sierra, good legs and nerves are required, and great caution, and a free number of weeks. Then you may feel reasonably safe among the loose crags of the peaks and crevasses of the glaciers, and return to the lowlands and its cares, rich forever in mountain wealth beyond your most extravagant expectations.

The best time to go to the High Sierra is about the end of September, when the leaf colors are ripe, and the snow is in great part melted from the glaciers, revealing the crevasses that are hidden earlier in the season. Setting out with a pack-animal by the way of Vernal and Nevada falls at the lower end of Little Yosemite Valley, you will strike the old Mariposa and Mono Trail, which will lead you along the base of Clouds Rest, past Cathedral Peak, and down through beautiful forests into the Big Tuolumne Meadows. There, leaving the trail which crosses the meadows and makes direct for the head of the Mono Pass, you turn to the right and follow on up the meadow to its head near the base of Mount Lyell, where a central camp should be established, from which short excursions may be made under comfortable auspices to the adjacent peaks and glaciers.

Throughout the journey to the central camp you will be delighted with the intense azure of the sky, the fine purplish-grey tones of the granite, the reds and browns of dry meadows and the translucent purple and crimson of huckleberry bogs, the flaming yellow of aspen groves, the silvery flashing of the streams in their rocky channels, and the bright green and blue of the glacier lakes. But the general expression of the scenery is savage and bewildering to the lover of the picturesque. Threading the forests from ridge to ridge, and scanning the landscapes from every outlook, foregrounds, middle-grounds, backgrounds, sublime in magnitude, yet seem all alike bare rock waves, woods,

groves, diminutive flecks of meadow and strips of shining water, pictures without lines of beginning or ending.

Cathedral Peak, grandly sculptured, a temple hewn from the living rock, of noble proportions and profusely spired, is the first peak that concentrates the attention. Then come the Tuolumne Meadows, a wide roomy stretch lying at a height of about 8,500 feet above the sea, smooth and lawn-like, with the noble forms of Mounts Dana and Gibbs in the distance, and curiously sculptured peaks on either side. But it is only towards evening of the second day from the valley, that in approaching the upper end of the meadows you gain a view of a truly beautiful and well-balanced picture. It is composed of one lofty group of snow-laden peaks, of which Mount Lyell is the center, with pine-fringed, granite bosses braided around its base, the whole surging free into the sky from the head of a magnificent valley, whose lofty walls are beveled away on both sides so as to embrace it all without admitting anything not strictly belonging to it.

The foreground is now aflame with autumn colors, brown, and purple, and gold, ripe and luminous in the mellow sunshine, contrasting brightly with the deep cobalt-blue of the sky, and the black and grey, and pure spiritual white of the rocks and glaciers. Down through the heart of the picture the young Tuolumne River is seen pouring from its crystal fountains, now resting in glassy pools as if changing back again into ice, now leaping in white cascades as if turning to snow, gliding right and left between granite bosses, then sweeping on through the smooth meadow levels of the valley, swaying pensively from side to side, with calm, stately gestures, past dipping sedges and willows, and around groves of arrowy pine; and throughout its whole eventful course, flowing however fast or slow, singing loud or low, ever filling the landscape with delightful animation, and manifesting the grandeur of its sources in every movement and tone.

The excursion to the top of Mount Lyell, 13,000 feet high, will take you through the midst of this alpine grandeur, and one day is all the time required. From your camp on the bank of the river you bear off up the right wall of the canyon and on direct to the glacier, keeping towards its western margin, so as to reach the west side of the extreme summit of the mountain where the ascent is least dangerous. The surface of the glacier is shattered with crevasses in some places; these, however, are easily avoided, but the sharp wave-like blades of granular snow covering a great part of the upper slopes during most of the season are exceedingly fatiguing, and are likely to stop any but the most determined climbers willing to stagger, stumble, and wriggle onward against every difficulty. The view from the summit overlooks the wilderness of peaks towards Mount Ritter, with their bright array of snow, and ice, and lakes; and northward Mount Dana, Castle Peak, Mammoth Mountain, and many others; westward, sweeping sheets of meadow, and heaving swells of ice-polished granite, and dark lines of forest and shadowy canyons towards Yosemite; while to eastward the view fades dimly among the sunbeaten deserts and ranges of the Great Basin. These grand mountain scriptures laid impressively open will make all your labor light, and you will return to camp braced and strengthened for yet grander things to come.

The excursion to Mount Ritter will take about three days from the Tuolumne Camp, some provision therefore will have to be carried, but no one will chafe under slight inconveniences while seeking so noble a mark. Ritter is king of all the giant summits hereabouts. Its height is about 13,300 feet, and it is guarded by steeply inclined glaciers, and canyons and gorges of tremendous depth and ruggedness, rendering it comparatively inaccessible. But difficulties of this kind only exhilarate the mountaineer.

Setting out from the Tuolumne, carrying bread, and an axe to cut steps in the glaciers, you go about a mile down

the valley to the foot of a cascade that beats its way through a rugged gorge in the canyon wall from a height of about 900 feet, and pours its foaming waters into the river. Along the edge of this cascade you will find a charming way to the summit. Thence you cross the axis of the range and make your way southward along the eastern flank to the northern slopes of Ritter, conforming to the topography as best you can, for to push on directly through the peaks along the summit is impossible.

Climbing along the dashing border of the cascade, bathed from time to time in waftings of irised spray, you are not likely to feel much weariness, and all too soon you find yourself beyond its highest fountains. Climbing higher, new beauty comes streaming on the sight--autumn-painted meadows, late-blooming goldenrods, peaks of rare architecture, bright crystal lakes, and glimpses of the forested lowlands seen far in the west.

Over the divide the Mono Desert comes full into view, lying dreaming silent in thick purple light--a desert of heavy sun-glare, beheld from a foreground of ice-burnished granite. Here the mountain waters separate, flowing east to vanish in the volcanic sands and dry sky of the Great Basin, west to pass through the Golden Gate to the sea.

Passing a little way down over the summit until an elevation of about ten thousand feet is reached, you then push on southward dealing instinctively with every obstacle as it presents itself. Massive spurs, alternating with deep gorges and canyons, plunge abruptly from the shoulders of the snowy peaks and plant their feet in the warm desert. These are everywhere marked with characteristic sculptures of the ancient glaciers that swept over this entire region like one vast ice-wind, and the polished surfaces produced by the ponderous flood are still so perfectly preserved that in many places you will find them about as trying to the eyes as sheets of snow. But even on the barest of these ice pavements, in sheltered hollows countersunk beneath the

general surface into which a few rods of well-ground moraine chips have been dumped, there are groves of spruce and pine thirty to forty feet high, trimmed around the edges with willow and huckleberry bushes; and sometimes still further with an outer ring of grasses bright with lupines, larkspurs, and showy columbines. All the streams, too, and the pools at this elevation, are furnished with little gardens, which, though making scarce any show at a distance, constitute charming surprises to the appreciative mountaineer in their midst. In these bits of leafiness a few birds find grateful homes, and having no acquaintance with man they fear no ill and flock curiously around the stranger, almost allowing themselves to be taken in hand. In so wild and so beautiful a region your first day will be spent, every sight and sound novel and inspiring, and leading you far from yourself. Wearied with enjoyment and the crossing of many canyons you will be glad to camp while yet far from Mount Ritter. With the approach of evening long, blue, spiky-edged shadows creep out over the snowfields, while a rosy glow, at first scarce discernible, gradually deepens, suffusing every peak and flushing the glaciers and the harsh crags above them. This is the alpenglow, the most impressive of all the terrestrial manifestations of God. At the touch of this divine light the mountains seem to kindle to a rapt religious consciousness, and stand hushed like worshippers waiting to be blessed. Then suddenly comes darkness and the stars.

On my first visit to Ritter I found a good campground on the rim of a glacier basin about 11,000 feet above the sea. A small lake nestles in the bottom of it, from which I got water for my tea, and a storm-beaten thicket nearby furnished abundance of firewood. Sombre peaks, hacked and shattered, circle half way round the horizon, wearing a most solemn aspect in the gloaming, and a waterfall chanted in deep base tones across the lake on its way down from the foot of a glacier. The fall and the lake and the

glacier are almost equally bare, while the pines anchored in the fissures of the rocks are so dwarfed and shorn by storm-winds you may walk over the tops of them as if on a shaggy rug. The scene was one of the most desolate in tone I ever beheld. But the darkest scriptures of the mountains are illumined with bright passages of Nature's eternal love and they never fail to manifest themselves when one is alone. I made my bed in a nook of the pine thicket where the branches were pressed and crinkled overhead like a roof, and bent down on the sides. These are the best bed-chambers the Sierra affords, snug as squirrel-nests, well-ventilated, full of spicy odors, and with plenty of wind-played needles to sing one asleep. I little expected company in such a place, but creeping in through a low opening I found five or six small birds nestling among the tassels. The night wind begins to blow soon after dark, at first only a gentle breathing, but increasing toward midnight to a gale in strength, that fell on my leafy roof in rugged surges like a cascade, while the waterfall sang in chorus, filling the old ice-fountain with its solemn roar, and seeming to increase in power as the night advanced--fit voice for such a landscape. How glorious a greeting the sun gives the mountains! To behold this alone is worth the pains of any excursion a thousand times over. The highest peaks bum like islands in a sea of liquid shade. Then the lower peaks and spires catch the glow, and the long lances of light streaming through many a notch and pass, fall thick on the frosty meadows. The whole mountain world awakes. Frozen rills begin to flow. The marmots come out of their nests beneath the boulders and climb sunny rocks to bask. The lakes seen from every ridge-top shimmer with white spangles like the glossy needles of the low tasselled pines. The rocks, too, seem responsive to the vital sun-heat, rock-crystals and snow-crystals throbbing alike. Thrilled and exhilarated one strides onward in the crisp bracing air as if never more to feel fatigue, limbs moving without effort, every sense unfolding

and alert like the thawing flowers to take part in the new day harmony.

All along your course thus far, excepting while crossing the canyons, the landscapes are open and expansive. On your left the purple plains of Mono repose dreamy and warm. On your right and in front, the near Alps spring keenly into the thin sky with more and more impressive sublimity.

But these larger views are at length lost. Rugged spurs and moraines and huge projecting buttresses begin to shut you in, until arriving at the summit of the dividing ridge between the head waters of Rush Creek and the northmost tributaries of the San Joaquin, a picture of pure wildness is disclosed, far surpassing every other you have yet seen.

There, immediately in front, looms the majestic mass of Mt. Ritter, with a glacier swooping down its face nearly to your feet, then curving, westward and pouring its frozen flood into a blue-green lake whose shores are bound with precipices of crystalline snow, while a deep chasm drawn between the divide and the glacier separates the sublime picture from everything else. Only the one huge mountain in sight, the one glacier, and one lake; the whole veiled with one blue shadow--rock, ice, and water, without a single leaf. After gazing spell-bound you begin instinctively to scrutinize every notch and gorge and weathered buttress of the mountain with reference to making the ascent. The entire front above the glacier appears as one tremendous precipice, slightly receding at the top and bristling with comparatively short spires and pinnacles set above one another in formidable array. Massive lichen-stained battlements stand forward, here and there hacked at the top with angular notches and separated by frosty gullies and recesses that have been veiled in shadow ever since their creation, while to right and left, far as the eye can reach, are huge crumbling buttresses offering no invitation to the climber. The head of the glacier sends up a few fingerlike

branches through couloirs, but these are too steep and short to be available, and numerous narrow-throated gullies down which stones and snow are avalanched seem hopelessly steep, besides being interrupted by vertical cliffs past which no side way is visible. The whole is rendered still more terribly forbidding by the chill shadow, and the gloomy blackness of the rocks, and the dead silence relieved only by the murmur of small rills among the crevasses of the glacier, and ever and anon the rattling report of falling stones. Nevertheless the mountain may be climbed from this side, but only tried mountaineers should think of making the attempt.

Near the eastern extremity of the glacier you may discover the mouth of an avalanche gully, whose general course lies oblique to the plane of the front, and the metamorphic slates of which the mountain is built are cut by cleavage planes in such a way that they weather off in angular blocks, giving rise to irregular steps that greatly facilitate climbing on the steepest places. Thus you make your way into a wilderness of crumbling spires and battlements built together in bewildering combinations, and glazed in many places with a thin coating of ice, which must be removed from your steps; while so steep is the entire ascent one would inevitably fall to the glacier in case a single slip should be made.

Towards the summit the face of the mountain is still more savagely hacked and torn. It is a maze of yawning chasms and gullies, in the angles of which rise beetling crags and piles of detached boulders, made ready, apparently, to be launched below. The climbing is, however, less dangerous here, and after hours of strained, nerve-trying climbing, you at length stand on the topmost crag, out of the shadow in the blessed light. How truly glorious the landscape circled this noble summit! Giant mountains, innumerable valleys, glaciers, and meadows, rivers and lakes, with the dark blue sky bent tenderly over them all.

Looking southward along the axis of the range, the eye is first caught by a row of exceedingly sharp and slender spires, which rise openly to a height of about a thousand feet from a series of short glaciers that lean back against their bases, their fantastic sculpture and the unrelieved sharpness with which they spring out of the ice rendering them peculiarly wild and striking. These are the Minarets. Beyond them you behold the highest mountains of the range, their snowy summits crowded together in lavish abundance, peak beyond peak, aspiring higher, and higher as they sweep on southward, until the culminating point is reached in Mount Whitney near the head of the Kern River, at an elevation of nearly 15,000 feet above the level of the sea.

Westward the general flank of the range is seen flowing grandly away in smooth undulations, a sea of grey granite waves, dotted with lakes and meadows, and fluted with stupendous canyons that grow steadily deeper as they recede in the distance.

Below this grey region lie the dark forests, broken here and there by upswelling ridges and domes; and yet beyond is a yellow, hazy belt marking the broad plain of the San Joaquin, bounded on its farther side by the blue mountains of the coast. Turning now to the northward, there in the immediate foreground is the Sierra Crown, with Cathedral Peak a few degrees to the left, the grey, massive form of Mammoth Mountain to the right, 13,000 feet high, and Mounts Ord, Gibbs, Dana, Conness, Tower Peak, Castle Peak, and Silver Mountain, stretching away in the distance, with a host of noble companions that are as yet nameless.

To the eastward the whole region seems a land of pure desolation covered with beautiful light. The hot volcanic basin of Mono, with its lake fourteen miles long, Owens Valley, and the wide table land at its head dotted with craters, and the Inyo Mountains; these are spread map-like beneath you, with many of the short ranges of the Great

Basin passing and overlapping each other and fading on the glowing horizon.

At a distance of less than 3,000 feet below the summit you see the tributaries of the San Joaquin and Owens Rivers bursting forth from their sure fountains of ice, while a little to the north of here are found the highest affluents of the Tuolumne and Merced. Thus the fountain heads of four of the principal rivers of California are seen to lie within a radius of four or five miles.

Lakes, the eyes of the wilderness, are seen gleaming in every direction round, or square, or oval like very mirrors; others narrow and sinuous, drawn close about the peaks like silver girdles; the highest reflecting only rock and snow and sky. But neither these nor the glaciers, nor yet the brown bits of meadow and moorland that occur here and there, are large enough to make any marked impression upon the mighty host of peaks. The eye roves around the vast expanse rejoicing in so grand a freedom, yet returns again and again to the fountain mountains. Perhaps some one of the multitude excites special attention, some gigantic castle with turret and battlement, or gothic cathedral more lavishly spired than any ever chiselled by art. But generally, when looking for the first time from an all-embracing standpoint like this, the inexperienced observer is oppressed by the incomprehensible grandeur of the peaks crowded about him, and it is only after they have been studied long and lovingly that their far-reaching harmonies begin to appear. Then penetrate the wilderness where you may, the main telling features to which all the topography is subordinate are quickly perceived, and the most chaotic alp-clusters stand revealed and regularly fashioned and grouped in accordance with law, eloquent monuments of the ancient glaciers that brought them into relief. The grand canyons likewise are recognized as the necessary results of causes following one another in melodious sequence--Nature's

poems carved on tables of stone, the simplest and most emphatic of her glacial compositions.

Had we been here to look during the glacial period we would have found a wrinkled ocean of ice continuous as that now covering North Greenland and the lands about the South Pole, filling every valley and canyon, flowing deep above every ridge, leaving only the tops of the peaks rising darkly above the rock-encumbered waves, like foam-streaked islets in the midst of a stormy sea--these islets the only hints of the glorious landscapes now lying warm and fruitful beneath the sun. Now all the work of creation seems done. In the deep, brooding silence all appears motionless. But in the midst of this outer steadfastness we know there is incessant motion. Ever and anon avalanches are falling from yonder peaks. These cliff-bound glaciers seemingly wedged fast and immovable, are flowing like water and grinding the rocks beneath them. The lakes are lapping their granite shores, and wearing them away, and every one of these young rivers is fretting the air into music, and carrying the mountains to the plains. Here are the roots of the life of the lowlands with all their wealth of vineyard and grove, and here more simply than elsewhere is the eternal flux of nature manifested.

But in the thick of these fine lessons you must remember that the sun is wheeling far to the west, and you have many a weary and nerve-trying step to make ere you can reach the timber-line where you may lie warm through the night. But with keen caution and instinct and the guidance of your guardian angel you may pass every danger in safety, and in another delightful day win your way back again to your camp to rest on the beautiful Tuolumne River.

II. The Passes of the High Sierra

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The roads that Nature has opened through the heart of the High Sierra are hard to travel. So the sedate plodder of the lowlands would say, whether accustomed to trace the level furrows of fields, or the paved streets of cities. But as people oftentimes build better than they know, so also do they walk and climb and wander better than they know, and so it comes, that urged onward by a mysterious love of wild beauty and adventure, we find ourselves far from the beaten ways of life, toiling through these rugged mountain passes without thinking of a reason for embracing with such ungovernable enthusiasm so much stem privation and hardship.

"Try not the pass" may sound in our ears, but despite the solemn warning, come from whom it may, the passes will be tried until the end of time, in the face of every danger of rock, avalanche, and blinding storm. And whatever the immediate motive may be that starts us on our travels--wild landscapes, or adventures, or mere love of gain, the passes themselves will in the end be found better than anything to which they directly lead; calling every faculty into vigorous action, rousing from soul-wasting apathy and ease, and opening windows into the best regions of both earth and heaven.

The glaciers were the pass makers of the Sierra, and by them the ways of all mountaineers have been determined. A short geological time before the coming on of that winter of winters, called "The Glacial Period," a vast deluge of molten rocks poured from many a chasm and crater on the flanks and summit of the range, obliterating every distinction of peak and pass throughout its northern portions, filling the

lake basins, flooding ridge and valley alike, and effacing nearly every feature of the pre-glacial landscapes.

Then, after these all-destroying fire-floods ceased to flow, but while the great volcanic cones built up along the axis of the range, still burned and smoked, the whole Sierra passed under the domain of ice and snow. Over the bald, featureless, fire-blackened mountains glaciers crawled, covering them all from summit to base with a mantle of ice; and thus with infinite deliberation the work was begun of sculpturing the range anew. Those mighty agents of erosion, halting never through unnumbered centuries, ground and crushed the flinty lavas and granites beneath their crystal folds. Particle by particle, chip by chip, block by block the work went on, wasting and building, until in the fullness of time the mountains were born again, the passes and the summits between them, ridges and canyons, and all the main features of the range coming to the light nearly as we behold them today.

Looking into the passes near the summits, they seem singularly gloomy and bare, like raw quarries of dead, unfertilized stone--gashes in the cold rock-bones of the mountains above the region of life, empty as when they first emerged from beneath the folds of the ice-mantle. Faint indeed are the marks of any kind of life, and at first sight they may not be seen at all. Nevertheless birds sing and flowers bloom in the highest of them all, and in no part of the range, north or south, is there any break in the chain of life, however much it may be wasted and turned aside by snow and ice, and flawless granite.

Compared with the well-known passes of Switzerland, those of the south half of the Sierra are somewhat higher, but they contain less ice and snow, and enjoy a better summer climate, making them, upon the whole, more open and approachable. A carriage-road has been constructed through the Sonora Pass, the summit of which is 10,150 feet

above the level of the sea--878 feet higher than the highest carriage-pass in Switzerland--the Stelvio Pass.

In a distance of 140 miles between lat. 36° degrees 20' and 38° degrees the lowest pass I have yet discovered exceeds 9,000 feet, and the average height of all above sea-level is perhaps not far from 11,000 feet.

Substantial carriage-roads lead through the Carson and Johnson Passes near the head of Lake Tahoe, over which immense quantities of freight were hauled from California to the mining regions of Nevada prior to the construction of the Central Pacific Railroad through the Donner Pass. Miles of mules and ponderous wagons might then be seen slowly crawling beneath a cloud of dust through the majestic forest aisles, the drivers shouting in every language, and making a din and disorder strangely out of keeping with the solemn grandeur of the mountains about them.

To the northward of the memorable Donner Pass, 7,056 feet in height, a number of lower passes occur, through whose rugged defiles long emigrant trains, with footsore cattle and sun-cracked wagons a hundred times mended, wearily toiled during the early years of the Gold Period. Coming from far, through a thousand dangers, making a way over trackless wastes, the snowy Sierra at length loomed in sight, to them the eastern wall of the Land of Gold. And as they gazed through the tremulous haze of the desert, with what joy must they have descried the gateway through which they were so soon to pass to the better land of all their golden hopes and dreams!

Between the Sonora Pass and the southern extremity of the High Sierra, a distance of a 160 miles, there is not a single carriage-road conducting from one side of the range to the other, and only five passes with trails of the roughest description. These are barely practicable for animals, a pass in this region meaning simply any notch with its connecting canyon and ridges through which one may, by the exercise of unlimited patience, make out to lead a surefooted mule