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Bee-Pastures of California In Two Parts.:II"

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REGARDING Mount Shasta comprehensively from a bee point of view, encircled by its many climates, and sweeping aloft from the torrid plain deep into the cold azure, we find the first five thousand feet from the summit pretty generally snow-clad, and therefore
they are about as flowerless and honeyless as the sea. The base of this arctic region is marked by a belt of naked lava measuring about a thousand feet in vertical breadth. Beautiful flowers enliven the faces of the cliffs with their bright colors, and in some of the warmer nooks of the rocks there are a few tufts of alpine daisies, wallflowers, and pentstemons; but, notwithstanding these bloom freely in the late summer, the zone as a whole is almost as honeyless as the icy summit, and its lower edge may be taken as the superior limit of the honey-line. Immediately below this comes the forest zone, covered with a rich growth of conifers, chiefly silver firs, rich in pollen and honey-dew, and diversified with countless garden openings, many of them less than a hundred yards across. Next, in orderly succession, comes the grand bee-zone. Its area far surpasses that of the icy summit and both the other zones combined, for it goes sweeping majestically around the entire mountain, with a breadth of six or seven miles and a circumference of nearly a hundred miles.

Shasta, as we have already suggested, is a fire-mountain, created by a succession of eruptions of ashes and molten lava, which, flowing over the lips of its several craters, grew outward and upward like the trunk of a knotty exogenous tree. Then followed a strange contrast. The glacial winter came on, loading the cooling mountain with ice which flowed slowly outward in every direction, radiating from the summit in the form of one vast conical
glacier—a down-crawling mantle of ice upon a fountain of smoldering fire, crushing and grinding for centuries its brown, flinty lavas with incessant activity, and thus degrading and remodeling the entire mountain. When, at length, the glacial period began to draw near its close, the ice-mantle was gradually melted off around the bottom, and, in receding and breaking into its present fragmentary condition, irregular rings and heaps of moraine matter were stored upon its flanks. The glacial erosion of most of the Shasta lavas produced a detritus, composed of rough, subangular boulders of moderate size and porous gravel and sand, which yields freely to the transporting power of running water. Under Nature's management, the next marked geological event made to take place in the history of Mount Shasta was a water-flood of extraordinary magnitude, which acted with sublime energy upon this prepared glacial detritus, sorting it out and carrying down immense quantities from the higher slopes; and redepositing it in smooth, delta-like beds around the base; and it is these flood-beds of moraine soil, thus suddenly and simultaneously laid down and joined edge to edge, that now form the main honey-zone.

Thus, by forces seemingly antagonistic and destructive, has Mother Nature accomplished her beneficent designs—now a flood of fire, now a flood of ice, now a flood of water; and then an outburst of organic life, a milky-way of snowy petals and wings, girdling the rugged mountain like a cloud, as if the vivifying sunbeams beating against its sides had broken into a foam of plant-bloom and bees.

In this lovely wilderness the bees rove and revel, rejoicing in the bounty of the sun, clambering eagerly through bramble and hucklebloom, stirring the clustered bells of the manzanita, now humming aloft among polleny willows and firs, now down on the ashy ground among gilias and buttercups, and anon plunging deep into snowy banks of cherry and buckthorn. They consider the lilies and roll into them, and, like lilies, they toil not, for they are impelled by sun-power, as water-wheels by water-power; and when the one has plenty of high-pressure water, the other plenty of sunshine, they hum and quiver alike. Sauntering in the bee-lands in the sun-days of summer, one may readily infer the time of day from the comparative energy of bee-movements alone—drowsy and moderate in the cool of the morning, increasing in energy with the ascending sun, and, at high noon, thrilling and quivering in wild ecstasy, then gradually declining again to the stillness of night. In my excursions among the glaciers I occasionally meet bees that are hungry, like mountaineers who venture too far and remain too long above the bread-line; then they droop and wither like autumn leaves. The Shasta bees are perhaps better fed than any others in the sierra. Their field-work is one perpetual feast; but, however exhilarating the sunshine or bountiful the supply of flowers, they are always dainty feeders. Humming-moths and humming-birds
seldom set foot upon a flower, but poise on the wing in front of it, and reach forward as if they were sucking through straws. But bees, though as dainty as they, hug their favorite flowers with profound cordiality, and push their blunt, polleny faces against them, like babies on their mother's bosom. And fondly, too, with eternal love, does Mother Nature clasp her small bee-babies, and suckle them, multitudes at once, on her warm Shasta breast.

Besides the common honey-bee, there are many other species here—fine mossy, burly fellows, who were nourished on the mountains thousands of sunny seasons before the advent of the domestic species. Among these are the bumble-bees, mason-bees, carpenter-bees, and leaf-cutters. Butterflies, too, and moths of every size and pattern—some broad-winged like bats, flapping slowly, and sailing in easy curves; others like small, flying violets, shaking about loosely in short, crooked flights close to the flowers, feasting luxuriously night and day. Great numbers of deer also delight to dwell in the brushy portions of the bee-pastures.

Bears, too, roam the sweet wildness, their blunt, shaggy forms harmonizing well with the trees and tangled bushes, and with the bees, also, notwithstanding the disparity in size. They are fond of all good things, and enjoy them to the utmost, with but little troublesome discrimination—flowers and leaves as well as berries, and the bees themselves as well as their honey. Though the California bears have as yet had but little experience with honey-bees, they often succeed in reaching their bountiful stores, and it seems doubtful whether bees themselves enjoy honey with so great a relish. By means of their powerful teeth and claws they can gnaw and tear open almost any hive conveniently accessible. Most honey-bees, however, in search of a home are wise enough to make choice of a hollow in a living tree, a considerable distance above the ground, when it is possible; then they are pretty secure, for though the smaller black and brown bears climb well, they are unable to break into strong hives while compelled to exert themselves to keep from falling, and at the same time to endure the stings of the fighting bees without having their paws free to rub them off. But woe to the black bumble-bees discovered in their mossy mouse-nests in the ground! The bears with a few strokes of their huge paws lay the entire establishment bare, and, before time is given for a general buzz, bees old and young, larvae, honey, stings, nest, and
Still more impressive are the warm, reviving days of spring in the mountain pastures. The blood of the plants throbbing beneath the life-giving sunshine seems to be heard and felt. Plant growth goes on before our eyes, and every tree in the woods, and bush and flower is seen as a hive of restless industry. The deeps of the sky are mottled with singing wings of every tone and color; clouds of brilliant chrysididae dancing and swirling in exquisite rhythm, golden-barred vespidæ, dragon-flies, butterflies, grating cicadas, and jolly, rattling grass-hoppers, fairly enameling the light.

On bright, crisp mornings a striking optical effect may frequently be observed from the shadows of the higher mountains while the sunbeams are pouring past overhead. Then every insect, no matter what may be its own proper color, burns white in the light. Gauzy-winged hymenoptera, moths, jet-black beetles, all are transfigured alike in pure, spiritual white, like snowflakes.

In southern California, where bee-culture has had so much skillful attention of late years, the pasturage is not more abundant, or more advantageously varied as to the number of its honey plants and their distribution over mountain and plain, than that of many other portions of the State where the industrial currents flow in other channels. The famous white sage (Aussiberaii), belonging to the mint family, flourishes here in all its glory, blooming in May, and yielding great quantities of clear, pale honey, which is greatly prized in every market it has yet reached. This species grows chiefly in the valleys and low hills. The black sage on the mountains is part of a dense, thorny chaparral, which is composed chiefly of adenostoma, ceanothus, manzanita, and cherry—not differing greatly from that of the southern portion of the sierra, but more dense and continuous, and taller, and remaining longer in bloom. Stream-side gardens, so charming a feature of both the sierra and coast mountains, are less numerous but exceedingly rich in honey flowers wherever found: melilotus, columbine, collinsia, verbena, zuischneria, wild rose, honeysuckle, philadelphus, and lilies rising from the warm, moist dells in a very storm of exuberance. Wild buckwheat of many species is developed in great abundance over the
dry, sandy valleys and lower slopes of the mountains toward the end of summer, and is
at this time the main dependence of the bees, reinforced here and there by orange groves, alfalfa fields, and small home gardens.

The main honey months in ordinary seasons are April, May, June, July, and August; while the other months are usually flowery enough to yield sufficient for the bees.

According to Mr. J. T. Gordon, president of the Los Angeles County Bee-keepers' Association, the first bees introduced into the county were a single hive, which cost $150 in San Francisco and arrived in September, 1854. In April of the following year this hive sent out two swarms, which were sold for one hundred dollars each. From this small beginning the bees gradually multiplied to about three thousand swarms in the year 1873. In 1876, it was estimated that there were between fifteen and twenty thousand hives in the county, producing an annual yield of about one hundred pounds to the hive—in some exceptional cases a much greater yield.

In San Diego County, at the beginning of the season of 1878, there were about 24,000 hives, and the shipments from the one port of San Diego for the same year, from July 17th to November 10th, were 1,077 barrels, 15,544 cases, and nearly ninety tons. The largest bee-ranches have about a thousand hives, and are carefully and skillfully managed, every scientific appliance of merit being brought into use. There are few bee-keepers, however, who own half as many as this, or who give their undivided attention to the business. Orange culture at present heavily overshadows every other business.

A good many of the so-called bee-ranches of Los Angeles and San Diego counties are still of the rudest pioneer kind imaginable. A man unsuccessful in everything else hears the interesting story of the profits and comforts of bee-keeping, and concludes to try it, buys a few colonies, or gets them from some overstocked ranch on shares, takes them back to the foot of some canon where the pasturage is fresh, squats on the land, with or without the permission of the owner, sets up his hives, makes a box cabin for himself scarcely bigger than a bee-hive, and awaits his fortune.

Bees suffer sadly from famine during the dry years which occasionally occur in the southern and middle portions of the State. If the rain-fall amounts only to three or four inches, instead of from twelve to twenty as in ordinary seasons, then sheep and cattle die in thousands, and so do these small winged cattle, unless they are carefully fed, or removed to other pastures. The year 1877 will long be remembered as exceptionally rainless and distressing. Scarce a flower bloomed on the dry valleys away from the stream-sides, and not a single grain-field depending upon rain was reaped. The seed only sprouted, and came up a little way, and withered; and horses, cattle, and sheep grew thinner day by day, nibbling at bushes and weeds along the shallowing edges of streams, many of which were dried up altogether for the first time since the settlement of the country.

In the course of a trip made during the summer of that year through Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles counties, the deplorable effects of the drought were everywhere visible—leafless fields, dead and dying cattle, dead bees, and half-dead people with dusty, doleful faces. Even the birds and squirrels were in distress, though their suffering was less painfully apparent than that of the poor cattle. These were falling one by one in slow, sure starvation along the banks of the hot, sluggish streams, while thousands of buzzards correspondingly fat were sailing above them, or standing gorged on the ground beneath the trees, waiting with easy faith for fresh carcasses. The quails, prudently considering the hard times, abandoned all thought of pairing off. They were too poor to marry, and so continued in flocks all through the year without attempting to rear young. In riding three hundred miles not a single brood of young was seen, though the breeding season was past; but, on the contrary, all the old ones were still in flocks. The ground-squirrels, though an exceptionally industrious and enterprising race, as every farmer knows, were hard pushed for a living; not a fresh leaf or seed was to be found save in the trees, whose bossy masses of dark green foliage presented a striking contrast to the ashen baldness of the ground beneath them. The squirrels, leaving their accustomed feeding-grounds, betook themselves to the leafy oaks to gnaw out the acorn stores of the provident woodpeckers, but the latter kept up a vigilant watch upon their movements. I noticed four woodpeckers in league against one squirrel, driving the poor fellow out of an oak that they claimed. He dodged round the knotty trunk from side to side, as nimbly as he could in his famished condition, only to find a sharp bill everywhere. But the fate of the bees that year seemed the saddest of all. From one-half to three-fourths of them died, in different portions of Los Angeles and San Diego counties, of sheer starvation—not less than eighteen thousand colonies.
in these two counties alone, while in the adja-
cent counties the death-rate was hardly less.

Even the colonies nearest to the mountains
suffered more or less this year, for the smaller
vegetation on the foot-hills was affected by the
drought almost as severely as that of the valleys
and plains, and even the hardy, deep-rooted
chaparral, the surest dependence of the bees,
bloomed sparingly, while much of it was be-
yond reach. All could have been saved, how-
ever, by promptly supplying them with food
when their own stores began to fail, and before
they became enfeebled and discouraged, or
by cutting roads back into the mountains, and
taking them into the heart of the flowery
chaparral. The Santa Lucia, San Rafael, San
Gabriel, San Jacinto, and San Bernardino
ranges are almost untouched as yet save by
the wild bees. Some idea of their resources,
and of the advantages and disadvantages they
offer to bee-keepers, may be formed from an
excursion that I made into the San Gabriel
range about the beginning of August of "the
dry year." This range, containing most of
the characteristic features of the other ranges
just mentioned, overlooks the Los Angeles
vineyards and orange groves from the north,
and is more rigidly inaccessible in the ordi-
nary meaning of the word than any other that
I ever attempted to penetrate. The slopes
are exceptionally steep and insecure to the
foot, and they are covered with thorny
bushes from five to ten feet high. With the
exception of little spots not visible in general
views, the entire surface is covered with them,
massed in close hedge growth, sweeping
gracefully down into every gorge and hollow,
and swelling over every ridge and summit
in shaggy, ungovernable exuberance, offering
more honey to the acre for half the year than
the most crowded clover-field in bloom time.
But when beheld from the open San Gabriel
valley, beaten with dry sunshine, all that was
seen of the range seemed to wear a forbidding
aspect. From base to summit all seemed gray
barren, silent, its glorious chaparral appear-
ing like dry moss creeping over its dull,
wrinkled ridges and hollows.

Setting out from Pasadena, a hopeful little
colony of orange groves about six miles from
the city of Los Angeles, I reached the foot
of the range about sundown; and being
weary and heated with my walk across
the shadeless plain, concluded to camp for
the night. After resting a few moments I
began to look about among the flood-bowl-
ders of the creek for a smooth camp-ground,
when I came upon a strange, dark-looking
man who had been chopping cord-wood. He
seemed greatly surprised at seeing me, so I
sat down with him on the live-oak log he had
been cutting, and made haste to give a reason
for my appearance in his solitude, explaining
that I was anxious to find out something
about the mountains and meant to make my
way up Eaton Creek next morning. Then he
kindly invited me to camp with him, and led
me to his little cabin, situated at the foot
of the first of the mountain slopes, where a
small spring oozes out of a bank overgrown
with wild rose-bushes. After supper, when the
daylight was gone, he explained that he was
out of candles, so we sat in the dark, while
he gave me a sketch of his life in a mixture
of Spanish and English. He was born in
Mexico, his father Irish, his mother Spanish.
He had been a miner, rancher, prospector,
hunter, etc.,rambling always, and wearing his
life away in mere waste, but now he was
going to settle down. His past life, he said,
was of "no account," but the future was
promising. He was going to "make money
and marry a Spanish woman." People mine
here for water as for gold. He had been run-
ning a tunnel into a spur of the mountain
back of his cabin. "My prospect is good," he
said, "and if I chance to strike a good strong
flow, I'll soon be worth five or ten thousand
dollars. For that flat out there," referring to
a small, irregular patch of bowldery detritus,
two or three acres in size, that had been
deposited by Eaton Creek during some flood
season,—"that flat is large enough for a nice
orange grove, and the bank behind the cabin
will do for a vineyard, and after watering my
own trees and vines I will have some left to
sell to my neighbors below me down the valley.
And then," he continued, "I can keep bees
and make money that way, too, for the mount-
ains above here are just full of honey in the
summer time, and one of my neighbors down
here says that he will let me have a whole lot
of hives on shares to start with. You see I've
a good thing; I'm all right now." All this
prospective affluence in the sunken, bowlder-
ched flash-bed of a mountain stream! Leaving
the bees out of the count, most
fortune-seekers would as soon think of set-
ting on the summit of Mount Shasta.

About half an hour's walk above the cabin
is "The Fall," famous throughout the valley
settlements as the finest yet discovered in
the range. It is a charming little thing, with a
low, sweet voice, singing like a bird: as it
pours from a notch in a short ledge some
thirty-five or forty feet into a round-mirror
pool. The face of the cliff back of it and on
both sides is smoothly covered and embossed
with mosses, against which the white water
shines out in showy relief, like a silver instru-
ment in a velvet case. Hither come the San
Gabriel lads and lasses to gather ferns and
ble away their hot holidays in the cool ver, glad to escape from their commonplacem gardens and orange groves. The deliciem maiden-hair grows on fissured rocksthin reach of the spray, while broad-leavedples and sycamores cast soft, mellow shadefin a rich profusion of bee-flowers growingong bowlders in front of the pool—the k the flowers, the bees, the ferny rocks and iy shade forming a charming little poemwildness, the last of a series extendingyn the flowery slopes of San Antonioough the rugged, foam-beaten bosses of thein Eaton cañon.

From the base of the fall I followed thege that forms the western rim of the Eatonin to the summit of one of the principallks, which is about five thousand feet abovelevel. Then, turning eastward, I crossedmiddle of the basin, forcing a way over itsmy subordinate ridges and across its eastrimg, having to contend almost everywhere th the floweriest and most impecinuouspath of honey bushes I had ever encoun-er since first my mountaineering began.ost of the Shasta chaparral is leafy nearly the-ground; here the main stems are nakedthree or four feet, and interspiked withad twigs, forming a stiff cheveaux de friseough which even the bears make their wayh difficulty. I was compelled to creep for lesen all-fours, and in following the bearssh often found tufts of hair on the bushesere they had forced themselves through.

For a hundred feet or so above the fall theent was made possible only by tough throns of club-moss that clung to the rock.ove this the ridge waters away to a knif-blade for a few hundred yards, andoce to the summit of the range it carriesirsty mane of chaparral. Here and therall openings occur on rocky places, com-bing fine views across the cultivated val-to the ocean. These I found by the tracksreat favorite outlooks and resting-places forwild animals—bears, wolves, foxes, wildgi etc.—which abound here, and wouldhe be taken into account in the establish-ment of bee-ranches. In the deepest thicketsfond wood-rat villages—groups of hutsor to six feet high, built of sticks and leavesrough, tapering piles, like musk-rat cabins.noticed a good many bees, too, most of them wild. The tame honey-bees seemed guid and wing-weary, as if they had come the way up from the flowerless plain.

After reaching the summit I had time toake only a hasty survey of the basin, nowwing in the sunset gold, before hasteningn into one of the tributary cañons in arch of water. Emerging from a particu-larly tedious breadth of chaparral, I foundmyself free and erect in a beautiful park-like grove of live-oak, the ground planted withaspidiums and brier-roses, while the glossy foliage made a close canopy overhead, leaving the gray dividing trunks bare to show the beauty of their plain, interlacing arches.

The bottom of the cañon was dry where I first reached it, but a bunch of scarlet mimul-sus indicated water at no great distance, and I soon discovered about a bucketful in the hollow of the rock. This, however, was full of dead bees, wasps, beetles, and leaves, well steeped and simmered in the hot sunshine, and would, therefore, require boiling and fil-tering through fresh charcoal before it could be made available. Tracing the dry channel about a mile farther down to its junction with a larger tributary cañon, I at length discovered a lot of bowlders pools, clear as crystal, brimm-ing full, and linked together by glistening streamlets just strong enough to sing audibly. Flowers in full bloom adorned their margins, lilies ten feet high, larkspurs, columbines, and luxuriant ferns, leaning and overarch-ing in lavish abundance, while a noble old live-oak spread its rugged arms over all. Here I camped, making my bed on smooth cobble-stones.

Next day, in the channel of a tributary that heads on Mount San Antonio, I passed about fifteen or twenty gardens like the one in which I slept—lilies in every one of them, in the full pomp of bloom. My third camp was made near the middle of the general basin, at the head of a long system of cascades from ten to two hundred feet high, one following the other in close succession down a rocky, inaccessible cañon, making a total descent of nearly seventeen hundred feet. Above the cascades the stream passes through a series of open, sunny levels, the largest of which are about an acre in size, where the wild bees and their companions were feasting on a fine, showy growth of zauncneria, painted cups, and monardella; and gray squirrels were busy harvesting the burs of the Douglass spruce, the only conifer I met in the basin.

The eastern slopes of the basin are in every way similar to those we have described, and the same may be said of other portions of the range. From the highest summit, far as the eye could reach, the landscape was one vast bee-pasture, a rolling wilderness of honey bloom, scarcely broken by bits of forest or the rocky outcrops of hill-tops and ridges.

Beyond the San Bernardino range lies the wild "sage-brush country," bounded on the east by the Colorado River, and extending in a general northerly direction to Nevada and
along the eastern base of the Sierra beyond Mono Lake.

The greater portion of this immense region, including Owens Valley, Death Valley, and the Sink of the Mohave, and whose area is nearly one-fifth that of the entire State, is usually regarded as a desert, not because of any lack in the soil, but for want of rain, and rivers available for irrigation. Very little of it, however, is desert in the eyes of a bee.

Looking now over all the available pastures of the State, it appears that the business of bee-keeping is still in its infancy. Even in the more enterprising of the southern counties, where so vigorous a beginning has been made, less than a tenth of their honey resources have as yet been developed; while in the Great Plain, the coast ranges, the Sierra Nevada, and the northern region about Mount Shasta, the business can hardly be said to exist at all. What the limits of its developments in the future may be, with the advantages of cheaper transportation and the invention of better methods in general, it is not easy to guess. Nor, on the other hand, are we able to measure the influence on bee interests likely to follow the destruction of the forests, now rapidly falling before fire and the ax. As to the sheep evil, that can hardly become greater than it is at the present day. In short, notwithstanding the wide-spread deterioration and destruction of every kind already effected, California, with her incomparable climate and flora, is still the best of all the bee-lands of the world.

John Muir.