at the corresponding times the dew point was at 37°.0, 41°.0, 38°.1, 39°.6, 44°. 9, 40°. 5; and the moisture in a cubic foot of air 2.838 grs., 3.179 grs., 2.935 grs., 3.034 grs., 3.766 grs., 3.150 grs. respectively. Much cloudy weather and some showers of rain, during this interval, considerably reduced the temperature, which rose with fine weather on the 5th. Salmon was now abundant in the Sacramento. Those which we obtained were generally between three and four feet in length, and appeared to be of two distinct kinds. It is said that as many as four different kinds ascend the river at different periods. The great abundance in which this fish is found gives it an important place among the resources of the country. The salmon crowd in immense numbers up the Umpqua, Tlamath, and Trinity Rivers, and into every little river and creek on the coast north of the Bay of San Francisco ; and up the San Joaquin River, into the Stanislaus, beyond which the Indians say they do not go. Entering all the rivers of the coast far to the north, and finding their way up into the smaller branches which penetrate the forests of the interior country, climbing up cataracts and lesser falls, this fish had a large share in supporting the Indians—who raised nothing, but lived on what Nature gave. "A Salmon-Water," as they named it, was a valuable possession to a tribe or village, and jealously preserved as an inheritance. I found the "Salmon-waters" in the forests along the eastern flank of the Cascade range below the Columbia River.

In the evening of the 5th we resumed our journey northward, and encamped on a little creek near the Sacramento, where an emigrant from "the States" was establishing himself, and had already built a house. It is a handsome place, wooded with groves of oak, and along the creek are sycamore, ash, cottonwood, and willow. The day was fine, with a northwest wind.

The temperature at sunrise the next day (April 6th) was 42°, with a northeasterly wind. We continued up the Sacramento, which we crossed in canoes at a farm on the right bank of the river. The Sacramento was here about one hundred and forty yards wide, and with the actual stage of water, which I was informed continued several months, navigable for a steamboat. We encamped a few miles above, on a creek wooded principally with large oaks. Grass was good and abundant, with wild oats and pea vine in the bottoms. The day was fine, with a cool northwesterly breeze, which had in it the air of the high mountains. The wild oats here were not yet headed.

The snowy peak of Shastl bore directly north, showing out high above the other mountains. Temperature at sunset 57°, with a west wind and sky partly clouded.

APRIL 7.—The temperature at sunrise was 37°, with a moist air ; and a faintly clouded sky indicated that the wind was southerly along the coast.



We travelled toward the Shastl peak, the mountain ranges on both sides of the valleys being high and rugged, and snow-covered. Some remarkable peaks in the Sierra, to the eastward, are called *the Sisters*, and, nearly opposite, the Coast Range shows a prominent peak, to which in remembrance of my friend Senator Linn, I gave the name MOUNT LINN, as an enduring monument to recall the prolonged services rendered by him in securing to the country our Oregon coast. I trust this reason will protect it from change. These giant monuments, rising above the country and seen from afar, keep alive and present with the people the memory of patriotic men, and so continue their good services after death. Mount Linn and Mount Shastl keep open to the passing glance each an interesting page of the country's history—the one recording a successful struggle for the ocean boundary which it overlooks, the other the story of a strange people passed away. And so, too, these natural towers call attention from the detail of daily occupation to the larger duties which should influence the lives of men.

Leaving the Sacramento, at a stream called Red Bank Creek, we entered on a high and somewhat broken upland, timbered with at least four varieties of oaks, with *mansanita* (*arbutus Menziesii*) and other shrubbery interspersed. The *mansanita* is the strange shrub which I met in March of '44 in coming down from the Sierra Nevada to Sutter's Fort, and which in my journal of that time I described as follows : "A new and singular shrub, which had made its appearance since crossing the mountain, was very frequent to-day. It branched out near the ground, forming a clump eight to ten feet high, with pale green leaves of an oval form, and the body and branches had a naked appearance as if stripped of the bark, which is very smooth and thin, of a chocolate color, contrasting well with the pale green of the leaves." Out of its red berries the Indians make a cider which, put to cool in the running streams, makes a pleasant, refreshing drink. A remarkable species of pine, having leaves in threes (sometimes six to nine inches long), with bluish foliage, and a spreading, oak-shaped top, was scattered through the timber. I have remarked that this tree grows lower down the mountains than the other pines, being found familiarly associated with oaks, the first met after leaving the open valleys, and seeming to like a warm climate. It seems that even among inanimate things association levels differences. This tree, growing among oaks, forgets its narrow piny form and color, and takes the spreaded shape of the oaks, their broad summits, and lesser heights. Flowers were as usual abundant. The splendid California poppy characterized all the route along the valley. A species of clover was in bloom, and the berries of the *mansanita* were beginning to redden on some trees, while others were still in bloom We encamped, at an elevation of about one thousand feet above the sea, on a large stream

called Cottonwood Creek, wooded on the bottoms with oaks, and with cotton-woods along the bed, which is sandy and gravelly. The water was at this time about twenty yards wide, but is frequently fifty. The face of the country traversed during the day was gravelly, and the bottoms of the creek where we encamped have a sandy soil.

There are six or seven rancherias of Indians on the Sacramento River between the farm where we had crossed the Sacramento and the mouth of this creek, and many others in the mountains about the heads of these streams.

The next morning was cloudy, threatening rain, but the sky grew brighter as the sun rose, and a southerly wind changed to northwest, which brought, as it never fails to bring, clear weather.

We continued sixteen miles up the valley, and encamped on the Sacramento River. In the afternoon (April 8th) the weather again grew thick, and in the evening rain began to fall in the valley and snow on the mountains. We were now near the head of the lower valley, and the face of the country and the weather began sensibly to show the influence of the rugged mountains which surround and terminate it.

The valley of the Sacramento is divided into upper and lower—the lower two hundred miles long, the upper known to the trappers as Pitt river, about one hundred and fifty ; and the latter not merely entitled to the distinction of upper, as being higher up the river, but also as having a superior elevation of some thousands of feet above it. The division is strongly and geographically marked. The Shastl peak stands at the head of the lower valley, rising from a base of about one thousand feet out of a forest of heavy timber. It ascends like an immense column upwards of fourteen thousand feet (nearly the height of Mont Blanc), the summit glistening with snow, and visible, from favorable points of view, at a distance of one hundred and forty miles down the valley. The river here, in descending from the upper valley, plunges down through a cañon, falling two thousand feet in twenty miles. This upper valley is one hundred and fifty miles long, heavily timbered, the climate and productions modified by its altitude, its more northern position, and the proximity and elevation of the neighboring mountains covered with snow. It contains valleys of arable land, and is deemed capable of settlement. Added to the lower valley, it makes the whole valley of the Sacramento three hundred and fifty miles long,

April 9.—At ten o'clock the rain which commenced the previous evening had ceased, and the clouds clearing away, we boated the river, and continued our journey eastward toward the foot of the Sierra. The Sacramento bottoms here are broad and prettily wooded, with soil of a sandy character. Our way led through very handsome, open woods, principally of oaks, mingled with a considerable quantity of the oak-shaped pine. Interspersed



among these were bosquets or thickets of *mansanita*, and an abundant white-flowering shrub, now entirely covered with small blossoms. The head of the valley here (lower valley) is watered by many small streams, having fertile bottom-lands, with a good range of grass and acorns. In about six miles we crossed a creek twenty or twenty-five feet wide, and several miles farther descended into the broad bottoms of a swift stream about twenty yards wide, called Cow Creek, so named as being the range of a small band of cattle, which ran off here from a party on their way to Oregon. They are entirely wild, and are hunted like other game. A large band of antelope was seen in the timber, and five or six deer came darting through the woods. An antelope and several deer were killed. There appear to be two species of these deer—both of the kind generally called black-tailed; one, a larger species frequenting the prairies and lower grounds ; the other, much smaller, and found in the mountains only. The mountains in the northeast were black with clouds when we reached the creek, and very soon a fierce hailstorm burst down on us, scattering our animals and covering the ground an inch in depth with hailstones about the size of wild cherries. The face of the country appeared as whitened by a fall of snow, and the weather became unpleasantly cold. The evening closed in with rain, and thunder rolling around the hills. Our elevation here was between one thousand and eleven hundred feet. At sunrise the next morning the thermometer was at 33°. The surrounding mountains showed a continuous line of snow, and the high peaks looked wintry. Turning to the southward, we retraced our steps down the valley, and reached Lassen's, on Deer River, on the evening of the 11th. The Sacramento bottoms between Antelope and Deer River were covered with oats, which had attained their full height, growing as in sown fields. The country here exhibited the maturity of spring. The California poppy was everywhere forming seed-pods, and many plants were in flower and seed together. Some varieties of clover were just beginning to bloom. By the middle of the month the seed-vessels of the California poppy which, from its characteristic abundance, is a prominent feature in the vegetation, had attained their full size ; but the seeds of this and many other plants, although fully formed, were still green-colored, and not entirely ripe. At this time I obtained from the San Joaquin valley seeds of the poppy, and other plants, black and fully ripe, while they still remained green in this part of the Sacramento—the effect of a warmer climate in the valley of the San Joaquin. The mean temperature for fourteen days, from the 10th to the 24th of April, was 43° at sunrise, 58° at nine in the morning, 64° at noon, 66° at two in the afternoon, 69° at four, and 58° at sunset (latitude 40°). The thermometer ranged at sunrise from 38° to 51°, at four (which is the hottest of those hours of the day when the temperature was noted) from 53° to 88°, and at sunset from 49° to

65°. The dew point was 40°.3 at sunrise, 47°.3 at 9 in the morning, 46°.1 at noon, 49°.2 at 2 in the afternoon, 49°.2 at 4, and 46°.6 at sunset; and the quantity of moisture in a cubic foot of air at corresponding times was 3.104 grs., 3.882 grs., 3.807 grs., 4.213 grs., 4.217 grs., 3.884 grs., respectively. The winds fluctuated between northwest and southeast, the temperature depending more upon the state of the sky than the direction of the winds—a clouded sky always lowering the thermometer fifteen or twenty degrees in a short time. For the greater number of the days above given the sky was covered and the atmosphere frequently thick with rain at intervals from the 19th to the 23d.

Here at Lassen's I set up the transit and during the nights of the 14th and 16th (April) obtained good observations of moon culminations which established the longitude of the place in 120° 56′ 44″, latitude obtained 39° 57′ 04″. This was the third of my main stations and the place of observation was upon Deer River half a mile above its mouth in the Sacramento and opposite Lassen's house.

On the 24th I left Lassen's, intending to penetrate the country, along the Cascade ranges north into Oregon, and connect there with the line of my journey of '43, which lay up the Fall River of the Columbia and south to the great savannah, or grassy meadow-lake through which flows from among the ridges of the Cascade Mountains the principal tributary, or rather the main stream of the waters which make the Tlamath Lake and River. It is a timbered country, clothed with heavy pine forests that nourish many streams.

Travelling up the Sacramento over ground already described, we reached the head of the lower valley in the evening of the second day, and in the morning of the 26th left the Sacramento, going up one of the many pretty little streams that flow into the main river around the head of the lower valley. On either side low, steep ridges were covered along their summits with pines, and oaks occupied the somewhat broad bottom of the creek. Snowy peaks which made the horizon on the right gave a cool tone to the landscape, and the thermometer showed a temperature of 71°, but there was no breeze and the air was still and hot. There were many runs and small streams, with much bottom-land, and the abundant grass and acorns, both of excellent quality, made it a favorite resort for game. The frequent appearance of game furnished excitement, and together with the fine weather, which made mere breathing an enjoyment, kept the party in exhilarated spirits. At our encampment among oak groves in the evening, we found ourselves apparently in a bear garden, where the rough denizens resented our intrusion and made a lively time for the hunters, who succeeded in killing four of them after we had encamped. During our skirmishing among



the bear this afternoon we had overtaken and slightly wounded one, just enough to irritate him. At this moment Delaware Charley's horse fell near by the bear. To save Charley we had all to close in on the bear, who was fortunately killed before he could get the Delaware. In his fall the hammer of his gun struck Charley on the bridge of his nose and broke it in the middle. We had no surgeon, but I managed to get it into good shape and it healed without trace of injury. I was always proud of this surgical operation, and the Delaware was especially pleased. He was a fine-looking young man, and naïvely vain of his handsome face, which now had a nose unusual among his people; the aquiline arch had been broken to knit into a clear straight line, of which he became very vain.

At sunset the weather was pleasant, with a temperature of 56°. I had only an observation for latitude, which put the camp in 40° 38′ 58″, and the elevation above the sea was one thousand and eighty feet. The day following we found a good way along a flat ridge; there was a pretty stream in a mountain valley on the right, and the face of the country was already beginning to assume a mountainous character, wooded with mingled oak and long-leaved pine, and having a surface of scattered rocks, with grass or flowers, among them the three-leaved poppy, its parti-colored blossoms waving on the long stem above the grass, and gaining for itself the name *mariposas*, already mentioned because of its resembling living butterflies. I speak often of the grass and the flowers, but I have learned to value the one and the other lends a beauty to the scenery which I do not like to omit, and the reader can always imagine for himself the brightness they give when once he has had described the glorious flowers of this country, where the most lovely hues are spread in fields over both hill and plain. At noon, when we were crossing a high ridge, the temperature was down to 61°, and where we encamped at an elevation of two thousand four hundred and sixty feet, on a creek that went roaring into the valley, the sunset temperature was 52°.

The next day I continued up the stream on which we had slept, and with it the mountain slope rose rapidly, clothed with heavy timber. On crossing one of the high ridges, snow and the great pine *Lambertiani* appeared together, and an hour before noon we reached a pass in the main ridge of the Sierra Nevada, in an open pine forest at an elevation of only four thousand six hundred feet, where the snow was in patches and the deciduous oaks were mingled with the pines. The thermometer was at 50°, and we were not above the upper limit of the oak region. This pass is in about the fortieth degree of latitude, and is in the terminating point of the northern link of the Sierra Nevada chain, which the Cascade range takes up with the link of the Shastl peak. Between the points of these links

the upper Sacramento River breaks down on its way to the Bay of San Francisco and the Tlamath River to the sea.

Going through this pass and descending the mountain, we entered into what may be called a basin or mountain valley, lying north and south along the ranges of the Cascade Mountains. Here we found a region very different from the valley of California. We had left behind the soft, delightful climate of the coast, from which we were cut off by the high, snowy mountains, and had ascended into one resembling that of the Great Basin, and under the influence of the same elevation above the sea; but more fertile and having much forest land, and well watered. The face of the country was different from that of the valley which we had just left, being open and more spread into plain, in which there were frequent lakes as well as rivers. The soil itself is different; sometimes bare. At times we travelled over stretches in the forest where the soil was a gray or yellowish-white pumice-stone, like that which I have seen along the Cascade range in travelling south from the Columbia River, where the soil was covered with splendid pine forests, but where there was hardly a blade of grass to be found. Very different from this the compact growth of grass and flowers which belong to the California valley, where the rich soil had accumulated the wash of ages from the mountains, and where the well-watered land and moisture of the air combine to cover the country with its uncommon and profuse vegetation. The country where we now were was not known to any of the men with me, and I was not able to communicate with any of the Indians, who in this region were unfriendly—from these I might have learned the names by which the natural features were known to them. Except in some of its leading features I regarded this district as not within the limits of fixed geography, and therefore I thought it well to give names to these; to some at the time, and to others afterward, when I came to making up a map of the country. And this was also necessary, as otherwise I could not conveniently refer to them.

On the 29th of April I encamped on the upper Sacramento, above Fall River, which is tributary to it. I obtained observations here, which gave for longitude 121° 07′ 59″, and for latitude 40° 58′ 43″; and the next day again encamped on it at the upper end of a valley, to which, from its marked form, I gave the name *Round Valley*. By observation the longitude here is 121° 01′ 23″, latitude 41° 17′ 17″. On the first of May I encamped on the southeastern end of a lake, which afterwards I named Lake Rhett in friendly remembrance of Mr. Barnwell Rhett, of South Carolina, who is connected with one of the events of my life which brought with it an abiding satisfaction. I obtained observations here which placed this end of the lake in longitude 121° 15′ 24″, and latitude 41° 48′ 49″.



This camp was some twenty-five or thirty miles from the lava beds, near which Major-General Canby was killed by the Modocs, twenty-seven years later; and when there was some of the hardest fighting known in Indian history between them and our troops.

This Indian fighting is always close, incurring more certain risk of life and far more sanguinary, than in the ordinary contests between civilized troops. Every Indian fights with intention, and for all that is in him; he waits for no orders, but has every effort concentrated on his intention to kill. And, singularly, this Indian fighting, which calls for the utmost skill and courage on the part of men, is not appreciated by the Government, or held worthy of the notice given to the milder civilized warfare.

When we left Round Valley in the morning Archambeau, who was an inveterate hunter, had gone off among the hills and towards the mountain in search of game.

We had now entered more into the open country, though still a valley or high upland along the foot of the main ridge, and were travelling north; but the route of the day is often diverted from its general course by accidents of country and for convenient camping grounds. Archambeau did not come in at night, and when the morning came and did not bring him I did not move camp, but sent out men to look for him. Since leaving the California Mountains we had seen no Indians, though frequently we came upon their tracks and other sign. All through this country there were traces of them. Doubtless our camp-fires had discovered us to them, but they hovered around out of our way and out of sight. The second day passed and still no trace of Archambeau had been found, and the greater part of the third was passed in scouring the country. There would have been little difficulty in a prairie region, but in a broken or hilly country much ground cannot be covered and the search is restricted to a small area. We had now been in camp three days and I began to be seriously disturbed by his absence. Game had been found scarce in the immediate neighborhood. He had nothing with him but a little dried meat when he turned off from the party, expecting to rejoin us before night, and the Indians in the region through which we were travelling were known to be hostile and treacherous, with a fixed character for daring. Parties from as far north as the Hudson Bay Company's post who had penetrated here had met with some rough experiences, and the story of trapper adventure hereabout was full of disaster. On one occasion a large party of trappers from the north were encamped on one of the streams of the Cascade range, and having been led into carelessness by the apparent friendly conduct of the Indians, were every man killed. It was easy to waylay a single man, especially if he were intent on game. I had always been careful of my men,