and Green River forks of the Great Colorado. The next day we encamped at a creek on the shore of the Great Salt Lake, where I made the second principal station for longitude. These observations resulted in longitude 112° 06′ 08″, and latitude 40° 45′ 53″.

It will be remarked that our journey from the head of the Arkansas River had been continuously in Mexican territory, as was all of the Salt Lake valley. Two weeks were spent in this valley and on its tributary streams, during which we were occupied in fixing the positions of various points, and extending our examination into and around the lake.

The rocky shores of its islands were whitened by the spray which leaves salt on everything it touches, and a covering like ice forms over the water which the waves throw among the rocks. This seems to be the dry season when the waters recede ; and the shores of the lake, especially on the south side, are whitened with incrustations of fine white salt. The shallow arms of the lake, under a slight covering of briny water, present beds of salt extending for miles. Plants and bushes blown by the winds upon these fields are entirely incrusted with crystallized salt. The stem of a small twig, less than the size of a goose-quill, from the southeastern shore, showed a formation of more than an inch thick of crystallized salt. The fresh water received by the lake is great in quantity, from the many fresh-water streams flowing into it, but they seem to have no perceptible effect. We could find in it no fish, or animal life of any kind, the larvæ which were accumulated in beds on the shore being found to belong to winged insects. On the contrary, the upper lake—the Timpanogos—which discharges into this by a stream about thirty-five miles long, is fresh water, and affords large trout and other fish in great numbers. These constitute the food of the Indians during the fishing season.

The mineral or rock salt is found in beds of great thickness at the heads of a stream in the mountains to the eastward behind the lakes. These strata probably underlie the bed of the Great Lake, and constitute the deposit from which it obtains its salt. It was found by us in the place marked by Humboldt on his map of New Spain as derived from the journal of the missionary Father Escalante, who towards the close of the last century attempted to penetrate the unknown country from Santa Fé of New Mexico to Monterey of California. But he does not seem to have got further in his adventurous journey—and this at that time was far—than the south end of the Timpanogos. Southeast of this lake is the chain of the Wahsatch Mountains, which make in that part the rim of the Great Basin. In this mountain, at the place where Humboldt has written "*Montagnes de sel Gemme*" (Rock Salt Mountain), the strata of salt are found in thick beds of red clay, at the heads of a small stream tributary to the Utah or Timpanogos Lake on its southeasterly side.

THE CLAIMANT.

There is at the southern end of the lake a large peninsular island, which the Indians informed me could at this low stage of the water be reached on horseback. Accordingly on the 18th I took with me Carson and a few men and rode from our encampment near the southeastern shore across the shallows to the island—almost peninsular at this low stage of the waters—on the way the water nowhere reaching above the saddle-girths. The floor of the lake was a sheet of salt resembling softening ice, into which the horses' feet sunk to the fetlocks. On the island we found grass and water and several bands of antelope. Some of these were killed, and, in memory of the grateful supply of food they furnished, I gave their name to the island. An observation of the meridian altitude of the sun, taken on the summit of the peak of the island, gave for its latitude 40° 58′ 48″.

Returning to the shore we found at the camp an old Utah Indian. Seeing what game we had brought in he promptly informed us that the antelope which we had been killing were his—that *all* the antelope on that island belonged to him—that they were all he had to live upon, and that we must pay him for the meat which we had brought away. He was very serious with us and gravely reproached me for the wrong which we had done him. Pleased with his readiness, I had a bale unpacked and gave him a present—some red cloth, a knife, and tobacco, with which he declared himself abundantly satisfied for this trespass on his game preserve. With each article laid down, his nods and gutturals expressed the satisfaction he felt at the success of his imaginary claim. We could see, as far as an Indian's face lets expression be seen, that he was thinking, "I went to the White Chief who killed my antelope, and made him pay for it." There is nothing new under the sun.

The climate of this lake country does not present the rigorous winter due to its elevation and mountainous structure. Observations made during our stay here show that around the southern shore of the lake, latitude 40° 30′ to 41°, for two weeks in the month of October, from the 13th to the 27th, the mean temperature was 40° at sunrise, 70° at noon, and 54° at sunset; ranging at sunrise from 28° to 57°; at noon, from 62° to 76°; at four in the afternoon, from 58° to 69°; and at sunset, from 47° to 57°.

Until the middle of the month the weather remained fair and very pleasant. On the 15th it began to rain in occasional showers which whitened with snow the tops of the mountains on the southeast side of the lake valley. Flowers were in bloom during all the month. About the 18th, when we visited the large island in the south of the lake, *helianthus*, several species of *aster*, *erodium cicutarium*, and several other plants were in fresh and full bloom; the grass of the second growth was coming up finely, and vegetation generally betokened the lengthened summer of the climate.

The 16th, 17th, and 18th were stormy with rain; heavy at night; the peaks of the Bear River range and tops of mountains covered with snow. On the 18th the sky cleared with weather like that of late spring, and continued mild and clear until the end of the month, when the fine weather was again interrupted by a day or two of rain. No snow showed within 2000 feet above the level of the valley.

On the 23d I encamped at a spring in a valley opening on the southern shore of the lake. On the way, near the shore, we came to a small run flowing into the lake, where an Indian was down on his hands and knees, drinking. Going there also to drink, we were surprised to find it salt. The water was clear, and its coolness indicated that it came from not far below the surface.

On the 25th we moved camp to a valley near the southwestern shore about fifty miles from the station creek, and in longitude 113° 05′ 09″, latitude 40° 38′ 17″.

At this point we were to leave the lake. From any neighboring mountain height looking westward, the view extended over ranges which occupied apparently the whole visible surface—nothing but mountains, and in winter-time a forbidding prospect. Afterwards, as we advanced, we found the lengthening horizon continued the same prospect until it stretched over the waters of the Pacific. Looking across over the crests of these ridges, which nearly all run north and south, was like looking lengthwise along the teeth of a saw.

Some days here were occupied in deciding upon the direction to be taken for the onward journey. The route I wished to take lay over a flat plain covered with sage-brush. The country looked dry and of my own men none knew anything of it; neither Walker nor Carson. The Indians declared to us that no one had ever been known to cross the plain, which was desert; so far as any of them had ventured no water had been found. It was probably for this reason Father Escalante had turned back. Men who have travelled over this country in later years are familiar with the stony, black, unfertile mountains, that so often discouraged and brought them disappointment. Nearly upon the line of our intended travel, and at the farther edge of the desert, apparently fifty to sixty miles away, was a peak-shaped mountain. This looked to me to be fertile, and it seemed safe to make an attempt to reach it. By some persuasion and the offer of a tempting reward, I had induced one of the local Indians to go as guide on the way to the mountain; willing to profit by any side knowledge of the ground, or water-hole that the rains might have left, and about which the Indians always know in their hunts through the sage after small game.

I arranged that Carson, Archambeau, and Maxwell should set out at night, taking with them a man having charge of a pack-mule with water and

provisions, and make for the mountain. I to follow with the party the next day and make one camp out into the desert. They to make a signal by smoke in case water should be found.

The next afternoon, when the sun was yet two hours high, with the animals rested and well watered, I started out on the plain. As we advanced this was found destitute of any vegetation except sage-bushes, and absolutely bare and smooth as if water had been standing upon it. The animals being fresh I stretched far out into the plain. Travelling along in the night, after a few hours' march, my Indian lost his courage and grew so much alarmed that his knees really gave way under him and he wabbled about like a drunken man. He was not a true Utah, but rather of the Pi-utes, a Digger of the upper class, and he was becoming demoralized at being taken so far from his *gite*. Seeing that he could be of no possible use I gave him his promised reward and let him go. He was so happy in his release that he bounded off like a hare through the sage-brush, fearful that I might still keep him.

Sometime before morning I made camp in the sage-brush, lighting fires to signal Carson's party. Before daybreak Archambeau rode in; the jingling of his spurs a welcome sound indicating as it did that he brought good tidings. They had found at the peak water and grass, and wood abundant. The gearing up was quickly done and in the afternoon we reached the foot of the mountain, where a cheerful little stream broke out and lost itself in the valley. The animals were quickly turned loose, there being no risk of their straying from the grass and water. To the friendly mountain I gave the name of Pilot Peak. From my observation this oasis is in the latitude 41° 00′ 28″ longitude 114° 11′ 09″. Some time afterward, when our crossing of the desert became known, an emigrant caravan was taken by this route, which then became known as *The Hastings Cut-off*.

We gave the animals a day's rest here. The crossing of the desert had been a little strain upon them; many of them being grain-fed horses, unused to travelling on grass. These cannot stand being over-fatigued, soon reaching the stage which is called in the language of the country *resté;* from which they cannot recover without time, and must be left on the trail. With a mule it is very different. He may be *resté* at night, but give him plenty of good grass and water and he is ready for service in the morning.

On the 1st of November we resumed our journey. The ridges which occupied the basin and which lay across our route are short, being the links which form the ranges; and between their overlapping points were easy passes by which the valleys connect. This is their regular structure.

Through these passes we wound our way and in the evening encamped at a spring in the head of a ravine which my observations put in longitude 114° 26′ 22″, latitude 40° 43′ 29″, and the next day I made camp at a spring to which I gave the name of Whitton, one of my men who discovered it.

In advancing, the country was always carefully examined, so far as the eye could form any judgment upon it; and from the early morning start the men were spread over it to search for a camping-place which with water should give the best grass.

The winter was now approaching and I had good reason to know what the snow would be in the Great Sierra. It was imprudent to linger long in the examination of the Great Basin. In order therefore to use to the best advantage the interval of good weather I decided to divide my party and run two separate lines across the Basin.

On the evening of the 8th I encamped on a small stream which I called Crane's Branch after one of my Delaware hunters. Crane was a good judge of country with a quick eye exercised in hunting. He was one of the men I liked to have near me. He was usually serious and dignified even for an Indian, who are naturally grave men. The objects which furnish ideas to the mind of an Indian are very few and mostly what he sees within a limited range. Within this, the game and other natural objects which come before his eyes; and outside of it, the enemies whom he goes to fight and scalp, if he can. These make his two sets of ideas. Nearer to the whites, other subjects force their way in confused shape through the barriers of an unknown language, but these are quite outside of the usual Indian understanding. The subjects belonging to their manner of life they hesitate to talk about with the whites; this and the difference of language make them reserved to us. With me the Delawares were now making the grand tour.

Crane's Branch led into a larger stream that was one of two forks forming a river to which I gave the name of Humboldt. I am given by himself the honor of being the first to place his great name on the map of the continent.

Both the river and mountain to which I gave his name are conspicuous objects; the river stretching across the Basin to the foot of the Sierra Nevada, and the mountain standing out in greater bulk and length than its neighbors, and being one of those which I have named fertile mountains, having on it abundant water and grass, and woods.

Years after in travelling through that country I was glad to find that river and mountain held his name, not only on the maps, but in usage by the people.

I now divided the party, giving to Mr. Kern the charge of the main body with instructions to follow down and survey the Humboldt River and its valley to their termination in what was called "the Sink." This is a broad level bottom of fertile land; probably once the bed of the lake when over all this region, at a time not very remote, the waters were higher. When I passed there two years later it was covered with grass and several varieties of clover. Thence to continue on along the eastern foot of the Sierra to a

lake to which I have given the name of Walker, who was to be his guide on this survey. I had engaged Mr. Walker for guide in this part of the region to be explored, with which, and the southern part of the "California Mountain" he was well acquainted. The place of meeting for the two parties was to be the lake.

This party would have a secure line of travel in following the river, which would furnish grass and water for the entire journey and so keep the greater number of the animals in as good condition as the season admitted.

To accompany myself I selected ten men, among whom were some of the Delawares. I took leave of the main party and set out on a line westward directly across the Basin, the look of the country inducing me to turn somewhat to the south.

We lost no time in pressing forward; but the tortuous course rendered unavoidable by the necessity of using just such passes as the mountains gave, and in searching for grass and water, greatly lengthened our road. Still it gave me knowledge of the country. The early morning began the day's work by the usual careful study of the ground ahead for indications to the best line of travel, and so soon as they were ready the hunters started out to the right and left, scouring the country as we advanced. When anything worthy of note was discovered a shot was fired, or the horseman would make a few short turns backward and forward as a signal that something requiring attention had been found.

We succeeded in finding always good camping-grounds, usually availing ourselves of the Indian trails which skirted the foot of the ridges. When well marked showing use, these never failed to lead to water and the larger the trail the more abundant the water. This we always found at the edge of the mountain, generally in some ravine, and quickly sinking into the ground; never reaching the valley except in seasons of rain. Doubtless artesian wells would find it and make fertile these valleys, which now are dry and barren.

Travelling along the foot of a mountain on one of these trails we discovered a light smoke rising from a ravine, and riding quietly up, found a single Indian standing before a little sage-brush fire over which was hanging a small earthen pot, filled with sage-bush squirrels. Another bunch of squirrels lay near it and close by were his bow and arrows. He was deep in a brown study, thinking perhaps of some game-trail which he had seen and intended to follow that afternoon, and did not see or hear us until we were directly upon him, his absorbed thoughts and the sides of the ravine cutting off sounds. Escape for him was not possible and he tried to seem pleased, but his convulsive start and wild look around showed that he thought his end had come. And so it would—abruptly—had the Delawares been alone. With a deprecating smile he offered us