

F. B. Graham, Lith.

A TRIBUTARY OF THE GILA.

we had a shower which scarcely sufficed to lay the dust, yet the whole face of the country bears marks of rains, and running water met with in no other part of our journey. The absence of vegetation will, in some measure, account for the deep incisions made by running water in the earth.

November 5.—The howitzers did not reach camp last night, yet, the grass was so bad, and our beds, on the round pebbles everywhere covering the surface of the ground, so uncomfortable, it was determined to move camp.

The Gila now presents an inhospitable look; the mountains of trap, granite, and red sandstone, in irregular and confused strata, but generally dipping sharply to the south, cluster close together; and one ignorant of the ground could not tell from what direction the river came, or in what direction it flowed onwards to its mouth. The valley, not more than 300 feet from base to base of these perpendicular mountains, is deep, and well grown with willow, cottonwood, and mezquite.

At several places, perpendicular walls of trap dyke projected from the opposite side of the river, giving the idea that the river waters had once been dammed up, and then liberated by the blow of a giant; for the barrier was shattered—not worn away. In the course of six miles we had crossed and re-crossed the river twice as many times, when we left it by turning abruptly up a dry ravine to the south. This we followed for three miles, and crossed a ridge at the base of Saddle-Back mountain, (so named from its resemblance to the outline of a saddle,) and descended by another dry creek to the San Pedro, running nearly north.

The valley of this river is quite wide, and is covered with a dense growth of mezquite, (acacia prosopis,) cotton wood, and willow, through which it is hard to move without being unhorsed. The whole appearance gave great promise, but a near approach exhibited the San Pedro, an insignificant stream a few yards wide, and only a foot deep.

For six miles we followed the Gila. The pitahaya and every other variety of cactus flourished in great luxuriance. The pitahaya, tall, erect, and columnar in its appearance, grew in every crevice from the base to the top of the mountains, and in one place I saw it growing nearly to its full dimensions from a crevice not much broader than the back of my sabre. These extraordinary looking plants seem to seek the wildest and most unfrequented places.

The range of mountains traversed to-day is the same we have been in for some days, and is a continuation of that of Mount Graham, which turns sharply westward from Turnbull's peak, carrying with it the Gila.

Saddle-Back is an isolated peak of red sandstone that has every appearance of having once formed the table land, and being harder than the surrounding surface, having withstood the abrasion of water.

The uplands covered as usual with mezquite, chimaza, ephydræ, the shrub with the edible nut, and cactus, of this a new and beau-

tiful variety. In the cañon we heard in advance of us the crack of a rifle; on coming up we found that old Francisco, one of the guides, had killed a calf, left there, doubtless, by the Apaches.

The dry creek by which we crossed to the San Pedro river was the great highway leading from the mountain fastnesses into the plains of Santa Cruz, Santa Anna, and Tucson, frontier towns of Sonora. Along this valley was distinctly marked the same fresh trail, noted yesterday, of horses, cattle and mules.

The bed of this creek was deeply cut, and turned at sharp angles, forming a zigzag like the bayoux laid by sappers in approaching a fortress, each turn of which (and they were innumerable) formed a strong defensive position. The Apache once in possession of them is secure from pursuit or invasion from the Mexican.

Since the 1st November, we have been traversing, with incredible labor and great expenditure of mule power, the stronghold of these mountain robbers, having no other object in view than making our distance westward; yet here we are at this camp, only five seconds of time west of camp 89, at Disappointment creek, and one minute and four seconds west of our camp at the mouth of the San Francisco.

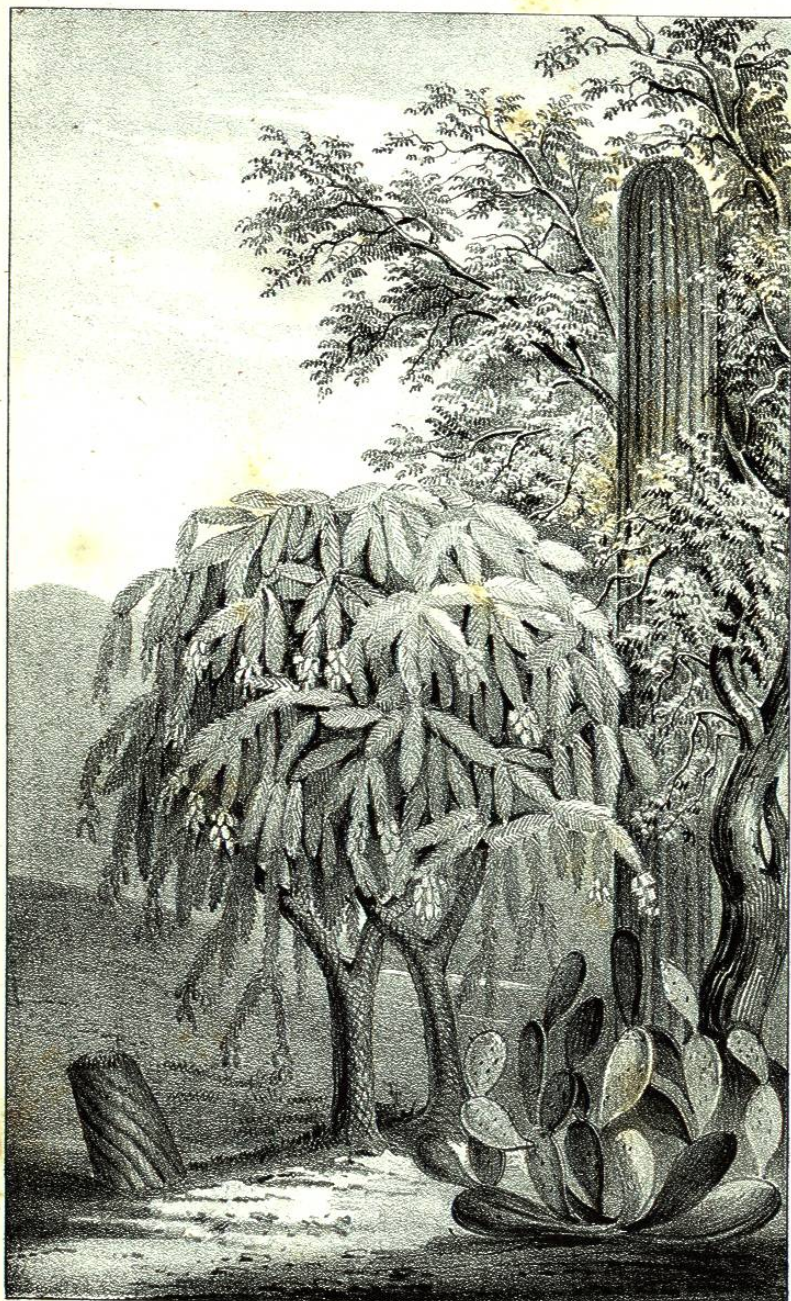
Nature has done her utmost to favor a condition of things which has enabled a savage and uncivilized tribe, armed with the bow and lance, to hold as tributary powers three fertile and once flourishing states, Chihuahua, Sonora, and Durango, peopled by a Christian race, countrymen of the immortal Cortez. These states were at one time flourishing, but such has been the devastation and alarm spread by these children of the mountains, that they are now losing population, commerce and manufactures at a rate which, if not soon arrested, must leave them uninhabited.

November 6.—For the double purpose of allowing the howitzers to come up, and to recruit our mules, it is decided this shall be a day of rest. The grama is good, but sparsely scattered over the hills, and it is necessary to loosen every animal and let them graze at will.

We are yet 500 miles from the nearest settlement, and no one surveying our cavalry at this moment would form notions favorable to the success of the expedition.

Except a few saddle mules, the private property of officers, which have been allowed to run loose, every animal in camp is covered with patches, scars, and sores, made by the packs in the unequal motion caused by the ascent and descent of steep hills.

The failure of the Apaches to bring in their mules, was a serious disappointment, and entirely justifies the name given to the creek, where they agreed to meet us. Besides, being the only means of transportation, they are, in extremity, to serve us as food, and the poor suffering creatures before us, give no very agreeable impression of the soup which their meat will furnish. However grave the subject may appear, it is the common source of merriment. All seem to anticipate it as a matter of course, and the constant recurrence of the mind to the idea, will no doubt accustom us to it, and make mule as acceptable as other soup.



VEGETATION ON THE GILA

In the sandy arroyos where our fires burn, that look as if they had been formed but a year or two since, was broken pottery, and the remains of a large building, similar in form, substance, and apparent antiquity to those so often described. Strolling over the hills alone, in pursuit of seed and geological specimens, my thoughts went back to the States, and when I turned from my momentary aberrations, I was struck most forcibly with the fact that not one object in the whole view, animal, vegetable, or mineral, had any thing in common with the products of any State in the Union, with the single exception of the cotton wood, which is found in the western States, and seems to grow wherever water flows from the vertebral range of mountains of North America; this tree we found growing near the summit of the Piñon Lano range of mountains, indeed, always where a ravine had its origin.

In one view could be seen clustered, the *larrea Mexicana*, the cactus, (king) cactus, (chandelier) green wood acacia, chamiza, *prosopis odorata*, and a new variety of sedge, and then large open spaces of bare gravel.

The only animals seen were lizards, scorpions, and tarantulas.

I made elaborate observations for time and latitude, and for longitude by measurement of lunar distances. Anxious to observe eclipses of Jupiter's satellites, I determined once more to try the small telescope with which the satellites of Jupiter could just be discerned. I strained my eyes for two nights in succession to see if I could discover the moment of immersion and emersion of I and III satellites of Jupiter, which were visible from our camp. My efforts were fruitless, and the result to myself is a distressing nervous affection of the eye, which may injure the correctness of my other observations of this night.

The resulting latitude of the place is $32^{\circ} 57' 43''$.

longitude " $110^{\circ} 7' 23''$.
Rate of chronometer 2075, losing $12'' 7s$. per day.

The height by barometer 2115 feet above the sea. The latitude was deduced from 13 circum-meridian altitudes of *beta aquirii*, and 12 altitudes of *polaris*. The longitude from 8 distances between *alpha arietis* and the δ , 9 of *regulus* and the δ , and 5 of *aldebaran* and the δ .

November 7.—About two miles from our camp the San Pedro joins the Gila just as the latter leaps from the mouth of the cañon. The place of meeting is a bottom three miles wide, seeming a continuation of that of the Gila.

It is principally of deep dust and sand, overgrown with cotton wood, mezquite, chamiza, willow, and the black willow. In places there are long sweeps of large paving pebbles, filled up with drift wood, giving the appearance of having been overflowed by an impetuous torrent. The hills on both sides of the river, still high, but now farther off, and covered to the top with soil producing the mezquite and pitahaya, as the day advanced, began to draw in closer, and before it closed, had again contracted the valley to a space little more than sufficient for the river to pass; and at halt, after

making seventeen miles, we found ourselves encompassed by hills much diminished in height, but not in abruptness. The road, except the deep dust which occasionally gave way and lowered a mule to his knee, was good, that is, there were no hills to scale. The river was crossed and re-crossed four times. At 12 and 14 miles there were good patches of grama, burned quite yellow, but for most of the way, and at our camp, there was little or no grass, and our mules were turned loose to pick what they could of rushes and willow along the margin of the stream.

Wherever the formation was exposed along the river, it was a conglomerate of sandstone, lime and pebbles, with deep caverns.

Nearly opposite our camp of this date, and about one-third the distance up the hill, there crops out ore of copper and iron, easily worked, the carbonate of lime and calcareous spar. A continuation of the vein of ore was found on the side where we encamped, and a large knoll strewed with what the Spaniards call *guia*, the English of which is "guide to gold."

The night has set in dark and stormy; the wind blows in gusts from the southwest, and the rain falling in good earnest, mingled with the rustling noise of the Gila, which has now become swift and impetuous, produces on us, who have so long been accustomed to a tranquil atmosphere, quite the impress of a tempest. We have been so long without rain as to cease to expect or make provision against it, and the consequence is the greatest difficulty in getting the men to provide coverings for the destructible portion of our rations.

Three Indians hailed us just before making camp, and after much parley were brought in. They feasted heartily, and promised to bring in mules. At first they denied having any; but after their appetites were satisfied, their hearts opened, and they sent the youngest of their party to their town, which was at the head of the dry creek of our camp, of the night before last. The fellow went on his way, as directed, till he met the howitzers, which so filled him with surprise and consternation that he forgot his mission, and followed the guns to camp in mute wonder. These people are of the Piñon Lano (piñon wood) tribe, and we had been told by the Pinoleros (pinole eaters) that the chief of this band had mules.

Flights of geese and myriads of the blue quail, and a flock of turkie's, from which we got one.

The river bed, at the junction of the San Pedro, was seamed with tracks of deer and turkey; some signs of beaver and one trail of wild hogs.

Our camp was on a flat, sandy plain, of small extent, at the mouth of a dry creek, with deep washed banks, giving the appearance of containing at times a rapid and powerful stream, although no water was visible in the bed. At the junction, a clear, pure stream flowed from under the sand. From the many indications of gold and copper ore at this place, I have named it Mineral creek; and, I doubt not, a few years will see flat boats descending the river from this point to its mouth, freighted with its precious ores.



CHAIN OF NATURAL SPIRES ON THE GILA.

There was a great deal of pottery about our camp, and just above us were the supposed remains of a large Indian settlement, differing very slightly from those already described.

November 8.—The whole day's journey was through a cañon, and the river was crossed twelve or fifteen times. The sand was deep, and occasionally the trail much obstructed by pebbles of paving-stone. The willow grew so densely in many places as to stop our progress, and oblige us to look for spots less thickly overgrown, through which we could break.

The precipices on each side were steep; the rock was mostly granite and a compact sandy limestone, with occasional seams of basalt and trap; and towards the end of the day, calcareous sandstone, and a conglomerate of sandstone, feldspar, fragments of basalt, pebbles, &c. The stratification was very confused and irregular, sometimes perfectly vertical but mostly dipping to the southwest, at an angle of 30° . Vast boulders of pure quartz; the river, in places, was paved with them.

About two miles from camp, our course was traversed by a seam of yellowish colored igneous rock, shooting up into irregular spires and turrets, one or two thousand feet in height. It ran at right angles to the river, and extended to the north, and to the south, in a chain of mountains as far as the eye could reach. One of these towers was capped with a substance, many hundred feet thick, disposed in horizontal strata of different colors, from deep red to light yellow. Partially disintegrated, and laying at the foot of the chain of spires, was a yellowish calcareous sandstone, altered by fire, in large amorphous masses.

For a better description of this landscape, see the sketch by Mr. Stanly.

To the west, about a mile below us, and running parallel to the first, is another similar seam, cut through by the Gila, at a great butte, shaped like a house. The top of this butte appears to have once formed the table land, and is still covered with vegetation. Through both these barriers the river has been conducted by some other means than attrition. Where it passes the first, it presents the appearance of a vast wall torn down by blows of a trip hammer. Under to-day's date, in appendix No. 2, will be found many interesting plants, but the principal growth was as usual, Pitahaya, acacia, prosopis, Fremontia, and obione canescens.

The latitude of this camp, which is within a mile of the spot where we take a final leave of the mountains, is, by the mean of the observations on north and south stars, polaris and beta aquarii, $33^\circ 05' 40''$; its longitude, derived by measurement and also by the chronometric difference of meridian between this and the camp of November 5th, is $111^\circ 13' 10''$ west of Greenwich, and the height of the river at this point above the sea, as indicated by the barometer, 1,751 feet.

At night, for the first time since leaving Pawnee Fork, I was interrupted for a moment in my observations, by moisture collecting on the glass of my horizon shade, showing a degree of humidity in

the atmosphere not before existing. In the States there is scarcely a night where the moisture will not collect on the glass exposed to the air, sufficient in two or three minutes to prevent the perfect transmission of light.

November 9.—The effect of last night's dampness was felt in the morning, for, although the thermometer was only 37°, the cold was more sensible than in the dry regions at 25°.

We started in advance of the command to explore the lower belt of mountains by which we were encompassed. The first thing we noticed in the gorge was a promontory of pitch-stone, against which the river impinged with fearful force, for it was now descending at a rapid rate. Mounting to the top of the rock, on a beautiful table, we found sunk six or eight perfectly symmetrical and well-turned holes, about ten inches deep and six or eight wide at top; near one, in a remote place, was a pitch-stone well turned and fashioned like a pestle. These could be nothing else than the corn-mills of long extinct races. Above this bed of pitch-stone, a butte of calcareous sand-stone shot up to a great height, in the seams of which were imbedded beautiful crystals of quartz. Turning the sharp angle of the promontory, we discovered a high perpendicular cliff of calcareous spar and baked argillaceous rock, against which the river also abutted, seamed so as to represent distinctly the flames of a volcano. A sketch was made of it, and is presented with these notes. On the side of the river opposite the igneous rocks, the butte rose in perpendicular and confused masses.

This chain continued, not parallel, as I supposed, to the first described barrier, but circled round to the east, and united with it. It also united on the north side, forming a basin three or four miles in diameter, in which we encamped last night. Except a few tufts of *larrea Mexicana*, these hills were bare of vegetation. Away off to the south, and bordering on the banks of the river, covering the surface of the ground for one or two feet, was an incrustation of black cellular lava or basalt, like that seen about the Raton. Nothing more was wanted to give the idea of an immense extinct volcano. Through the centre of the crater the Gila now pursues its rapid course.

The Gila at this point, released from its mountain barrier, flows off quietly at the rate of three miles an hour into a wide plain, which extends south almost as far as the eye can reach. Upon this plain mezquite, chamiza, the green acacia, *prosopis*, *artemisia*, *obione canescens*, and *petahaya*, were the only vegetation. In one spot only we found a few bunches of grass; more than four-fifths of the plain were destitute of vegetation; the soil, a light brown loose sandy earth, I supposed contained something deleterious to vegetation*.

* A specimen of this soil was submitted to Professor Fraser, who says: "It is a light brown, loose sandy earth containing scarcely anything soluble in water, the solution giving only faint indications of common salt and carbonate of lime. A very small portion of iron pyrites is also contained in it, but I imagine its want of fertility may more properly be attributed to its deficiency in organic matters."

We made our noon halt at the grass patch. At this place were the remains of an immense Indian settlement; pottery was everywhere to be found, but the remains of the foundations of the houses were imbedded in dust. The outlines of the acequias, by which they irrigated the soil, were sometimes quite distinct.

The soil was moist, and wherever the foot pressed the ground the salts of the earth effloresced, and gave it the appearance of being covered with frost. In this way the numberless tracks of horses and other animals, which had at times traversed the plains, were indelible, and could be traced for great distances, by the eye, in long white seams.

We found fresh trails of horses, which might be those of General Castro, or the Indians. When leaving California, Castro's determination, as we learn from Carson, was to go to Sonora, beat up recruits, and return. Our route might easily be reached, for we are now marching along a road everywhere accessible, and within three days' march of the settlements of Sonora and the fort at Tucson, said to be regularly garrisoned by Mexican soldiers.

We passed the deserted lodges of Indians, and, at one place remote from the lodges, we saw thirteen poles set up in a sort of incantation formula; twelve on the circumference of a circle, twenty feet in diameter, and one in the centre. Radii were drawn on the ground from the centre pole to each one in the periphery of the circle. It was the figuring of some medicine man of the Apaches or Pimos, we could not tell which, for it was on neutral ground about the dividing line of the possessions claimed by each.

After leaving the mountains all seemed for a moment to consider the difficulties of our journey at an end. The mules went off at a frolicsome pace, those which were loose contending with each other for precedence in the trail. The howitzers, which had nearly every part of their running gear broken and replaced, were, perhaps, the only things that were benefitted by the change from the mountains to the plains. These were under the charge of Lieutenant Davidson, whose post has been no sinecure. In overcoming one set of difficulties we were now to encounter another. In leaving the mountains we were informed that we bade adieu to grass, and our mules must henceforth subsist on willow, cotton wood, and the long green ephedra.

November 10.—The valley on the southern side of the Gila still grows wider. Away off in that direction, the peaks of the Sonora mountains just peep above the horizon. On the north side of the river, and a few miles from it, runs a low chain of serrated hills. Near our encampment, a corresponding range draws in from the southeast, giving the river a bend to the north. At the base of this chain is a long meadow, reaching for many miles south, in which the Pimos graze their cattle; and along the whole day's march were remains of zequias, pottery, and other evidences of a once densely populated country. About the time of the noon halt, a large pile, which seemed the work of human hands, was seen to the left. It was the remains of a three-story mud house, 60 feet square, pierced for doors and windows. The walls were four feet thick, and formed

by layers of mud, two feet thick. Stanly made an elaborate sketch of every part; for it was, no doubt, built by the same race that had once so thickly peopled this territory, and left behind the ruins.

We made a long and careful search for some specimens of household furniture, or implement of art, but nothing was found except the cornginder, always met with among the ruins and on the plains. The marine shell, cut into various ornaments, was also found here, which showed that these people either came from the sea coast or trafficked there. No traces of hewn timber were discovered; on the contrary, the sleepers of the ground floor were round and unhewn. They were burnt out of their seats in the wall to the depth of six inches. The whole interior of the house had been burnt out, and the walls much defaced. What was left bore marks of having been glazed, and on the wall in the north room of the second story were traced the following hieroglyphics.

Where we encamped, eight or nine miles from the Pimos village, we met a Maricopo Indian, looking for his cattle. The frank, confident manner in which he approached us was in strange contrast with that of the suspicious Apache. Soon six or eight of the Pimos came in at full speed. Their object was, to ascertain who we were, and what we wanted. They told us the fresh trail we saw up the river was that of their people, sent to watch the movements of their enemies, the Apaches. Being young, they became much alarmed on seeing us, and returned to the town, giving the alarm that a large body of Apaches were approaching.

Their joy was unaffected at seeing we were Americans, and not Apaches. The chief of the guard at once despatched news to his chief, of the result of his reconnoissance. The town was nine miles distant, yet, in three hours, our camp was filled with Pimos loaded with corn, beans, honey, and zandias (water melons.) A brisk trade was at once opened. This was my *observing* night; but the crowd of Indians was great, and the passing and repassing, at full speed so continuous, that I got an indifferent set of observations.

The camp of my party was pitched on the side nearest the town, and we saw the first of these people and their mode of approach. It was perfectly frank and unsuspecting. Many would leave their packs in our camp and be absent for hours, theft seeming to be unknown among them. With the mounted guard, which first visited us, was a man on foot, and he appeared to keep pace with the fleetest horse. He was a little out of breath when he reached us, but soon recovering, told us he was the interpreter to Juan Antonio Lluñas, chief of the Pimos.

We were taking some refreshments at the time, and invited him to taste of them. The effect was electric; it made his bright, intelligent eye flash, and loosened his tongue. I asked him, among other things, the origin of the ruins of which we had seen so many; he said, all he knew, was a tradition amongst them, that in bygone days, a woman of surpassing beauty resided in a green spot in the mountains near the place where we were encamped. All the men admired, and paid court to her. She received the tributes of their devotion, grain, skins, &c., but gave no love or other favor in return.