

Southern Pacific Railroad.

SURVEY OF A ROUTE

FOR THE

SOUTHERN PACIFIC R. R.,

ON THE

32ND PARALLEL,

BY

A. B. GRAY,

FOR THE

TEXAS WESTERN R. R. COMPANY.

CINCINNATI, O:

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REPORT OF A. B. GRAY,
UPON THE
ATLANTIC AND PACIFIC RAILWAY.

NEW YORK, February, 1855.

*The Honorable President and Directors of the
Texas Western Railroad Company:*

GENTLEMEN:

The computations and estimates given in my rough statement last November, having been carefully revised, I have now to submit to you the following, as the result of my reconnoissance in the vicinity of the parallel of 32 degrees north latitude; for the purpose of determining the practicability of constructing a railway to connect the Atlantic and Pacific Oceans.

The maps, profiles, landscape views, and sketches of mountain passes, exhibiting the nature of the country, with its topographical features, will aid in illustrating the feasibility, as well as practical advantages of the route through the State of Texas.

Early in December, 1853, I reached San Antonio, via New Orleans and Indianola. At the latter place I received a dispatch from one of the commissioners of the company, requesting me to repair to the capital (Austin), upon

matters connected with his mission. Returning to San Antonio, I organized a party, consisting of nineteen persons, well armed and equipped—having previously provided myself with the necessary instruments for the survey—and on the 1st of January, 1854, set out for Fort Chadbourne, where we arrived the 13th of the same month. Our route was that usually traveled northward, by way of Fredericksburg and Fort Mason, crossing the Guadalupe, Piedernallis, Llano, San Saba, Concho, and the west fork of the Colorado. The observations from the *Gulf coast*, at Matagorda Bay, fully prove it to be practicable, should a branch railway at any time be deemed expedient to connect with the proposed main stem on the parallel of 32° north latitude.

Fort Chadbourne, near the present northern frontier of Texas, was established about three years ago, upon Oak creek, a tributary of the Colorado. I found it to be in latitude $32^{\circ} 01'$ and $40''$; and longitude very nearly $100^{\circ} 05'$ west from Greenwich. It is relatively situated to the navigable waters of the Mississippi, near Shreveport, 407 miles south of west; and from El Paso, on the Rio Grande, it is 376 miles east. From St. Louis, Mo., it is about southwest, distant 700 miles. Examinations had been made from the eastern boundary of the State thus far, by Hon. Thos. J. Rusk, U. S. Senator, from Texas, and General Orville Clarke, of New York; whose reports being highly favorable to the construction of a railway, and having upon several expeditions explored much of that district of country myself, it was deemed advisable that I should proceed at once to make this my point of departure westward, near the line of 32° . Reference to the nature of the country up to this place, and its peculiar adaptation to a railway, will be made in the following chapter.

From the Valle de Sauz to Santa Cruz Valley, 135 miles.

The lofty granite range of the Chiricahua mountains—through some pass of which the road must be made—forms the entire western boundary of the Valley of Willows. It extends in a northwardly direction to the parallel of $32^{\circ} 27'$, where a deep indentation occurs several miles wide; when, rising suddenly again, it reaches its greatest eminence, Mount Graham, whose Peak is intersected by the meridian of $109^{\circ} 47'$ west longitude; and thence continuing on the same course to the great *canon* of the Gila, it becomes blended with the Pine Plain mountains (Pinal Llano) of the Apaches. It is the most extensive and well-defined range between the Rio Grande and junction of the Colorado and Gila rivers.

I will here remark, that on the eve of my departure, I received a note by express from Major Backus, commanding Fort Fillmore, some 45 miles above El Paso, informing me of the arrival of Lieut. Parke from California, on the survey of a route for the Pacific railroad. Through this very thoughtful and kind act of Maj. Backus, I was enabled to see Lieutenant Parke, and learn from him the direction of his explorations. He had completed his field work and very generously turned over to me an excellent cistern barometer, one of two which he had brought with him for the determination of altitudes. This was a valuable accession to my other instruments. It had got a little out of order, from the bottom of the glass tube not having been cut the proper length, being rather long; but through the ingenuity of Captain George Stoneman, commanding Lieut. Parke's escort, it was repaired, and afterwards worked well, giving good results, having tested it with accurately determined points.

Lieut. Parke's route from the Valle de Sauz to El Paso, was partly the road made by us (Boundary Commission) in 1851, far to the north of the line now explored by me, and some 40 miles longer. From the San Pedro river, his line was also the one traveled by us that year. I had, therefore, in addition to my own, the benefit of his examinations of the Pass del Dado, and having also traversed the Chiricahua mountains, through the defile near Mt. Graham, in latitude 32 deg. 27 min., and satisfied that no other practicable pass for a railway existed northward, I determined to seek a passage, in the opposite direction, which might prove more favorable.

The camp was moved across the valley to the mouth of a bold and rugged *canon*, ten miles from the Sauz springs; and facing La Puerta. Abundance of pure water was found by us, and a couple of men whom I sent to explore, returned with the information that a mile above, was a mountain stream, fringed with large pines, and the ground carpeted, as it was all around us, with luxuriant grama. This grass, though of last season's growth, was yet very nutritious, like the best of hay at top, and perfectly green for several inches from the ground.

The view of this *canon* in the morning, with the sunlight reflected from its deep recesses, and upright walls rising majestically on all sides to a height of several thousand feet, tapering like spires amid the clouds, presented a scene of grandeur and beauty rarely excelled. The mouth of the *canon* is a mile wide, and a line of alamos and willows extending some distance into the plain, mark the course of an arroya which is filled with large boulders; indicating it, in the rainy season, to be a rapid torrent.

In looking across the wide valley to the mountains, on

the east side, it was difficult to tell which way this arroya turned; there being a slight elevation all the way, and it sloping almost imperceptibly to the right and to the left. I subsequently discovered that this slight divide separated the waters of the Yaqui river, upon which the old ranche of San Bernardino is situated, from those of the Cienaga del Sauz, or willow swamps of the Valle de Sauz. The Yaqui river empties into the Gulf of California, near the Port of Guaymas, in Sonora.

From the *Grand Canon* we followed along the base of the mountains, examining minutely every break that appeared the least encouraging. Finally, a large opening was discovered, with an arroya whose banks afforded an excellent road, and ascending gradually, we came to a spring having cotton-woods and a few sycamores about it. From this point, through a broad and beautiful defile, with a very gentle ascent, we rose to the summit of a fine Pass, through which an ordinary coach could be driven without the necessity of locking the wheels. This pass led us by an equally gradual descent into the wide valley and plain of the "Playa de los Pimas." Near the summit is a red rock of gigantic dimensions, and singular beauty. Our arrieros called it "Cerrillo Colorado," the Little Red mountain. Its lower part is of conical form for 400 feet, from whence it rises with nearly perpendicular sides 300 feet higher, and is crowned with a massive dome of symmetrical proportions. Standing isolated and alone, it becomes a prominent land-mark, easily recognised, from the hills east of the old rancho of San Bernardino; from whence it bears N. 53° W. (magnetic), and distant about twenty miles. Opposite, and south of the spring, are high vertical cliffs of porphyry, resembling pallasades.

This pass, which we call the *Pass of the Dome*, has a summit elevation of 4,826 feet; less by 402 feet than the altitude of Paso del Dado, determined by Lieut. Parke with the same instrument. It is the lowest of the three passes through this formidable chain of mountains, along the base of which I have now skirted from the extreme north to its southern terminus. Below the Paso del Dado, it is covered with timber of forest oak and pine, and in the gorges and ravines, are sycamore, walnut and cedar.

The arroya which we followed to reach the Dome Mountain pass, is a tributary of the Rio San Bernadino. The spring, where we made our noon halt, is 40 miles S. W. of La Puerta. Chiricahua mountains are almost entirely of granite, with much feldspar; as in the case of Grand Canon; which, from disintegration, presents a curious serrated appearance. Towards the lower or southern end, there are trap dykes and basalt in irregular and confused directions, showing a powerful volcanic action, at some long period back.

Recent Indian signs were numerous; large numbers having lately camped at the springs of the *canon*, and trails were running in every direction. I recognized at once the familiar print of the square-toed moccasin boot of the Apache. Our number was small, but very compact, thirteen all told. I had divided the party for the purpose of running two lines, when we struck Cook's road. We were to join again at the valley of Santa Cruz. The others numbered the same, well armed and mounted.

Crossing the valley of the Playa de Los Pimas on a west course, we entered a gap in the low range bordering the Rio San Pedro, 37 miles from the summit of the preceding pass, and almost a right line west. From thence by

a broad Indian trail, we descended a grassy dale, to the river banks, $11\frac{1}{2}$ miles. The elevation of the San Pedro pass is 4731 3-10 feet. The valley of the Playa de Los Pimas is here firm soil, with less sand than where I crossed it further north two years before. At the lowest depression are a number of arroyas, two to three feet wide, which in the rainy season are filled with water and flow northerly to the Playa, which latter is somewhat similar to the "Dry Lake" of Col. Cooke. There was no water in the valley this month, (April), unless by digging, which we had no means of doing and no necessity for. There is a scrubby growth of mezquite and oak, where we first entered, but no timber for railroad ties. The soil is of a reddish clay, and generally good, with abundance of grass.

The San Pedro river, where we struck it, in latitude $31^{\circ} 34'$, is a small stream at this stage, about eight feet wide, and shallow; between steep banks 10 feet high and 25 to 50 feet apart. It is good water here, but further down, where much alkaline matter is associated with the earth, it is a little brackish and not so pleasant to the taste. At three points that I have crossed it, it is a living stream, with large fish. At its mouth, where it joins the Gila, it spreads into passes, forming a sort of diminutive delta. Occasional bunches of mezquite and cotton-wood are seen upon its borders, and in the neighboring ravines higher up towards the old San Pedro ranch, are found walnut and ash. Abundant springs and large districts of grama were frequently met with from half a mile to a mile off. During an encampment of a month, in 1851, at what we called the San Pedro springs, some miles below our present ford, our animals fattened and recruited rapidly.

There were large haciendas and fine cattle ranches in

this neighborhood, until a war of extermination was declared by the Apaches against the Mexicans. Remains of the old San Pedro ranch, are seen at this day; also the "Tres Alamos;" and the ruins of the hacienda of Babacomeri, whose walls and towers are still standing. These were among the wealthiest of Sonora in horses, cattle, sheep, etc., but it has been many years since. It is a fine grazing region, with wild cattle and mustangs constantly seen roving over the plains.

The district from San Pedro to Santa Cruz valley, nearly due west from our present crossing (latitude $31^{\circ} 34'$), will be to the Pacific slope what the region of Fort Chadbourne, in Texas, is to the Atlantic. The mountains and hills are covered with splendid timber of the largest size, and for all purposes; and the valleys are full of springs, and the finest grass.

To Tubac, a town in the valley of Santa Cruz, it is 69 miles. This is by following the San Pedro about a league, passing over a few insignificant spurs, and ascending the Rio Babacomeri; thence continuing westward by a gradual rise over delightful plains to the divide between that and the Sonoita or Clover creek, and along the latter, until it loses itself in the porous earth, a mile from the Santa Cruz river, and by the broad valley of that stream to Tubac.

This line I explored the last season, also that by the emigrant wagon route from Cooke's road into the town of Santa Cruz; which latter route was found impracticable for a railway, beside being partly in Mexico. The other, proved perfectly feasible, although the summit elevation between the Babacomeri and Sonoita creeks, was greater than we had reached in crossing the mountains east of us.

It passes through the most desirable region, with the hills and mountains for forty miles, containing inexhaustible quantities of timber. We noticed tall cedar and oaks of every description; one kind more interesting than the others, being a white oak from twenty to forty feet in the body. Pine and spruce, with superior white ash and walnut, were found, and the most gigantic cotton-woods, particularly on the Sonoita.

The atmosphere is pure and healthy, and the climate agreeable winter and summer, except in the immediate vicinity of the town of Santa Cruz, where there are swamps hemmed in by high mountains. This town is some distance from the line spoken of, and south of the national boundary. The mountains in the neighborhood are filled with minerals, and the precious metals are said to abound. The famous Planchas de Plata and Arrizonia silver mines, which the Count Rousett de Boulbon attempted to take possession of, are in this section of country, not many miles below the present limits, and at several of the old ranchos and deserted mining villages which we visited, were found the argentiferous galena ore and gold.

The Sierra Santa Rita runs along to the east of the Santa Cruz valley, and forms a part of this interesting region. It is very high and bold, filled with fertile valleys and flowing rivulets, and covered with a dense growth of timber. I saw much of this district, when here in 1851, on the survey of the boundary.

As there are two routes explored from the Sauz valley to the valley of Santa Cruz, one which I have described, leading to the town of Tubac, and the other to the town of Tucson, I will remark that the Paso del Dado route is

the shortest; but by the Dome Mountain pass to the San Pedro river, there will be lower grades, less cutting and lighter work. From thence by the Babacomeri, and Sonoita tributaries, the line would be through far the most interesting country, offering great facilities in timber and cultivable land, though of higher elevation.

Surveys, more in detail, than a mere reconnaissance to determine the practicability of the road, may show that it is expedient to pursue the line direct to Tucson through the del Dado pass, and thence to the Gila, striking it above the Pimas villages. In either case it will not alter the line I recommend from the Rio Grande to the Sauz valley.

With regard to gradients, they will average as follows: From La Puerta to lowest depression in the Chiricahua valley, south-west course 26 miles, 27 feet to the mile. To head spring of Dome mountain pass, 32 miles, 13 feet per mile; thence five miles to summit, 63 feet to the mile; thence to the lowest depression of Playa de los Pimas valley, 27 miles, at eighteen feet per mile. For six miles, grade of 54 feet per mile; to summit of San Pedro mountain pass, 15 feet per mile for four and a half miles; and to the river bank, $11\frac{1}{2}$ miles, at 43 feet per mile. From the San Pedro to Babacomeri rancho, $15\frac{1}{2}$ miles at 25 feet per mile; to Wild Peas spring, 10 miles, at 48 feet per mile; and to summit before reaching the head of the Sonoita, 43 feet per mile for $5\frac{1}{2}$ miles. From summit of Sonoita springs, $4\frac{1}{2}$ miles at 86 feet per mile; down the Sonoita for $15\frac{1}{2}$ miles, average grade of 61 feet per mile; down same creek for $10\frac{1}{2}$ miles at 38 feet per mile; and thence by valley of Santa Cruz to Tubac, $12\frac{1}{2}$ miles at 26 feet per mile.

The pass into the valley of the Playa de los Pimos, will require some blasting in hard rock, but only at short intervals cutting off points of the bluffs; and also some excavation in softer rock west of the San Pedro. Again, at the Sonoita creek, one or two places will require heavy clearing of matted vines and large cotton-woods, also a slight cutting through a short *cañon*. Comparatively there will be required very little clearing or grubbing; with but one stream to bridge, that of the San Pedro.

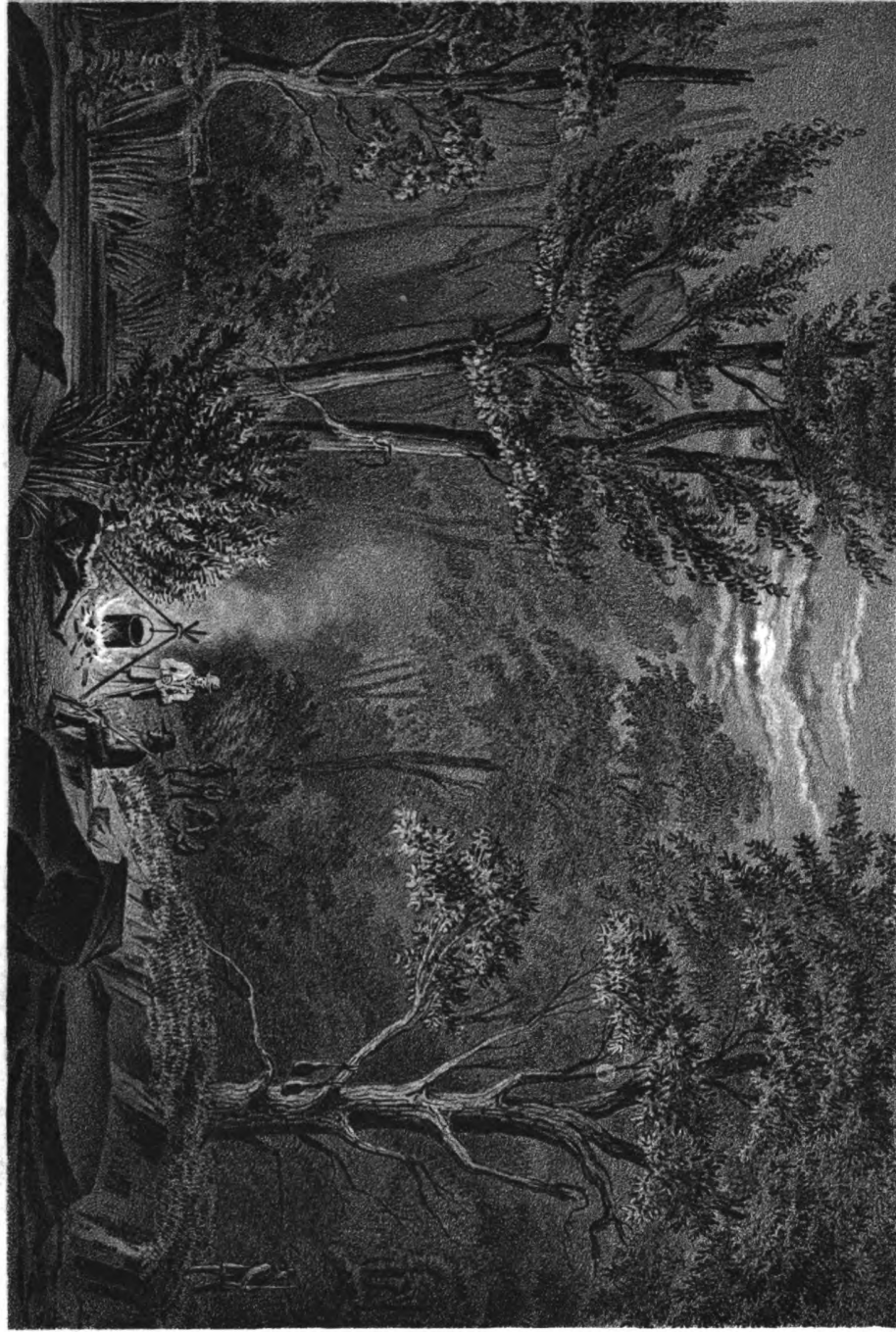
From Tubac, in Latitude 31° 37' N., to the Junction of the Gila and Colorado.

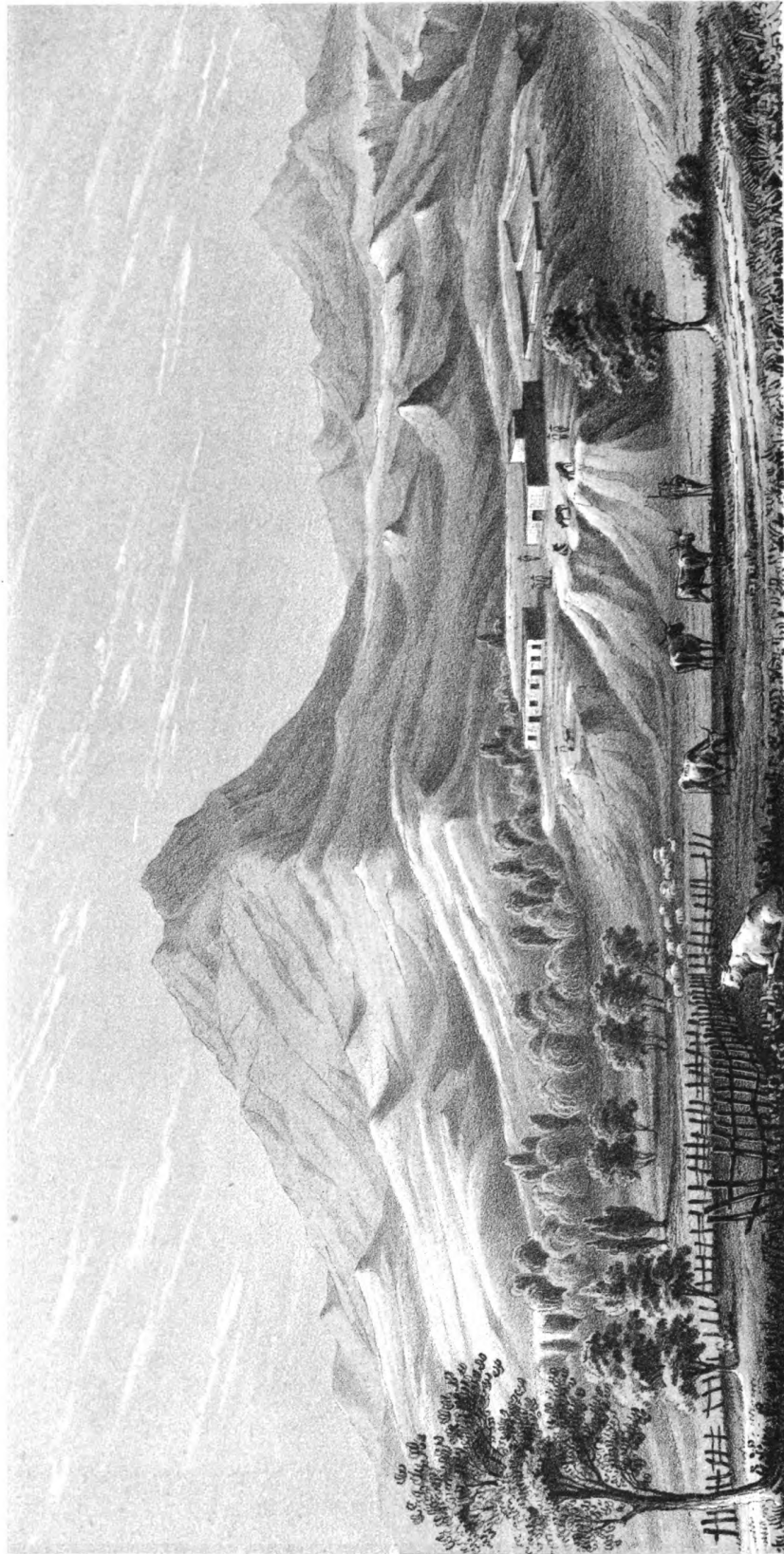
To follow the valley to Tucson would be nearly a north course for 43 miles, with a descending grade of 26 feet per mile, the altitude of Lieut. Parke's camp, near Tucson, by barometer, No. 392 being 2,300 feet, while near Tubac, the same instrument gave, after a series of observations which I made with it, an elevation of 3,380 feet. To continue to the Gila river, would be a distance of 90 miles, with an average gradient of 20 feet to the mile. From this point the Gila has a fall for 215 miles, to its junction with the Colorado, of about 6 feet to the mile. By leaving the river at the Pimas villages, and passing over a low spur of the Sierra de los Estrellas, a large bend in the Gila is cut off, saving a distance of 35 miles. The distance from river to river would be 53 miles, without any difficulties to overcome, and a maximum grade not exceeding 50 feet to the mile. Thence down to the junction it is a clear way, with here and there a side cutting through mixed sand and clay.

Water, on the level plain from Tucson, 90 miles, is scarce, but there is no doubt of its being procured by wells.

CAMP VIEW NEAR TUBAC SONORA
April 1854.

W. H. Holmes, del.





Madellon, Wallace & Co., Cincinnati, O.

**CALABAZA,
SANTA CRUZ VALLEY, SONORA.**

“Included within the limits of the Gadsden Treaty.”

Having previously examined the Gila river to the junction, I was desirous to know the nature of the country near the head of the Gulf, and to see if a line could not be carried from the Santa Cruz valley, on a direct course to Fort Yuma; or at any rate, to a point on the Gila below the great bend, which would shorten very much the route by way of the Pimas villages.

It was now late in the season, and the dryest part of the year (May). To the rancho of Bosano I shaped my course, where I learned there was an old Indian trail northward, striking the river some distance below the Pimas villages; also another trail further west, from Altar, which came out at the junction of the Gila and Colorado. Bosani I found to be in latitude $31^{\circ} 10' 25''$, and south of our present limits, though at the time of my exploration, no new boundary had been negotiated. It is south-west about 50 miles from Tubac, and situated 46 miles above the town of Altar, at the head springs of a stream of the same name.

From this rancho, I sent a party to the Gila, which they struck at the west end of the little Jornada, below the big bend of that river. They found villages and planting-grounds of the friendly Papigos, and grazing-valleys with numerous wells of water; rough gullies and ravines were encountered, and the country on both sides much broken, with no extensive ranges of mountains, but distant and isolated ridges.

After obtaining some good astronomical observations, and making further reconnaissances, I proceeded with remainder of the party down the beautiful valley of Altar. Fine wheat is raised here, and almost every variety of vegetables and fruit grow readily. Several very respec-

table looking towns, with highly cultivated fields and gardens were noticed, and before reaching Tubi tami are fine missions and ranchos deserted on account of the Apaches. From Altar to the Gulf of California, where there is represented to be a good harbor, it is 55 miles. To Guaymus are valleys and plains running the whole distance. I found no difficulty in the way of a railroad to the Gulf, the maximum grade not exceeding 70 feet to the mile.

The locality of this region had never been correctly determined. Some good observations which I got, places Altar in latitude $30^{\circ} 42' 25''$ north. From this place to the junction of the Gila and Colorado, we ran a line, passing by the gold mining town of Zonia, and through an extensive mineral district. Sonoita, by my observations, in latitude $31^{\circ} 51' 19''$ north, and a short distance below the limits of our territory, is an Indian town, where the Gobernador of the Papigos resides. There are also a few Mexican families. The valley is broad, with springs, and a small stream (the Sonoita) which flows a few miles in the dry months, when it sinks, like the river of San Diego in California. During the rainy season it extends for a long distance toward the Gulf. Near Sonoita, but within our own territory, are copper mines of surpassing richness. Some 40 pounds of the ore which I brought away, was of the red oxide of copper, producing 71.8 per cent. of metal. It was represented to yield gold of great value; but from an analysis of a specimen by Doctor Chilton, it exhibited no such indications.

The Indians represent rich Placers existing throughout this region, and large numbers of them have lately come in with considerable quantities of the dust. They were