

1 to 20 or 30 miles. The surface covered with vegetation, though small, is difficult to estimate; and perhaps it is unimportant that an estimate should be made, since the productiveness of these regions depends on other considerations than smoothness of surface, and character of soil. The rains cannot be relied upon, and the tiller of the earth depends upon irrigation from the mountain streams for his crops. The extent of ground, capable of tillage, is thus reduced to very narrow limits, easy of computation. A knowledge of the water courses, their fall, volume and extent, and the quantity of lands on their margin, within the level of these waters, are the data upon which the computation must be based.

Taking this as a guide, an inspection of the accompanying map will give a general idea of the extent of arable ground, sufficiently correct for all practical purposes; but, in candor it should be said, that many streams laid down in it disappear in the sand, while the rocky cliffs, forming the banks of others, render irrigation impracticable. The scale upon which the map is projected is too small to represent these accidents of the ground.

Where irrigation can be had in this country, the produce of the soil is abundant beyond description. All the grains and fruits of the temperate zones, and many of those of the tropical, flourish luxuriantly.

Descending from the heights of San Barnardo to the Pacific, one meets every degree of temperature. Near the coast, the winds prevailing from the southwest in winter, and from the northwest in summer, produce a great uniformity of temperature, and the climate is perhaps unsurpassed in salubrity. With the exception of a very few cases of ague and fever of a mild type, sickness is unknown.

The season of the year at which we visited the country was unfavorable to obtaining a knowledge of its botany. The vegetation, mostly deciduous, had gone to decay, and no flowers nor seeds were collected. The country generally, is entirely destitute of trees. Along the principal range of mountains are a few live oaks, sycamore, and pine; now and then, but very rarely, the sycamore and cotton wood occur in the champaign country, immediately on the margins of the streams.

Wild oats every where cover the surface of the hills, and these, with the wild mustard and carrots, furnish good pasturage to the immense herds of cattle, which form the staple of California.

Of the many fruits capable of being produced with success, by culture and irrigation, the grape is perhaps that which is brought nearest to perfection.

Men experienced in growing it, and Europeans, pronounce the soil and climate of this portion of California, unequalled for the quality of the grape and the wine expressed from it.

We sailed from San Diego on the 25th of January, and coasted along the rocky and barren shores of Lower California. The information in reference to this country, which it was in my power to obtain, is not so precise as that which might be derived from an actual survey, and I have therefore embodied it in the appendix.

I have the honor to be, very respectfully, yours,

W. H. EMORY.

APPENDIX No. 1.

NEW YORK, October 1, 1847.

DEAR SIR: I return you my thanks for the very interesting information contained in your letter of the 20th of September.*

It unfortunately happens that I cannot wait for the arrival of your papers, or for the publication of the map of the War Department. My essay makes part of the second volume of the transactions of the New York Ethnological Society. The work is now in the press, completed with the exception of my essay; and the printer presses me for it. The map, which will accompany it, is principally intended to show the original abodes of the Indian tribes. It will be presented as a sketch, without pretensions to accurate correctness. But there is a consideration, which makes me anxious to obtain every possible information respecting the Rio Gila, and especially its upper waters.

You may not be aware that a work has lately been recovered and published, which contains a full and authentic account of an expedition in the year 1540-1542, by order of the viceroy Mindoça, and under the conduct of Vasquez Coronado. It consisted of 350 Spaniards and 800 Indians. Setting off from Culiacan, they reached the sources of the Rio Gila, passed across the mountains to the Rio del Norte, wintered twice in the province now called New Mexico, explored it through its whole length, from north to south, and afterwards, taking a northeast course, crossed the mountains, reached the buffalo plains, through which they wandered a considerable distance eastwardly, and as far north as the 40th degree of latitude. Finding no gold, they returned to Mexico. The Spaniards did not re-enter the country till the year 1581; and the conquest of New Mexico was not completed till about the year 1595.

The veracity of the narrator, Castenador, who was a volunteer in the expedition, and who wrote the account twenty years after, is fully established by a variety of circumstances, too multiplied to be inserted here. It is sufficient to say, that the Indians of the Rio Gila, and of the upper valley of the Rio del Norte, were an agricultural people, cultivating maize, beans, pumpkins, and cotton; depending exclusively on agriculture for their subsistence, dwelling in villages built of mud, (torchis,) mixed with certain balls of hardened matter, and well cemented together. The houses were generally four stories high, with no opening on the first floor, accessible only by moveable ladders, with top terraces, and an under ground apartment occupied exclusively by the men, and used as *estufas*;

* This letter gives a general outline of the route, and twenty words of the Cocomaricopa language, and a few of the Pimos.

in short, similar in every respect to the existing pueblos of New Mexico, and to the ruins of the Casas Grandes described, as I think, erroneously to the Aztecs.

With respect to New Mexico, one principal want is that of vocabularies, which would at once settle the question of identity with any of the Mexican nations. The same difficulty exists with respect to all the tribes of the country drained by the great Rio Colorado of the west. But there is an additional embarrassment respecting the actual situation of what were called the seven villages of Cibala; of which we can only say, that they were situated in a narrow valley six leagues long, and on the very sources of some one branch of the Rio Gila.

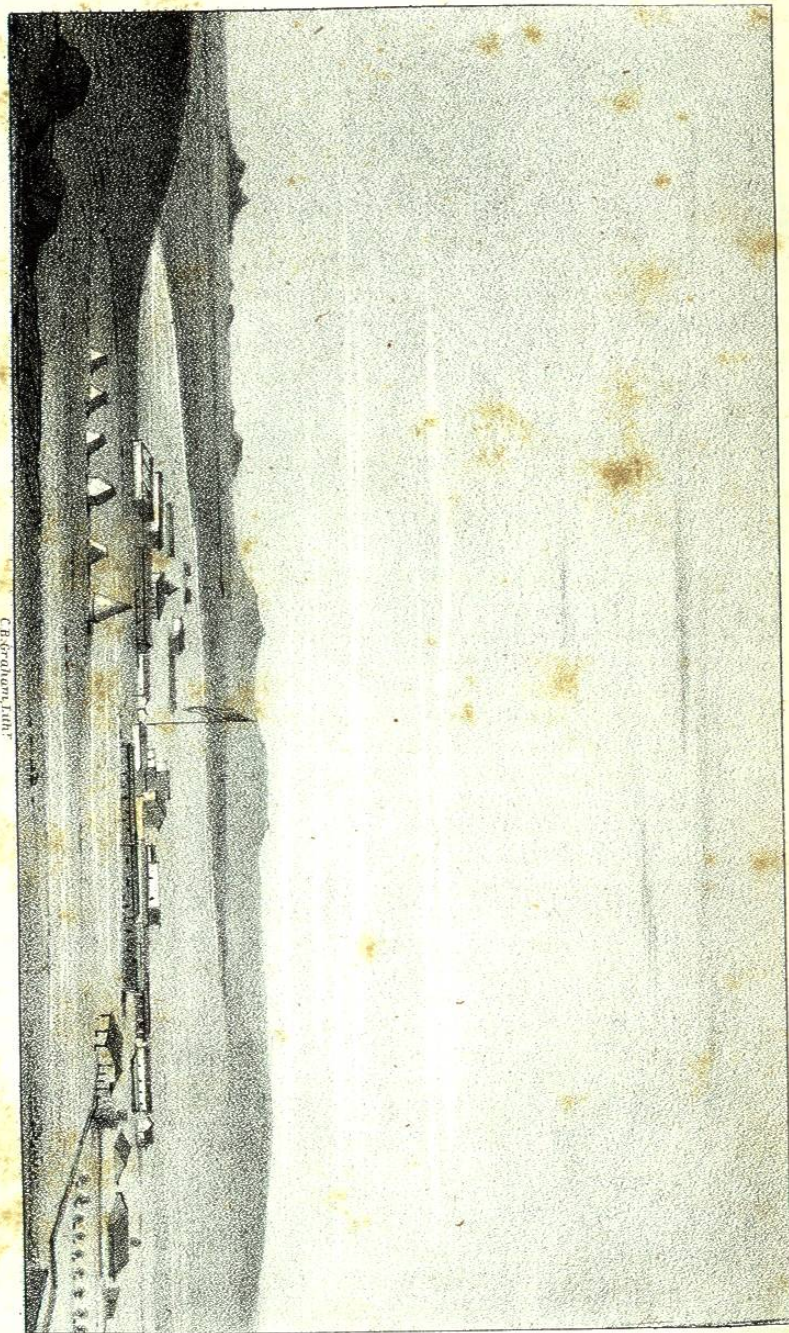
The phenomenon of this insulated semi-civilized population, is in itself remarkable, and difficult to be explained; and the discovery of the precise spot, where the seven Cibala villages were situated, is especially desirable. With this object in view, I beg leave to submit to you the following queries.

1st. On leaving the copper mines, on the 18th of October, and after having crossed the Sierra Mimbres, you reached the main branch of the river Gila on the 20th; now what I wish to know, is, from what quarter did that main branch come, or in other words, if you had ascended that main branch, what was its apparent course? What was the distance from the western foot of the Sierra Mimbres to that main branch where you struck it? Did you, along that distance, cross any tributary streams of the Rio Gila, and from what quarter did they come?

2d. Can you furnish me with the approximate latitude of some of the principal points observed when descending the river; principally the junction of the Salmas, the village of the Pimos Indians, any other spot where evident traces of ruins were discovered, and the mouth of the river Gila. From what quarter did the river Salmas come? Did you carry time with you, so as to obtain the relative longitude of some points? The most important would be the spot where you left the Rio del Norte, that where you struck the main branch of the Gila, the mouth of the Salmas, the Pimos village, and the mouth of the Rio Gila. If you had no other means, still your travelled distance may give a rough approximation.

It seems to me that the easiest way to answer these two queries, would be a rough approximate sketch of the country traversed by you. I will take special care not to commit you in any way. I am no plagiarist, and I must in general terms acknowledge that I am indebted to you for some important information; but I will at the same time refer to your intended complete report and map, which will give that precise information which was not within my reach.

3d. You did not visit the mouth of the great Rio Colorado: but General Kearny states in his letter that the mouth of the Gila was in about latitude 32° ; that he crossed the Colorado ten miles below, and marched near it for thirty miles, when he left it, (turning off eastwardly across the desert,) without having reached its mouth. Now the generality of our maps place the mouth of the Colorado



SAN DIEGO FROM THE OLD FORT.

in latitude 32° , and it is clear from what precedes, that it must be nearly one degree further south. Do you think that I may in my sketch set it down at about latitude 31° ?

4th. The cultivation of cotton is one of great general importance. As now informed, I believe that, independent of varieties, there are but two distinct species: the black seed, which is the native American, and found as such no where else, and the green seed, which adheres to the staple, of Asiatic origin, thence brought to the Levant and the Mediterranean, and imported into North America, of which it was not a native. I cannot obtain in this city a copy of Bomplant's great botanical work, which would have thrown much light on the subject. I wish now to know, whether you took any notice of the cotton cultivated by the Pimos, and what species it was? I presume that it was not a native of that region, and that the seed must have been imported from Mexico.

I now proceed to that which relates to the Indians, who are the principal objects of my researches.

1st. I have compared your vocabulary of the Coco Maricopas with those of the four Mexican languages in my possession, and of thirty-two well ascertained families of Indians, living within the United States or further north, and have found no resemblance with either. It is to me a quite new language, but there is a remarkable word. *Apache* is the word for *man*; and judging by analogy from several other Indian languages, they should be Apaches or belonging to that family. Thus, for instance, amongst the Algonquin tribes, the names assumed by two of them, Illinois and Linno Linnap, are evidently derived from Linno, a man. However this may be, I wish to have some further information respecting that tribe; to know, with as much precision as you can, the quarter whence they came; their present location in reference to the Pimos, and particularly whether and what they do cultivate; also, whether they are wilder than the Pimos, and whether on good terms with them.

2d. You say that the accounts, by report, of the Indians to the mouth of the Gila are conflicting and of an indefinite character. This observation applies to every information derived from other sources. We have as yet only vague rumors. Yet I wish to collect all these, as far as possible. A few legitimate inferences may, perhaps, be drawn by comparing them together; but it is principally for the purpose of enabling me to point out the most important objects of inquiry that I wish to be thus informed. You will, therefore, oblige me by communicating such rough notes as you may have taken on that subject, and also what were the abodes and occupations of the few scattered Indians whom you met on your journey.

(a.) Have you, by any direct observation, ascertained within $30'$ the positive longitude, in reference to Greenwich, of any point on the Rio del Norte or vicinity which may serve as a starting point?

There must be some kind of a dividing ridge which separates the waters of the river Gila from the waters that empty into the gulf of California. From what you say of Colonel Cooke's route, I would infer that he left the Rio Norte a short distance above El

Passo, and that he must have traveled south of that ridge, in an almost due west course to the Rio Colorado.

I use the word "Sierra Madre" in the sense attached to it by the Mexicans, viz: that ridge which separates the waters that fall into the Atlantic from the rivers which empty into the Pacific ocean, without any regard to its elevation.

I pray you to accept the assurances of my distinguished consideration and personal regard.

Your most obedient and faithful servant,

ALBERT GALLATIN.

To Lieutenant W. H. EMORY,
U. S. Topographical Engineers, Washington.

WASHINGTON, October 8, 1847.

DEAR SIR: In answer to your letter of the 1st instant, I have the pleasure to send you, with the permission of the chief of my department, a table of twenty-three geographical positions determined by myself, which you are at liberty to use; and, should you think the information of sufficient importance, I should feel much flattered that you should, as you propose, communicate them to the Ethnological Society of New York for publication.

No astronomical observations that I am aware of have ever before been made on the same grounds, if we except the observations of Dr. Coulter at the mouth of the Gila, which have never yet been published.

You will see that the position of the Gila is very much changed, as well as that of Santa Fé, in New Mexico.

The observations were made with an $8\frac{1}{2}$ inch sextant, constructed by the celebrated Gambey, of Paris. In most cases, the determinations of the places in latitude are the mean of the results obtained by many observations on north and south stars, of nearly equal altitudes, by which the errors of eccentricity, &c., in the instrument were avoided.

The longitudes are derived from a combination of the results from the chronometers, and measurement of distances between the moon and stars, nearly equi-distant on either side of it.

The chronometers used were two very good box chronometers, by Parkinson & Frodsham, (Nos. 783 and 2,075.)

The observations themselves, including those between Santa Fé and Fort Leavenworth, (our point of departure,) in number 2,500 or 3,000, were all computed in the field, and are now undergoing verification by Professor Hubbard, a very accurate young computer, attached to the observatory at Washington.

The computations for all the points embraced in the table sent you, have been verified.

The objects of our expedition being purely military, the subjects of interest to scientific men were only pursued so far as they were incidental to the expedition, and did not interfere with its great ob-

ject. The instruments with which I was furnished were not those, perhaps, which I would have selected; at the same time there was nothing for me to regret, except the absence of a good portable telescope, with which occultations of the fixed stars by the moon, and the immersion of Jupiter's satellites, could have been observed, and a few pocket chronometers.

We left Washington on twenty-four hours' notice, and time was not allowed to procure either the telescope or pocket chronometers.

1st. We struck the Gila, as the table will show, in latitude $32^{\circ} 44' 52''$ and longitude $108^{\circ} 45'$ west from Greenwich; thence its course is very nearly west. As well as we could judge from the course of the mountains, its course from that point to its source was not very far from northeast or southwest.

No tributaries to the Gila were crossed before reaching it, except one named by me Night creek, a very insignificant stream. The Sierra Mimbres, 6,000 feet above the sea at the highest point where we crossed it, falls gradually and almost imperceptibly to the Gila.

2d. Your second interrogatory is answered principally by the table of geographical positions.

The Rio Salinas comes in from the *northeast*, a little west and north of camp 97, of November 12. (See table.) This camp, the astronomical position of which is given in the table, is about midway between the villages of the Pimos and Coyo Marricopas Indians.

3d. The table will show you that the junction of the Gila and Colorado is on the parallel of $32^{\circ} 43'$ or $4'$; and, in the absence of more specific information, I would advise you to place the mouth of the Colorado on the parallel of $31^{\circ} 51'$, which is the latitude given it by Lieutenant Hardy, of the royal navy, whose little book of travels in Mexico you have no doubt seen.

4th. Specimens of the seed of the cotton grown by the Pimos were obtained, but they have not yet reached me. Overcoming space was the great object we had in view when we passed the Pimos, and our investigations and collections were necessarily hasty and superficial. We passed with them only the part of a day, whereas, if exploration alone had been the object of our party, I should have considered a week as little enough to have devoted to this interesting people. When I left California, it was as a special envoy to the government, and on so short a notice that many of my collections and notes were left behind, with my assistants. Among the things so left, were the seed of the cotton.

Most of the plants collected, however, were brought home. These will show a very complete history of the botany of the country. They are in the hands of Doctor Torrey, who is preparing an elaborate catalogue and drawings of those plants, heretofore unknown. This catalogue I should be very glad to place at the disposal of your society.

The Coyo Marricopas Indians come from the west. So late as 1826, Mr. Kit Carson, one of our guides, met these people at the mouth of the Colorado. Subsequently to that period, they were