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aids of ~~later~~ ^{more recent} research. ~~by Bandelier and Hodges~~ The map on which he lays down this route is small, and places the Sonora River somewhat too far east, making correct minor detail impossible; but the route, as he indicates it, leads from Sonora River to the head of the San Pedro, and thence — leaving the latter stream to the left — passes to Chichilticalli, which he places on the south side of the Gila, ^{Gila's first} east of the 110th meridian, and opposite the ^{great} south bend ~~the 110th meridian~~.

Footnote
*Mr. Squier legends the ruins here with the double title, "Casas Grande (Chichilti Calli)"; but he carefully distinguishes them geographically from the ruins of the better-known Casa Grande on the south of the Gila, west of Florence, and from those of the Casa Blanca on the north of Salt River, — indicating both of these in their proper places on his map by a cross and the word "Ruins."

above San Pedro River (the Solomonville bend), near where is ~~now~~ ^{is the town} today ~~now~~ ^{crosses} Safford; and thence northeasterly, across the mountains, to Zufi.

In his well-known essay, ~~of 1869~~ General ~~...~~ Simpson quotes the

~~Coronado's March in Search of the Seven Cities of Cibola and Discussion of their Probable Location.~~ By Brevet Brigadier General F. H. Simpson, Colonel of Engineers, U. S. A. Annual Report, Smithsonian Institution, 1869, pp. 309 to 340.

Footnote
quaint translation of Coronado by Hakluyt, "The sea returneth toward the west, right against the Corazones, the space of ten or twelve leagues," as meaning that Coronado had alleged San Hieronimo de los Corazones to be only ten or twelve leagues from the Gulf of California, and taking that idea in connection with Castaneda's statement that "it was forty leagues from Señora to the valley of the Suya, where was founded the city of San Hieronimo," he places San Hieronimo de los Corazones 10 or 12 leagues from the Gulf, on the San Ignacio River, which he identifies with Suya River. But Coronado was merely informing the viceroy that the coast turns westerly for a few leagues opposite that particular "Corazones" which was in the Valley of the Corazones or Hearts Indians, not far from present Ures, which in

~~fact it does, according to Johnson's map of Seriland*~~

Footnote
*Mr. Willard D. Johnson's survey made in 1895 for the ~~the~~ topographical map of Seriland accompanying Dr. W. J. McGee's paper on the Seri Indians, in the 17th Annual Report of the Bureau of American Ethnology. ~~is doubtless the most accurate that has been made of the coast in the vicinity of Tiburon Island.~~

of about 6 leagues, from Laguna la Cruz to Punta Ygnacio. Its trend is west-northwesterly, to the latter point; and beyond this, for a few leagues farther, it leads nearly northwestward. ~~Against, or opposite, understanding~~ the Corazones, however, is here understood to mean, not ~~due~~ west of that place, but in the direction of the shortest line, or perpendicular, to the coast; and as the general trend of the coast ~~is~~

is considerably west of north, this short line to it, bears considerably south of west, and is roughly indicated by the lower limb of Sonora River, which subterraneously enters the sea ~~at the Mexican~~

*In his "Coronado's March," page 37, Mr. Hodge remarks, "Coronado's allusion, based on hearsay, that the sea turned westward directly opposite Corazones, is an error unless it refers to the slight westerly trend of the coast northeast of Tiburon Island, about Tepoca Bay." Judged by the ordinary maps of Mexico, ~~Mr. Hodge's~~ ^{the high authority} comment would be correct. But the Johnson map of Seriland ~~as~~ ^{as} ~~high authority~~ as to this part of the coast; and judged by that map, the westerly turn which I have described, is much greater than that at Tepoca Bay.

It may be well to note here that, on the Herbert map of Sonora (1884-1904), the Sonora coast is represented as turning abruptly to the west for a distance of nearly 6 leagues along the 29th parallel, where its course, if continued a few leagues farther, would bisect Tiburon Island. This would even more strikingly fit the condition described by Coronado; but the map of Herbert is probably much less correct between Laguna ~~del~~ la Cruz and Tepoca Bay than is that of Johnson. The actual ~~westward~~ turn of the coastline, however, as shown by the latter map, meets the conditions ~~described~~ ~~meets~~ to ~~satisfy~~ the approximate accuracy of the information obtained by Coronado.

→ was doubtless down the Sonora River Valley to Seriland, that Coronado's messengers "from the Hearts", or Indian town of Corazones, proceeded to the sea; and from

In the 17th Annual Report of the Bureau of American Ethnology (page 25), regarding the rivers of Seriland, Mr. McGee observes, "eventually all the running waters are absorbed by the dry sands of the plains or evaporated into the drier air; and from the mouth of the Colorado to that of the Yaqui, 500 miles away, no fresh water ever flows into the sea;" and similar statements have been made by other writers. But these statements should not be interpreted to mean that none of the water of any of these rivers enters the sea; but only that so much ~~of them~~ as does enter it, reaches it subterraneously, through the lower detrital fillings of the deep valleys which these rivers eroded at a time when this part of the continent stood ^{at} much higher level, toward which, after a period of depression, it has in recent centuries, as its raised beaches show, been slowly returning.

By the favor of that rare man and refined patron of science, art, and letters, the late Edward Wilder, many years treasurer of the Atchison, Topeka & Santa Fe Railroad, it was the writer's privilege to make a natural history collecting expedition to the Pacific Coast at Guaymas, Mexico, in December, 1882; just after the completion of the Sonora Railroad. The drinking water of that port was brackish, being well-water obtained from the coastal sands at shallow depths. It was peddled around town in burro-borne skin bottles. Near the town, however, the ~~MM~~ railroad company had a well and pumping station which utilized the subterranean flow of Guaymas river, and from that "underground river," as it was called, fresh water was brought to ~~MM~~ ~~the~~ town and iced for drinking, and could be ~~had~~ had by a visit to the company's offices.

its delta region that the Indians were summoned to him, as noted farther on.

By misconstruing the meaning of Hakluyt, and thus crediting to Coronado what the latter did not write, General Simpson was led into the error of placing a San Hieronimo de los Corazones and the Suya river much too far to the west, ^{and of identifying the latter with Rio San Jondico,} and he accordingly brought Coronado northward by the Santa Cruz River, identifying the latter with Jaramillo's "Nexpa", and to the well known Casa Grande, ^{which he} ~~which he~~ ^{was} identified with Chichiltic-Calli; and thence brought him, in a general northeasterly course, to Zuñi-Cibola.

~~It is now known, that Bandelier pointed out that the San Pedro was a more convenient and reasonable route for Coronado to have followed northward to Cibola than was the Santa Cruz, and showed that the identification of the Casa Grande, of Pinal county, Arizona, with Chichiltic-Calli, is untenable.~~

Footnote
S. M.atheron, R. H. B.
1869, p. 325.

Bandelier in 1880 indicated, and in 1891 more conclusively showed, that the identification of the Chichiltic-Calli with the Casa Grande recognized the upper course of the Rio Sonora as part of the route, and is untenable. In the former year he wrote, "Now whether the Nexpa is the Rio Santa Cruz or the Rio San Pedro, their course, after they ^{once} crossed the Sierra [to the right of the Nexpa], could certainly not have led them to the 'great houses' on the Rio Gila, but much farther east;" and he is even inclined to query whether Coronado might not have marched eastward to ^{the} Rio de las Casas Grandes, ~~in Chihuahua~~, and thence north to Zuñi, and whether the ruins of the Casas Grandes, ~~in Chihuahua~~, might not be those of the Chichiltic-Callis. But in the

^{his} ~~See~~ Historical Introduction, pp. 11, and 12.

latter year he had evidently abandoned these queries, ^{and was} in favor of the route down the San Pedro and, for Chichiltic-Calli, a position near Fort Grant, in the following words:

"It is certain that Coronado marched up the Sonora River very nearly to its source, and thence either across to the San Pedro valley, or else to the Santa Cruz. In case he chose the latter route, he would have had to contend with much greater difficulties in regard to water, and would besides have left the Indian settlements, which are what Castañeda means by 'inhabited country,' much sooner. The Sobaypuris had their villages within a short distance of Arivaypa creek, and the latter flows not far from Fort Grant. Everything, in my opinion, points towards the latter place, or to some spot in its neighborhood, as the locality where Coronado passed, and where Chichiltic-Calli, the Red House, stood in 1540." *

~~The latest and by far the most the ^{most} ~~most~~ scientific study that has been made of Coronado's march, is that of Hedge (1890) in Volume II of~~

Footnote
Pt. II, p. 109.
Final Report.

Of papers not hitherto mentioned herein, that relate to Coronado's route to Cibola, one that calls for passing notice in this connection, is Mr. F. S. Dellenbaugh's "The True Route of Coronado's March"; which was published in the Bulletin of the American Geographical Society, N. Y., December, 1897. That paper starts Coronado's reorganized army from ^{the vicinity of} San Miguel (still so called) near the 109th meridian, (a town which is in fact on the Rio Fuerte about 130 miles northwest of Culiacan, and which Mr. Dellenbaugh supposes to have been the San Miguel de Culiacan of Coronado's time), and brings it by way of the Yaqui River Valley and over the Pass of Carretas to the east side of the Sierra Madre, and thence northerly through Chihuahua and southern New Mexico to the Mimbres River and a Cibola near the Florida Mountains {^{the Durango region. In his Romance of the Colorado River, however, (1902,) he transfers Cibola to the} But we have already seen incontrovertible proof that Cibola is the province of Zufi, and the ~~absurd~~ intenability of Mr. Dellenbaugh's location of San Miguel de Culiacan has been shown by Mr. Hodge, whose memoir cites Tello's testimony that the mission of San Miguel de Culiacan was established as early as 1532, by transfer of a San Miguel Mission from Navito* to Culiacan, "where," wrote Tello,

* The position of the town of Navito, about 35 miles south of Culiacan, may be seen on any modern map of Mexico. It is near the coast, on the San Lorenzo River, a stream whose aboriginal name was Ciguatlan, but which was once known to the Spaniards as "Rio de las Mugeres," by reason of a fable of Amazons that attached to it. The D'Anville map of North America (1746) marks a mission at "Culiacan" ~~midway~~ on ~~the~~ ~~legended~~ "R. Miguel" the "Culiacan" River, and also one legended "S. Miguel" on the river "Ciguatlan" in the position of Navito, no town of the latter name being shown; but the ~~name~~ ~~entry~~ ~~name~~ is probably from some much older map of that region.

in 1650, "it still remains." Mr. Hodge also calls attention to the fact that the San Miguel of the 109th meridian "was never San Miguel Culiacan, but San Miguel Zuaque, after the Zuaque division of the Cahita Indians, by whom it was inhabited, and among whom missions were not established until 1613." ~~Mr. Dellenbaugh~~ As to Chichilticalli, Mr. Dellenbaugh supposes it to be an undescribed ruin, probably not ~~far~~ many miles from the Chihuahua ruin of Casas Grandes.

~~was traced by Mr. Hodge, in 1899.~~

~~the~~ ~~as~~ ~~been~~ ~~outlined~~ ~~on~~ ~~a~~ ~~preceding~~ ^{are shall be set in this paper}
page of this Paper ~~is~~ is doubtless close to the true one; though there are reasons
for believing that this will be ~~more~~ ⁱⁿ Creek in the western and the Pueblo Viejo Valley than to Somonville in the eastern part.
We will now turn our attention to certain places of special interest.

Before giving farther attention to the expedition itself or to its route, we will consider the values of its chroniclers' leagues,

as these are fundamental criteria of its geography and chronology.

Spanish leagues ^{have} had a variety of values, ranging, according to the 1884 edition of the Royal Spanish Academy's Diccionario de la Lengua Española, from 15 and $17\frac{1}{2}$ to 20 and 25 to the degree. Of these, only ~~the three last mentioned need to be considered here.~~

In the scale-legend of his map of Amerique Septentrionale (1746), the eminent French geographer, Mathurin Sieur d' Anville, mentions "Spanish leagues according to the common evaluation, and of $17\frac{1}{2}$ to the degree", and "Spanish leagues proper, of about 19 to the degree."

According to Seoane's Neuman and Baretti, Velazquez, "17 $\frac{1}{2}$ Spanish leagues make a geographical degree", and "8000 Spanish yards make a Spanish league, or nearly four English miles."

As a coincident value in latitude and longitude, adopted by such geographers as Guyot, we here reckon the geographical degree at $69\frac{1}{2}$ English or American statute miles. The Spanish common league is therefore equal to about 3.95 of our statute miles.

The 20 to the degree, are the marins leagues, of 3.46 statute miles. D' Anville's "Spanish leagues proper, of about 19 to the degree", are perhaps intended for the same.

The 25 to the degree, are the Spanish terrestrial leagues, of 2.77 statute miles.

According to the Century Dictionary, the Spanish judicial league is only 2.634 statute miles, and the land league in Texas and other parts of the United States derived from Mexico, is usually reckoned at 2.63.

Beneath his definitions of French and Spanish leagues, specified as such, ^{respectively}, in the above-said scale-legend, D' Anville mentions, apparently as common to both French and Spanish usage, "leagues or hours of travel. (heures de chemin) in countries little frequented and difficult".

The leagues of Coronado's expedition from Culiacan northward were certainly "leagues of travel in countries little frequented and difficult"; but whether they were hours of travel, and variant in linear value with the roughness of the ~~mountain~~ way, or whether they were ^{usually} ~~paced~~ ^{as it is said they were on the plain of the Colorado} by a ~~mountain~~ ^{pace} detailed for that purpose, we ~~can not directly tell~~. The latter alternative seems most probable, for Castañeda tells us that they were so paced in the march to Quivira.* In either case,

*Winship's Translation, Eth. Ann. XIV, 508.

it is not unlikely that they averaged below 2.77 statute miles, the technical value of the Spanish terrestrial league; though if paced, they can hardly have fallen very far short of it. We shall therefore reckon them at 2.7 statute miles, the mean between the Spanish judicial

and the Spanish terrestrial league. This figure accords well, in general, with the criteria by which it may be tested, north of Culiacan. ~~It may possibly be a trifle small, but can hardly be too large.~~ Indeed, if we consider 5 such leagues per day, or $13\frac{1}{2}$ miles, as the ordinary day's travel for expeditions consisting wholly or in part of Spanish footmen, pack-laden Indians, or horse or mule pack-trains, we shall doubtless not be very far away from the average Spanish-American practice of the present and of the past four centuries.*

*In No. 1 of the Early Far West Papers, we have ~~indicated~~ seen that the Tejo slave of Nuño de Guzman said, "It took forty days to go there ~~to the Seven Cities~~ from his country", [Oxitipar], and that Guzman "thought, from the forty days of which the Tejo had spoken, that it would be found to be about 200 leagues": an estimate ~~undoubtedly~~ obviously based upon a conventional traveling rate of 5 leagues per day.

In his interesting description of "the art of packing" as observed by him in 1831-'40 in New Mexico and Chihuahua, Dr. Josiah Gregg says, concerning the movements of ~~the~~ the atajos, or pack-trains:

"The day's travel is made without a nooning respite; for the consequent unloading and reloading would consume too much time: and as a heavily-packed atajo should rarely continue en route more than five or six hours, the jornada de recua (day's journey of a pack-drove) is usually but twelve or fifteen miles." (Commerce of the Prairies, Second edition (1845), Volume I, page 181.)

At Culiacan, where Coronado's army was reorganized and divided, we find that the chroniclers make a change of ^{ha} itinerary measure. From Culiacan northward they have undoubtedly measured by terrestrial leagues of about the value that we have indicated; but we are forced to conclude that, for distances south of that town, they employed the larger ^{Coronado} leagues, of $17\frac{1}{2}$ to the degree.

On modern maps, a straight line from Mexico City to Compostela measures about 388 miles; and one from Compostela to Culiacan, about 290 miles. The former distance is equivalent to 112 leagues of 3.46 statute miles each, ~~420 to the degree~~, or to 140 leagues of 2.77