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1. Submarine Valleys on the Pacific Coast
of the United States.
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on the Coast of California.

By Prof. GEO. DAVIDSON, A. M., Ph. D.

Extract from Bulletin 6, California Academy of Sciences.

SUBMARINE VALLEYS ON THE PACIFIC COAST OF THE
UNITED STATES.

BY GEORGE DAVIDSON.

Read at the Meeting of October 4th, 1886.

(This paper was illustrated with diagrams.)

The plateau of the Pacific Ocean reaches a depth of 2,000 to 2,400 fathoms within as little as forty or fifty miles of the Coast to the southward of Cape Mendocino. The descent to these profound depths is not uniform, however, except off the high range of the Santa Lucia. Generally there is a marginal plateau of ten miles out to the hundred fathom curve, and then the descent is sharp to five or six hundred fathoms. Off the level and shallow plateau of the Gulf of the Farallones, the descent is rapid within five miles of the South East Farallones, and reaches 2,000 fathoms in fifty miles. The determination of these great depths we owe to the deep sea soundings of Commodore Belknap, of which a full discussion was presented by me to the Academy in 1873-4.

Into this marginal plateau of one hundred fathoms there have been developed, in the course of the operations of the United States Coast and Geodetic Survey, several remarkable submarine valleys. Notably that in Monterey Bay, heading to the low lands at the great bend of the Salinas River; and that off Point Hueneme at the eastern entrance to the Santa Barbara Channel, also heading into the low coast at the wide opening of the Santa Clara Valley. Then there are one or two near the mouth of the Laguna Mugu, two or three off the southern point of Carmel Bay, while the deepest one enters far into the Bay. These all have remarkable characteristics which I have heretofore brought to the notice of the Academy.

Submarine Valley I. The latest developments of submarine valleys are near the high, bold coast under Cape Mendocino. A submarine ridge runs southward from Point Delgada at Shelter Cove, in latitude $40^{\circ} 01'$, for ten miles or more. But the depth of the marginal plateau at 100 fathoms is about six or seven miles from the shore. Just north of this bank, off Shelter Cove, there has been developed a deep submarine valley where it breaks through the marginal plateau and runs sharply into the immediate coast-line under the culminating point of the crest-line of mountains. The head of this submarine valley is 100 fathoms deep at one and a quarter miles from the shore, and the depth of 25 fathoms almost reaches to the rocks under the cliffs. The mountain peak toward which it points is 4,236 feet above the sea and only two and a half miles inside the shore line. The 100 fathom line lies six miles off Point Delgada, but where the valley breaks through the marginal plateau the depth reaches 400 fathoms. The slopes of the sides of this valley are very steep.

Submarine Valley II. Hence northwestward to Point Gorda the 100 fathom line of soundings continues nearly parallel with the coast line except about midway, where a minor submarine valley 300 to 150 fathoms deep stretches sharply toward the shore, and within two and a half miles thereof. The head lies two and a half miles south by east from Spanish Flat, under the mountains. But immediately north of the point, there is a very deep submarine valley which comes in from the westsouthwest, and heads close under the shore three miles north of Point Gorda, and therefore less than a mile north of the mouth of the Mattole River.

The head of this great submarine valley, at the 30 fathom line, is only one-third of a mile from the shore in latitude $40^{\circ} 18\frac{1}{2}'$. The depth of 100 fathoms in the valley is only one and a half miles from shore, and the sides of the valley

are remarkably steep. The 100 fathom curve of the valley comes close between the general 30 fathom curve on the north and south, where they are one-third of a mile apart.

The opening of this valley through the edge of the 100 fathom plateau is 520 fathoms deep, and is only six miles S. 62° W. from Point Gorda. The barrier of coast line at the head of this valley is over 2,000 feet high.

Submarine Valley III. Between Point Gorda and Cape Mendocino there is a second submarine valley, a little nearer to the cape. It comes in from the westward, but does not indent the 20 fathom line along the shore, but the depth of 100 fathoms in the valley is only one-third of a mile outside the regular 25 fathom coast line, and lies five miles S. by E. from Cape Mendocino light house.

The 450 fathom sounding in the entrance to the valley is only six and a half miles SW. by S. from the cape, and this valley is comparatively wide. Its north side is formed by a 30 fathom submarine plateau extending five miles from the cape. This valley heads under the great mountain mass, rising behind Cape Mendocino and reaching 3,400 feet elevation.

The bottom of the valley is green mud, and yet in two places, at depths of 320 fathoms, broken shells were brought up with gravel. Both slopes of the valley are green mud up to about 30 or 35 fathoms, when the bottom changes to fine gray sand.

Between the two submarine valleys of Point Gorda (II.) and Cape Mendocino (III.), the submarine ridge carries 50 fathoms out for four and a quarter miles from shore; the bottom is green mud outside of 35 to 40 fathoms, with fine gray sand inside.

Northward of the Cape Mendocino submarine valley, the irregular bottom off Cape Mendocino, marked by Blunt's reef, stretches well to the westward of the usual coast

depths, and is thence spread out towards Humboldt Bay as a broad and comparatively shallow plateau.

Two problems are at once suggested by these submarine valleys. One is eminently practical. Steam coasting vessels bound for Humboldt Bay, when they get as far north as Shelter Cove in very thick fogs, haul into the shore to find soundings, and then continue parallel with the shore. One vessel has been lost by failing to find bottom until close upon the rocky coast. This steamer doubtless sounded up the axis of the deep submarine valley off King Peak, and could find no bottom. Had the existence of this valley been known, the vessel would have proceeded in a more guarded manner.

The second bearing which these great submarine valleys have, is upon the deep sea fauna which must be brought close under the shores, the more especially as they bring in the colder waters coming down the coast outside of the influence of the close inshore eddy current to the northward.

STANDARD GEODETIC DATA.

COMMUNICATED BY AUTHORITY OF THE SUPERINTENDENT OF THE UNITED STATES
COAST AND GEODETIC SURVEY.

BY PROF. GEORGE DAVIDSON.

Read October 18, 1886.

In the development of the main triangulation of the Pacific Coast, it was early discovered that large and irregular deflections of the plumb-line existed at the triangulation stations, whether they were situated on the mountains or in the plains.

When the main triangulation was undertaken it embraced lines of unusual length, and one part of the scheme was the projection of a network across the continent along the 39th parallel.

In order to collect standard geodetic data for the computation of the geographical positions on this coast, Assistant Davidson planned at the outset to have the latitude observed at each triangulation point; and he also observed the azimuth of some one line in the series of directions which were observed from the same station.

This scheme of triangulation commenced from an accurately-measured base-line of nearly eleven miles in length situate in the plains of Yolo county, California. From this line it was carried by quadrilaterals to the Coast Range of mountains, as far west as Mount Tamalpais; and from the line Mount Helena—Mount Diablo it stretched across the great valley of California to the line Mount Lola—Round Top. This scheme of triangulation was named by the Superintendent of the United States Coast and Geodetic Survey the "Davidson Quadrilaterals." The observations at all the stations have been shown to be remarkably satisfactory, and the discussion has been rigorously carried out in

the computing division of the Survey, under the direction of Assistant Schott. From the means already at hand, the following summary of results is made known, wherein it is seen that the accepted standard station for latitude is Mount Helena, and the standard line for azimuth is Mount Helena—Mount Diablo. The tabulation exhibits the observed and computed latitudes and azimuths, the probable error of each determination, and the deflection of the plumb-line from the means.

Including the stations Mount Lola and Round Top, which are the easternmost points of the "Davidson Quadrilaterals," in the Sierra Nevada, we have nine stations, at each of which the latitude and azimuth were determined astronomically; and we shall take the mean results derived from all these observations for the formation of the standard values φ_0 and a_0 .

The direct results of the astronomical observations for latitude require two corrections: one, the reduction to the station point Δ ; the other, the correction for curvature of the vertical or reduction to the sea level. The heights required for the latter purpose are given in Appendix No. 10, Coast and Geodetic Survey Report for 1884, (Mount Lola being 2,796.4 metres, or 9,175 feet; and Round Top 3,173.5 metres, or 10,412 feet above the level of the sea.)

For the expression of the curvature between the sea-level and the altitude of the station, we have (see Clarke's

Geodesy, pp. 101-102), $\delta\varphi = -\frac{h}{r \sin 1''} (\frac{5}{2} m - e') \sin 2\varphi$. Putting $\frac{5}{2} m - e' = 0.0052^1$, and $\log. (r \sin 1'') = 1.490$, then for h , the height in metres, and $\delta\varphi$ the correction in seconds of arc we have for the latitude φ

$$\delta\varphi = -0.000167h \sin 2\varphi; \text{ or } [n 6.212]h,$$

for the average latitude 39° ; the number within brackets being a logarithm.

¹.—G. Zachariae, in his *Principal Geodetic Points* (German translation by Dr. Lampe, Berlin, 1878), prefers the value 0.00513.

GEODETIC OR STANDARD LATITUDE φ_0 OF MOUNT HELENA,
FOR THE "DAVIDSON QUADRILATERALS."

No.	Astronomical Station.	Year of Obsn.	Observed Astron'mic ^l Latitude.	Probable Error.	Red'n to Δ	Red'n to Sea Level.	Resulting seconds of Latitude (A).	Adopted Geodetic Latitude. (G).	A—G
			o ' "	"	"	"	"	o ' "	"
1	S. E. Yolo Base.	1880	38 31 34.52	± 0.06	-0.45	-0.00	34.07	38 31 35.41	-1.34
2	N. W. Yolo Base.	1880	38 40 37.34	0.07	-0.13	-0.01	37.20	38 40 38.03	-0.83
3	Monticello.....	1880	38 39 46.31	0.09	-0.31	-0.15	46.05	38 39 43.85	+2.20
4	Vaca Mt.	1880	33 22 23.38	0.05	+0.37	-0.12	23.63	38 22 27.02	-3.39
5	Mt. Diablo. ...	1876	37 52 49.59	0.06	0.00	-0.19	49.40	37 52 48.70	+0.70
6	Mt. Tamalpais.	1882	37 55 19.04	0.08	-0.04	-0.13	18.87	37 55 20.69	-1.82
7	Mt. Helena.....	1876	38 40 01.02	0.06	+0.47	-0.22	01.27	38 40 04.26	-2.99
8	Mt. Lola.....	1879	39 25 57.98	0.06	-0.22	-0.46	57.30	39 25 53.34	+3.96
9	Round Top....	1879	38 39 46.89	0.08	+0.01	-0.52	46.38	38 39 43.64	+2.74
								Mean...	-0.09

The mean difference, A—G, is small, approximating zero, as it should be. We have, therefore, retained and adopted for the present φ_0 for Mount Helena $38^\circ 40' 04.26''$, with a probable uncertainty of $\pm 0.''59$. The average local deflection in the meridian is about $2.''2$.

GEODETIC OR STANDARD AZIMUTH α_0 OF DIRECTION MT. HELENA
TO MT. DIABLO, FOR THE "DAVIDSON QUADRILATERALS."

No.	Station Occupied.	To Station Observed.	Observed Astronomical Azimuth.	Probable Error.	Reduction to Sea Level.	Resulting seconds of Azimuth (A)	Adopted Geodetic Azimuth (G')	A—G'
			o ' "	"	"	"	o ' "	"
1	S. E. Yolo Base.	N. W. Yolo Base.	163 07 13.51	± 0.18	-0.00	13.51	163 07 15.07	-1.56
2	N. W. Yolo Base.	S. E. Yolo Base.	343 05 02.35	0.16	-0.00	02.35	343 05 04.03	-1.68
3	Monticello.....	Mt. Helena.....	91 04 25.16	0.21	-0.00	25.16	91 04 23.79	+1.37
4	Vaca Mt.	S. E. Yolo Base.	235 38 36.44	0.28	-0.00	36.44	235 38 33.47	+2.97
5	Mt. Diablo.....	Mt. Helena.....	144 28 16.13	0.15	*	*	144 28 15.06	+1.07
6	Mt. Tamalpais.	Mt. Diablo.....	274 15 15.39	0.14	-0.01	15.38	274 15 15.71	-0.33
7	Mt. Helena.....	Mt. Diablo.....	324 01 24.86	0.19	*	*	324 01 31.04	-6.18
8	Mt. Lola.....	Mt. Helena.....	67 21 62.57	0.17	-0.16	62.41	67 21 59.55	+2.86
9	Round Top....	Mt. Helena.....	90 58 53.67	0.13	-0.16	53.51	90 58 53.01	+0.50
							Mean...	-0.11

The mean difference is sufficiently near zero to retain the old value, and we adopt for the present α_{\circ} Mount Helena to Mount Diablo:

$$324^{\circ} 01' 31.''04 \pm 00.''64.$$

This value will slightly change after the Mount Lola and Round Top observations shall have been finally adjusted. The average local difference in azimuth is about 2.''1.

At the stations Mount Diablo and Mount Helena the astronomical azimuths were referred to a mark and not to a triangulation point, and the same is the case at Mount Lola and at Round Top.

The references to the stations marked by an asterisk [*] in the preceding table would therefore be arbitrary since the results must depend on the adjustment of the directions of the figure; but by applying a correction which is the mean of all the corrections to the lines at the stations, the reference of the astronomical meridian to the geometrical figure of the triangulation is effected with respect to all directions; thus for the two stations in question:

At Mount Diablo:—

Observed azimuth of the reference mark (Clayton)=	
$9^{\circ} 42' 25.''92$ West of North; hence, astronomical azimuth	
of the mark=	$170^{\circ} 17' 34.''08$
Or when reduced to the sea level=	$170 17 34. 07$
At Mount Diablo the mean correction to the	
six adjusted directions is $+ 0.''023$	
($\pm 0.''11$); this added to the observed	
geodetic direction of the azimuth	
($25^{\circ} 49' 17.''194$) gives=	$25 49 17. 217$
Hence with the corrected direction to Mount	
Helena (see below)=	$359 59 59. 273$
The angle between the mark and Mount He-	
lena, adjusted=	$25 49 17. 94$
and the astronomical azimuth referred to	
Mount Helena becomes	$144 28 16. 13$
as given in the preceding table.	

Similarly at Mount Helena:—

The Observed Azimuth of the reference mark (Woods)=	189 18 14. 36
the same reduced to the sea level	189 18 14. 37
The mean correction to four adjusted directions at the station is $-0.''032 (\pm 0.''13)$.	
The angle between the mark and Mount Diablo adjusted=	225 16 49. 51
Whence the Astronomical Azimuth, referred to Mount Diablo=	324 01 24. 86

We have also the following table of adjusted directions at these two stations:—

AT MOUNT DIABLO.				AT MOUNT HELENA.			
Direction to	Result of Station Adjustment	Cor'n. Figure Adjust.	Final Seconds.	Direction to	Result of Station Adjustment	Cor'n. Figure Adjust.	Final Seconds
	° ' ''	''	''		° ' ''	''	''
Mt. Helena.....	359 59 59.918	-.645	59.273	Mt. Diablo.....	359 59 59.927	+.183	60.110
Monticello.....	20 03 30.611	-.102	30.509	Mt. Tamalpais....	33 43 57.138	+.303	57.441
Vaca Mt.	20 19 59.481	+.319	59.800	Azim. Mark (Woods)	225 16 49.650		(49.618)
Azim. Mark (Clayton)	25 49 17.194		(17.217)	Monticello.....	306 46 16.069	+.008	16.077
North West Base....	38 39 09 129	+.086	09.215	Vaca Mt.....	340 03 44.097	-.621	43.476
South East Base....	43 24 20 921	+.524	21.445		Mean =-	0.032	
Mt. Tamalpais.....	310 12 09.218	-.047	09.171				
	Mean =+	0.023					

Tables of resulting adjusted directions were prepared for all stations, because the respective mean corrections are to be applied to all other directions not yet adjusted before they can be submitted to the process of the next figure adjustment which ordinarily is of a secondary character.

For the standard *Longitude* of the triangulation about the Yolo Base Line, we have to retain at present the telegraphic longitude of San Francisco station at Washington Square, $\lambda=8h\ 09m\ 38.34\ secs$, (see Coast and Geodetic Survey Report for 1884, Appendix No. 11, p. 424) and derive from it for

Mount Helena the value $\lambda_0 = 122^\circ 38' 01.'' 41$. [This gives for the present astronomical and telegraphic longitude station, Lafayette Park in San Francisco, the longitude west of Greenwich = $8h 09m 42.72s$, or $122^\circ 25' 40.'' 75$.]

These standard geodetic data φ_0 a_0 λ_0 are subject to changes hereafter; but generally they are best retained and the small corrections are noted, so long as the changes do not exceed the respective probable errors of these quantities.

EARLY SPANISH VOYAGES OF DISCOVERY ON THE COAST OF CALIFORNIA.

PROF. GEORGE DAVIDSON, A. M., PH. D.

Read at the meeting of the Academy, Monday, October 18, 1886.

The following tabulation exhibits in a condensed form the identification of the "landfalls" of Cabrillo and Ferrelo, in their explorations of the coast of California in 1542 and 1543, from Cape San Lucas to latitude $42^{\circ} 30'$.

During my work on the Pacific Coast of the United States since the spring of 1850, I have been deeply interested in the discoveries and explorations of the early Spanish navigators. My special duties have made me peculiarly well acquainted with the coast line, and I have thought it my duty to establish the identity of the landfalls, which I believe I have clearly done. Unfortunately, the great length of the paper in which I have given the details of the narratives of Ulloa, Cabrillo, Ferrelo, Drake and Vizcaïno, and my explanations, together with a chart, precludes its publication by the Academy at this time; and it has been presented, *in extenso*, to the Superintendent of the U. S. Coast and Geodetic Survey for publication.

This tabulation contains the resumé of the identification of the ~~sixty-eight~~ ^{county} places which Cabrillo and Ferrelo particularly mention. In it are shown, in parallel columns, the names by which Ulloa, Drake and Vizcaïno designated the same localities, together with the modern names. The latitudes of Cabrillo and Ferrelo were given only to a third of a degree, with an occasional qualification of "a little more," or "a little less," while the large and nearly constant errors indicate very defective instruments. The present latitudes are taken from the published charts of the United States Coast and Geodetic Survey.

It should be understood that the whole of the work embraced in the paper and in this condensed statement has occupied much of my unofficial time during the last two years.

THE LANDFALLS OF CABRILLO, (C), AND FERRELO, (F), WITH
AND THE PRESENT

No.	Dates, 1542, 1543.	Name of place by Cabrillo and Ferrelo.	Latitude by Cabrillo and Ferrelo.	Names by Ulloa, Drake or Vizcalno.
7 9 1	Jun. 2 ^d , 1542 Apr. 14, 1543	El Puerto de Navidad	..... C. F..	El Puerto de la Navidad. V.
2	Jun. 28, 1542	El Cabo de Corrientes	20½°, C..	El Cabo de Corrientes. V.
3	July 2, 1542	La Punta de California	24° "and more," C..	
4	.....	El Puerto del Marques del Valle.....	Do.....	La Bahía de Santa Cruz. U.
5	July 6, 1542	El Puerto de San Lu- cas .....	..... C. F..	La Bahía de San Ben- arbè. V.
6	July 8, 1542	El Puerto de La Trini- dad.....	25°, ....F..	La Bahía de San Abad. U.; La Bahía de Santa Marina. V.
7	" " "	La Punta de la Trini- dad.....	25°. C. F..	
8	" " "	Una Isla.....	.....F..	
9	" 13, 1542	El Puerto de San Ped- ro	25½°, F..	El Puerto de la Mag- dalena. V.
10	.....	La Bahía de San Mar- tin .....	.....F..	La Bahía de Santa Marta. V.
11	" "	Una Gran Ensenada	26°, F..	
12	July 19, "	El Puerto de la Mag- da'ena	27° C. F..	
13	" -- "	La Punta de Santa Catalina.....	.....
14	" 25 "	El Puerto de Santiago	27½°, F..	La Bahía de las Bal- lenas. V
15	" -- "	Habre Ojo.....	27½°, F..	Abreojos, V.'s chart
16	" -- "	Punta y Puerto de Santa Ana.....	28°, F..	
17	" -- "	Una Isleta obra de una legua de Tierra	28°, F..	La Isla de San Roque. U. V.

THEIR NAMES BY ULLOA, (U), DRAKE, (D), AND VIZCAÏNO, (V),
NAMES AND LATITUDES.

No.	Present Name of the Place.	Latitude, ° /	Correction to C., F. or D.	Remarks.
1	Port Navidad.....	19 13	.....
2	Cape Corrientes.....	20 25	-05' (a)....	(a) It is more than probable that Cabrillo assumed the latitude as given by previous navigators.
3	Cape Pulmo.....	23 23	-37', "and more" C..	
4	Anchorage under Cape Pulmo.....	23 23	-37', "and more" C..	
5	San Lucas Bay.....	22 52	.....	Cabrillo did not observe the latitude. "They say it is in latitude 23," F.
6	Santa Marina Bay....	24 20	-40' F..	
7	Cape Tosco.....	24 17	-43' C. F..	The S. E. point of Santa Margarita Island.
8	Santa Margarita Island	24 17	.....	The island is 22 miles long.
9	Magdalena Bay.....	24 32	-58' F..	
10	Santa Maria Bay.....	24 44	.....
11	.....	.....	.....	There is no gulf; but the lowland north of Cape Lazaro slightly recedes, and would mislead a navigator in a small vessel in the offing.
12	Pequeña Bay and Point.....	26 14	-46' C. F..	Ferrello says: "It is 40 leagues from the Bay of San Martin to this coast."
13	San Domingo Point and Anchorage.....	26 19	.....
14	Ballenas Bay.....	26 45	-45' F..	
15	Abreojos Rocks.....	26 46	-44' F..	A dangerous reef of visible and sunken rocks.
16	Asuncion Point and Anchorage	27 07	-53' F..	
17	Island of San Roque..	27 09	--51' F..	Ulloa saw the two islands, Asuncion and San Roque.

THE LANDFALLS OF CABRILLO, (C), AND FERRELO, (F), WITH
AND THE PRESENT NAMES

No.	Dates, 1542, 1543.	Name of place by Cabrillo and Ferrelo.	Latitude by Cabrillo and Ferrelo.	Names by Ulloa, Drake or Vizcaino.
18	July 27, 1542	El Puerto Fondo.....	..... F.	
19	July 31, 1542	[Anchorage].....	..... F..	
20	Aug. 1 " "	El Puerto de San Pedro Vincula.....	28½° "and more," F..	El Puerto de San Bartolomè V.
21	" 2 " "	La Isla de San Esteban.....	..... F..	La Isla de Natividad de Nuestra Señora. V.
22	Aug. 2, 1512	Una Ensenada Grande.....	..... F..	
23	" 5 " " Mar. 28, 1543	La Isla de Zedros	29°, F..	La Isla de los Cedros. U; La Isla de Cedros. V.
24	Aug 11, 1542	El Puerto de Santa Clara.....	30° "scant" F	La Bahía de San Hipolito. V
25	" 14, 1542	La Punta del Mal Abrigo.....	30½°, F..	
26	" 19 " "	La Isla de San Bernardo.....	30½°, F..	La Isla de San Geronymo. V.
27	" 20 " "	El Cabo del Engaño... La Punta del Engaño.	31°, C.. 31°, F..	El Cabo del Engaño, 30°, U. Do.
28	" 20 " " Mar. 21, 1543	El Puerto de la Posesion.....	31½°, F..	La Bahía de las Virgines. V.
29	Aug. —, 1542	La Isla de San Augustin.....	..... F..	La Isla de Cenigas. V. La Isla de San Hilario. V.
30	Sept. 4, 1542	[Anchorage, 7 leagues from San Augustin.]	..... F..	
31	" 8 " "	El Cabo de San Martin.....	32½°, F..	
32	" 11 " "	El Cabo de la Cruz....	33°, C..	
33	" 11 " "	El Cabo de Cruz.....	33°, F..	
33	" 11 " "	Una Isleta.....	..... F..	
34	" 17 " " Mar. 18, 1513	El Puerto de San Mateo.....	33½°, F..	La Ensenada de Todos Santos. V.

THEIR NAMES BY ULLOA, (U), DRAKE, (D), AND VIZCAÏNO, (V),
AND LATITUDES.—CONTINUED.

No.	Present Name of the Place.	Latitude,		Correction to C., F. or D.	Remarks.
		°	'		
18	Table-Head Cove, or San Pablo Bay	27	11	.....
19	Bay of San Cristoval .....			.....
20	Port San Bartolomè..	27	39	-51' "and more" F ..	
21	Natividad Island....	27	53	.....	The Afégua, or Bird Island of Father Taraval, 1734.
22	Sebastian Vizcaïno Bay	27 to 28	45 35	.....	This is the Gulf of San Xavier, of Father Tara- val. It is 50 by 60 miles in extent.
23	Cerros Island	28	02	-58' F...	They anchored under the south shore. This is the Amalgua, or Fog Island of Father Taraval, 1734.
24	La Playa Maria Bay .	28	55	-65' "scant" F ..	They anchored here.
25	Point Canoas.....	29	25	-65' F ..	
26	San Gerónimo Island.	29	48	-42' F ..	
27	Point Baja.....	29	56	-64' C ..	
	Point Baja.....	29	56	-64' F ..	
28	Port San Quentin....	30	24	-66' F..	
29	San Martin Island ...	30	29	.....
30	San Ramon Bay	30	49	....
31	Point Santo Tomas, or Cape San Tomas.	31	33	-57' F..	The anchorage under the cape
32	Grajero Point, or Ban- da Point.....	31	45	-75' C..	Distance from Cape San Martin, 4 leagues.
	Do.....	31	45	-75' F..	
33	The Todos Santos Is- lands.....	31	48	.....
34	The Ensenada in To- dos Santos Bay	31	51	-89' F..	Anchorage in the north- east part of Todos Santos Bay.

THE LANDFALLS OF CABRILLO, (C), AND FERRELO, (F), WITH
AND THE PRESENT NAMES

No.	Dates, 1542, 1543.	Name of place by Cabrillo and Ferrelo.	Latitude by Cabrillo and Ferrelo.	Names by Ulloa, Drake or Vizcaino.
35	Sep. 26, 27, 1542.....	Las Islas Desiertas...	34°, F..	Las Islas de los Coronados. V; Las Islas de San Martin, V.'s chart.
36	Sep. 28, 1542 Mar. 11, 1543	El Puerto de San Miguel.....	34 $\frac{1}{3}$ °, F..	El Puerto de San Diego V.; El Puerto Bueno de San Diego, V.'s chart.
37	Oct. 7, 1542	La Isla de San Salvador.....	.....F..	La Isla de Santa Cathalina. V.
38	Oct. 7, 1542	La Isla de la Vittoria.....	.....F..	
39	Oct. 8, 1542	La Bahia de las Fumos..... La Bahia de los Fuegos.....	35°, F.. .....F..	
40	Oct. 9, 1542	[Anchorage].....	.....F..	
41	Oct. 10, 1542	Los Pueblos de las Canoas.....	35 $\frac{1}{3}$ °, C..	
	Mar. 8, 1543	El Pueblo de las Canoas.....	35 $\frac{1}{3}$ °, F..	
42	Oct. 13, 1542	[Anchorage].....	.....F..	
43	Oct. 14, 1542	[Anchorage].....	.....F.	
44	Oct. 15, 1542	[Anchorage].....	.....F..	
45	Oct. 16, 1542	[Anchorage].....	.....F..	
46	Oct. 17, 1542	[Anchorage].....	.....F..	
	Nov. 2-6, "	El Pueblo de las Sardinias.....	.....C..	
	.....	Los Pueblos de las Sardinias.....	.....F..	
47	Feb. 12-14, 1543.....	El Puerto de las Sardinias.....	35 $\frac{1}{2}$ °, F..	
48	Nov. 1, 1542	El Puerto de Todos Santos.....	.....F..	
49	.....	El Pueblo de Xexo...	.....F..	
50	Oct. 18, 1542	El Cabo de la Galera..	36 $\frac{1}{2}$ °, C..	
	" " "	El Cabo de Galera....	36° "and more." F..	

THEIR NAMES BY ULLOA, (U), DRAKE, (D), AND VIZCAINO, (V),
AND LATITUDES —CONTINUED.

No.	Present Name of the Place.	Latitude, ° /	Correction to C., F. or D.	Remarks.
35	Los Coronados Islands	32 25	—95' F..	
36	San Diego Bay.....	32 40	—100' F..	He has one of the largest errors in the best-known port.
37	Santa Catalina Island.	33 27	.....	At the great depression across the island.
38	San Clemente Island	32 49	.....
39	Santa Monica Bay....	34 00	—60' F..	
	Do			
40	The Anchorage off Laguna Mugu.....	34 05		
41	San Buenaventura....	34 17	—63' C..	
	Do.	34 17	—63' F..	
42	Anchorage off "the Rincon".....	34 22	.....
43	Anchorage off "the Carpinteria".....	34 24	.....	A few miles east of Santa Barbara.
44	Anchorage 4 or 5 miles west of Goleta Point	34 25	.....
45	Anchorage off the Cañada del Refugio....	34 27	.....
46	Anchorage off Gaviota Pass.....	34 27		
	The Indian Villages at Gaviota Pass.....	34 28	.....	Ferrelo says the Indian name was Cicacut.
	Do			
47	Anchorage off Gaviota Pass	34 27	—73' F..	
48	Anchorage off El Coxo	34 28	.....	There are two Coxo's. The Coxo Viejo is one mile east of the usual anchorage El Coxo.
49	Indian Village at El Coxo	34 29	.....
50	Point Concepcion, or Point Conception	34 27	—123' C.... —93' "and more" F..	La Punta de la Concepcion of recent Spanish navigators.

THE LANDFALLS OF CABRILLO, (C), AND FERRELO, (F), WITH
AND THE PRESENT NAMES

No	Dates, 1542, 1543.	Name of place by Cabrillo and Ferrelo.	Latitude by Cabrillo and Ferrelo.	Names by Ulloa, Drake or Vizcaino.
51	Oct. 14, 1542.	La Isla de San Lucas.	..... F..	
52	" 18 "	Las Islas de San Lucas	..... C. F..	
53	" 25 "	La Isla de la Posesion	... C. F..	La Isla de Baxos. V.
...	Dec., 1542	La Isla de Posesion..	..... F..	
54	Dec., 1542	Una de las Islas de San Lucas .....	..... C..	
55	Jan. 3, 1543 Mar. 5, "	La Isla de Juan Rod- riguez.....	.....F.	
56	Oct. 25, 1542	El Puerto de la Posesion.....	..... C. F..	
57	Mar. 5, 1543	[Dangers].....	F.'s consort.	
58	Jan. 29, 1543	La Isla de San Lucas.	..... F.	La Isla de Cleto. V.
59	Mar. 5, 1543	La Isla de San Sebas- tian	F.'s consort	
60	Jan. 19, 1543 Feb. 14, "	La Isla de San Salva- dor.....	..... F..	La Isla de San Am- brosio. V.
61	Nov. 11, 1542	El Rio de Nuestra Señora .....	..... C..	
62	Nov. 11, 1542	Las Sierras de San Martiu	37½°, C. F..	La Sierra de Santa Lu- cia. V.

THEIR NAMES BY ULLOA, (U), DRAKE, (D), AND VIZCAINO, (V), AND LATITUDES.—CONTINUED.

No.	Present Name of the Place.	Latitude, ° ′	Correction to C., F. or D.	Remarks.
51	The three Islands, Santa Cruz, Santa Rosa and San Miguel.....			They overlap each other, and were seen as one great island.
52	San Miguel, and then Santa Cruz and Santa Rosa as one.....			One large—Santa Cruz and Santa Rosa overlapping—and one small, which was San Miguel.
53	San Miguel Island ...	34 03		Ferrello says the Indian name was Ciquimuymu.
...	Do.			
54	Do.			
55	Do.			So named by Ferrello to commemorate Cabrillo's death on the island.
56	Cuylers Harbor.....	34 03		Cabrillo and Ferrello wintered here in 1542-43; it is on the north shore of San Miguel island.
57	Wilson Rock, &c.....	34 06½		The rocks and reefs off the northwest shores of San Miguel island.
58	Santa Rosa Island....	33 57		Ferrello says the Indian name was Nicalque.
59	Do.			
60	Santa Cruz Island... ..	34 02		Ferrello says the Indian name of the island was Limun.
61	La Purisima, or Santa Ynez River	34 42		Cabrillo and Ferrello did not see it. They learned of its existence north of Pt. Concepcion, from Indian information, when in the Santa Barbara channel.
62	Sierra Santa Lucia....	36 03	—87' C. F..	This mountain range is 50 miles long, and overhangs the coast line. The culminating point is Mt. Santa Lucia, 6,000 feet elevation and 12 miles inside the shore.

THE LANDFALLS OF CABRILLO, (C), AND FERRELO, (F), WITH
AND THE PRESENT NAMES

No.	Dates, 1542, 1543.	Name of place by Cabrillo and Ferrelo.	Latitude by Cabrillo and Ferrelo.	Names by Ulloa, Drake or Vizcaino.
63	Nov. 11, 1542	El Cabo de San Mar- tin.....	38°, ... F..	La Punta de Pinos. V.
64	Nov. 11, 18, 1542.	El Cabo de San Mar- tin	37½°, F..	
65	Nov. 18, 1542	El Cabo de Nieve, ...	28½°, C F..	
66	.....	(de las Sierras Nevad- as )	.....
67	Nov. 16, 1542	La Baía de Pinos.....	..... C..	Portus Novæ Albionis 38°.D.
	.....	La Bahía de los Pinos	39° "and more," F..	El Puerto de San Francisco.V.
68	Nov. 14, 1542	El Cabo de Pinos ...	40° "and more," C..	
	Feb. 25, 1543	El Cabo de Pinos....	40°, F..	
	Mar. 3, 1543			
69	Feb. 26, 1543	El Cabo de Fortunas.	41°, C..	

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69 Feb 25/43 a Point / T Punta de la

THEIR NAMES BY ULLOA, (U), DRAKE, (D), AND VIZCAINO, (V)
AND LATITUDES.—CONCLUDED.

No.	Present Name of the Place.	Latitude.		Correction to C., F. or D.	Remarks.
		°	'		
63	Point Pinos.....	36	32	—88' F.....	
64	The Twin Peaks.....	36	03	—87' F.....	The height is 5,100 feet, and the distance $3\frac{1}{2}$ miles inland.
65	Black Mountain.....	37	09	—91' F.....	The mountain mass 13 miles behind Point Año Nuevo.
66	The Santa Cruz mountains.....				Embracing Black Mount- ains.
67	Anchorage in Drake's Bay.....	38	00	—00' D....	The northern part of the Gulf of the Farallones.
	Drake's Bay, or the Gulf of the Faral- lones.....	38	00	—60' "and more," F..	"A great gulf," Cabrillo. (Una Ensenada Grande.)
68	The Northwest Cape.	38	31	—89' "and more" C....	The mountain mass just east of Fort Ross anchor- age, and reaching 2,200 feet elevation.
	Do.	38	31	—89' F.....	
69	King Peak, behind Punta Delgada.....	40	00	—60' C. . .	The mountain mass north- ward of Shelter Cove, with King Peak, only 10 miles inland and 4,235 feet elevation, as the cul- minating point.

69, Point arena | 38 ? ↑





