THE

WEST COAST

OF MEXICO

No. 56.

U. S. HYDROGRAPHIC OFFICE—BUREAU OF NAVIGATION.

THE

WEST COAST OF MEXICO,

FROM

THE BOUNDARY LINE BETWEEN THE UNITED STATES AND MEXICO TO CAPE CORRIENTES,

INCLUDING

THE GULF OF CALIFORNIA.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1880.

ADVERTISEMENT.

Since publication No. 56 (Remarks of Commander George Dewey, U. S. N., on the coasts of Lower California and Mexico) was issued from this office, the whole coast described therein has been replotted, with many additions and corrections to the preliminary charts. This necessitated a new publication, revised and much enlarged.

The present work has been compiled by Lieut. Samuel Belden, U. S. N., chiefly from the data furnished by Commander Dewey and the officers of the *U. S. S. Narragansett*. Where other authorities are quoted it is mentioned in the text.

The originals of the views are by Messrs. W. F. Beardslee and H. von Bayer. They were redrawn at this office by Mr. A. von Motz, for photo-lithographing.

J. C. P. de KRAFFT,
Hydrographer.

U. S. HYDROGRAPHIC OFFICE,
Washington, D. C., August, 1880.

NOTE.

The bearings, courses, and trend of the land are given both true and magnetic, the true bearing in degrees and minutes and the magnetic, following it, in points and fractions of a point, to the nearest eighth, thus, N. 43° 30′ W. (NW. ⅞ W. mag.) The magnetic variation and annual change are given up to the date of the latest reliable information, which date is stated in the text.

The direction of the winds as given, is the point from which they blow; of currents, the point toward which they set.

Distances are expressed in nautical miles. A cable's length is 100 fathoms.

Soundings are reduced to mean low water, unless otherwise stated.

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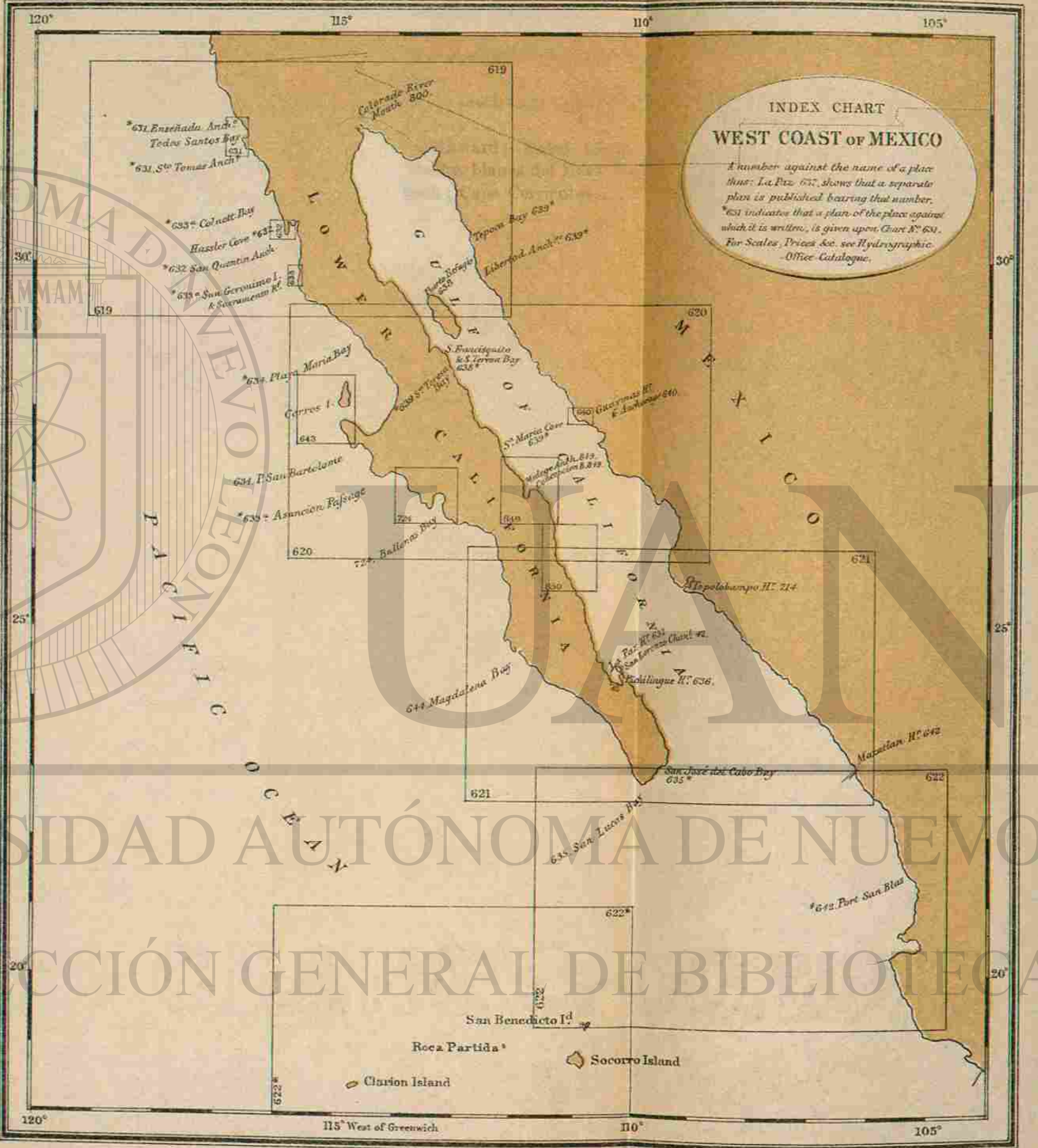

PART I.

WEST COAST OF THE PENINSULA OF LOWER CALIFORNIA — GENERAL DESCRIPTION — WINDS, WEATHER, CURRENTS, ETC.

General description.

The entire west coast of the peninsula of Lower California from the boundary line to Cape San Lucas is, with the exception of the valleys of Santo Tomas and Todos Santos, barren in the extreme. The land is generally high and precipitous, and its approaches bold; but there are many places where vessels may anchor and find shelter from the prevailing coast wind.

Winds.

The prevailing winds along the coast are from a north-westerly direction, and they may be said to blow steadily from that direction for eight months out of the year. During the months of November, December, January, and February, winds from south-east to south-west will be frequently met with, and during these months moderate south-east gales, accompanied with considerable rain, will be occasionally encountered. About the breaking up of these gales the wind hauls to the south-west, and sometimes blows quite hard for a few hours, then comes from the north-west with fine weather. In December and January, heavy northers are liable to occur; these winds blow from north to north-east and last from one to three days. During the summer months strong south-east gales of short duration occur in the vicinity of Cape San Lucas, sometimes extending as far north as Magdalena Bay.

Weather.

During the greater part of the year the weather along the coast is clear and pleasant, and the climate salubrious and equable; rains are most frequent between May and October; fogs occur at all seasons of the year; the largest proportion of foggy weather being encountered during the summer months; they usually occur at night or in the early morning and clear up at about ten o'clock in the forenoon,

Fogs.

the remainder of the day being clear and pleasant. South of Cerros Island there is much less fog than north of it, the weather clears earlier in the forenoon, the temperature is lower, and the winds lighter.

Currents. The currents along the coast set in the direction of the prevailing wind, and vary in strength from half a knot to a knot per hour. Near the land the influence of the tides is felt. *At all times an easterly set should be guarded against.* A very slight NW. current has occasionally been found in the winter season, but it is of rare occurrence.

CHAPTER I.

FROM THE BOUNDARY MARK BETWEEN THE UNITED STATES AND MEXICO TO POINT SAN EUGENIO, INCLUDING CERROS, NATIVIDAD, AND THE SAN BENITO ISLANDS.

Boundary monument. The boundary line between the United States and Mexico is marked by a white marble obelisk about 20 feet high, resting on a pedestal. It stands on a low table land near the edge of the bluff, about 300 yards from the beach, and is plainly visible from the water. Its geographical position, as determined by the *U. S. Coast Survey* in 1871, is Lat. 32° 31′ 58″.46 N., Long. 117° 07′ 32″.37 W., about $10\frac{2}{10}$ miles S. 36° 30′ W. (true) from Point Loma light-house. This monument marks the north-western initial point of the survey of the "Coast of Mexico from the northern boundary to Cape Corrientes, including the Gulf of California," by Commander George Dewey, in the *U. S. S. Narragansett.*

Los Coronados. The Coronados Islets are a group of barren rocks of trap formation lying about 7 miles off the coast and extending about 5 miles in a NW. and SE. direction. The southernmost is the largest and is 2 miles long by half a mile in width; it is wedge-shaped, and its highest peak is 674 feet above the sea level. The south-eastern extremity of the group bears S. 34° 30′ W. (S. by W. $\frac{3}{4}$ W. mag.), distant $10\frac{1}{2}$ miles from the boundary monument and S. 2° E. (S. by E. $\frac{1}{2}$ E. mag.), 17 miles distant from Point Loma light-house. On the west and north-west sides of the southern islet, at a distance of three-quarters and one-half a mile respectively, are two barren rocks about 50 feet high that are a favorite resort for the enormous sea elephants that frequent this coast. N. 62° 30′ W. (WNW. $\frac{1}{2}$ W. mag.) from the northern end of the largest islet, at a distance of $2\frac{1}{2}$ miles, lies the northwesternmost of the group, a barren rock about 7 cables in length, and 350 feet high. Between this islet and the others is a passage with from 18 to 50 fathoms water and numerous patches of growing kelp.

Rocks.

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Rocks.

Anchorage and landing. A fair anchorage may be found on the east side of the largest islet, a little north of its center, in 8 fathoms water, sandy bottom. Boats may safely land in a small cove near the anchorage, which is open to the northward.

Coast from the boundary monument to Descanso Point. From the boundary monument the coast trends S. 3° 30′ E. (S. by E. ½ E. mag.) 5 miles; thence S. 23° E. (SE. ¾ S. mag.) to Descanso Point, it is generally bluff from 50 to 80 feet high. A few miles inland is a range of hills about 400 feet in height, and back of these a range of mountains, one of which, Table Mountain, is 2,230 feet high, and another, a triple-peaked mountain, a few miles south of Table Mountain, called Sharp's Peak, is 2,700 feet high. They are easily distinguished, and are excellent landmarks in approaching the coast. (View opposite, page 6.)

Landmarks

Four miles north of Descanso Point are a ranch and an arroyo, off which are some outlying rocks at a short distance from the shore.

Descanso Bay. From Descanso Point the coast turns sharply to the eastward for about 3 miles, and then curves gradually around to the southward, forming Descanso Bay. Three and a half miles S. 52° E. (SE. by E. ¾ E. mag.) from Descanso Point is the Sugar-loaf Rock, a small rock about 15 feet high, which is apparently the only outlying danger in the bay.

Anchorage. There is an anchorage to the southward of it, often used by the small coasters, and anchorage may be found anywhere along the shore of the bay in from 8 to 15 fathoms, sand bottom. S. 63° E. (E. by S. ¼ S. mag.) 6½ miles from Descanso Point is a small settlement near the shore, which may be recognized by conspicuous sand hills to the northward of it. Small vessels frequently anchor near it.

Sal-si-puedes Point. Sal-si-puedes Point is low and not well defined. It is 16 miles S. 26° 30′ E. (SE. ½ S. mag.) from Descanso Point. The intermediate coast is generally sandy, with an occasional rocky cliff and high hills rising immediately back of the beach. Soundings taken at a distance of 3 miles from the shore gave *no bottom* at 40 fathoms.

Cape San Miguel. Cape San Miguel is the northern limit of Todos Santos Bay, and is a bold point 150 feet high. It bears S. 40° E. (SE. ¾ E. mag.) from Sal-si-puedes Point, and is 10½ miles distant from it. The intermediate coast consists of alternate sand bluffs and rocky cliffs about 50 feet high, backed

by hills of from 300 to 500 feet in height, and a mountain range of 2,000 feet and upwards a few miles inland. This latter has the appearance, to a person a few miles at sea, of bordering on the coast.

Ensenada Point. S. 62° E. (ESE. ⅝ E. mag.) from Cape San Miguel, at a distance of 6¼ miles, is Ensenada Point, a steep hill 370 feet high. The coast between them is bold, with cliffs from 50 to 100 feet in height.

Kelp. A large field of kelp extends from 2½ to 3 miles off the point to the westward, having from 13 to 16 fathoms water at its southern edge.

Anchorage. From Ensenada Point the coast turns sharply to the northward and eastward for about half a mile, forming a snug anchorage, where vessels may lie in from 3 to 5 fathoms water, sand bottom, sheltered from all winds except those from the SW.

Tides. H. W., F. and C., IX^{h} (approx.); tides rise about 4 feet.

Variation. The magnetic variation in 1877 was 13° E., increasing about 2′ annually.

Todos Santos Bay. From Ensenada anchorage the land sweeps around in a semicircular form to Banda Point, which is a bold rocky headland 500 feet high, forming the south-western limit of Todos Santos Bay. At the bottom of the bay is a low sand beach, about 2¼ miles in extent, flanked on the north by a range of hills 500 feet high, and on the west by the cliffs of Banda Point. Numerous detached rocks line the southern shore of the bay, and a rocky ledge extends about three-quarters of a mile to the northward and westward from Banda Point.

Whaling station. About 3 miles to the eastward of the point there is a whaling station, off which good anchorage may be had in from 3 to 10 fathoms, sand bottom.

Anchorage. Numerous patches of kelp are found in the bay and lining the beach.

Todos Santos Islands. The Todos Santos Islands lie N. 36° W. (NW. ½ W. mag.) from Banda Point, the south-eastern end of the southernmost and larger of the two being about 3 miles distant from it. From this point they extend about 2 miles in a north-westerly direction. The southernmost is about 1¼ miles long, less than half a mile wide, and 374 feet high.

Channel. Between it and Banda Point there is a clear channel 2 miles wide. The northernmost island is about half a mile long, a quarter of a mile wide, and from 30 to 60 feet high. Both are barren, and surrounded by detached rocks and kelp.

Anchorage. There is a boat passage between them, and anchor-

age may be found in good weather on the north-eastern side of the larger one in 10 fathoms, sand bottom, the NW. extremity of the island bearing west.

Point Santo Tomas.

Point Santo Tomas lies 12 miles S. 14° E. (SSE. ½ E. mag.) from Banda Point. The coast between them is in crescent form, high and precipitous, with deep water close to the shore, and numerous detached outlying rocks. The point itself is low and rocky, rising abruptly to a height of 395 feet where it unites with the coast range, which attains at a few miles from the coast a height of 3,500 feet.

Soledad Rocks.

The Soledad Rocks lie one mile west of Point Santo Tomas. They are 20 feet high, small in extent, and surrounded with kelp. There is deep water close to them, except on the northern side, where, at a distance of one-quarter of a mile, 8¼ fathoms were found, rocky bottom, and thick masses of growing kelp. There is a channel between the rocks and Santo Tomas Point, with 30 fathoms water and no *known* dangers. In passing through it care should be taken to keep clear of the kelp on either side.

Channel.

Santo Tomas anchorage.

Half a mile to the southward of Point Santo Tomas the coast makes a sharp turn to the eastward, forming a small bight, where good anchorage may be found in from 5 to 10 fathoms, sandy bottom, sheltered from the prevailing coast winds. When making for the anchorage from the northward or westward give the land to the southward of Point Santo Tomas a berth of from a quarter to half a mile, to avoid the dense masses of kelp found there; stand to the eastward until a small sand beach, with a few outlying rocks at its southern end, to the northward of the inner point, is open; then haul up to the northward and anchor as soon as the Soledad Rocks are shut in. Coming from the southward there are no outlying dangers; steer for the deepest bight until the small sand beach is made out; then follow directions given above. This will place you in from 7 to 8 fathoms water, sand bottom, within a quarter of a mile of the landing place, which is on the small strip of sand beach. At the time of the *Narragansett's* visit there was a rough board building near the inner point, which was used as a whaling station. H. W., F. and C., IX^{h} (approx.); tides rise about 6 feet. The magnetic variation in 1877 was

Directions.

Whaling station.

Tides.
Variation.

Plate I

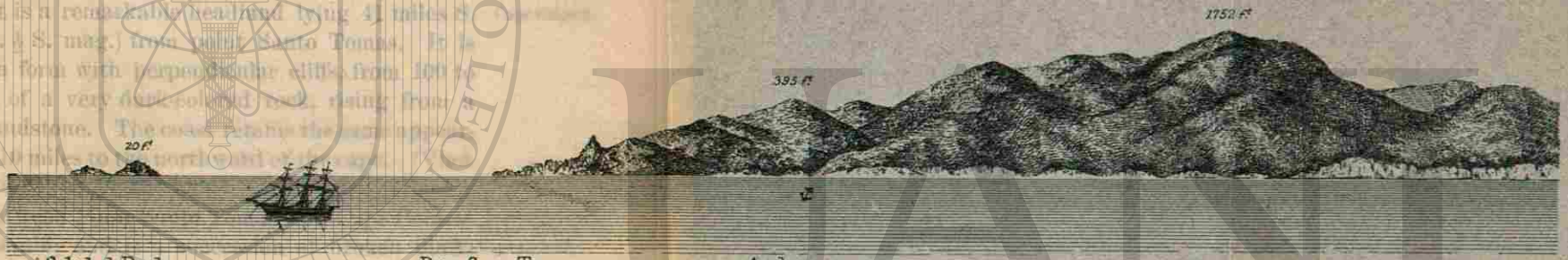
Soledad
N.W by W ½ W.

olnett,
g.) — 5 miles.

Plate I.

Table Mountain (near San Diego). *E by N ½ N. (mag.) 9 m.* Sharp Peak, *(E ½ S. mag. 10 m.)*

Off the coast, to the northward of Descanso Point.



Soledad Rocks, *N.W by W ½ W. (mag.) — 3¼ m.*

Point Santo Tomas, *N.W ½ N. (mag.) 2¼ m.*

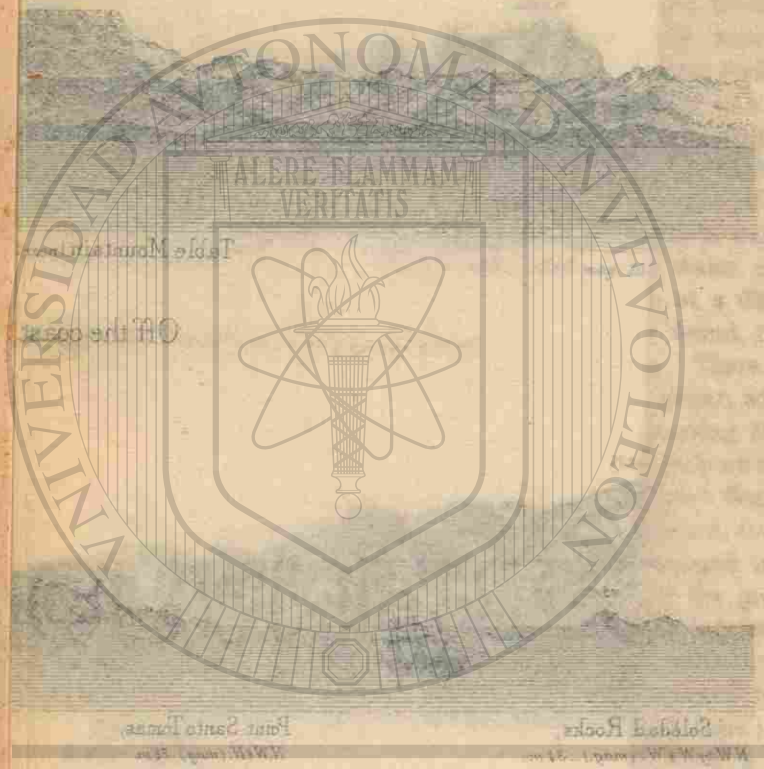
Anchorage, *N.N.W. (mag.) — 1¼ m.*

Off the coast, to the southward of Pt. Santo Tomas.

Jagged Mountain.

Cape Colnett, *E ½ S. (mag.) — 5 miles.*

Off Cape Colnett.



12° 50′ E., increasing about 2′ annually. (View opposite page 6.)

Santo Tomas. The village of Santo Tomas, formerly a mission, lies in a remarkably fertile valley, about 16 miles from the coast (18 miles by the road from the anchorage). Throughout the valley, wherever water can be had for irrigation, the fruits of the tropics and of the temperate zone flourish side by side, requiring but little care except a supply of water. The Santo Tomas River furnishes a good supply of water to the village, but as it approaches the coast disappears in the porous soil, as do most of the streams of the peninsula of Lower California. An abundance of small game, such as ducks, quail, snipe, &c., was found near the banks of the river in the winter. The road from the anchorage runs along the coast for about 2 miles, until it strikes the river, after which it follows the general course of the stream to the village of Santo Tomas.

Fruit.

Game.

Cape Colnett. Cape Colnett is a remarkable headland lying 41 miles S. 26° 30′ E. (SE. ½ S. mag.) from point Santo Tomas. It is semi-circular in form with perpendicular cliffs, from 100 to 350 feet high, of a very dark-colored rock, rising from a base of light sandstone. The coast retains the same appearance for about 10 miles to the northward of the cape. (View opposite page 6.)

Coast from Point Santo Tomas to Cape Colnett. The coast between Point Santo Tomas and Cape Colnett recedes considerably and is a succession of broken bluffs and low beaches to within 10 miles of Cape Colnett, where the perpendicular cliffs commence and extend around the cape. There is a good depth of water along the coast for the entire distance and no outlying dangers. A patch of kelp extends about 2½ miles off San José Point, but not less than 13 fathoms water were found in it. A few miles inland the coast range attains an elevation of 1,500 to 2,000 feet. About 5 miles from the coast and 21 miles N. by E. (N. ⅛ W. mag.) from Cape Colnett is the old mission of San Vicente. Although practically abandoned, there are many traces of former thrift in the extensive ruins of the mission buildings, the famous grove of olive trees, the hedges and irrigating ditches that wind around the hills and through the valleys.

Kelp.

Mission of San Vicente.

From Cape Colnett the coast trends to the northward and

Colnett Bay, anchorage, landing place, &c.

eastward about 2½ miles, forming Colnett Bay, where good anchorage may be found abreast of a remarkable gorge, in from 6 to 9 fathoms water, sand bottom. The best landing place is at the intersection of the cliffs and the shingle beach at the bottom of the bay. The magnetic variation in 1877 was 12° 55′ E., increasing about 2′ annually.

Variation.

San Ramon Bay.

South of Cape Colnett the coast sweeps around to the eastward, forming what is called on the charts San Ramon Bay, the land is lower than to the north of the cape, and consists of sand hills varying in height from 25 to 100 feet. For a distance of 15 or 18 miles after leaving the anchorage, fields of kelp make off from the shore about 3 or 4 miles, thence to abreast San Martin Island the coast is clear, the water is shoaler than northward of the cape, but there are apparently no outlying dangers.

Kelp.

San Martin Island.

San Martin Island (*Las Virgenes of Sir E. Belcher*) lies 30 miles S. 24° E. (SE. ¾ S. mag.) of Cape Colnett. It is nearly circular in form, having its greatest diameter (1½ miles) in an east and west direction. There are two remarkable peaks near the center, the westernmost of which, 497 feet high, is an *extinct volcano*, having a crater at its summit 350 feet in diameter and 40 feet deep. The island is quite barren, producing nothing but the prickly pear and a few stunted bushes that grow among the loose masses of lava.

Anchorages.

There is a good anchorage on the south-east side of the island, off a small lagoon which has communication with the sea at half tide, and anchorage may be found anywhere on the north-east side. The best place to anchor is in *Hassler Cove*, a snug little bight on the eastern side of the island, protected on all sides except the north. Anchor in from 7 to 9 fathoms, the northern end of the natural breakwater that forms the east side of the cove, bearing S. 57° 30′ E. (ESE. ¼ E. mag.) The island is surrounded by detached rocks and kelp, and great numbers of seal and sea fowl resort to it, particularly to the shores of the cove and lagoon. The magnetic variation in 1877 was 12° 55′ E., increasing about 2′ annually. Neap tides rise 4 feet.

Variation.

Tides.

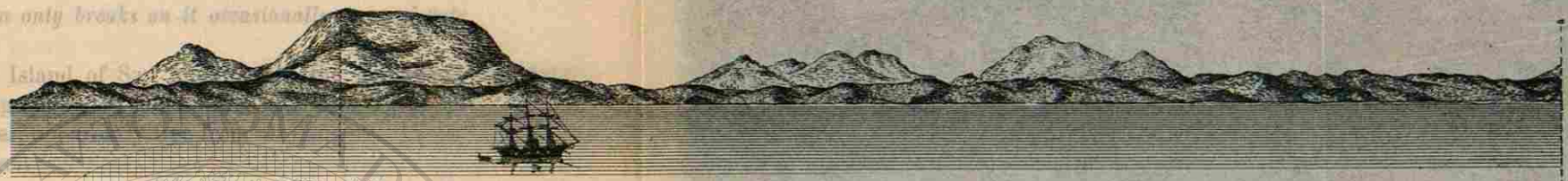
Ben's Rock.

A dangerous rock, known as Ben's Rock, with from 9 to 12 feet water over it, lies 2⅝ miles south of San Martin Island and 4⅛ miles from the main land, on the following bearings, viz: Western peak of San Martin Island N. 2° 45′ W. (N.

San Martin Island,
S.S.W.¼W. (mag.) 3¼ m.

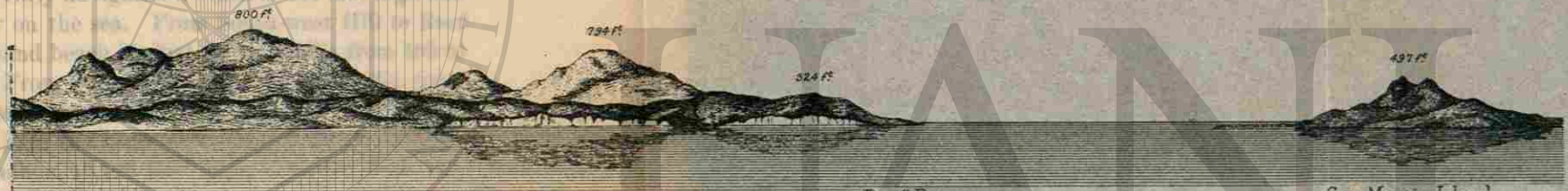
Mt Ceniza,
N.¾E. (mag.) 5¼ m.

Plate II.



E ¼ N. (mag.) 2¼ m.

Off the coast, to the northward of San Martin Island.



Reef Point,
S.E by S ½ S. (mag.) 10¼ m.

San Martin Island,
S.S.W ¼ W. (mag.) 3¼ m.

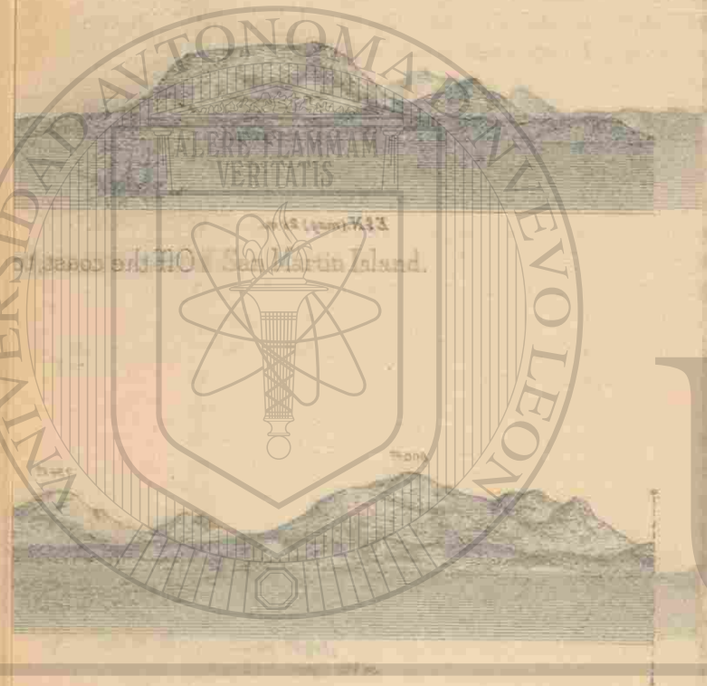
San Martin Island,
N.W ¼ W. (mag.) – 9½ m.

Southwest Hill,
N by W ½ W. (mag.) 4⅝ m.

Kenton Hill.

Mt Ceniza,
N ½ E. (mag.) 5½ m.

Off Reef Point, near Cape San Quentin.



by W. ⅜ W. mag.), Mount Ceniza N. 85° 30′ E. (ENE. ½ E. mag.), the latter being just open to the southward of south-west hill on this bearing.

There are 5 fathoms water close to the rock and 25 fathoms 200 yards from it. *There is no kelp surrounding this rock, and the sea only breaks on it occasionally in moderate weather.*

San Martin Passage.

Between the Island of San Martin and the main land there is a passage about 2½ miles wide, with from 10 to 15 fathoms of water, apparently free from all dangers. (View on opposite page.)

Coast south of San Ramon Bay.

At the southern extremity of San Ramon Bay and nearly abreast of San Martin Island the coast rises suddenly in a perpendicular cliff of dark-colored rock from 150 to 200 feet high and about 1¾ miles in extent, its southern end bearing nearly east (true) from the highest peak of San Martin Island. From this point the coast is a low sand beach for 1¼ miles, then bold rocky cliffs to *South-west Hill* (one of the five hills of the early navigators), which is 324 feet high and borders directly on the sea. From South-west Hill to Reef Point is a low sand beach backed by sand hills from 100 to 150 feet high. From Cape Colnett to Reef Point the coast is apparently free from outlying dangers, with a moderate depth of water near the shore.

Mount Calamahue.

Mount Calamahue, 10,126 feet high, is visible from this vicinity.

Reef Point.

Reef Point is the northernmost of a series of rocky points extending out from the southern extremity of the peninsula that forms the western side of Port San Quentin. A reef extends off from the point to the westward about one-quarter of a mile. (View on opposite page.)

Coast from Reef Point to Cape San Quentin.

From Reef Point to Cape San Quentin the coast is low and rocky, with numerous projecting points and outlying rocks over which the sea breaks heavily. There is a short strip of sand beach, about a cable in length, just west of Cape San Quentin, and Afuera Point, which is the southernmost point of land, lies 3 cables to the westward. From Cape San Quentin the low rocky beach continues for a little more than three-eighths of a mile to the northward and eastward, thence to Entrada Point is a low sand beach with one projecting rock 1½ cables south-west of the point.

Entrada Point. Entrada Point is a low rocky point with no outlying dangers; it may be approached from the eastward to within 1 cable by a vessel drawing 18 feet; from any other direction it is not safe to approach it within one-quarter of a mile. Half a mile N. 31° 30′ W. (NW. mag.) from Entrada Point

Sextant Point. is a low sandy point called Sextant Point. The beach between them is low and sandy, and recedes about 2 cables, forming a small bight in which the water is shoal.

Port San Quentin. Port San Quentin is a small, perfectly secure anchorage, protected on every side; the land in the vicinity is low and sandy, and with the exception of the cactus and a few stunted bushes, entirely without vegetation. No fresh water can be found near the coast.

Five Hills. To the northward of the port are five remarkable hills, which caused one of the early navigators to give it the name of the "*Bay of Five Hills.*" The south-westernmost of these hills, called South-west Hill, is 324 feet high, the others range from 500 to 1,000 feet in height. When approaching the coast from the northward these hills have the appearance of islands.

Caution. No vessel drawing over 12 feet should attempt to enter Port San Quentin without either sending a boat ahead to sound or buoying the channel, which is narrow and tortuous and liable to change with every southerly gale. Not more than 2¼ fathoms can be depended upon in crossing the bar at low water.

Directions. Being off Cape San Quentin and wishing to enter the port, stand to the northward and eastward, keeping half a mile off shore, until Rocky Point, which is easily distinguished, is open to the eastward of Sextant Point, when haul up to N. 12° 50′ E. (N. mag.), taking care not to get in less than 3½ fathoms water. When Rocky Point bears N. 48° W. (NW. by W. ⅝ W. mag.) steer for it and keep this course until Sextant Point is passed and Mount Mazo (a hill 210 feet high, easily distinguished) bears S. 69° W. (SW. by W. mag.), when haul up to N. 82° 50′ W. (W. ¼ S. mag.), and anchor anywhere in 4½ to 5½ fathoms, sand bottom. The

Variation. magnetic variation in 1877 was 12° 50′ E., increasing about

Tides. 2′ annually. H. W., F. and C., VIII^{h} 30^{m}; tide rises 5 feet.

San Quentin. The village of San Quentin lies 5 or 6 miles in a northeasterly direction from the anchorage, at the foot of a range

of hills and near some salt ponds. A small quantity of salt is exported, but owing to difficulty of transportation the business has not hitherto been profitable.

There is said to be a channel through the inner bay or lagoon to San Quentin, but it was not examined by the *Narragansett.*

From Port San Quentin the coast trends to the eastward San Quentin Bay. for 7 or 8 miles and then turns to the southward, forming San Quentin Bay. The water is shoal for several miles off shore, and a long swell will usually be found rolling in, making it an uncomfortable anchorage. The shore of the bay is a low sand beach, with hills about 300 feet high rising a short distance inland, backed by a mountain range of from 1,500 to 4,000 feet in height. About 10 miles from Cape San Quentin, where the coast assumes a southerly direction, its character changes, sand bluffs and dark-colored cliffs 50 to 100 feet in height alternating for several miles, and gradually decreasing in height as they approach Punta Baja.

Punta Baja. Punta Baja, which is situated 26¾ miles S. 20° E. (SE. by S. mag.) from San Quentin, is a low sand cliff about 30 feet high; 5½ miles to the northward of it is a ranch lying in a small indentation of the coast between a dark-colored hill, 409 feet high, and an arroyo. A reef surrounded by kelp Reef. makes off a short distance to the southward of the point, and vessels entering Rosario Bay should give it a good berth.

Rosario Bay. From Punta Baja the coast turns abruptly to the eastward, forming Rosario Bay, so called from the old mission of Rosario, which is situated in a fertile valley a few miles inland.

Anchorage. Safe anchorage may be found in the bay in from 5 to 6 fathoms, sandy bottom, sheltered from the usual coast wind.

From Rosario Bay to Point San Antonio the coast is of sand bluffs 50 to 100 feet high, with hills from 300 to 500 feet in height 1½ to 2 miles back from the beach.

San Geronimo Island. The northernmost point of San Geronimo Island lies 8½ miles S. 5° E. (S. by E. ¼ E. mag.) from Punta Baja. It is a barren rock, covered in many places with a mixture of sand and guano, three-quarters of a mile long and less than a third of a mile wide, with rocky beaches and cliffs 10 to 20 feet in height. Near the center is a peak 172 feet high;

Reef. northward of this are two lower ones. A reef extends half a mile off the southern extremity of the island, its termination being marked by a rock above water, over which the sea breaks heavily, and the whole island is surrounded by outlying rocks and kelp.

Rocky patch. About a mile and a half to the northward of the island the U. S. Coast Survey steamer *Hassler* found a rocky patch with only 5¾ fathoms water over it and from 8 to 12 fathoms around it. As there are many rocky patches in the vicinity, it is possible that other shoal spots may exist. (View on opposite page.)

Anchorage and landing place. There is an anchorage to the eastward of the island in about 7 fathoms, sand bottom, but an uncomfortable swell will usually be felt. A good landing place will be found on a small shingle beach, in a slight indentation of the shore line on the south-east side of the island, at the base of the highest peak.

Variation. The magnetic variation in 1877 was 12° 35′ E., increasing about 2′ annually.

Tides. Tides rise about 5 feet.

Sacramento Reef. Sacramento Reef lies about SW. by S. (mag.) from San Geronimo Island, and is very dangerous. The channel between them is about 3 miles in width, with from 11 to 13 fathoms water in the center, shoaling to about 6 fathoms within a quarter of a mile of the breakers on either side. The reef is a little more than a mile in extent from northwest to south-east, and half a mile wide; there are several large rocks *awash* and *above water*, over which the sea breaks constantly. (View on opposite page.)

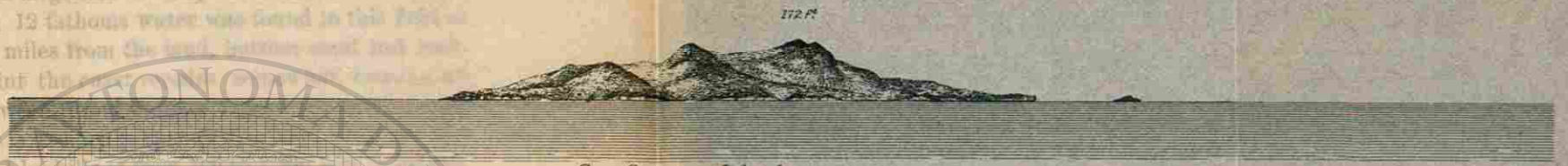
Caution. In the passage between the reef and San Geronimo Island and in that between them and the main land there are large, dense masses of kelp which should always be avoided if practicable, as there are many rocky patches in this vicinity, and although no hidden dangers were found in the short time devoted to its examination, vessels should proceed with great caution while in these passages.

Coast from Point San Antonio to Canoas Point. From Point San Antonio the coast trends S. 53° E. (SE. by E. ¾ E. mag.) to Canoas Point, retaining its character of sand bluffs varying in height from 50 to 100 feet, backed by moderately high hills and in some portions by table lands from 1,000 to 2,000 feet high, of which Sombrero Peak, lying about 2½ miles to the north-east of Bluff Point, is the most conspicuous and is 1,968 feet in height.

Plate I

Point, Sta. Rosalia Bay.
S.E by E.¼E. (mag.) 6 m.

Plate III.



San Geronimo Island, *(S.S.E.½E.(mag.) 5½ m.)*

San Geronimo Island.

Wreck & Sacramento Reef, *W.½S.(mag.) 3 m.*

Rock.

San Geronimo Island, *N.W.by W.½W.(mag.) 6 m.*

San Geronimo Island and Sacramento Reef.

Elide Island, *E.S.E.½E.(mag.) 5 m.*

Point, *S.E.by E.½E.(mag.) 6 m.*

Sta. Rosalia Bay.

Off Elide Island.

Bluff Point is a bold sand bluff 100 feet high, lying 18¾ miles in a south-easterly direction from Point San Antonio, between it and a *remarkable gorge*, 3 miles to the southward of the latter, is a large field of kelp which extends about 5 miles off shore; 12 fathoms water was found in this field at a distance of 4 miles from the land, bottom sand and rock. From Bluff Point the coast recedes somewhat, forming an indentation between it and Canoas Point. Bluff Point. Kelp.

Canoas Point is a sharp perpendicular sand bluff 224 feet high, surrounded by hills of from 700 to 1,200 feet in height, which are backed by a mountain range of 2,000 feet or more. Canoas Point.

An anchorage partially protected from the coast winds will be found under the lee of the point in good weather in from 5 to 7 fathoms water, sand bottom, about half a mile from the shore. The magnetic variation in 1877 was 12° 30′ E. Tides rise about 4 feet. Anchorage. Variation. Tides.

Blanco Point lies 33 miles S. 53° E. (SE. by E. ¾ E. mag.) from Canoas Point. The coast between them recedes somewhat and is composed of sand bluffs and rocky points alternating with low sand beaches. From seaward three distinct mountain ranges are visible on this part of the coast. The first or coast range being from 500 to 1,000 feet in height; the second, back of the first, 2,000 feet high, and the third rises back of the second to a height of 3,000 feet and upwards. About 13½ miles to the northward of Blanco Point, half a mile from the shore, is a solitary rock 20 feet high, surrounded by kelp. Large quantities of driftwood were found on the beach in the vicinity of this rock. Coast from Canoas Point to Blanco Point. Solitary Rock.

Blanco Point is a perpendicular sand cliff about 50 feet high and is the eastern of two points which form the northern limit of Blanco Bay. Between the two points there is a cove about a mile wide and half a mile deep; the westernmost point is surrounded by detached rocks. Blanco Point.

S. 35° E. (SE. ¼ E. mag.), 10½ miles from Blanco Point, is Cone Point, a steep rocky point, with a reef of rocks extending to the southward a quarter of a mile. Cone Point.

The coast between these two points recedes 2¾ to 3 miles, forming Blanco Bay, the shores of which are a succession of bluff points and sand beaches. Good anchorage may be found here, protected from the prevailing coast wind. Just Blanco Bay.

north of Cone Point is a conspicuous hill of a reddish color called Red Cone. It is 200 feet high, and when first seen from the northward has the appearance of an island.

Red Cone.

Falsa Bay.

Falsa Bay is formed by an indentation in the coast to the southward of Cone Point; its shores are quite low and consist of sand and shingle beaches to within 1½ miles of Maria Point, thence to the point it is steep and rocky. At the bottom of the bay is a wide arroyo, with sand hills on either side. There is anchorage in the northern part of the bay, in from 4 to 6 fathoms, pretty well protected from the usual coast winds.

Anchorage.

Maria Point.

Maria Point, which forms the southern limit of Falsa Bay, is low and rocky, with sand hills rising to a height of 100 feet, one-quarter of a mile to the northward.

Sebastian Viscaino Bay.

From Maria Point the coast sweeps around to San Eugenio Point in an almost unbroken curve, and with Cerros Island on the west forms the great bay of Sebastian Viscaino. The eastern coast of this bay is for the most part low and sandy, with extensive marshes; high mountain ranges being visible far in the interior. The south coast has the same character until within a few miles of False Point, when the bluffs become high and the mountains approach the coast. Nearer Point San Eugenio the character of the coast changes, rocky formation predominating and forming a steep rocky point called False Point. Whales were formerly found in large numbers in the bay at certain seasons of the year. Sharks are abundant wherever the water is shoal, and many other varieties of fish are plentiful. The great *Jew-fish* attains here a weight of from 100 to 400 pounds. Within the limits of this great bay (which is 60 miles wide from east to west and about 55 miles deep from an imaginary line drawn between Maria Point and the north point of Cerros Island) are several smaller bays and anchorages, a detailed description of which follows.

Fish.

Playa Maria Bay.

Playa Maria Bay, formed by a sweep in the coast line between Maria Point and Black Point, is about 2 miles deep and 5½ miles in extent between the two points. Its shores are low, sandy, and barren. A few miles inland there is a little vegetation and some small game. On the northern shore of the bay is a cone-shaped hill, 256 feet high, called Station Peak. There is good anchorage in the northern part of the bay in 6 or 7 fathoms, sand bottom, where vessels may lie, protected from the prevailing coast wind.

Anchorage.

The magnetic variation in 1875 was 11° 55′ E., increasing about 2′ annually. H. W., F. and C., IX^h 20^m. Springs rise 7 to 9 feet.

Variation.

Tides.

Black Point.

Black Point, which forms the southern limit of Playa Maria Bay, is a low, dark, rocky projection, backed by white sand; 5 miles to the southward of it is a steep rocky point with a hill 500 feet high rising close to it; with this exception the coast as far as Rocky Point is composed of sand beaches.

Rocky Point.

Rocky Point is a steep cliff 75 feet high, and is the abrupt termination of a ridge of high hills running at a right angle to the coast line; 1½ miles from the point in a northeasterly direction is a conspicuous conical hill 1,000 feet high. In clear weather the high peaks of Cerros Island, 60 miles distant, are visible from this vicinity.

The coast for 3¼ miles to the southward and eastward of Rocky Point is bold and rocky with cliffs 50 feet high; thence to Elide Island it consists chiefly of low sand beaches, with hills of moderate height rising a short distance inland.

Elide Island.

Elide Island is a barren rock 3 cables in length, about 40 feet high, and covered with a thin layer of guano. It is a favorite resort of seals and sea fowl. A sand spit or bar, over which the sea breaks, connects it with the main land, from which it is about half a mile distant.

Vessels sometimes anchor on the south-east side of the island, but the anchorage is not recommended, as a heavy swell usually heaves in there.

From Elide Island to Rosalia Point the coast is composed of rocky bluffs, 50 to 75 feet high. (View opposite page 12.)

Santa Rosalia Bay.

From Rosalia Point the coast turns sharply to the northward and eastward, forming Santa Rosalia Bay, where good anchorage may be found in from 5 to 8 fathoms, sand bottom; sheltered from the coast winds. On the north side of the bay is a shingle beach, where the best landing will be found. Bold, rocky cliffs line the eastern shore, and the southern limit of the bay is marked by a low projecting point with numerous outlying rocks, and a dangerous reef extending half a mile to the southward and surrounded by

Landing place.

Reef.

kelp. An ample supply of excellent clams was found by the *Narragansett's* crew, by digging on the beach. No fresh water was found.

South of Santa Rosalia Bay the coast falls away about 5 miles, forming a large open bay with bluff shores from 50 to 100 feet high, increasing to 200 feet as Lagoon Head is approached. High hills rise a few miles inland and mountain ranges are visible in the interior, the most conspicuous being "High Leaning Peak," whose jagged top appears to overhang.

Lagoon Head

Lagoon Head, the Cabo Negro of the old Spanish charts, is a high dark-colored headland of volcanic origin; its highest point is 475 feet above high-water mark, and it can be seen in clear weather from a distance of 30 to 40 miles, having, when first seen from seaward, the appearance of an island. (View on opposite page.)

From Lagoon Head the coast makes a sudden turn to the eastward for about two miles and then sweeps around to the southward, forming a small open bay which affords good anchorage in from 3 to 8 fathoms, sandy bottom. A

Landing place.

good landing place will be found on a sand beach at the foot of the bluffs about 2 miles east of the head. The magnetic

Variation.

variation in 1877 was 11° 50′ E., increasing about 2′ annually.

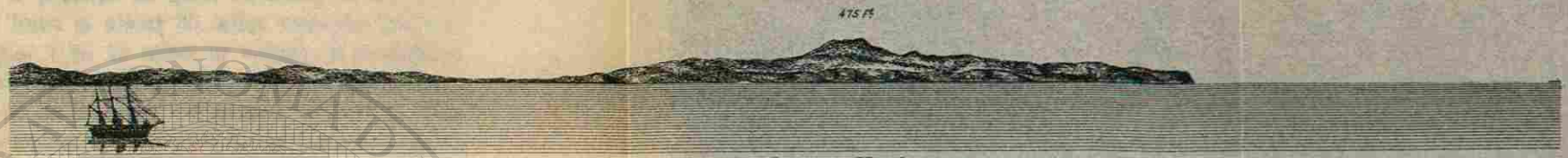
Manuela Lagoon.

Manuela or Upper Lagoon is the northernmost of three large lagoons situated near the eastern shore of Sebastian Viscaino Bay and communicating with its waters. It is nearly 8 miles long in a north and south direction and about 2 miles wide, a narrow strip of low sand beach interspersed with small hillocks and partially covered with stunted bushes intervening between it and the waters of the bay. The entrance is $3\frac{1}{2}$ miles S. 38° E. (SE. $\frac{1}{2}$ E. mag.) from Lagoon Head, and is obstructed by a bar which makes off about a mile and has 5 feet of water over it at low tide. The sea usually breaks on the bar in fine weather, except near high water.

Black Warrior Lagoon.

Black Warrior Lagoon takes its name from that of a bark which was lost on the bar in 1859. It is about 10 miles long north and south, and 3 to $3\frac{1}{2}$ miles wide. The entrance is $7\frac{3}{4}$ miles to the southward of that of Manuela Lagoon, and shoal water makes off from $1\frac{1}{2}$ to 2 miles. Vessels have crossed the bar drawing 13 feet.

Plate IV.



Lagoon Head. (S.S.E. mag. 13 m.)

Lagoon Head.
(From the Northward.)

Lagoon Head,
N by E. (mag.) 8 m.

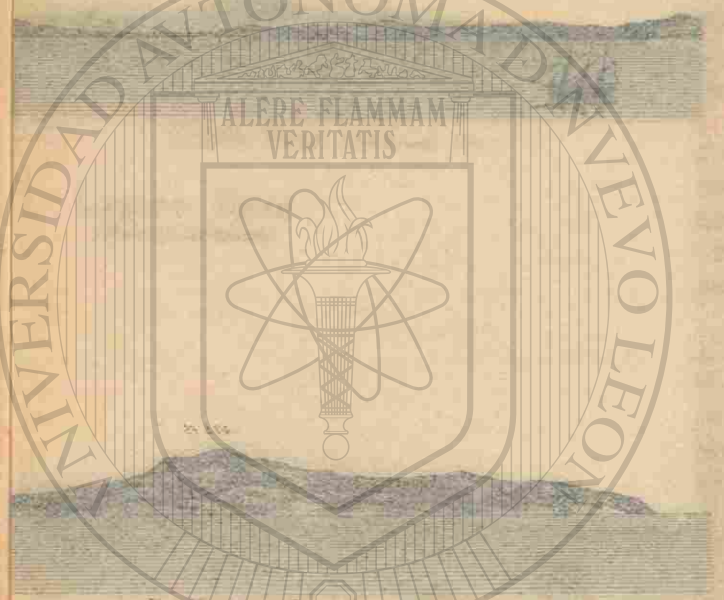
Lagoon Head.
(From the Southward.)

Obsr Mound on Western Island,
N.W by W. (mag.) abt 10 m.

Middle Id

Eastern Island.

San Benito Islands from the Southeast.



Scammon's Lagoon. Scammon's Lagoon (*Ojo Liebre*) is the southernmost and much the largest and most important of the lagoons that open into Sebastian Viscaino Bay. It has never been surveyed and opinions differ greatly as to its extent (Captain Scammon, who is perhaps as good authority as any, says that its eastern limit is about 35 miles from the bar, and that it varies from 4 to 12 miles in width); it is studded with low islets and there are numerous sand bars in it, many of which uncover at low tide. A branch known as Fort Lagoon extends 8 miles to the southward of the main lagoon and is navigable.

Extensive shoals make off from the entrance, which lies 14½ miles in a south-westerly direction from that of Black Warrior Lagoon, in lat. 27° 54′ N., long. 114° 19′ W., and is marked by white sand bluffs on either side 30 to 40 feet high.

Caution. No definite directions can be given for crossing the bar, which is constantly changing, and its passage should not be attempted by a stranger without either sending a boat ahead to sound or buoying the channel.

It is said that 18 feet have been carried over the bar (probably 12 to 15 feet would be found at ordinary high tides), which is about half a mile wide, the water rapidly deepening after it is passed to 4, 5, and 6 fathoms.

The *Narragansett* was unable to examine either the channel or the lagoon, as the sea was breaking heavily over the bar during her stay.

Report of Capt. C. M. Scammon. The following is from a report by Capt. C. M. Scammon:

"Scammon's Lagoon was first known commercially in 1858. The passage into it is lined on the south side by a continuous line of breakers, forming a curve which extends 4 miles from the heads of the harbor, reaching the bar, which has 3 fathoms water over it at ordinary tides; detached breakers on the north side plainly mark that side of the channel, which is of sufficient width to afford a good beating passage for a vessel of 300 tons, drawing 12 feet. The brig *Boston*, with the schooner *Maria* as tender, on a whaling and sealing voyage, were the first vessels to traverse this hitherto unknown whaling ground. At that time the waters were alive with whales, porpoises, and other fish; turtles and seals basked on the shores of the low islands studding the lagoon, and many species of game were so abundant that

Fish, game, &c.

acres of sand bars left bare by the tide were closely packed with geese, ducks, snipe, &c."

Channel. A good channel is found along the south shore, reaching to near the head of the lagoon. To the north of this channel are numerous sand bars and low islets, the latter being the breeding place of seals and sea fowls. The whales formerly found in the lagoon were of the species known as the California gray, and from 1858 to 1861 many whalers visited it during the winter months. The oil taken there during that time amounted in the aggregate to 22,250 barrels. At the present time so few whales are found that it has been abandoned as a whaling ground.

Salt. Near the head of the lagoon are the *salt fields of Ojo Liebre*, which are capable of furnishing an almost unlimited supply of salt. Vessels of 400 tons may lie within 5 miles of where it may be put in lighters of from 25 to 50 tons capacity.

Surrounding country. The surrounding country for miles from the shores of the lagoon is a sandy desert, the only vegetation consisting of a few clusters of dwarfed shrubbery and the ever-present cactus. The nearest *fresh water* is 7 miles distant, and everything for man's subsistence, except fish, turtle, and sea fowl, must be brought from the interior or imported by sea. South and south-west from the lagoon may be seen the high, boulder-like peaks of the Santa Clara Mountains.

The sand bar off Scammon's Lagoon extends about 5 miles in a south-westerly direction from the entrance; thence to False Point the coast is clear, with 5 to 6 fathoms water within a cable's length of the beach.

Chester Islets. The Chester Islets are two rocks 18 feet high, covered with guano. The westernmost lies half a mile N. 55° E. (NE. mag.) from False Point, and has a small outlying rock close to, on the north side. Two-thirds of a mile S. 69° E. (E. $\frac{7}{8}$ S. mag.) from the westernmost and $1\frac{1}{6}$ miles N. 87° E. (ENE. $\frac{3}{4}$ E. mag.) from the point, is the eastern one. The channel between the two islets and that between them and the point is filled with kelp, and, although no hidden dangers were found, it is not recommended to attempt their passage.

Reef. Half a mile to the northward of False Point is a dangerous reef. It is egg-shaped, three-quarters of a mile long by half a mile in width, and is surrounded by kelp. There is a rock awash nearly in its center, over which the sea breaks

heavily. From 7 to 8 fathoms, rocky bottom, were found in the channel between the reef and the point and also between it and the westernmost of the Chester Islets.

Point San Eugenio. Point San Eugenio is the NW. extremity of the peninsula that forms part of the southern shore of Sebastian Viscaino Bay. It lies $1\frac{3}{4}$ miles S. 61° 30′ W. (SW. $\frac{3}{8}$ W. mag.) from False Point, and is a dark, rocky projection surrounded by a reef, which extends about a quarter of a mile from the shore. There is a whaling station in a little cove about half a mile to the eastward of the point.

Whaling station.

Natividad Island. Natividad Island, lying to the north-westward of Eugenio Point and separated from it by Dewey's Channel, is about $3\frac{3}{4}$ miles long NW. and SE., and from half a mile to a mile wide, being widest at its south-eastern end. It is of moderate elevation, its highest point being 502 feet above the sea level, hilly and barren, with mostly steep rocky shores surrounded by detached rocks and kelp; on the south-eastern end is a sand beach about half a mile long.

Maria Rock. Half a mile off the north-west point is a rock 15 feet high called Maria Rock, which is connected with the island by a reef.

Sail Rock. Sail Rock lies about 400 yards west of the southern point of the island; a short reef extends off from it to the southward and eastward, on which the sea breaks only at long intervals in fine weather. About a quarter of a mile to the eastward of the southern point, connected with it by a reef, is a flat-topped rock about 25 feet high, called Flat Rock, upon which the sea breaks continually.

Reefs. There are several reefs making off from the north-east side of the island.

Dewey's Channel. Dewey's Channel, which lies between Natividad Island and San Eugenio Point, is about 4 miles wide and may be used with safety if proper care is observed.

Foul ground. On the Natividad side of the channel there is much foul ground and the soundings are very irregular. One mile S. 78° E. (E. mag.) from Flat Rock there is a circular shoal about half a mile in diameter, with rocky bottom, having 3 fathoms water over it and from 6 to 10 fathoms around it, the sea breaks over it only at long intervals in fine weather.

Shoal.

For a mile and a half to the eastward of this, numerous shoal spots exist, with from 6 to 7 fathoms over them. On the San Eugenio side there is a clear passage a mile wide,

through which, at a distance of about 1½ miles from the shore, may be carried 17 to 20 fathoms, the kelp on either side plainly marking the channel. (View opposite page 25.)

Kellet Channel. Kellet Channel is a deep, clear channel 7½ miles wide, separating Cerros and Natividad Islands; from 20 to 30 fathoms may be carried through the center; no obstructions are known to exist.

Cerros Island. Cerros Island, which forms the western side of Sebastian Viscaino Bay, is 21¼ miles long and from 4 miles wide near the centre to 9 miles near the southern end. It is of volcanic origin, with numerous high peaks, the highest of which (the Mount Ayres of Dr. Veatch) is 3,955 feet high. In clear weather the peaks of the island may be seen from a distance of 60 miles.

Morro Redondo Point. Morro Redondo Point is the south-eastern extremity of the island, and is a rocky cliff 30 feet high, with numerous outlying rocks to the southward and westward. A round hill (El Morro Redondo) lies just back of it.

Observation spot. The *observation spot* was on a low point with a shingle beach and outlying rocks, situated half a mile to the northward of Morro Redondo Point, its position being lat. 28° 01′ 48″.7 N.; long. 115° 11′ 02″.6 W. The magnetic-variation in 1878 was 11° 40′ E., increasing about 2′ annually.

Variation.

Tides. H. W., F. & C., IX^h 10^m; springs rise 7 to 9 feet.

Anchorage. To the northward of the observation spot the coast recedes, forming a good anchorage in from 7 to 10 fathoms, sandy bottom, not over a quarter of a mile from the beach. Care must be taken not to let go the anchor too far off shore, as the water deepens suddenly.

Watering place. About 4 miles to the northward of the anchorage and 5½ from Morro Redondo is a good watering place, which may be easily recognized by a patch of tall rank grass that lies back of a sand beach about 250 feet in length, and the only one in the vicinity. The course of the stream ends in an arroyo about a mile to the southward of the easternmost point of the island and half a mile from the beach, where it is lost in the sand. There is a rough wooden spout at the stream by means of which casks may be easily filled.

There is deep water close to the shore, abreast of the watering place (20 to 25 fathoms within two cable lengths of the beach). Other fresh water springs are said to exist

in some of the ravines to the northward, where landings can be effected.

Eastern side of Cerros Island. The whole eastern side of the island north of the watering place is a succession of rocky bluffs and ravines, with short stretches of gravel beach. Back of the shore line the land rises abruptly in sharp ridges and precipitous cliffs to mountain peaks of 3,000 feet and upwards.

The sea on this side is generally smooth, and deep water extends close up to the shore, which is free from kelp. Capt. C. M. Scammon's report contains the following: "On the NE. side, at about 3 miles from the extreme north end, a low sandy point makes out. Southward of this is good anchorage with the prevailing winds."

Northern point of Cerros Island. The northern point of the island is formed by broken bluffs, with many large outlying rocks. A sharp peak 1,761 feet high, with a comb or crest of cedar trees on it, rises just back of the point.

Western side of Cerros Island. The western side of the island for about 8 miles from the northern point has the same general character as the eastern coast, but the outlying rocks are more numerous and extend farther off shore; thence the coast curves around to the south-west and is an unbroken line of steep cliffs to a point 2½ miles north of Cape San Augustin. A stony beach fronts these cliffs for the entire distance except about 2½ miles in the centre, where a rocky ledge with outlying rocks extends into the sea.

Reef. From the point 2½ miles north of Cape San Augustin a reef of rocks makes off 2 miles in a north-westerly direction; half a mile from the north-west extremity of this reef is a conspicuous rock called Red Rock.

Cape San Augustin. Cape San Augustin is a bold basaltic headland at the south-western extremity of the island, and is the termination of a range of high hills that is separated from the main range of mountains. There is generally a heavy surf on the whole western side of the island, and there are extensive fields of kelp along the shore of the south-western part.

South Bay. The character of the southern coast of the island is similar to that of the eastern side. An indentation of 2½ miles forms what is known as South Bay, where anchorage may be had in about 7 fathoms water, close to the shore. and sheltered from the prevailing winds, but open to the southerly gales that sometimes occur during the early part of the winter.

On the northern and eastern sides of the bay sand beaches front the bluffs; on the north-west side there are numerous outlying rocks, extending as much as half a mile off shore.

From the eastern limit of South Bay to Morro Redondo Point there are many outlying rocks, and the soundings off shore are very irregular, 10 to 15 fathoms being found within a mile of the coast, and patches of from 5 to 10 fathoms, rocky bottom, 3 miles off shore to the southward.

Remarks. The northern portion of Cerros Island is comparatively fertile; the crests and western slopes of the mountains are covered with a growth of cedars and pines, some of which attain a height of 60 to 70 feet. A species of dwarf oak is also found, and the cactus and many varieties of shrubs and flowers are met with in the ravines. The southern part is generally barren.

Game, seals, &c. There is said to be a few deer on the island; wild goats and rabbits are plentiful, especially in the northern part; sea-otters, sea-elephants, seals, &c., resort to its shores in great numbers.

Minerals. Report assigns great mineral wealth to this island, but copper and a species of chromic iron were the only minerals found, and those existed apparently only in small quantities.

Fogs Low fog banks in the morning are of frequent occurrence, the peaks showing plainly above them.

San Benito Islands. The easternmost of the San Benito Islands lies about 15 miles to the westward of the northern part of Cerros Island; the group is about 4 miles in extent east and west, and $1\frac{3}{4}$ miles north and south.

The westernmost island is the largest and is nearly rectangular in shape; it is $1\frac{1}{4}$ miles long by three-quarters of a mile wide, and is rather flat-topped, with a mound in the centre 650 feet high. There is an anchorage on its south side in 10 fathoms, sand bottom, a little to the westward of the south-eastern point, the mound bearing N. 33° 10′ W. (NW. mag.), and the north end of the easternmost island just open of the south-east point, and bearing N. 56° 50′ E. (NE. mag.). A landing place may be found on a small shingle beach behind a large *red rock* that lies just to the eastward of the point.

Anchorage.

Landing place.

All three of these islands are barren and surrounded by outlying rocks and kelp. There are boat passages between them. (View opposite page 16.)

Pinnacle Rocks. The Pinnacle Rocks lie about three-quarters of a mile west of the south-west point of the largest of the San Benito Islands. They are about 80 feet apart NE. and SW., the southern one about 30 feet and the northern one about 10 feet in length on top and from 2 to 4 feet wide. At 100 feet east of the rocks bottom was found at 12 fathoms, but at no other place at the same distance from them was bottom found at 20 fathoms.

CHAPTER II.

FROM SAN EUGENIO POINT TO CAPE SAN LUCAS, INCLUDING SAN LUCAS BAY.

From San Eugenio Point the coast trends S. 28° E. (SE. ½ S. mag.) to Breaker Point, and consists of rocky bluffs, with projecting points and outlying rocks surrounded by kelp. Sharp, bare hills rise close to the coast, the most conspicuous of which is a mile and a half north-westward from Breaker Point, and is over 600 feet high.

Breaker Point.

Breaker Point is a steep, rocky headland, with numerous detached rocks lying to the southward of it, over which the sea breaks heavily. South of Breaker Point the coast recedes about a mile to the eastward. The land is lower, but rugged and barren, as far as Kelp Point, which forms the northern limit of Port San Bartolomé, and is about 30 feet high, of pudding-stone conglomerate, on a bed of sandstone, with many outlying rocks surrounded by kelp.

Port San Bartolomé.

Port San Bartolomé is the best harbor on the west coast of Lower California between San Diego and Magdalena Bay. It is nearly circular in its general form, and is about 2½ miles in diameter. The entrance, which lies between Kelp Point and Cape Tortolo, is a mile in width between the rocks that make off from either side, and is free from hidden dangers.

Reef.

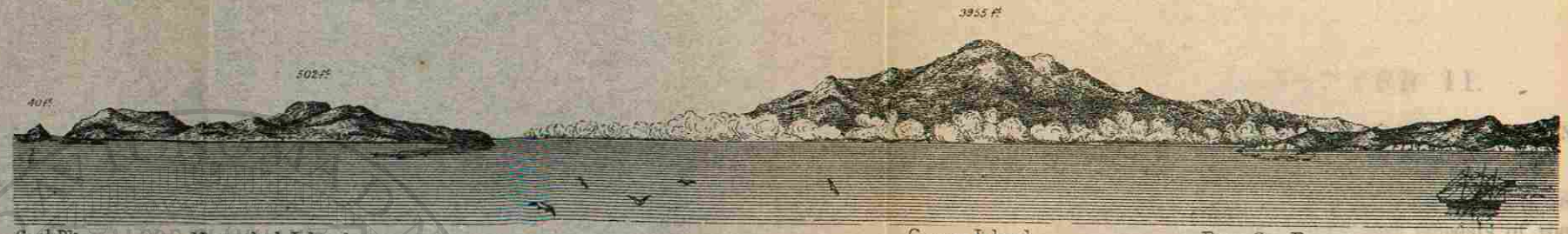
From Cape Tortolo, which is a rocky point about 20 feet high, rising rapidly to an elevation of 425 feet, a reef makes off in a north-westerly direction nearly a mile, its outer end being marked by a rock which is two feet above high water.

Conspicuous rocks.

Between the rock just mentioned and the cape there are three conspicuous rocks of large size, the outer one, Sulphur Rock, being 30 feet high; the middle one, called Coffin Rock, 50 feet high, and the one nearest the cape 60 feet high. There are numerous smaller rocks awash and above water, the whole forming a natural breakwater, against which the sea breaks heavily.

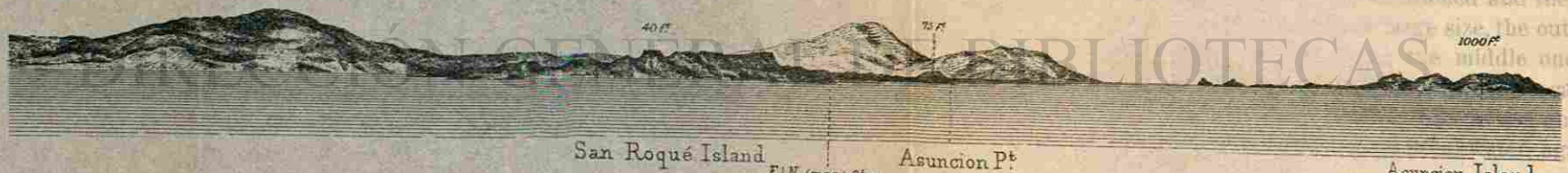
The northern and eastern shores of the bay are low shingle and gravel beaches, with generally sandy and low land

Plate V.



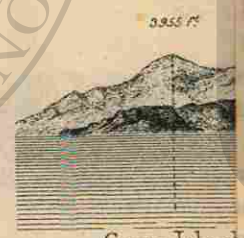
Cerros & Natividad Islands from the Southward.

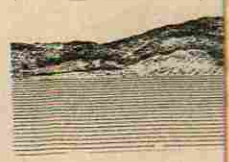
Off Port San Bartolomé.



San Roqué & Asuncion Islands from the Westward.

Plate V.





behind them, which gradually rises to a higher, broken country, with but few traces of vegetation. The western shore consists of high bluffs.

Anchorage. Vessels may anchor anywhere in the bay after passing the point of the reef which makes off from Cape Tortolo. The soundings are regular and the bottom sand. In the outer bay they will be somewhat exposed to the long regular swell from the ocean.

Fish, turtle, &c. The best anchorage is to the eastward of the reef that makes off from Cape Tortolo, where perfectly smooth water will be found, with protection from every wind. The bay abounds in fish, turtle, and sea-fowl; but no indications of fresh water were seen.

Directions. In making for the port when off the coast, bring a conspicuous jagged peak, 690 feet high, to bear N. 17° E. (N. ½ E. mag.) and steer for it until the entrance is plainly visible, after which the eye, assisted by the lead, will be the only guide needed. (View on opposite page.)

This port was formerly much frequented by whalers for the purpose of refitting their ships.

Asphaltum. The early Spanish navigators reported the existence of extensive beds of asphaltum in the vicinity of Port San Bartolomé.

Variation. The magnetic variation in 1875 was 11° 30′ E., increasing about 2′ annually.

Tides. H. W., F. and C., IX^h 10^m; springs rise from 7 to 9 feet.

Thurloe Head. Thurloe Head is a bold, rocky point, with a reef extending a short distance off from it to the southward. It lies about 2½ miles in a south-easterly direction from Cape Tortolo, the coast between them being a long, irregular cliff, high, rocky, and steep, with high hills just back of it. A field of kelp extends about a quarter of a mile off shore for the entire distance.

Anchorage. From Thurloe Head the coast recedes about a mile to the northward and eastward, forming a small open bay, where vessels may anchor in 6 to 7 fathoms water and find protection from the prevailing coast wind. The land at the bottom of the bay is low, with a shingle beach.

From this anchorage to Morro Hermoso, which is a bare, rocky cliff rising abruptly to a hill of 900 feet in height, the coast consists of steep bluffs from 50 to 100 feet high, with a range of high hills immediately back.

San Cristobal Bay.

Between Morro Hermoso and Point San Pablo the coast recedes several miles, forming the open bay of San Cristobal, whose shores consist principally of bluffs and sand cliffs from 50 to 100 feet high, the coast range rising to a height of several hundred feet at a short distance inland.

Rocks.

There are a few large outlying rocks near the shore in the northern part of the bay, and a strip of shingle and sand beach 4 miles in extent makes a break in the line of sand cliffs at the place where the indentation in the coast line is deepest. There is a deep arroyo 3 miles north of Point San Pablo.

Arroyo.

Point San Pablo.

Point San Pablo is a dark, slate-colored bluff, with a prominent hill, 760 feet high, rising immediately from it. A reef extends off from the point to the southward for about half a mile, outside of which the water deepens rapidly, no bottom being found at 50 fathoms, less than 1½ miles from the land.

Table-lands.

In the vicinity of Point San Pablo, a few miles in the interior, are extensive table-lands from 1,000 to 2,000 feet high; back of these is a remarkable range of peaks from 2,000 to 3,000 feet high and of variegated colors, which is probably the Sierra Pintada of Sebastian Viscaino; it corresponds well with his description, being "of bare and naked rocks of varied and beautiful formation, where great mines of gold and silver are supposed to be."

San Pablo Bay.

San Pablo Bay is an open bay, about 1½ miles deep, formed by an indentation in the coast between Points San Pablo and San Roque. It is apparently free from all dangers and affords good anchorage in from 10 to 15 fathoms of water at about three-quarters of a mile from the shore. At the bottom of this bay there is a sand beach about three-quarters of a mile in extent, with steep bluffs on either side of it.

Coast from Point San Roque to Asuncion Point.

Point San Roque is a light-colored bluff from 30 to 50 feet high, with a hill rising just back of it to a height of 543 feet. The water is deep close up to the point, 16 fathoms being found within half a cable of it. From this point to Asuncion Point it is 7¾ miles; the coast between them recedes somewhat, forming the open bay of San Roque, the shore of which is generally bluff, with occasional stretches of shingle and rocky beach fronting the bluff. Back from the coast the country is hilly, with table-lands a few miles in the interior.

San Roque Island.

San Roque Island lies 2¼ miles S. 58° E. (ESE. ¼ E. mag.) from Point San Roque and about 1¾ miles from the bottom of the bay of the same name. It is a rugged rock a mile long east and west, less than half a mile wide at its widest part, and about 40 feet high.

A reef, over which the sea breaks, extends a quarter of a mile off from the eastern end of the island, and half a mile E. by N. from the point of the reef is a patch of rocks with 11 fathoms water between it and the reef. Half way between the patch of rocks and the shore of the mainland is a 3-fathom shoal.

Heavy breakers extend off nearly a mile from the main land north of the island, indicating shoal and rocky ground. (View opposite page 25.)

The passage between the island and the mainland is *not recommended* except for boats or very small vessels.

Asuncion Point.

Asuncion Point is a low, sharp, bluff point with a cone-shaped mound about 75 feet high at its outer extremity, and moderately high hills a short distance inland. A short reef extends off from the point, and on either side of it are several large detached rocks, against which the sea breaks heavily.

Asuncion Island.

Asuncion Island lies a little more than three-quarters of a mile to the southward of Asuncion Point; it is three-quarters of a mile long and less than a quarter of a mile wide, of sandstone formation and entirely barren; toward its southern end some hills reach an altitude of 100 feet. The whole island is surrounded by detached rocks and kelp, and from its northern end a reef of rocks, many of them above water and two of large size, extends off 3 cables to the northward and half a mile to the westward, the sea breaks over it continually. About midway between the point and the island is a solitary rock which is awash at low water. (View opposite page 29.)

Asuncion Passage.

There is a clear passage a quarter of a mile wide between Asuncion Point and the rocks to the northward of the island through which from 4 to 6 fathoms may be carried. In using this passage, which should only be done in cases of emergency, keep well over toward Asuncion Point, which may be passed in safety at 1½ cables distance.

Variation.

The magnetic variation at Asuncion Island in 1875 was 11° 25′ E., increasing about 2′ annually.

Tides.

Tides rise about 5 feet.

Asuncion Bay.

From Asuncion Point the coast turns abruptly to the

northward for about a mile and then sweeps around to the south-eastward to San Hipolito Point, forming in its western part Asuncion Bay, which is about 2 miles deep and affords good anchorage in moderate weather under the lee of Asuncion Point, close to the shore, in from 5 to 7 fathoms water; off shore the soundings deepen rapidly to 30 fathoms and over.

The coast between Asuncion and San Hipolito Point is low and sandy, with an occasional bluff. Hills and table-lands of moderate elevation rise at a short distance inland.

San Hipolito Point.

San Hipolito Point is low and of black rock, with barren sand-hills 50 to 100 feet high rising a short distance from it. A shelving, rocky reef, over which the sea breaks, extends southward from it nearly half a mile. A remarkable table-shaped mountain, 1,227 feet high, lies 5½ miles north (mag.) from the point.

From San Hipolito Point the coast turns abruptly to the northward for a mile and a half, thence to the eastward for about 3 miles, and then sweeps around to the south-eastward toward Abreojos Point.

San Hipolito Bay.

The open bay formed by the indentation in the coast line east of San Hipolito Point is called San Hipolito Bay, where good anchorage may be found under the lee of the point, in from 5 to 7 fathoms, sandy bottom, at half a mile from the shore.

The coast as far as Abreojos Point is low and sandy, the land back of it rising gradually to hills and table-lands from 600 to 1,000 feet high; in the distance may be seen high and broken mountains.

The soundings are regular and the water bold along this portion of the coast until within about 11 miles of Abreojos Point, when the soundings become irregular and the water shoaler. About 8 miles north-westward from the point a shoal about 2 miles in extent, over which the sea breaks heavily, makes off over a mile from the shore; it is probably the mouth of a lagoon which lies parallel to the coast, ending near Abreojos Point, which at very high tides communicates with the sea. Two miles farther up the coast is a smaller shoal making off about half a mile.

Shoal.

Abreojos Point.

Abreojos Point is low and sandy, being composed of a bed of pudding-stone conglomerate which rises about 5 feet above high-water mark, and is covered with a layer of sand

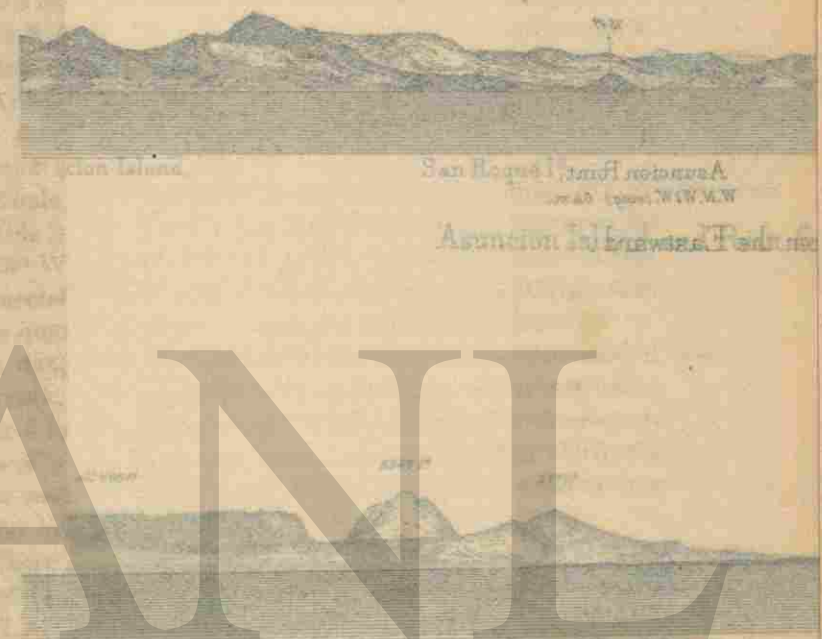
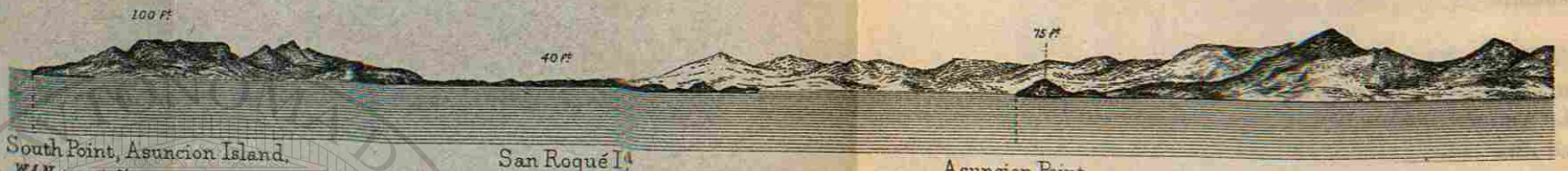


Plate VI.



South Point, Asuncion Island.
W ¼ N. (mag.) 5¼ m.

San Roqué Is.

Asuncion Point,
W.N.W.¼W. (mag.) 6½ m.

Asuncion Island and Point from the Eastward.

Table land,
about N by W. (mag.) abt. 7 m.

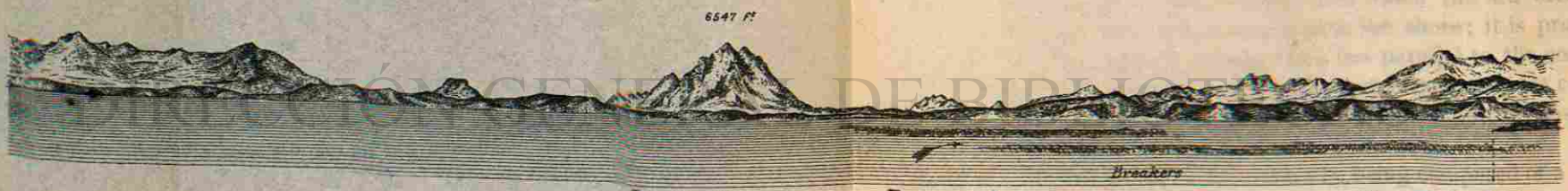
Las Tres Virgenes,
75 miles.

Barren Hill,
N.E.¼N. (mag.) 7 m.

Whale Rock,
N.E.½N. (mag.) 1½ m.

Abreojos Point,
E.N.E. (mag.) 5¼ m.

Off Whale Rock and Reef, from the Southwestward.



Las Tres Virgenes,
N.N.E.½E. (mag.) 58 m.

Entrance to Lagoon.

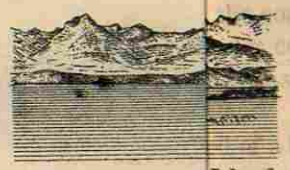
West end Sand Island,
E.½S. (mag.) 2 m.

Off the entrance to San Ignacio Lagoon.

Plate VI.

South Point, Asun.
W. ¾ N. (mag.) 5¼ m.

Tak
about N



Island,
)-2 m.

10 to 15 feet in depth, in which are growing some stunted bushes. A reef extends a short distance south from the point, and there are numerous detached rocks on the eastern side close to the shore.

A barren hill, 277 feet high, in front of and separated from a conspicuous range of table-land, 600 feet high, lies 3 miles N. 6° E. (N. ½ W. mag.) from the point, and is a good landmark for it when off the coast. It is H. W., F. and C., at Abreojos Point at IX^{h} (approx.); tides rise about 5 feet. Tides.
The magnetic variation in 1878 was 11° 15′ E., increasing about 2′ annually. Variation.

Whale Rock, which is about a quarter of a mile long by a cable in width and 4 feet above high water, lies 4¼ miles S. 85° W. (WSW. ½ W. mag.) from Abreojos Point. A reef connected with it, over which the sea breaks heavily, makes off a quarter of a mile in a south-easterly direction. Whale Rock.

A dangerous reef lies half a mile to the south-westward of the rock, with a passage between them, in which was found from 5 to 10 fathoms water. The reef is nearly three-quarters of a mile in extent north and south, and a third of a mile east and west; many of the rocks are awash at low water and the sea breaks heavily over them. Reef.

There is a passage between Whale Rock and the main land 1½ miles wide, through which 5 fathoms may be carried. Passage.

The soundings to the southward and to the westward of the rock and reef increase quickly to 10 and 20 fathoms. (View on opposite page.)

S. 19° E. (SSE. ¾ E. mag.), 1¼ miles from Abreojos Point, a rocky patch was found with only 4 fathoms water over it, with 5 to 8 fathoms between it and the point. Breaker.

The swell was observed to break occasionally in this vicinity, and vessels making for the anchorage under the lee of the point are advised to give it a wide berth.

A good anchorage, protected from the prevailing winds, may be found in about 6 fathoms water, sandy bottom, on a line between Abreojos Point and the next point to the north-east, at a distance of half a mile from a sandy beach, where boats may readily land in moderate weather. Anchorage.

Abreojos Point and the plains in the vicinity are a favorite resort of the prong-horned antelope, large droves of which were seen, and one fine specimen shot, the flesh of which Remarks. Game.

proved to be excellent. Another quadruped inhabiting this region in great numbers is the *coyote* or *cajote*, a species of wolf; they are very shy and cunning and extremely voracious.

At the foot of the barren hill, 277 feet high, (before mentioned), on its south-east side, is a pond which contains brackish water, not fit for drinking purposes, but from the large number of animals seen in the vicinity there is undoubtedly fresh water to be found at no great distance. The shores near Abreojos Point are strewn with the bones of whales, the relics of a formerly flourishing business.

Ballenas Bay.

From Abreojos Point the coast trends to the northward and eastward, forming, with the west end of a low sand island, that bears N. 88° 30′ E. (ENE. ¾ E. mag.) from the point, and its surrounding shoals, which uncover at low water, a large open bay from 5 to 6 miles deep, known as Ballenas Bay. The soundings in this bay are quite regular, with moderately deep water close to the shore, except off the entrances to the lagoons, which will be described hereafter. With strong winds a heavy swell rolls into the bay, causing a high surf on the beach.

The shores of the bay are extremely low and sandy, except on the western side, where two rocky points project, connected by low bluffs, behind which the land gradually rises to the hill before mentioned. Whales of the humpback species formerly resorted to this bay in large numbers.

Lagoon.

About 9 miles to the north-eastward of Abreojos Point is the entrance to a lagoon that extends about 8 miles in a northerly direction, and varies in width from 3 to 8 miles, the latter near its northern limit. A shoal, over which the sea breaks, extends about three-quarters of a mile off its mouth. Only vessels of small size are able to enter this lagoon.

San Ignacio Lagoon.

The coast, for 10¾ miles to the eastward of the entrance of the lagoon just described, is low and sandy, terminating in San Ignacio Point, which lies 17 miles N. 78° 30′ E. (ENE. mag.) from Abreojos Point, in lat. 26° 45′ 44″.6 N., long. 113° 16′ 25″ W., and forms the western side of the entrance to San Ignacio Lagoon. (View opposite page 29.)

Extensive shoals which partly uncover at low tide make off from the entrance to this lagoon, and the channel, in which will be found from 9 to 13 feet at low tide, is narrow

and tortuous, but is clearly marked by the lines of breakers on either side, which are the best guides for entering the lagoon.

Vessels drawing 12 feet may cross the bar at ordinary high tides by keeping midway between the two lines of breakers. As soon as the bar is passed the water deepens quickly to from 3 to 7 fathoms. At full and change of the moon the strong tides usually cause a heavy swell on the bar.

Just inside the bar a lagoon branches off to the eastward which has an opening to the sea at a distance of 8½ miles; it was not examined.

Remarks.

The following remarks bearing upon San Ignacio Lagoon are taken from Capt. C. M. Scammon's report:

"A passage was found into Ballenas Lagoon practicable for vessels drawing 12 feet of water. It is very narrow, not more than half a cable in width, but at this particular place the land and sea breezes are strong and regular. Were it not for the certainty of these winds the passage into this lagoon would not be practicable for sailing vessels. The main branch of the lagoon is 2 miles wide at its mouth. After running northerly about 3 miles it turns to the westward, increasing in width to 4 miles and terminating 14 to 18 miles from the bar. Near the head of this fine sheet of water are two low islands, each not over 2 miles in length and less than a mile in width. The upper one has on its highest elevation a growth of green bushes which affords a pleasant contrast to the surrounding country. The southern island is quite barren; flocks of gray gulls literally covered its shell beaches, hawks were building their high nests, while pelicans and cormorants filled the air and surrounding waters. Around the shores numbers of turtle lay sleeping and cowfish and porpoises gamboled. All gave evidence of the place being unfrequented by human beings.

"Vessels first entered this lagoon for the purpose of whaling in 1859. Large numbers of whales (California grays) were found, and in the first two seasons over 8,000 barrels of oil were taken by four ships and a small shore party; but this limited whaling ground soon gave out, and the place is no longer regarded as valuable for that purpose.

"The face of the country inland from Ballenas Bay and the lagoons is nearly level and extremely barren. A few

stunted mesquite trees, patches of a species of rush grass, and a large species of cactus are occasionally met with."

In clear weather the high volcanic peaks of Las Tres Virgenes, near the eastern coast of the peninsula of Lower California, are plainly visible.

San Ignacio. Not far from the head of San Ignacio Lagoon, at the foot of gradually rising mesas, is the village of San Ignacio (formerly a mission), which numbers about 20 families. Near the village are extensive cultivated tracts of land in which are raised grain, all sorts of vegetables, sugar cane, dates, figs, olives, grapes, pomegranates, and many other fruits. A never failing supply of running water relieves San Ignacio from all fear of drought, and the only labor necessary is to keep the irrigating ditches open and gather the crops.

Anchorage. In moderate weather, good anchorage will be found off the entrance to San Ignacio Lagoon, in from 4 to 5 fathoms, sandy bottom, Point San Ignacio bearing N. 57° E. (NE. mag.), distant 3 miles. (View opposite page 33.)

From the shoals off the entrance to San Ignacio Lagoon the coast trends to the southward and eastward 40 miles, to San Domingo Point. Throughout the entire distance it is low and sandy and for 32 miles from San Ignacio Lagoon, a lagoon lies parallel to the shore, having a strip of sand beach about a mile wide (through which there are several passages) between it and the sea.

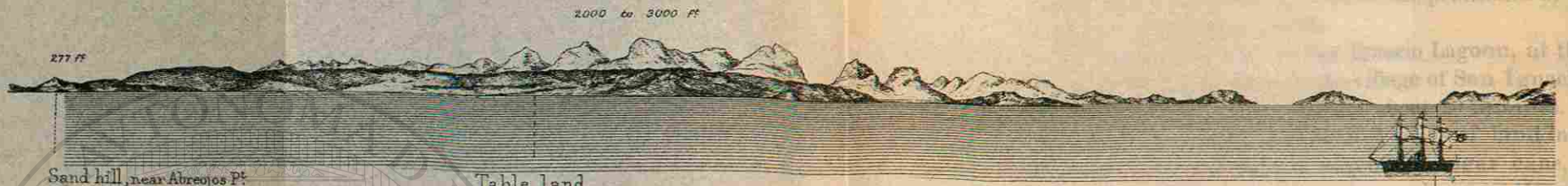
Extensive shoals extend off from the several passages into the lagoon, upon which the sea breaks heavily; the passages are narrow and shallow, and can only be used by boats in smooth weather.

Caution. The soundings off shore increase gradually, and the lead is a good guide in navigating along this part of the coast; the land being low, its proximity is not easily established, especially at night.

San Domingo Point. San Domingo Point is a remarkable perpendicular rocky cliff of dark color, 175 feet high, the cliff extending for several miles above and below the point. A short reef extends off the point in a south-westerly direction; at half a mile distance from the edge of the reef 15 fathoms water were found, sandy bottom.

Anchorage. Anchorage may be found to the eastward of the point, under its lee, in from 5 to 6 fathoms, half a mile from the

Plate VII.

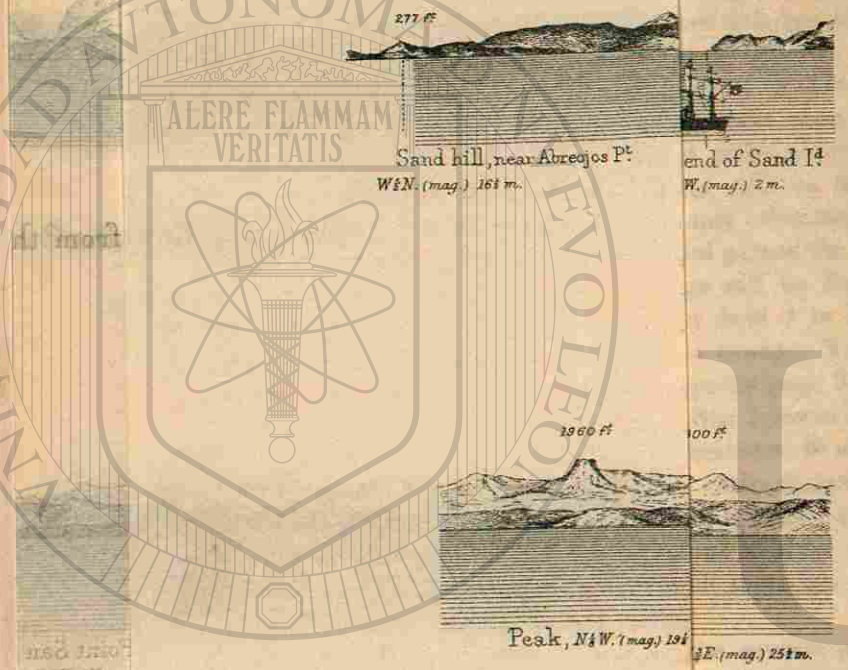


Ballenas Bay from the South-East.

The Coast off Point San Juanico.

Boca de San Domingo from the Bar.

Plate VII.



shore, where a vessel will find some protection from the prevailing wind.

The surf breaks heavily on the rocks at the foot of the cliff and unless the weather is quite moderate it will be found difficult and dangerous to effect a landing.

From San Domingo Point to Point San Juanico the coast consists generally of sand hills from 100 to 200 feet high with high table lands and mountains farther inland. Three and three-quarter miles to the eastward of San Domingo Point there is a break in the cliffs, through which is the entrance to a small lagoon. A shoal extends a short distance off this entrance, over which only small boats can pass. Lagoon entrance.

Twelve miles S. 64° E. (ESE. ¾ E. mag.) from San Domingo Point there is a rocky point with bluffs of a volcanic nature 15 to 30 feet high and a hill at the point 85 feet high. For about half a mile off this point the water is shoal with rocky bottom, over which the sea breaks. Outside the shoal the water deepens quickly, 12 fathoms being found within 2 cables and 22 fathoms at half a mile from its outer edge. Pequeña Bay.

After passing this point the land falls away to the northward for 1½ miles, whence it turns abruptly to the eastward for about 3 miles and then gradually sweeps around to Point San Juanico, forming Pequeña Bay, in which vessels may find shelter from the prevailing coast wind by anchoring to the north-eastward of the point, a mile from the shore, in from 5 to 6 fathoms. On the north-eastern shore of the bay is an estero, which at the time of the *Narragansett's* visit had no opening to the sea.

Point San Juanico is a sand bluff about 50 feet high, resting on a bed of conglomerate. (View on opposite page.) About 2½ miles north-westward of the point a shoal makes off from the land from half to three-quarters of a mile, its outer edge lying nearly parallel with the coast until after passing the point, when it gradually trends toward the shore, terminating about 1¼ miles eastward of the point. Point San Juanico.

About half a mile to the eastward of San Juanico Point is the entrance to the lagoon of the same name. The entrance is narrow and only about 3 feet of water will be found on the bar at low tide. The lagoon extends about 6 miles in a northerly direction and is widest in its northern part. It has an average depth of about 2 fathoms, but San Juanico Lagoon.

is much cut up in its southern part by shoals and sand bars. Small coasters drawing 6 or 7 feet enter it, crossing the bar at the highest spring tides. Considerable orchilla is gathered near the shores of this lagoon.

Orchilla.

Anchorage. Vessels may anchor to the south-eastward of Point San Juanico in 5 to 6 fathoms, about a mile from the shore, and find some protection from the coast wind.

Sulphur spring. Not far from the shore, on a barren hillside, is a spring, the waters of which are slightly sulphurous.

Abalones. Large numbers of snails are found in the vicinity, the dead shells appearing like a light layer of snow on the ground. On the rocks near the shore are numbers of abalones (an edible mollusk).

Sierra de la Giganta. When off the coast the famous peaks of the Sierra de la Giganta, over 5,000 feet high, are distinctly visible, overtopping the intervening ranges of mountains.

From Point San Juanico the coast trends to the eastward for a short distance and then curves around to the southward; 10 miles below the point the hills and table-lands cease; thence to Cape San Lazaro the coast is low and sandy, with high land many miles in the interior.

Boca de la Purissima. Eleven miles S. 43° E. (SE. $\frac{3}{4}$ E. mag.) from Point San Juanico is the Boca de la Purissima, which is open to the sea only during the rainy season. The valley through which this stream runs is narrow but exceedingly fertile.

Mission. The old mission of Purissima, now a village of 20 or 30 houses with about 250 inhabitants, lies on the bank of this stream about 10 miles from the sea.

Products. Only a small portion of the land near the village is under cultivation, but cotton, sugar-cane, wheat, vines, figs, oranges, peas, beans, &c., are raised almost without labor.

The *lomboi*, a peculiar plant, found nearly the whole length of the peninsula, flourishes here. It is a small tree with soft brittle wood, thick, clumsy branches and twigs, with leaves sparsely distributed. On cutting the twigs or branches a very fluid, milky-looking sap exudes abundantly. This sap on being exposed to the light and air turns black as promptly as a solution of nitrate of silver, and is equally indelible.

Mescal. One of the principal occupations of the people in this vicinity appears to be the manufacture of mescal or pulque, a strong, highly alcoholic liquor made from the sap of the maguey plant (a species of aloe). The plant is taken just

as it is about to send out its flower-stalk and all the leaves cut off, leaving a core not much larger than a man's head. This is crushed, the sap allowed to ferment, and is afterward distilled. The liquor thus obtained is as limpid and colorless as water, but is excessively alcoholic and has a harsh, rasping taste like new whisky.

Boca de Comandu. Seven miles to the southward of Boca de la Purissima is the Boca de Comandu. Like the former, it is open to the sea during the rainy season only. The ancient mission of Comandu is about 25 miles distant, near the headwaters of the river, in a fertile valley. Further information about Comandu and the surrounding country will be given further on.

Boca de las Animas. Boca de las Animas is the northernmost of three entrances to a series of lagoons that, commencing about 5 miles south of Boca de Comandu, extend the entire distance to Magdalena Bay and are connected with it. These lagoons lie nearly parallel to the coast and are connected with one another; they are separated from the sea by a narrow strip of sand and are used by the small, light-draught coasting vessels.

The Boca de las Animas is about three-quarters of a mile wide and is encircled by a shoal that extends half a mile off shore, over which the sea breaks. The best channel is on the southern side, near the beach, where 3 feet of water will be found at low tide. As soon as the bar is crossed the water deepens to 3 and 5 fathoms. The lagoon in this vicinity is filled with shoals and islands, and branches off in all directions; its shores are covered with a thick growth of mangroves.

Tides. The tide rises between 5 and 6 feet.

Variation. Magnetic variation 10° 35′ E. in 1876.

Boca de San Domingo. Boca de San Domingo is the middle one of the three entrances before mentioned, and is $9\frac{3}{4}$ miles south of Boca de las Animas, the coast between them being a low sand beach, with occasional low hills and a few bushes. It is three-quarters of a mile wide with a shoal extending a mile off the entrance. The best channel is through the middle of the entrance, the breakers on either side plainly marking it; a high mountain 50 miles distant makes an excellent leading mark. (View opposite page 33.)

The least depth on the bar at *low water* is $2\frac{1}{2}$ feet; tides rise 5 feet.

Boca de Soledad.

Boca de Soledad is the southernmost and deepest of the three entrances into the lagoons, and 13¾ miles to the southward of Boca de San Domingo. It is not over half a mile wide, and is marked on either side by a ridge of sand-hills 50 to 100 feet high. From its southern side an extensive

Shoal.

shoal, over which the sea breaks, extends off to the northward and westward 1½ miles. From the northern side the breakers do not extend far from the beach.

Directions.

To enter, approach from the northward, keeping close to the line of breakers making off from the northern side of the entrance; following this line the shoalest part of the bar will be crossed, on a southerly course, in 9 feet water, *at low tide*, and when midway between the two points of the entrance, the course at this time being easterly, there will

Tidal current.

be from 5 to 8 fathoms water. The tide runs at a rate of from 4 to 5 knots between the points of the entrance, and

Variation.

rises about 5 feet. The magnetic variation in 1876 was 10° 30′ E., increasing about 2′ annually.

Between Boca de San Domingo and Boca de Soledad the lagoon has numerous inlets to the eastward.

General remarks.

The description that has been given of the entrances to the lagoons refers to them at the time of the *Narragansett's* visit in 1874. There is good reason to believe that the shoals and bars at the entrances are subject to occasional changes, necessitating a previous examination before attempting to enter. At high water and in moderate weather the channels are plainly marked by the smooth water between the lines of breakers. At low water and in heavy weather the breakers will extend farther out and sometimes across the entrances.

Wells.

On the plains fronted by the lagoons there are many wells furnishing a permanent supply of good water, and there is no reason why, by digging wells for irrigation, the whole plain should not be cultivated.

Remarks

J. Ross Browne in his report makes the following remarks: "Should a successful colony ever be located on the peninsula of Lower California, it must be on this plain. Here is the only tract sufficiently large for a large enterprise of such a kind, that comprises the other requisites of a good soil free from stones and good water accessible in sufficient quantities."

Cape San Lazaro.

The coast south of Boca de Soledad retains the same general character as that to the northward, being low and sandy, until reaching Cape San Lazaro, which is a high, remarkable looking headland of volcanic origin, which can be seen for many miles, and when first made out appears like an island. About this headland are bold rocky cliffs, with high rugged mountains immediately back, the highest being 1,270 feet high. There are numerous outlying rocks along the shore, extending off a quarter of a mile on the northwestern and south-eastern points of the headland. (View opposite page 41.)

From the cape proper the coast trends about south-east 3½ miles to a low rocky point, from which it turns abruptly north for 2 miles to the mouth of a small lagoon.

Santa Maria Bay.

Between Cape San Lazaro and Cape Corso the coast recedes considerably, forming Santa Maria Bay, which is 4½ miles deep from a line drawn between the two capes. The land around the bay is merely a sand beach interspersed with low sand hills and a few bushes, separated from the mainland by the lagoons connecting with Magdalena Bay. The soundings in this bay are very regular, increasing gradually from 3 fathoms near the shore to 20 fathoms at its outer limit.

Anchorage.

Good anchorage will be found in from 5 to 8 fathoms water, sandy bottom, near the western shore of the bay, at from half to three quarters of a mile from the beach, where a vessel will be well protected from the prevailing winds.

Abalones, fish, &c.

Abalones can be found in abundance along the shores, and fish abound in the bay.

Cape Corso.

Cape Corso is a bold, rocky point, fronted by white sand bluffs from 70 to 80 feet high, upon which, in marked contrast, dark-colored hills rise abruptly to a height of 600 feet and upwards.

From Cape Corso to Entrada Point the coast is a succession of rocky points and intervening sand beaches, with numerous detached rocks close to the shore. The land rises abruptly to a height of from 500 to 1,000 feet and over, Mount Isabel, the highest peak, being 1,592 feet high.

Entrada Point.

Entrada Point, at the north-western side of the entrance to Magdalena Bay, is a dome-shaped hill about 200 feet high, connected with the mainland by a narrow strip of sand and rock, which is but a few feet above high-water mark. There are several outlying rocks from 10 to 20 feet high

quite near it, and a reef makes off to the south-east about 300 yards, over which the sea generally breaks.

Cape Redondo. Cape Redondo is the westernmost point of Santa Margarita Island, and is a round, rocky headland nearly 100 feet high, the land rising rapidly back of it to a height of over 500 feet.

Reef. A reef extends off to the westward from the cape a distance of 600 yards, its outer limit marked by a rock *awash*. The sea breaks over this reef in all weathers, although Lieutenant Tanner observed an interval of two hours, including the last of the flood and the first of the ebb, in which there was no break on the outer rock; it was perfectly calm and the sea smooth at the time. Lieutenant Tanner also says: "I observed at the beginning of the flood a heavy overfall at least two cables off from the extremity of the reef, where Lieutenant Taussig found from 7 to 9 fathoms of water."

This may account for the rock reported near the middle of the channel.

Magdalena Bay. Magdalena Bay, one of the most spacious and safe harbors in the world, is about 15 miles long, north-west and south-east, and 12 miles wide. At its north-western limit it is connected with a series of lagoons (already mentioned), which extend in a northerly direction upward of 60 miles. At the junction of these lagoons with the bay there are several shoals and sand bars, the depth of water in the channels between them varying from 4 to 8 fathoms. Whaling vessels have ascended these lagoons for a distance of 40 miles from the bay.

Numerous small lagoons are scattered along the northern shore of the bay, and shoal water extends off from that shore from 1 to 2 miles.

At the south-eastern limit of this great bay it is connected by a navigable channel with another large bay, called Almejas or Lee Bay, which will be described hereafter.

Entrance. The entrance to Magdalena Bay is between Entrada Point and Cape Redondo, and the channel between the reefs that make off from either point is 2½ miles wide, with from 10 to

Directions. 20 fathoms water and no hidden dangers. It has usually been recommended to keep well over toward Entrada Point in entering, but there is no reason why a steamer should do so, as the channel is clear to within half a mile of Cape Redondo. With a sailing vessel it is well to keep well up

toward Entrada Point, as both the prevailing wind and the current tend to set her down toward Cape Redondo.

To reach the best anchorage, at all seasons, follow the Anchorage. land to the north-westward from Entrada Point, keeping at a distance of three-quarters of a mile from it, to Man-of-War Cove, and anchor in from 8 to 10 fathoms water, abreast of some houses that are near the beach, 7½ miles from Entrada Point.

The following remarks by Capt. W. H. Parker, P. M. S. Remarks. S. Co., will be found useful when making for the anchorage in Man-of-War Cove *in the night:*

"Having rounded Point Entrada, half a mile distant, haul up along the land to the westward. From Point Entrada to Mount Isabel the land is only tolerably high. Mount Isabel is the first high land after entering, and when that is abeam the shoal or sand spit running off from the low point (the only danger) 3 miles inside of Point Entrada *is abaft the beam*, and you can haul up with safety for Cove Point. Thence to Cove Point the land is high, gradually sloping toward the point.

"The land recedes a little from Entrada Point to the sand spit.

"You cannot fail to make Cove Point distinct from the land back of it. Run close to it, and follow to the anchorage, which is directly off the houses. Anchor in 8 or 9 fathoms water, one-third of a mile from the beach.

"The land back of the houses is high, with low land to the right."

In the winter months, with *southerly winds*, good anchor- Anchorage. age will be found in the southern part of the bay; the chart is sufficient guide for picking out an anchorage. The *lead* should, of course, be carefully attended.

The tides in the bay are regular and cause strong currents Tides. through the entrance (from 1 to 2 knots per hour). It is H. W., F. and C., at Man-of-War Cove at VIII^h 25^m. Springs rise 5½ feet, neaps 4 feet. The magnetic variation is 10° 25′ Variation. E. (approx.).

In the summer season the only regular supply of fresh Remarks. Fresh water. water is obtained about 40 miles from the bay, near one of the northern lagoons. Small vessels make regular trips for the express purpose of bringing it to the settlement. There are several places marked on the charts of the bay as water-

ing places. This is accounted for by the fact that water of *inferior quality* was obtained by whalemen by sinking a cask in the sand on the beach. This is done by removing the heads of the cask and working it down, removing the sand from the inside until a sufficient depth is reached for the water to ooze in freely, and can be bailed out conveniently.

The water obtained in this way was of a milky-white appearance, and had to settle a few days before it became clear and drinkable.

There is said to be a spring of excellent water near the southern end of Santa Margarita Island.

The bay is bounded on the south by broken ridges of mountains, which separate it from the ocean. On the north a low sandy country, dotted with low bushes and patches of cactus, spreads out as far as the eye can reach. Orchilla is found in great abundance, the gathering and shipping it to San Francisco being a profitable business. Fish, oysters, clams, mussels, and abalones are abundant in the bay and lagoons, and there is plenty of game on the northern shore. Plenty of wood may be obtained, the shores of the lagoons being covered with a thick growth of mangrove bushes.

Orchilla.

Fish, game, wood, &c.

A remarkable phenomenon which occurred during the *Narragansett's* visit in 1874, and is said to occur frequently in the bay, is the appearance of vast numbers of shrimps, from one to two inches long, giving the water a crimson color. The tide receding leaves the shore covered with thick layers of them, on which the sea-birds feed, and at times the atmosphere is filled with the stench arising from their decomposition.

Settlement.

At the time of the *Narragansett's* visit there were about 10 houses near the beach on the west side of Man-of-War Cove, one of which was used as a *custom-house* and the others occupied chiefly by men engaged in collecting and shipping orchilla.

Trail to La Paz.

A rough trail leads through a barren and almost level country to La Paz, a distance of about 115 miles.

Santa Margarita Island.

Santa Margarita Island is a high barren island of volcanic origin, 21¾ miles long and of varying width, being 4¼ miles wide at its widest part. It presents a bold rocky face its entire length, except a small space in the center, where the land recedes somewhat, forming on the south side an open bay called Pequeña Bay; the land hereabout is low and

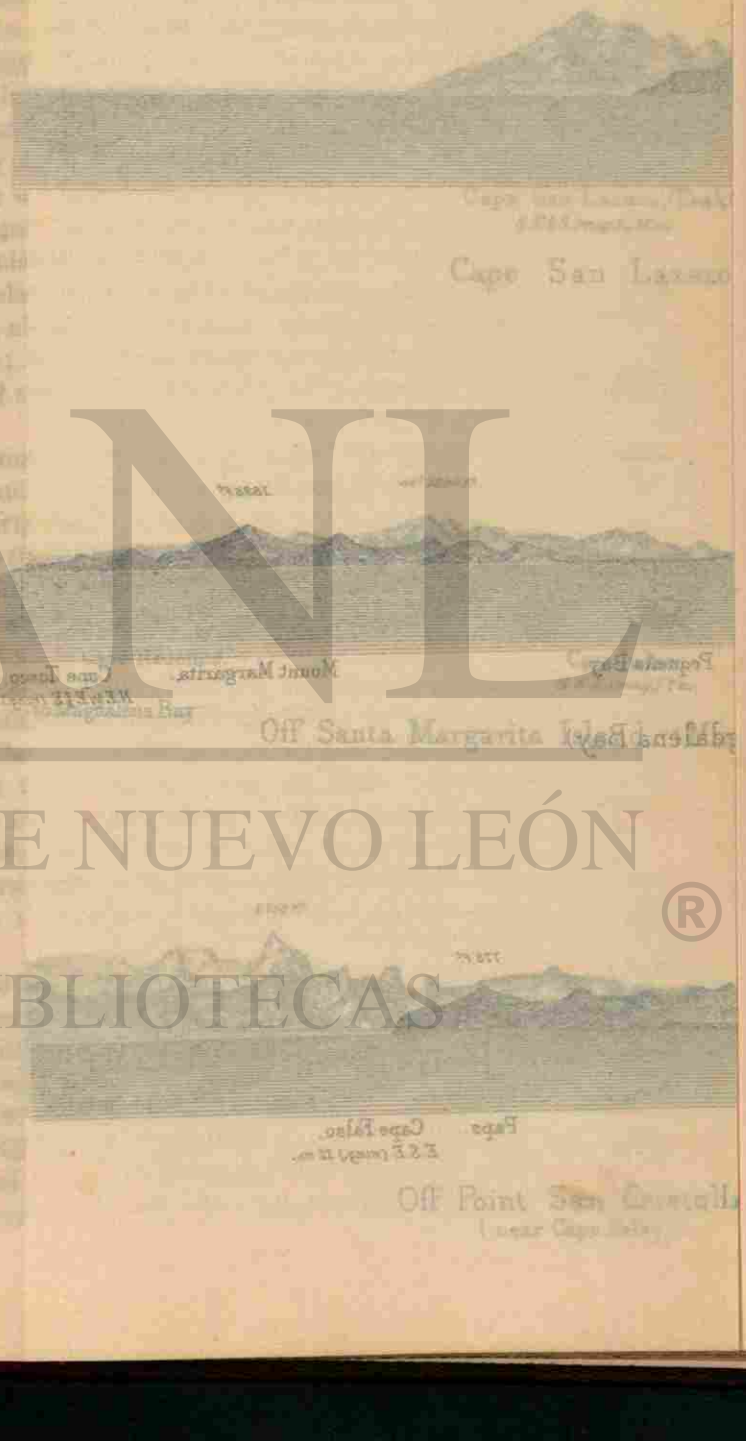
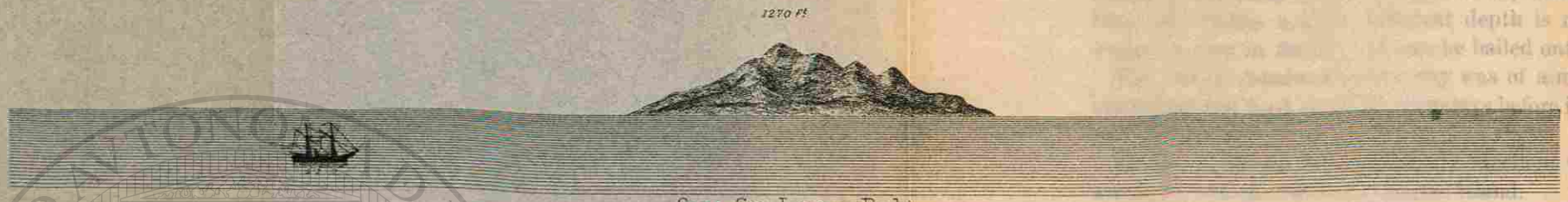
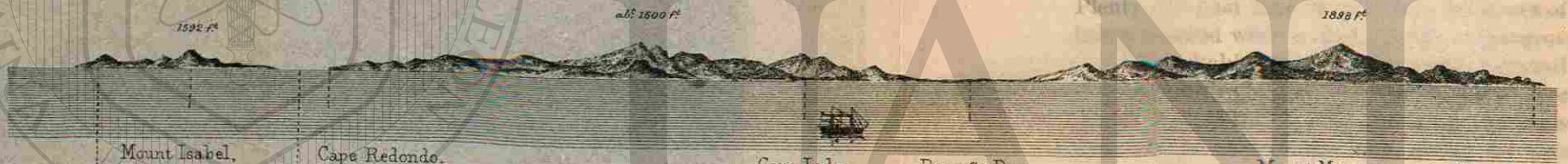


Plate VIII.



Cape San Lazaro, (Peak),
S.E¼S. (mag.) 25 m.

Cape San Lazaro.



Mount Isabel,
NW¼N. (mag.) 16 m.

Cape Redondo.

Cape San Lazaro

Entrance to Magdalena Bay

Cape Judas,
N.N.E. (mag.) 7 m.

Pequeña Bay.

Mount Margarita.

Cape Tosco,
N.E by E½E. (mag.) 14 m.

Off Santa Margarita Island. (Magdalena Bay)

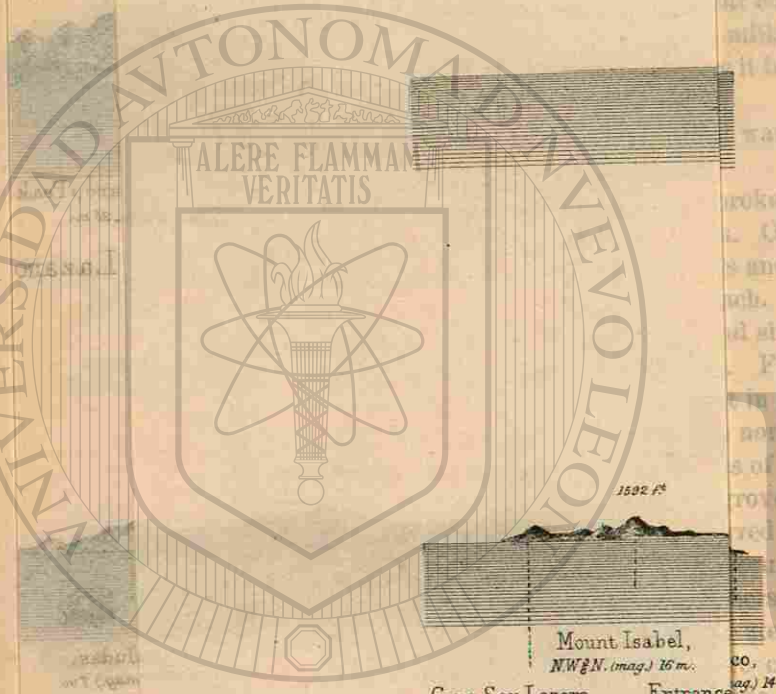
Mount Calaveras,
NE¼E. (mag.) 15 m.

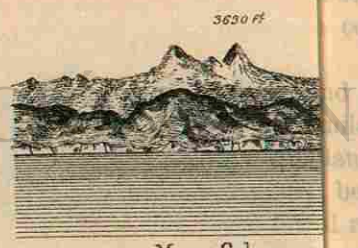
Paps.

Cape Falso,
E.S.E. (mag.) 12 m.

Off Point San Cristobal,
(near Cape Falso).

Plate VIII.





sandy, and the island at this place is only 1¾ miles wide. A short distance to the south-west of Pequeña Bay there are two remarkable peaks over 1,000 feet high, known as the Sisters. At about the same distance to the north-west of the bay is a prominent white bluff point 200 feet high, off which there is a reef and some outlying rocks above water. (View on opposite page.)

Remarkable peaks.

Reef.

Cape Tosco is the extreme south-eastern point of Santa Margarita Island, and is a sharp, bold, rocky point, with a reef extending off to the south-eastward about 600 yards, over which the sea breaks with great violence.

Cape Tosco.

A tolerably good anchorage may be found to the eastward of the cape, under its lee, in from 7 to 9 fathoms water.

Anchorage.

Cresciente Island is a low sand island in something like crescent form, about 10 miles long in a nearly east and west direction; Santa Maria Point, its south-western extremity, lies 3¾ miles N. 36° E. (NNE. ¼ E. mag.) from Cape Tosco.

Cresciente Island.

Rehusa Channel, lying between Santa Margarita and Cresciente Islands, is too narrow and intricate for anything except boat navigation. A shoal extends 1½ miles off Santa Maria Point to the south-eastward, and between it and Cape Tosco are several shoal spots over which the sea breaks.

Rehusa Channel.

The tides run strongly through this channel, causing many tide rips and overfalls.

Almejas or Lee Bay is in reality a continuation of Magdalena Bay, being connected with it by a navigable channel called Marcy Channel, which has an average width of about a mile between the shoals that line the shores on either side, free from hidden dangers, and with a depth varying from 6 to 17 fathoms. The bay is about 12 miles long, of the same general trend as Magdalena Bay and over 7 miles wide. On its northern and eastern sides are extensive shoals.

Almejas or Lee Bay.

Both this and Magdalena Bay were formerly much resorted to by whalemen in the winter months, and vast numbers of whales were taken, the greater number in Almejas Bay.

The tides rise about 4½ feet. The magnetic variation in 1874 was 10° 20′ E.

Tides. Variation.

El Conejo Point is a low point on the main land opposite the eastern end of Cresciente Island. It is backed to the north by a dome-shaped mound about 50 feet high and

El Conejo Point.

separated from it by a narrow arm of a lagoon making to the eastward.

The general trend of the coast from El Conejo Point to Lobos Point is S. 52° E. (SE. by E. ½ E. mag.) and the land is generally low, sandy, and barren. About half way between the two points is a low, rocky point called Point del Marquis. A reef of rocks extends a short distance off from it, and on either side near the coast are low sand bluffs. This is the only rocky formation on this part of the coast.

Point del Marquis.

Las Mesas.

At a distance of 5 to 10 miles inland are some isolated table-shaped hills 600 to 800 feet high, known as Las Mesas. The land in the interior generally rises gradually toward the gulf coast, with conspicuous table lands here and there. From Point del Marquis to the bottom of La Paz Bay, about 25 miles in a north-easterly direction, the land is low and flat for nearly the entire distance, with a scanty growth of stunted trees, bushes, and cactus.

Vessels may anchor anywhere along this part of the coast in fine weather in from 8 to 10 fathoms, a mile or two from the beach. The soundings are regular and there are no known hidden dangers. The beach is generally steep and the breakers close to.

Caution.

In sailing along this part of the coast the *lead* should be frequently used, as the land is low and not easily discerned, especially at night or in thick weather, and the lead becomes the best means of ascertaining its proximity.

When approaching Lobos Point the high mountains back of La Paz and the sharp peaks of the Sierra de la Victoria are plainly visible, Mount Aguja, the northernmost and most conspicuous of the latter range, being 5,924 feet high.

Five miles to the northward of Lobos Point is the Arroyo de las Palmitas, with a grove of palm trees on either bank at its mouth and a beautiful valley extending inland.

Todos Santos River.

Todos Santos River is a never-failing running stream of water, which flows through the fertile valley of the same name, reaching the sea about 1½ miles to the northward of Lobos Point.

The point on the southern side of its mouth is known as Point La Poza, and is the northern end of a table land extending from the vicinity of Lobos Point. It is a perpendicular bluff about 50 feet high, with numerous outlying rocks.

The village of Todos Santos is situated on the bank of the river of the same name, 2 miles from its mouth. A road leads to it from a sand beach situated about half a mile above Lobos Point, which is the best landing place in the vicinity. The village is on the site of the ancient mission of Santa Rosa, and is beautifully situated in a fertile valley, where all the advantages of a temperate and a tropical climate are combined, with few of the disadvantages of either. It is surrounded by well-cultivated fields of sugar-cane, while in its gardens are found the cereals and vegetables of the north, together with the fruits of the south. Many thousands of pounds of sugar (*panoche*) are made every year; oranges, bananas, cocoanuts, dates, figs, pomegranates, limes, mangoes, guayatas, zapotes, &c., are raised, and the castor bean, indigo plant, and the *pitahaya* (a species of cactus with edible fruit) grow wild in the vicinity. The population is about 800.

Todos Santos.

Products.

This is an excellent place for a vessel to procure fresh provisions and water.

Fresh provisions, water, &c.

In moderate weather a good anchorage may be found in from 7 to 10 fathoms, sandy bottom, one-third of a mile off shore and about half a mile to the northward of Lobos Point.

Anchorage.

Anchor immediately after passing the range between Lobos Point and the next point to the southward, San Pedro Point.

Lobos Point is the north-western point of a high rocky promontory, abruptly rising to a hill 773 feet high. It projects at a sharp angle from a sand beach which joins it to the northward, forming a little cove, which is somewhat protected from the ocean swell.

Lobos Point.

The best *landing place* is at the junction of the sand beach with the rocky point. The magnetic variation in 1876 was 9° 50′ E. Tides rise about 4 feet.

Landing place.

Variation.

Tides.

The coast for 20 miles south of Lobos Point is in general a succession of sand beaches and rocky bluffs, the latter forming slight projections in the coast line; the land immediately back of the coast is hilly, with high and broken mountains in the interior. La Aguja, the most prominent peak, when viewed from the westward, presents an almost perpendicular column, with a sharp point to the northward, isolated from and but little lower than the adjoining mountain, which is 5,924 feet high. There is said to be a fresh-

water lake near its summit, which gives an unfailing supply to the numerous herds of deer and other wild animals that are found in the vicinity.

San Pedro Point and Bay.

San Pedro Point is three-quarters of a mile to the southward of Lobos Point and is the south-western extremity of the same promontory. Just south of the point is a small bay, formed by a slight indentation in the coast line, called San Pedro Bay, where landing is said to be practicable in good weather. Back of the sand beach that encircles the bay is a fertile valley in which the settlement of San Pedro is situated. The southern limit of the bay is marked by a steep, rocky bluff which extends about 1½ miles to the south-eastward, and 3¼ miles from the southern end is a bluff, rocky point on which is a conical-shaped hill 414 feet high. On either side of the point is a sand beach; the southern one, receding somewhat, forms the Bay of Pescadores, near the shore of which, half a mile from the beach, is a small fishing village. Back of the sand beach the land slopes toward the coast range of hills and is covered with cactus.

Pescadores Bay.

Point Casparino.

A rocky bluff 75 feet high, just south of Pescadores Bay, is known as Point Casparino.

From this point to La Tinaja Point is 8½ miles. Between the points are two arroyos, the northern of which has a small settlement on its banks with some palm trees. The banks of the southern one are bluffs of a yellow color, with a cactus slope toward the hills.

La Tinaja Point.

La Tinaja Point is a rocky bluff 75 feet high, with a hill rising rather abruptly from it to a height of 596 feet, N. 71° E. (NE. by E. ½ E mag.). Three and three-quarter miles from the point is a conspicuous mountain, 2,183 feet high, called La Tinaja (the pitcher), because of a cavity or basin at its summit, which, filling with water during the rainy season, affords a watering place for the cattle of the neighboring ranch.

Soundings.

The soundings along this part of the coast from Lobos Point to Cape San Lucas show a depth of 100 fathoms and upwards within 2 or 3 miles of the land.

South of La Tinaja Point the coast has the same general character as above, except that back of the beach sand bluffs of moderate height begin to appear. About 2½ miles south of the point are an arroyo and a ranch, and just north of the Cerro de la Playa are another arroyo and ranch.

Cerro de la Playa.

Cerro de la Playa is a rocky bluff 75 feet high, back of which rises abruptly a conical hill 1,114 feet high. About 2½ miles south of this point is a red-colored, rocky bluff 50 feet high, with numerous rocks at its foot; northward of it, close to, is a ranch.

Point San Cristobal.

Point San Cristobal is a bold, rocky bluff from 200 to 300 feet high.

The coast from Point San Cristobal gradually sweeps around to the eastward to Cape Falso, and consists of steep sand beaches, back of which are sand bluffs of a whitish color from 150 to 300 feet high, covered with patches of low shrubs, which appear dark in contrast with the white background. From these bluffs the coast range of hills rises gradually to a moderate height, decreasing somewhat in height toward Cape Falso, and rising again suddenly 1½ miles north of the cape to a double hill 778 feet high, known as the Paps. (View opposite page 41.)

Cape Falso.

Cape Falso is the southernmost point of the peninsula of Lower California, and is a rocky bluff about 50 feet high, with many detached outlying rocks near the shore. The coast is bold and may be approached within a quarter of a mile, carrying 5 and 6 fathoms of water. A mile south of the cape 55 fathoms were obtained, sandy bottom.

Between Cape Falso and Cape San Lucas the coast is a succession of sand beaches and bold, rocky bluffs, against which the sea breaks heavily, even in the finest weather. Barren hills from 400 to 800 feet high rise immediately back of the beach. (View opposite page 46.)

Three-quarters of a mile west of Cape San Lucas there is a gap in the hills where a strip of sand beach a cable in width extends through from San Lucas Bay to the sea. From this beach to the cape is a wedge-shaped mass of steep, rocky hills, the highest of which, Vigia hill, is 527 feet high.

Los Frailes.

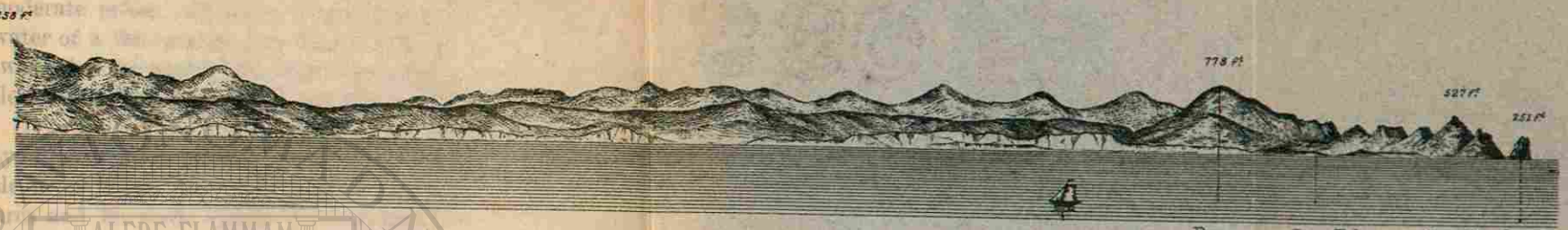
Los Frailes are two high, bold, and, upon certain bearings, grotesque-looking rocks, with a number of smaller outlying rocks near them.

The western one, connected with the just-mentioned wedge-shaped ridge of hills by a narrow strip of low sand beach, is 303 feet high, of sugar-loaf shape, and has on its eastern side an archway through which the sea rushes with great force.

Cape San Lucas.

The eastern Fraile is 251 feet high, with nearly perpen-

Plate IX.

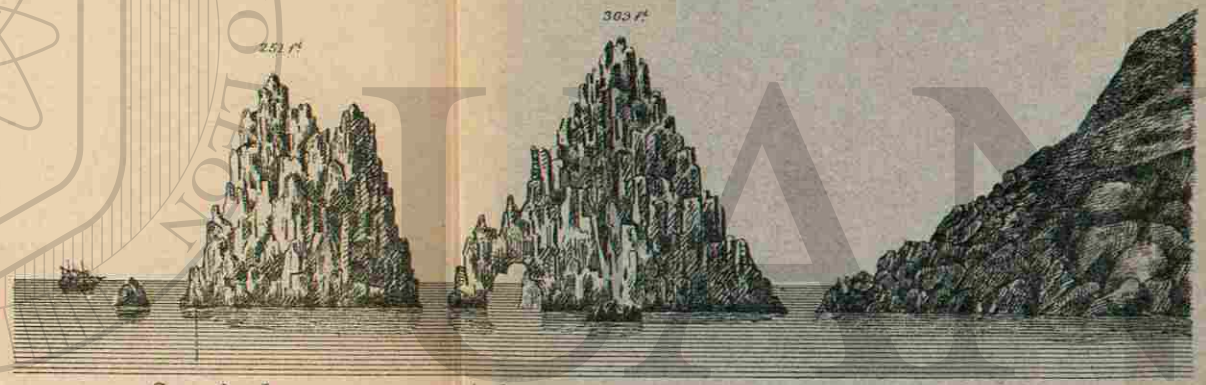


Paps, N.E ½ N. (mag.) 4 m.

Cape Falso.

Cape San Lucas, (Los Frailes.) N.E by E ½ E. (mag.) 7 m.

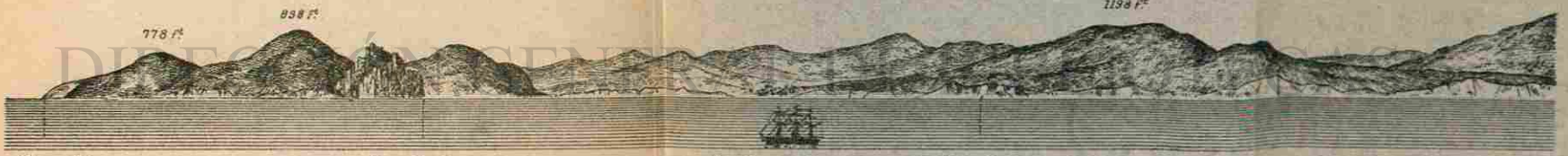
Cape San Lucas from the Westward.



Cape San Lucas, S. ¼ E. (mag.) ½ m.

Archway.

Los Frailes, from San Lucas Bay.



Cape Falso, W ¼ N. (mag.) 15 ½ m.

Los Frailes, (Cape San Lucas) W by N. (mag.) 12 m.

San Lucas Bay.

Cabeza Ballena, N.W by W ½ W. (mag.) 10 ½ m.

Cape San Lucas from the Eastward.

is well adapted. There are some extensive ranches in the vicinity.

A road from San Lucas runs along the coast to San José del Cabo, distant about 16 miles.

Excellent fresh beef and vegetables can be obtained at San Lucas at moderate prices, and there is also an abundance of fresh water of a fair quality; the best is that obtained from the wells that are sunk in the bed of an arroyo, about half a mile from the beach. Wood can also be obtained. Fresh provisions, wood, &c.

There is plenty of game in the vicinity, and the countless numbers of turtle-doves filling the woods deserve especial mention. Vultures and buzzards appear to a stranger to be domesticated, as the streets and yards of the houses are filled with them.

The magnetic variation in 1878 was 9° 40′ E., increasing about 2′ annually. H. W., F. and C. VIII^{h} 28^{m}; tides rise 4 feet. Variation. Tides.

CHAPTER III.

ISLANDS AND SHOALS OFF THE COAST OF LOWER CALIFORNIA BETWEEN SAN DIEGO AND CAPE SAN LUCAS.

Cortez Shoal.

The following remarks on the Cortez Shoal are taken from the Directory for the Pacific Coast of the United States (U. S. Coast Survey):

"The extent of this bank, which lies 46 miles SW. ¼ W. (mag.) from the south-east end of the island of San Clemente, has been sounded out carefully and found much greater than the early examinations led us to suppose. Within the limits of the 50-fathom curve the general trend is parallel with the islands of Santa Catalina, San Clemente, and San Nicolas, and it stretches about 17 miles from lat. 32° 24′ N., long. 118° 59′ 30″ W., to lat. 32° 32′ N., long. 119° 17′ 30″ W.,* but curves slightly to the south-west. It has an average and nearly uniform width of 3½ miles. The nature of the bottom is hard, composed of white sand, broken shells, and fine coral at the south-east portion, and sand with broken shells at the north-west. The shoalest and most dangerous part is that known as the *Bishop Rock*, lying 5 miles from the south-east tail of the bank and having but 2½ fathoms of water upon it. Around this danger the depth increases gradually, and in an extent of 2½ miles in the general direction of the bank reaches but 15 fathoms. The geographical position of these rocks is, approximately, lat. 32° 25′ 45″ N., long. 119° 05′ W.

"From the north-west end of the island of San Nicolas the rocks bear SE. ½ S. (mag.), distant 57 miles, and from the south-east end of San Clemente they bear SW. ¼ S. (mag.), distant 46 miles.

"The next shoal spot is one of 10 fathoms, about the middle of the bank, and of limited extent, being only half a mile

* The longitudes given of various points on Cortez Shoal require a correction of + 1′ 21″ to make them correspond with latest Coast Survey determinations.

square within the 15-fathom curve. Its geographical position is approximately, lat. 32° 26′ 45″ N., long. 119° 10′ 30″ W.

"From the north-west end of San Nicolas, the spot last mentioned bears SE. by S. (mag.), distant 54 miles, and from the south-east end of San Clemente it bears SW. ¼ W. (mag.), distant 50 miles. From the Bishop Rock it bears W. ¼ N. (mag.), distant 5 miles.

"To the north-westward of this latter shoal spot the depth is nearly uniform at 49 fathoms for 7½ miles, and between it and the Bishop Rock the depth is uniform at about 43 fathoms.

"Upon this bank the current is variable, frequently setting against the strong NW. winds with a velocity of nearly 2 miles per hour producing at all times a heavy swell and even in moderate weather breaking heavily upon the rocks. In passing over the bank at night we have been sensible of our proximity to it by the increased swell. In the detailed examination of 1856 it was found that the general set of the current was to the southward and eastward, and the greatest velocity 1½ miles per hour, but no statement is made concerning the prevailing wind.

"This bank lies in the direct route now followed by the Panama and San Francisco steamships, and was discovered by Captain Cropper, of the steamship *Cortez*, in March, 1853. His position was determined by bearings upon San Nicolas and San Clemente and was very close, being within a mile of the latest and best assigned place.

"Attention was subsequently called to a more extended examination of the vicinity by the clipper ship *S. S. Bishop*, of Philadelphia, striking on the rock (in 1855), since called by her name, and under unfavorable circumstances two points of rock were supposed to exist, to which approximate positions were assigned. In 1856 the bank was sounded out to the extent of 130 square miles, and from a consideration of the highly-favorable circumstances under which this last survey was made confidence is expressed that the point of rock above mentioned is the only one existing; but as it is very difficult to find detached single points of rock below the surface in a sea-way, it will not be surprising if others be eventually found. At all events the prudent navigator will give this bank a good berth. Its existence forcibly sug-

gests the probability that other submarine ridges lie parallel to the coast."

Guadelupe Island. Guadelupe Island, lying in lat. 29° 10′ 50″ N., long. 118° 18′ 30″ W. (*obs. spot at North Point*), is 14½ miles long in a north and south direction, and from 3 to 5 miles wide. It is of volcanic origin and has a ridge of mountains throughout its length, the highest of which, near the northern end, is 4,523 feet high. The island can be seen in clear weather at a distance of about 60 miles and will appear, when bearing either east or west, lower at its southern extremity than at its northern. The shores are generally bold, rocky bluffs, with detached rocks close to. (View opposite page 52.)

Off the south end of the island are two rocky islets, one of which is half a mile and the other, which is 560 feet high, 1½ miles from it.

The southern part of the island is very barren, but in the northern part there are several fertile valleys and there is some vegetation on the mountains.

Wood, water, &c. Wood and water may be obtained from a small cove on the north-east side of the island, and goat's flesh may be obtained for the trouble of shooting the animals.

Anchorage. There is a small cove on the south-east side of the island, formed by a few outlying islets, where vessels may anchor in 7 fathoms water and find shelter from all winds except those from SE. to ENE., which seldom blow here. There are no dangers to navigation at a distance of a quarter of a mile from the shores of the island. Sailing vessels bound from San Francisco to the Gulf of California generally sight it, passing to the westward on account of the stronger northwest winds.

The longitude given for the north point of this island may be slightly in error, as no late determination has been made.

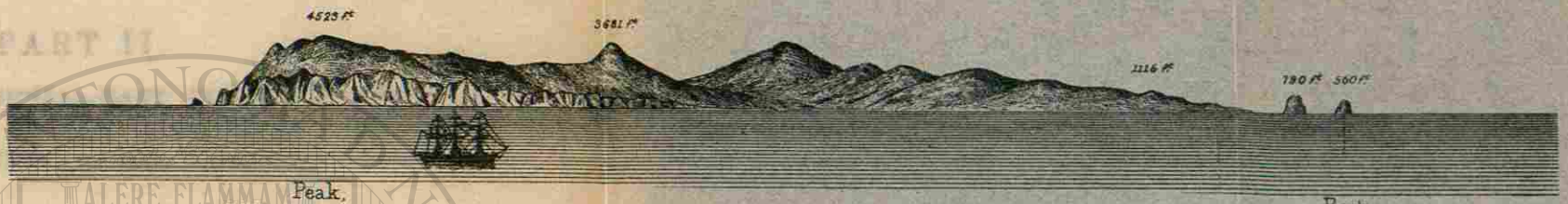
Alijos Rocks. The Alijos Rocks are a dangerous group lying in the track of sailing vessels bound down the coast of California, in lat. 24° 58′ 6″ N., long. 115° 44′ 47″ W. They extend about half a mile north and south and not over a cable east and west; the southernmost and highest of the four principal rocks is 112 feet, and the northernmost 72 feet high. Beside the four principal rocks there are numerous smaller ones, the whole appearing, when seen from a distance, like a ship under sail.

The geographical position given is that of the southernmost rock. (View opposite page 52.)

Reported Islands and shoals. Numerous shoals and islands have been reported to exist off the coast of Lower California as far as 140° west. Among them are New Island, Maria Laxara Island, Gaspar Rock, Paxaros, Passion, Cooper, and Henderson Islands, with some others. Careful search has been made for them by the United States ships *Portsmouth* and *Narragansett* in the years 1873 to 1875 without finding them or detecting any indications of land near the positions assigned to them.

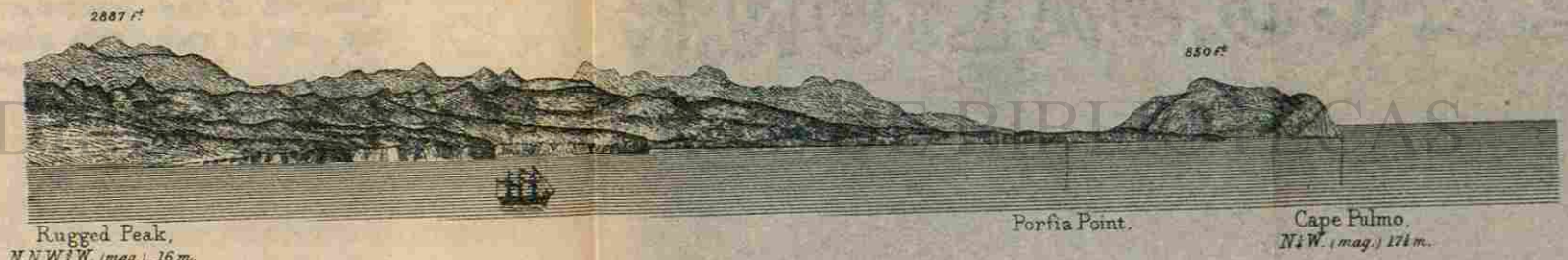
Similar search has been made by vessels of other governments with the same result.

Plate X.



Guadalupe Island, from the Westward .

Alijos Rocks, from the Southeastward .



Cape Pulmo, from the Southward .

PART II.

GULF OF CALIFORNIA—EAST COAST OF THE PENINSULA OF LOWER CALIFORNIA — GENERAL DESCRIPTION, WINDS, WEATHER, CURRENTS, &c.

General description.

The east coast of the peninsula of Lower California, bordering on the gulf, from Cape San Lucas to the mouth of the Colorado River, is, with few exceptions, high and precipitous, the mountains rising abruptly back of it.

Off the coast there are numerous islands, a description of which will be given hereafter, with navigable channels between them and the main land.

The depth of water near the east or gulf coast of the peninsula is generally much greater than it is near the western or Pacific coast; but there are many places where vessels may anchor and find protection from the prevailing winds.

The coast and islands near it are generally barren, but there are some exceptions, among which are San Josef Island, and the vicinity of Loreto and Mulege, on the gulf coast, and the vicinity of San Lucas Bay and the Valley of San José del Cabo, at the southern extremity of the peninsula.

Winds.

The prevailing winds in the Gulf of California, from November to May, are from the north-west; during the remainder of the year south-east winds prevail. In the upper portion of the gulf moderate north-west gales are frequently experienced during the months of December, January, and February. They generally last from two to three days. During the rainy season, or from May to November, south-easterly gales may be expected at any time in the lower part of the gulf. Occasionally (usually with an interval of several years between them) a local hurricane or cyclone, known as *El Cordonazo*, blows with great violence; these occur at about the end of the rainy season, always blowing from

El Cordonazo.

south-east to south-west, and are of short duration but tremendous force, and are accompanied by much lightning.

Weather.

During the greater part of the year the weather along the coast is fair and pleasant, the heat of the day during the summer months being made tolerable by the succeeding cool nights. The scarcity of rain is compensated for, in some measure, by frequent heavy dews. During the winter months the north-west winds passing over the snow-covered peaks of the Calamahue Mountains cause a quite low temperature in the northern part of the gulf.

Although the rainy season is said to be from May to November, but little rain falls during that period on the peninsula of Lower California, and the land is for the most part dry and hot. Unlike the eastern or Mexican coast of the gulf in this respect, the rains, except in the southern part of the peninsula, occur mostly in the winter months. Summer rains are almost unknown north of Carmen Island.

Extract from work of M. Duflot de Mofras.

The following, taken from the work (published in 1844) of M. Duflot de Mofras, attaché of the French legation at Mexico, may prove valuable to the navigator:

"The year is divided into the dry and rainy seasons, the changes of which occur at variable periods. During the dry season the weather is always fine, the winds blowing regularly during the day from north-west to west, following the direction of the coast; they are replaced at night by a light breeze off the land or by calms.

"The rainy season, which commences in June, is at first indicated by calms and light showers of rain. As the season advances the showers become heavier, and, instead of occurring only at night, they commence in the afternoon and terminate in very violent tempests, accompanied by thunder and lightning and violent winds from all points of the compass. This weather continues until the end of September, and it often happens that the season terminates with a violent hurricane, that usually occurs between the 1st and 5th of October, the feast days of St. Francis.

"These hurricanes, which always blow from SE. to SW., are of short duration, but are of such violence and raise such a tremendous sea that nothing can withstand them. They are known in the country as *Los Cordonazos de San Francisco*. A vessel surprised by them in a roadstead is liable to founder at her anchors, or, breaking from her moorings, be driven ashore. At the approach of the cordonazo the offing should be run for, or, if obliged to remain in the roadstead, an anchorage should be chosen where it will be easy to get under way at the first sign of the tempest's striking."

Although usually occurring about the 1st of October, these tempests have been experienced as late as the 1st of November, a fact which it is well to remember.

Currents.

The currents in the middle of the gulf set to the southeastward; they are of very little strength and are greatly influenced by the tides. Along the western shore the current, when uninfluenced by the tide, sets to the north-westward, but is so slight as to be hardly perceptible. Off Cape San Lucas the current sets to the eastward. The *Narragansett* experienced quite a strong easterly current off the southern extremity of the peninsula. The tides ebb and flow regularly along the coast, but their strength and direction depend greatly on the prevailing wind; the tidal currents increase in strength toward the head of the gulf; at the mouth of the Colorado River they frequently run at a rate of 5 to 6 knots per hour.

Fish.

According to J. Ross Browne, "Nearly every species and variety of edible fish found in the waters of the Mediterranean, or on the coasts of Europe, the West Indies, Atlantic North America, or Chili, are found in the waters of Lower California in greater abundance than elsewhere. Their numbers are not only incredible, but many of them are of extraordinary beauty and brilliancy of color. The missionary and discovery writers bear invariable testimony to this feature of the animal life of California.

"*Sword-fish* of immense size are found in the waters of the gulf; they have been known to attack vessels and leave their swords in the timbers.

"A singular fish found in these waters is the *boeps ochione*, or bull's-eye; it seems to be a species of sun-fish and has only *one* large eye, about the size of a bullock's, set in the center of the upper part of the body.

"*Sharks* of several species abound in every bay and harbor; among them are the thresher and the hammer-headed shark. Some of the sharks of the upper gulf waters are said to be as large as middling-sized California whales and to weigh over 1,000 pounds. They are called *Tiburones*

and reach a length of 30 feet; they are very ferocious and are much dreaded by pearl-divers, boatmen, and fishermen.

Manta raya.

"The *Manta raya*, a species of ray, is an immense brute of enormous strength, cunning and ferocity, and is more the terror of the pearl-divers than any other creature of the sea."

When at anchor off La Paz, one of these monsters was captured after hard work for hours in harpooning and lancing it. During the struggle it exhibited enormous strength, pulling a boat fully manned after it at immense speed.

It measured 17 feet in width, 11 feet in length, exclusive of tail (which was armed with a spine), and over 3 feet in thickness at the middle. Its mouth, armed with formidable jaws (no teeth), measured 26 inches across, occupying the space between two singularly-shaped flaps, projecting from its head like horns. Its weight was estimated at 3,000 pounds. It seems identical with the horned ray, sometimes called a *sea devil*, of the Mediterranean.

Octopod.

Another inhabitant of these waters is the Octopod, or great squid (devil-fish), a gigantic mollusk, that is found in the rocky cavities along the shore, particularly in localities sheltered from the surf, where it lies quietly among the seaweeds watching for its prey. Its arms, which are furnished with flat disks or suckers, are from 10 to 20 feet in length. With these arms it seizes, envelopes, and smothers its prey, which it afterwards devours at its leisure with its sharp, formidable bill.

Red water.

A very curious phenomenon in the waters of the gulf is the existence of extensive patches of red-colored water. This was noted by the earliest Spanish navigators, who at one time named the gulf "El Mar Vermejo," the vermilion sea. It is believed that the first investigation and description of this phenomenon was by Assistant Surgeon Thomas H. Streets, U. S. N., of the U. S. S. *Narragansett*, in 1875. (See American Naturalist, February, 1878.) He makes a distinction between the vermilion patches of the mouth of the gulf and the brick-colored and corrosive waters of certain portions of the upper gulf. The former he assigns to the presence of countless numbers of *ciliate infusoria* suspended some distance *below the surface* of the water; the latter to the presence of great numbers of *flagellate infusorium*, the common *noctiluca miliaris*, floating *on the surface* of the water, giving it a milky red color.

CHAPTER I.

THE COAST AND ISLANDS FROM CAPE SAN LUCAS TO THE NORTHERN END OF SAN JOSEF ISLAND, INCLUDING SAN JOSEF CHANNEL.

Cabeza Ballena.

Cabeza Ballena is a perpendicular rocky point of dark lead color from 50 to 75 feet high, with numerous detached rocks lying off it. Immediately back of the point a range of hills, one of the spurs of the Sierra de la Victoria, rises to a height of over 1,000 feet. A rocky formation, the same as that of Cabeza Ballena, extends 2 miles to the westward of it, where it joins the steep sand beach of San Lucas Bay, which has already been described.

From Cabeza Ballena the coast for 4 miles to the northeastward is generally rocky and of moderate height; thence it recedes somewhat, and for a distance of 2½ miles is low and sandy, sloping gradually to a mountain range a short distance inland, called the Sierra de San Lazaro. Near the south-western end of this sand beach are an arroyo and several ranches. After passing the strip of sand the coast is of rocky formation as far as Palmia Point. Near the point and within half a mile of the beach is the Cerro Colorado, 502 feet high, and of *red sandstone*. It is an excellent landmark, being the only formation of the kind between Cape San Lucas and San José Bay.

Palmia Point.

Palmia Point is the south-western extremity of San José Bay, and is a low, bluff, rocky point, with numerous detached rocks close to. It is backed, at a distance of 3 cables from the point, by a mound 353 feet high. The soundings off this part of the coast showed over 100 fathoms at a distance of 1½ miles.

San José del Cabo Bay.

San José del Cabo Bay is an open bay formed by an indentation in the coast line between Palmia and Gorda Points. The shore of the bay consists of steep sand beaches, with rocky patches at either end, that toward Palmia Point being the most extensive. A short distance inland are mod-

and reach a length of 30 feet; they are very ferocious and are much dreaded by pearl-divers, boatmen, and fishermen.

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From Cabeza Ballena the coast for 4 miles to the northeastward is generally rocky and of moderate height; thence it recedes somewhat, and for a distance of 2½ miles is low and sandy, sloping gradually to a mountain range a short distance inland, called the Sierra de San Lazaro. Near the south-western end of this sand beach are an arroyo and several ranches. After passing the strip of sand the coast is of rocky formation as far as Palmia Point. Near the point and within half a mile of the beach is the Cerro Colorado, 502 feet high, and of *red sandstone*. It is an excellent landmark, being the only formation of the kind between Cape San Lucas and San José Bay.

Palmia Point.

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San José del Cabo Bay.

San José del Cabo Bay is an open bay formed by an indentation in the coast line between Palmia and Gorda Points. The shore of the bay consists of steep sand beaches, with rocky patches at either end, that toward Palmia Point being the most extensive. A short distance inland are mod-

erately high hills, with the mountains of the Sierra de San Lazaro to the north and west. The bay is entirely open to the south and east, and the sea breaks heavily upon its shores.

Anchorage. Vessels may anchor anywhere in the bay at a distance of a third of a mile from the beach in from 7 to 9 fathoms water, sandy bottom, *except just south of the watering place* (see Chart No. 635), where there is a deep hole, with from 30 to 50 fathoms water to within 2 cables of the shore. The best anchorage is about three-quarters of a mile to the northward of Palmia Point, in 8 to 9 fathoms, abreast a short strip of sand beach about a cable in length, fronting a rocky formation. On this sand beach is the best boat landing. The heavy swell that sets into the bay at all times, and particularly during the season of the SE. gales (viz, from May to October), makes this bay an uncomfortable anchorage and renders landing in ordinary ship's boats a hazardous undertaking.

San José River. The San José River waters an extensive valley of the same name, which extends many miles into the interior. It empties into the sea a little over 3 miles NNW. (mag.) from Palmia Point. At ordinary times the water percolates through the high sand ridge thrown up by the action of the sea, and only breaks through at the time of freshets. A mile farther to the eastward is a small outlet, which is always open, where good water may be obtained at the last of the ebb. Mount San Lazaro, the highest peak of the range of the same name, 4,564 feet high, kept on a bearing N. 45° 30′ W. (NW. by W. mag.), leads up to the watering place.

San José del Cabo. The village of San José del Cabo is on the western bank of the river, three-quarters of a mile from the sea. The population is variously estimated at from 1,000 to 1,500, of which a few are foreigners. Vessels may obtain supplies of fresh meat, vegetables, and wood at moderate prices.

The business of the place is mainly dependent on the silver mines of San Antonio. Some of the natives are engaged in the shark fishery and the preparation of shark oil; and it seems as though a profitable business might be done in the gathering and pressing of the castor bean, which grows wild in the vicinity in great abundance. There is also plenty of rosewood and cedar growing on the mountain sides.

San José Valley. The valley of San José is one of the most fertile of Lower

California. Throughout its extent are plantations of sugar-cane, cotton, corn, and tobacco, while in the gardens are groves of orange, fig, lemon, lime, and pomegranate trees, and plantains and bananas are found growing by the side of every ditch or aqueduct. Here and there are seen waving groves of palm trees.

Road to La Paz and intermediate places. There is a road from San José del Cabo through the valley, winding around the numerous lateral spurs of the Sierra de San Lazaro to Santa Anita, La Palma, Miraflores, Santiago and Los Martires, near the coast in Palma Bay; thence up a cañon to San Bartolo, San Antonio, Triunfo silver mines, and La Paz. Horses and mules for making this journey, which is somewhat over 100 miles, can be obtained at San José del Cabo.

Salatea. An extensive salt marsh, known as Salatea, lies between the beach near the mouth of the river, and the village of San José. By landing near the *watering place* it will be possible to procure horses to ride to the village, and native guides who will point out the best places for fording the intervening water courses. Generally there will be no delay in getting horses at this point, as the natives are on the watch for parties landing, and bring the horses down at once.

Variation. The magnetic variation in 1878 was 9° 40′ E., increasing about 2′ annually.

Tides. Tides rise about 4 feet.

Gorda Point. Gorda Point is a round, rocky bluff, about 50 feet high, with many outlying rocks close to; from it a rather flat-topped hill rises to a height of 300 feet. Near the shore, 1½ to 2 miles west of Gorda Point, is a cluster of conspicuous hills, called Cerros Prietos. They are of conical shape and of a light-gray color, resembling small craters. They can be distinguished at considerable distance, and cannot escape notice, when coming from the westward, before entering San José Bay.

Coast from Gorda Point to Cape Pulmo. Cape Pulmo lies 21 miles N. 28° 30′ E. (N. by E. ¾ E. mag.) from Gorda Point. The coast between them projects considerably to the eastward of the line of bearing, having a gradually sweeping convex shore line, without any intermediate prominent points that are recognizable from a distance. It is moderately low and rocky, with occasional sand beaches, sloping gradually to the mountain range in the interior. Polfia Point, which is 3 miles north-eastward from Gorda

Point, projects but little from the general coast line. It is low and rocky, and a heavy surf breaks upon it at all times.

Porfia Point. Porfia Point, which lies 10 miles farther to the northeastward, is a bold, rocky bluff 60 feet high, which may be recognized by its light, grayish color, differing several shades from other points in the vicinity. Off this point are numerous detached rocks close to.

Shoal water. About midway between Polfia and Porfia Points, where a lateral spur of the coast range of hills terminates near a low sand beach, the water is shoal and discolored for a mile or more off shore. Soundings about a mile off shore showed a depth of 12 fathoms, increasing to 16½ fathoms at a mile and a half off. On other parts of this coast soundings at the same distance showed 40 and 50 fathoms.

About 3 miles to the northward of Porfia Point is a minor point, with a rocky bluff 60 feet high; about midway between the two points is an arroyo and ranch.

Cape Pulmo. Cape Pulmo (view opposite page 52) is a bold, rocky bluff of a light grayish color, 410 feet high, surmounted by a hill 850 feet high. The country between this headland and the coast range of hills is low.

Immediately south of the cape is a small bay, three-quarters of a mile deep, at the bottom of which is an arroyo and ranch. The water in this bay and off the cape is deep, 10 fathoms and over being found within a cable's length of the beach.

Breaker. Off the south-east point of the bay the sea breaks for a quarter of a mile off shore.

There is a small white rock, 12 feet high, 1½ miles northward of the cape proper, and about a third of a mile from the nearest shore to the south-west; 12 fathoms of water were found close to it.

Silver mines. About 7 or 8 miles to the north-westward of Cape Pulmo are some silver mines that were opened a few years ago by a French company, but soon given up on account of the difficulty and expense of transportation of the necessary material for such an enterprise.

High Bluff. High Bluff is a rocky headland which lies 4 miles to the northward of Cape Pulmo, and is from 50 to 75 feet high, surmounted by a hill 820 feet in height, which is the eastern end of a range of mountains from 1,500 to 2,000 feet high. Shoal water extends off this headland a short distance in

every direction, and there are numerous detached rocks close to it; the coast between it and Cape Pulmo consists chiefly of sand bluffs about 20 feet high, with some rocky patches and a few outlying rocks along the shore. Just south of High Bluff there is a small settlement of people engaged in the pearl fishery.

Coast between High Bluff and Arena Point. The coast between High Bluff and Arena Point recedes considerably, forming an open bay 1½ miles deep, the shores of which are sandy, and, toward Arena Point, low.

Shoal. A mile and a half N. 16° W. (NNW. ¼ W. mag.) from High Bluff, and 4 cables distant from the nearest shore to the westward, is a shoal of small extent on which the sea breaks. Between it and shore is a passage with from 4 to 5 fathoms water.

Directions. To avoid this shoal when coming from the south, after passing Cape Pulmo keep it on a bearing nothing to the eastward of south (S. ¾ E. mag.) until High Bluff is well on the port quarter, bearing S. 45° W. (SW. ¾ S. mag.), when you can safely haul up for Arena Point. Coming from the north, keep Cape Pulmo well open of High Bluff, or on a bearing nothing to the east of south (S. ¾ E. mag.) until High Bluff bears S. 56° 15′ W. (SW. ¼ W. mag.), when you will be well past the shoal.

Arena Point. Arena Point is low and sandy, with a heavy surf breaking all around it; there are no outlying dangers, and the water off the point to the eastward is very deep, no bottom being found at 150 fathoms three-quarters of a mile off it.

Anchorage. Good anchorage may be found in moderate weather in from 7 to 10 fathoms water, dark sandy bottom, less than half a mile from the shore, Arena Point bearing N. 24° E. (N. by E. ¼ E. mag.), distant 1 mile.

Variation. The magnetic variation at Arena Point in 1876 was 9° 50′ E., increasing about 2′ annually.

Tides. Tides rise about 4½ feet.

Palmas Bay. Between Arena and Pescaderos Point the coast falls away, forming Palmas Bay, which is from 3 to 4 miles deep, and 19½ miles between the two points. It is entirely open to easterly winds, and affords no shelter from the south-easterly gales. In the northern part of the bay the hills extend to the water, with rocky cliffs and stony beaches. The southern part is less broken, the coast being low and sandy and rising gradually to the coast range of mountains.

Near Arena Point there is quite an extensive plain covered with cactus and various kinds of bushes and trees;

among the latter is the *copal tree*, which is found in many places in the southern part of the peninsula.

Soundings.

The soundings in the northern and western part of the bay show deep water close to the shore, in the southern part, between Arena Point and a steep rocky point 3¼ miles northwestward from it. Shoal water from 3 to 5 fathoms, with indications of shifting shoaler spots, extends half a mile off shore. When approaching Arena Point from the northward the land should not be approached to within a mile and the lead should be kept going.

Boca Trinidad. Ranch.

Several arroyos open into the bay, one of them, known as Boca Trinidad, is 9½ miles north-westward of Arena Point, near a cluster of conspicuously formed hills, and has an extensive ranch near it. There are several other ranches near the shore of the bay and about 2½ miles to the southward of Pescaderos Point are the ruins of a stone building.

Pescaderos Point.

Pescaderos Point is bold, rocky, and of a reddish color; it may be safely approached to within half a mile, carrying about 10 fathoms of water; the hills back of the point rise to a considerable height.

Muertos Bay.

Muertos Bay is very much the same in character as Palmas Bay, being formed by the receding of the coast between Pescaderos and Perico Points. The land back of the bay rises to a height of nearly 4,000 feet, with a gradual descent on its southern side to a sand beach, and on the northern to a broken rocky shore. The most prominent peak in the coast range of mountains, 3,768 feet high, is 9 miles N. 69° W. (W. by N. mag.) from Pescaderos Point, and is not more than 4 miles from the bottom of the bay.

In the northern part of the bay the water is deep close to the shore; in the southern part anchorage can generally be had within half a mile of the beach in from 6 to 10 fathoms water, sandy bottom.

There are several ranches situated near the shores of the bay.

Perico Point.

Perico Point is a steep rocky bluff, of a whitish color, from 40 to 60 feet high, back of which a hill rises abruptly to a height of 797 feet. The coast to the south-eastward is of the same formation as the point for a distance of about 2 miles, where there is a small cove with a sand beach on its western and southern sides.

The soundings off the point show deep water close to; from 10 to 14 fathoms were obtained at from 200 to 300 yards off it, increasing to 135 fathoms at half a mile distant.

The coast northward of the rocky bluffs of Perico Point recedes a little and is low and sandy to Point Arena de la Ventana, which is a low sandy point, the eastern limit of Ventana Bay and the south point of entrance to Ceralbo Channel; back of it to the westward, is a low sandy plain, gradually rising as it extends inland.

Point Arena de la Ventana.

In rounding this point it should not be approached nearer than half a mile, as the soundings at that distance to the northward show only 6 fathoms, increasing rapidly from that point.

Caution.

Anchorage may be obtained in moderate weather inside the point in from 6 to 8 fathoms, sandy bottom. The magnetic variation in 1876 was 10° 05′ E., increasing about 2′ annually. Tides rise about 4½ feet.

Anchorage. Variation. Tides.

Ventana Bay is a large open bay lying between Points Arena de la Ventana and Gorda; it is about 6 miles deep and 12½ miles between the two points above mentioned. The southern shore of the bay is low and sandy, with an extensive plain back of it, covered with cactus and stunted bushes. On the north-western side the high coast hills rise more abruptly from the water's edge, forming, with the high peaks of the interior, an unbroken stretch of mountainous country extending to La Paz Bay. The two highest peaks, over 4,000 feet high, known as Los Cacachiles, lie 7½ miles in a south-westerly direction from Point Gorda; they are a mile apart and visible from a great distance.

Ventana Bay. Los Cacachiles.

The bay is much frequented at the proper season by vessels engaged in the pearl fishery.

La Ventana is a small village lying near the shore of the bay 9½ miles westward of Point Arena de la Ventana. There is a road from the village to San Antonio (Triunfo silver mines), a distance of about 15 miles, and at one time the products of the mines were brought to La Ventana for shipment; at present they are taken to La Paz. Fresh water, cattle, hogs, poultry, vegetables, &c., may be obtained here.

La Ventana. Supplies.

Anchorage may be found in any part of the bay within half a mile of the shore in from 5 to 8 fathoms water; farther off shore the water deepens rapidly.

Anchorage.

Point Gorda, the western limit of Ventana Bay, is a bold, rocky bluff 50 to 75 feet high, with high land immediately

Point Gorda.

back of it. It may be safely approached to within a short distance, 5 fathoms water being found close to.

Ceralbo Island. Ceralbo Island, which lies to the northward of Point Arena de la Ventana, is of volcanic origin, high and barren. It is 15½ miles long in a nearly NW. and SE. direction, and its greatest width is about 4 miles. It is said to contain rich copper mines. Two high peaks rise, one in the northern and one in the southern part of the island, to heights of 2,265 and 2,477 feet respectively.

The whole eastern face of the island is a succession of bold, rocky bluffs with small stretches of gravel beach intervening, with deep water close to the shore. From the northernmost point, which is a high bluff, a reef of rocks extends off nearly half a mile. Small vessels, especially those engaged in the pearl fishery, frequently anchor to the eastward of and close under this point, which affords some protection from the strong north-west winds.

Seal Rock. Four miles N. 27° W. (NW. ⅝ N. mag.) from the northernmost point of Ceralbo Island is a rock, about 100 feet long, 50 feet wide and 12 feet above water, known as Seal Rock, from its being a favorite resort of those animals. On the north-western side of this rock, at something less than 100 yards distant, is a smaller one that is awash at low water, and 200 yards SSW. about S. by W. (mag.) is a sunken rock with only 2 fathoms water over it. There are a few smaller rocks in the immediate vicinity, the whole forming a dangerous group.

Channel. Between the above-mentioned group of rocks and Ceralbo Island there is a deep channel that is believed to be free from dangers. At a quarter of a mile from Seal Rock 25 fathoms were obtained, increasing to over 100 fathoms at a mile and a half distant.

The north-west point of Ceralbo Island ends in a reef of rocks fronting a bluff point and extending off but a short distance. The western side of the island presents nearly the same appearance as the eastern—bold, rocky bluffs—wherever the steep lateral spurs of the main ridge approach the shore, with sand and gravel beaches intervening.

Four and a half miles from the north-western point there is a slight indentation in the shore line, with a strip of sand beach at the bottom of the bight, known as La Limoña, and 3 miles farther south a similar indentation is known as El

Mostrador. The southern limit of El Mostrador is formed by a steep, high bluff of a whitish color, called Farallones Blancos; 2¼ miles southward of this bluff is a bold, rocky point, called Carrera de los Viejos. The next point to the southward is low and sandy and forms the south-western extremity of the island; the water off this point is very deep, but anchorage may be found on the north side of it, 2 cables distant from the shore, in 10 fathoms water. Three-quarters of a mile SE. by E. from the last-mentioned point is a bold, rocky point called Piedra Gorda, off which a reef of rocks extends about a quarter of a mile; from this point to the south-eastern point of the island, which is a steep, rocky bluff, is a distance of a little over 3 miles.

Montana Rock. Montana Rock is a dangerous sunken rock which has only 4 feet of water over it at low tide. It lies about three-quarters of a mile off the south-eastern point of the island, the eastern extreme of the island bearing north (about N. by W. mag.), and Piedra Gorda N. 72° 30′ W. (W. ⅝ N. mag.). Between the rock and the island there is a clear passage with 5 and 6 fathoms water; outside the rock the water deepens rapidly to 10 fathoms and upwards. This rock, although it has not heretofore appeared on any chart, has long been well known to the native fishermen and pearl-divers. It takes its name from that of the Col. S. N. Co.'s steamer *Montana*, which struck on it in 1874, when rounding the point, coming from the northward.

Captain Shirley, commanding the U. S. S. *Suwanee*, reports in 1866, "While passing the south-east point of Ceralbo Island, within a mile of the land, passed over a reef of rocks about 50 yards wide, the bottom plainly visible; went over it so quickly that we could not get a cast of the lead."

This undoubtedly refers to the Montana Rock, as no other rocks or shoals could be found in the vicinity, nor were any others known to the natives.

Ceralbo Channel. Between Ceralbo Island and the main-land there is a channel 3½ miles wide at Point Arena de la Ventana, and 6½ miles wide at Point Gorda.

Directions. In using this channel with a steamer it is only necessary to keep in mid-channel. The *Montana Rock* is the only danger that lies at any distance off shore; that is easily avoided by keeping toward the southern side of the entrance. *Do not let Los Cacachiles* (before described), 4,000

feet high, bear any to the southward of west (W. by S. mag.), and you will pass well to the southward of the rock.

The above directions apply equally well to a sailing vessel having a *fair wind*. With a *head wind* they should not attempt to pass through the channel, as the tides run with considerable force, sometimes 2½ knots per hour, and nothing would be made beating against them. Calms are also frequent in the channel, and as a rule sailing vessels bound to La Paz will do better to go well outside of Ceralbo Island.

Caution. Unless well acquainted with the coast, it is not advisable to attempt to pass through the channel at night or in thick weather.

From Point Gorda to Coyote Point. The coast between Point Gorda and Coyote Point, a distance of 16½ miles, is generally bold and rocky, with occasional sand beaches. Back of the coast the country is broken and mountainous.

Point La Luz. Point La Luz is $2\frac{6}{10}$ miles north-westerly from Gorda Point, the coast between being steep, with a succession of bluffs. Two miles farther, in the same general direction, is a rocky point, with a reef of rocks extending off nearly a quarter of a mile; fresh water may be obtained near this point. Following the coast for 3¾ miles from the last-mentioned point, we come to Point Santa Cruz, a bluff point, outlying from which are a large white rock and several smaller ones.

Point Santa Cruz.

Rosario Bay. Rosario Bay is an open bay formed by an indentation in the coast-line between Point Santa Cruz and the next point to the north-westward. At the deepest part of the bight, near the shore of the bay, is a ranch known as San Rosario. Just north of this ranch a shoal extends a short distance off the coast. The soundings in the bay are from 3 fathoms at a cable's length from the shore to 10 fathoms half a mile off. The northern end of the bay is formed by a rocky bluff, with a conspicuous hill 984 feet high just back of it. From here to Coyote Point is 5¾ miles, the coast-line curving inward somewhat, and the hills receding considerably from it. Before reaching Coyote Point, when coming from the south-east, a bold rocky bluff with moderately high hills is passed. This bluff is frequently mistaken for Coyote Point, which is somewhat over half a mile north-westward from it.

Coyote Point. Coyote Point is the south-eastern point of the entrance to San Lorenzo Channel; it is moderately low and rocky, with

a small outlying white rock close to, and a reef of rocks extending a little more than a cable's length off the point. (See view opposite page 71.)

Las Galeras. Two miles to the westward of Coyote Point a shelving rocky ledge called Las Galeras makes off from a bluff point, in a WNW. (mag.) direction, a quarter of a mile.

Arranco Cabello Point. Arranco Cabello Point is a steep rocky projection, just back of which is a hill 164 feet high, lying about a mile to the westward of Las Galeras. A small shoal with but 1¼ fathoms water lies 3 cables to the north-westward of this point; between the shoal and the point is a passage with 2¾ fathoms water.

San Lorenzo Channel. San Lorenzo Channel, which separates Espiritu Santo Island from the main-land southward of it, is 3½ miles wide at its narrowest part, but on account of the dangerous shoals and rocks in it must be navigated with the greatest caution.

Scout Shoal. Scout Shoal is a dangerous shoal on which there is, in the shoalest part, only 1¾ fathoms water. It lies $1\frac{1}{10}$ miles N. 30° W. (NW. ½ N. mag.) from Arranco Cabello Point and is nearly circular in form, having a diameter of one-quarter of a mile; the bottom is rocky, being composed chiefly of loose stones. There is generally a *can buoy* on its north-western side. Between this shoal and the one previously mentioned as lying off Arranco Cabello Point there is a passage a quarter of a mile wide, with 4 fathoms of water.

San Lorenzo Reef. San Lorenzo Reef is a rocky ledge lying 1¼ miles N. 13° W. (NNW. mag.) from the shoalest part of Scout Shoal; its north-western limit is about the same distance S. 39° E. (SE. ¼ E. mag.) from Lupona Point (the SE. point of Espiritu Santo Island). It is 4 cables in length in a general SE. and NW. direction by 2½ in width; the least depth of water, near the centre, is 4½ feet. Between it and Lupona Point there is a clear passage three-quarters of a mile wide, through which 4 fathoms may be carried.

Suwanee Rocks. The Suwanee Rocks lie half a mile N. 52° E. (NE. ¼ N. mag.) from the shoalest part of San Lorenzo Reef. The patch is small in extent and has in its shoalest part only 1 foot of water at low tide; all around it, close to, are 5 and 6 fathoms water.

Directions. The main channel which lies between Scout Shoal and San Lorenzo Reef is three-quarters of a mile wide with a

depth of from 5 to 8 fathoms. To pass through it when coming from the eastward, bring the *north end* of Ceralbo Island to bear S. 88° 50′ E. (E. ¾ N. mag.), and keep it on that bearing, steering W. ¾ S. (mag.), which will lead through in from 7 to 8 fathoms water, nearly midway between the two shoals. When Lobos Rock (12 feet high) is open of Diablo Point, the point bearing S. 12° 25′ W. (S. ¼ W. mag.), you will be past all dangers and may steer for any part of La Paz Bay.

If coming through Ceralbo Channel and for any reason the *north end* of Ceralbo Island cannot be clearly made out, steer so as to pass Coyote Point at about three-quarters of a mile distance, and as soon as it is passed bring Dispensa Point (the SW. extremity of Espiritu Santo Island) to bear N. 69° 9′ W. (W. by N. mag.) and steer for it until Arranco Cabello Point bears S. 37° 43′ W. (SSW. ½ W. mag.), when steer N. 88° 50′ W. (W. ¾ S. mag.) until Lobos Rock is open of Diablo Point, when all dangers will be passed. As a precautionary measure, when the hill, 164 feet high, just back of Arranco Cabello Point bears S. 1° 39′ E. (S. by E. mag.), verify the position of your vessel by a bearing of Dispensa Point. *The buoy marked on the chart as on the NW. edge of Scout Shoal cannot be depended on.*

Caution.

North channel.

Vessels coming from the eastward around the *north end* of Ceralbo Island should, if the weather be at all hazy or night is coming on, make for the north channel, which is between Lupona Point on the north and San Lorenzo Reef and Suwanee Rocks on the south.

To pass through this channel, steer for the southern end of Espiritu Santo Island until Tanner's Hill, 575 feet high (the first hill north of Lupona Point), is made out, when steer for it on any bearing between S. 77° 6′ W. (WSW. mag.) and N. 52° 16′ W. (NW. by W. ½ W. mag.) until Bonanza and Lobos Points (the latter the easternmost point of Espiritu Santo Island) are in range, bearing N. 20° 50′ E. (N. by E. mag.), when haul to the southward, steering S. by W. (mag.), and keeping the points in range until Lobos Rock is well open of Diablo Point, the point bearing S. 12° 25′ W. (S. ¼ W. mag.), when you may steer to clear Diablo Point. If the weather should be hazy, so that Lobos Rock is not easily distinguished, keep on the S. by W. course, which

will take you from half to three-quarters of a mile clear of Diablo Point.

Coming from La Paz Bay, and intending to pass out through the *main channel*, bring Bonanza and Lobos Points in range on the bearing already given, viz, N. 20° 50′ E. (N. by E. mag.), and steer that course, keeping the points in range until Ballenas Island, 200 feet high, is shut in by Dispensa Point, the point bearing N. 36° 50′ W. (NW. ⅛ W. mag.), when steer E. ¾ N. (mag.) for the north end of Ceralbo Island. This course will take you through the centre of the channel, and when Lobos Point bears north (N. ¾ W. mag.) all the dangers will be passed.

To pass through the north channel continue on the N. by E. (mag.) course until Lupona Point bears west (W. ¾ S. mag.), when you may steer east (E. ¾ N. mag.); and, as before, when Lobos Point bears north (N. ¾ W. mag.) all dangers will be passed.

Remarks.

Of the two passages the northern one seems to be the safer for vessels of not over 21 feet draught, especially at night or in thick weather, as the shore line, when followed at a reasonable distance, makes an excellent guide for avoiding the rocks and shoals in the channel. The channel south of Scout Shoal, before mentioned, should not be attempted except in case of necessity.

Winds.

The winds in the channel are regular during the greater part of the year, blowing from a north-westerly direction from 9 a. m. until 4 p. m., and succeeded toward evening by a southerly wind, which lasts all night.

La Paz Bay.

San Lorenzo Channel is the eastern entrance to the large Bay of La Paz, which is nearly 40 miles long, north and south, and from 16 to 20 miles wide. It has a good depth of water throughout its extent, and is believed to be free from hidden dangers. The town of La Paz is situated in its south-eastern part.

San Lorenzo Point.

San Lorenzo Point is the north-western extremity of the peninsula that forms part of the eastern shore of La Paz Bay. It is a moderately high bluff, with no dangers off it.

Diablo Point.

Diablo Point lies about 1¼ miles south-westward from San Lorenzo Point, and is a sharp, rocky bluff, with deep water close to. Between it and San Lorenzo Point the shore line recedes about three-quarters of a mile, forming a small cove, called Puerto Balandra. At the entrance of this cove there

Puerto Ballandra.

are 12 fathoms water, and the 3-fathom curve is about 3½ cables inside of a line drawn between the two points; inside the 3-fathom curve it is full of rocks and shoals.

Lobos Rock. Lobos Rock lies 1¼ miles S. 16° W. (S. ½ W. mag.) from Diablo Point. It has a broken surface, and is 12 feet high. The water is deep close to, and between it and the shore to the westward there is a passage half a mile wide.

There is a small cove or indentation in the shore to the westward of the rock, with from 2 to 2½ fathoms of water, which would afford good shelter for a few small, light-draught vessels.

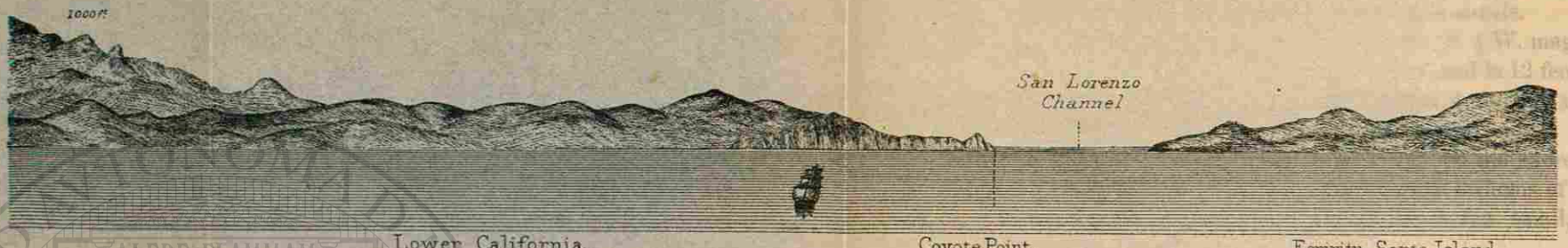
Lobos Island. Lobos Island lies three-quarters of a mile to the south-eastward of Lobos Rock and an eighth of a mile from the main-land. It is about a quarter of a mile long and 90 feet high. A light deposit of guano on its surface gives it a whitish color, by which it may be easily recognized. On its western side the water is deep close to.

San Juan Nepomucino Island. San Juan Nepomucino Island, which is 1½ miles long, north and south, by about 3 cables in width and 60 feet high, forms the harbor of Pichilingue, which lies between it and the main-land to the eastward. The western shore of the island is a steep bluff with 5 fathoms water to within a cable's length of the land, except at a point 4 cables from the northern end, where there is a rock awash, one cable distant from the shore. Fifty yards outside the rock there are 5 fathoms of water. The bluff character of the western shore terminates near the southern end of the island in a gravel beach which extends around the southern end. Near the SE. point, which is a rocky bluff, is a small hill 75 feet high, its western side sloping to a *salt lagoon* about 3 cables in length by 2 in width, which yields by the natural evaporation large quantities of salt. The eastern side of the island is for the most part a shelving sand and gravel beach.

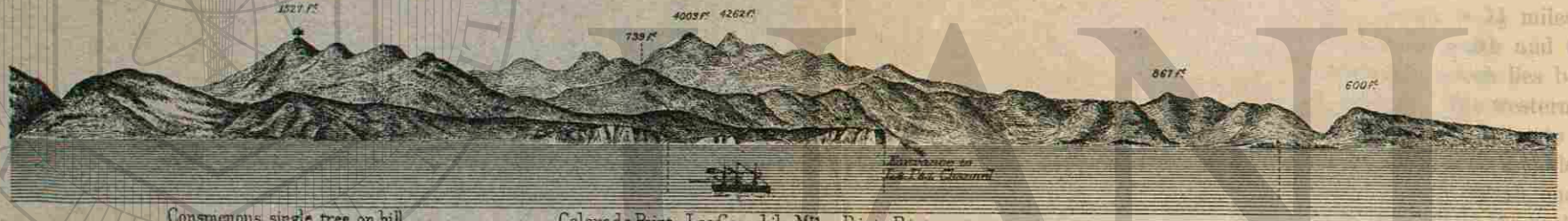
United States coal depot. The United States Navy Department has a coal depot near the south-eastern end of the island, where a supply of anthracite coal is kept for the use of its vessels of war. A temporary landing place has been made, and the coal is transported in small lighters.

Pichilingue Harbor. Pichilingue Harbor, as before stated, lies between San Juan Nepomucino Island and the main-land to the eastward of it. Although small, it is one of the best harbors on the coast, being well protected on all sides.

Plate XI.



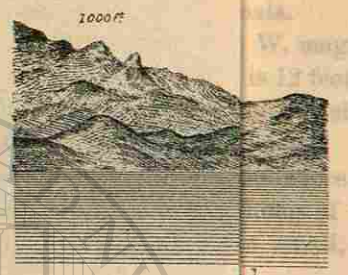
Off Coyote Point,
(San Lorenzo Channel.)

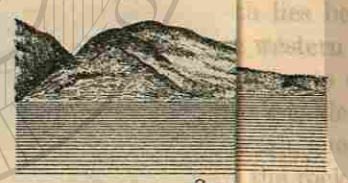


Approaching La Paz.

La Paz, from the Anchorage.

Plate XI.





The entrance is from the southward, the northern end of the island being connected with the main-land by a shoal, over which there is only 3 feet of water. It is unnecessary to give any directions for entering the harbor, as the passage is clear with 3 fathoms of water to within 50 yards of the shore on either side, deepening to $4\frac{3}{4}$ and $5\frac{1}{2}$ fathoms midway between the heads. In rounding the southern end of San Juan Nepomucino Island, give it a berth of a quarter of a mile as the shoal water makes off a little from it.

Fresh water. Tolerably good water may be obtained in small quantities from a well situated in a valley on the eastern shore of the harbor.

Remarks. In case of contagious disease at La Paz (a rare occurrence), or for vessels drawing over 20 feet of water, which cannot, even at high water, pass through the channel to that place, Pichilingue Harbor affords an excellent anchorage, whence communication can easily be kept up by means of boats, the wind being fair to go to La Paz during the greater part of the day, and fair to return toward evening and during the night. Large quantities of pearl oysters were formerly gathered in this vicinity, affording handsome profits to those engaged in the business. There is a tradition among the natives of a large amount of treasure being hidden somewhere on the island of San Juan Nepomucino, and many unsuccessful searches have been made for it.

Tides. It is H. W., F. and C., at the entrance of Pichilingue Harbor at VIII^{h} 30^{m}. Spring tides rise $4\frac{1}{2}$ feet.

Variation. The magnetic variation in 1879 was 10° 15′ E., increasing about 2′ annually.

False Bay. Immediately south of the eastern point of the entrance to Pichilingue Harbor is a cove about three-quarters of a mile in extent NE. and SW. known as False Bay, having in its outer part 5 and 6 fathoms of water.

Colorado Point. Colorado Point is the first point to the southward of the extrance to Pichilingue Harbor, and is a bold, rocky bluff, of a reddish color, about 50 feet high. For a distance of nearly 200 yards off the point there are numerous outlying rocks. South of Colorado Point is a small bay, formed by indentations in the coast line, which is full of shoals and coral reefs. (View on opposite page.)

Prieta Point. Prieta Point is at the entrance to the channel leading to La Paz. It is a sharp, perpendicular bluff of gray color, 32

feet high, the land rising gradually back from it. There are some outlying rocks near the point, and shoal water, with rocky bottom, extends off it about a quarter of a mile in a south-westerly direction. Two and nine-tenths miles N. 69° E. (NE. by E. ¼ E. mag.) from the point is a hill 1,527 feet high (the highest in the vicinity), on the very top of which is a conspicuous single tree.

La Paz Channel.

From Prieta Point to La Paz, by way of the channel, is 3½ miles. Vessels of 16 feet draught may enter and navigate La Paz Channel at any stage of the tide, but should always take a pilot, as the channel is narrow and tortuous with steep banks on either side; the water in some places shoaling from 3 fathoms to 3 or 4 feet within a distance of 20 yards. There is a pretense of keeping a buoy on either side of the northern (main) entrance to the channel, but they will not always be found there.

If obliged to enter and pass up the channel without a pilot, an experienced eye aloft and the lead are the only guides that can be depended on; from aloft the deep water of the channel ahead can be readily distinguished, as well as the projecting points of the shoals on either side; the lead should be kept going constantly on both sides of the vessel.

About a mile to the southward of Prieta Point there is an entrance to the channel through which 1¼ fathoms may be carried; it is not over 100 yards wide, but is much used by the small coasters. To pass through it, being outside in from 6 to 10 fathoms water, bring the north part of a large detached rock that lies on the eastern side of the channel (the only one in the vicinity) to bear S. 57° E. (ESE. mag.) and steer for it. This course will lead through the centre of the passage; when in 3 fathoms water, after having passed over the shoal, haul to the southward. When the rock is on the bearing given above, a hill 836 feet high will be just open to the southward of it.

Anchorage.

When waiting for a pilot, vessels may anchor anywhere to the southward of Prieta Point in from 7 to 10 fathoms. The best anchorage at La Paz is from 200 to 300 yards in a westerly direction from the wharf, in 3½ fathoms water, sandy bottom. Vessels drawing less than 12 feet can lie at the end of the wharf. (View opposite page 71.)

After passing La Paz the channel curves to the westward

and terminates in a large lagoon that lies in a low, almost level plain, covered with a thick growth of trees, bushes, and cactus. The water in the greater part of this lagoon is shoal, but there is a channel with from 2 to 3 fathoms leading to its north-western limit.

El Mogote.

The harbor or anchorage of La Paz is protected on its northern and western sides by a low peninsula about 5 miles long in an east and west direction and 1½ miles wide at its widest part, called *El Mogote*. It is for the most part sandy and covered with scattered shrubs and bushes.

Boat passage.

There is a boat passage with a scant fathom of water at low tide, which, passing near the northeast point of El Mogote, enters the main channel opposite La Paz.

Directions.

To pass through it bring a conspicuous red-brick house (the northern one of two situated to the northward of the cathedral and back of a sand bluff 28 feet high), just open of the north-east point of El Mogote, the house bearing SW. by W. ¾ W. (mag.), and stand in, keeping the house just open of the point until nearly up with the latter, when you will be in about 3 fathoms of water; from this point follow the shore of El Mogote at a distance of 150 to 200 yards until you can look up the street leading from the wharf at La Paz, when you may steer for the wharf. This passage is very convenient for vessels anchored north of El Mogote, as it affords a short cut for boats to and from the town.

Tides.

It is high water, F. and C., at the anchorage off La Paz at VIII^h 27^m; tides rise 4½ feet.

Variation.

The magnetic variation in 1875 was 10° 10′ E., increasing about 2′ annually.

La Paz.

La Paz is the largest and most important town in the peninsula of Lower California. It has a population of about 2,000, including many foreigners, and is the seat of the territorial government.

It has a very cheerful appearance, many of the streets being lined with shade trees and nearly every house having a court or garden filled with tropical plants. The houses are generally of adobe, one story high, with flat roofs. The principal part of the town is built on a low flat, but little raised above the level of high water; but many of the finer residences, as well as the cathedral and *cuartel*, or barracks, are situated on a low table-land immediately back of the lower town. The water supply is obtained by means of wells and

cisterns, very good water being obtained by digging a few feet below the surface of the ground.

The climate is very healthy; although the temperature in summer frequently reaches 100° F. during the day, the nights are always cool. During the months of September, October, and November terrible hurricanes sometimes occur, and it is principally on that account that the houses are built so low.

Supplies.

Supplies of various kinds, such as fresh beef, vegetables, bread, fruits, wood, and water, may be obtained in small quantities.

Commerce.

An extensive trade is carried on between La Paz and the settlements of the interior of the peninsula, as well as those of both coasts of the gulf. It is the centre of the pearl trade and a prominent port for the export of silver, both bars and ore.

Pearl fishery.

The pearl-divers are mostly Yaqui Indians from the vicinity of Guaymas, and it is said that they are able to remain a minute and a half under water each time they go down; they carry a heavy stone with them to hasten their descent and keep them down, and a bag into which they put the oysters, which they tear from the rocks with their hands; they dive in from 3 to 6 fathoms of water with ease. Diving suits and apparatus have recently been used considerably. Pearl fishing begins in May and ends in October. In 1870 the trade in pearls amounted to $62,000, and in pearl oyster shells, from which mother-of-pearl is obtained, to $25,500. The business is principally in the hands of Germans.

Silver mines.

The only successful mining enterprise on the peninsula of Lower California is at the little village of Triunfo (*Las Casitas*), near San Antonio, a former mission, that lies about 40 miles in a south-easterly direction from La Paz. The mines, seven in number, are the property of an American company, of which Mr. Henry Brooks is the manager and principal capitalist.

Bullion to the amount of $50,000 per month is produced at present, with one 36-stamp mill, with enough ore in sight to treble or quadruple that amount. The ore is brought from the mines on pack-mules to the stamping mill, where it is crushed, it is then mixed with common salt and roasted, then washed and amalgamated with mercury in large vats, and finally the mercury is driven off by heat and the remaining silver run into bars of 20 pounds each and sent to La Paz by wagon, thence by vessel to San Francisco.

The process of reducing the ore by means of acids has been successfully tried, and will probably come into general use, as firewood for the roasting process is becoming scarce in the vicinity.

All of the officials and mechanics at the mines are Americans or Europeans; the laborers are Mexicans, and frequently cause disturbances from their jealousy of the foreigners.

Gold

Gold has been found in small quantities toward the granitic range of San Lazaro, and copper ore is said to exist near the *Calabazas*, 16 miles from the Triunfo mines, on the road to La Paz.

La Paz Bay, continued.

From the eastern end of El Mogote, the southern shore of the bay, for a distance of about 8 miles, trends nearly west, and is low and sandy, covered at a short distance from the beach with shrubs and bushes, in which are found large numbers of doves and other small game; for 6 miles farther, sand hills, varying in height from 25 to 75 feet, are found, the coast line curving gradually to the north-westward. Throughout this distance a series of sand shoals extends off the coast for nearly a mile, the soundings over them varying from ¾ of a fathom to 3 fathoms.

Fourteen and a half miles from the eastern point of El Mogote the character of the coast changes, and it assumes a more northerly direction. From this point it presents a long unbroken range of table-land from 500 to 1,000 feet high, ending in almost perpendicular cliffs from 50 to 100 feet in height, interspersed with shingle beaches. Five and a half miles south of Coyote Point, which is a perpendicular, white, rocky bluff 150 feet high, there is a small ranch called San Juan, situated back of a stretch of low shingle beach. A conspicuous dark-colored peak, 1,431 feet high, lies just back of the ranch to the westward. The soundings off this part of the coast show a depth of 15 to 20 fathoms at a distance of 2 miles from the shore.

Conspicuous peak.

North of Coyote Point the coast recedes considerably, the bluffs gradually decrease in height, and their place is taken by sand beaches backed by sand hills. A short distance inland a range of table mountains, broken by deep cañons, rises abruptly to a height of from 1,500 to 2,000 feet. As

Mechudo Head is approached the main range of table mountains is nearer the coast, and perpendicular bluffs from 150 to 200 feet high replace the sand beaches.

Mechudo Head

Mechudo Head is considered the northern limit of La Paz Bay. It bears N. 50° W. (NW. by W. ¼ W. mag.) from the north point of Espiritu Santo Island, distant 18¾ miles, and is a bold, perpendicular, stratified cliff about 300 feet high, surmounted by a dome-shaped hill 750 feet in height. Three and a half miles nearly due west from the headland is Mechudo Mountain, 3,672 feet high, the only prominent peak in the range of table mountains before spoken of; it is visible upwards of 50 miles, and, with the prominent headland, makes an excellent land-mark in the navigation of the gulf. There is said to be plenty of game, such as hares, rabbits, deer, squirrels, foxes, badgers, coyotes, antelopes, wild-cats, lions (*chimbicá*), *tajé* (Rocky Mountain sheep), &c., in the mountain country of this vicinity.

Game.

Espiritu Santo Island.

Espiritu Santo Island, which lies north of San Lorenzo Channel, forms part of the eastern shore of La Paz Bay. It is of volcanic origin, with numerous peaks, the highest of which is 1,970 feet high, 12 miles long, and from 2 to 4 miles wide. Copper mines of great value are said to exist on it.

Copper mines.

Lupona Point.

Lupona Point is the southern extremity of the island and is low and sandy; toward the hills to the northward there are a few scattered bushes. Between it and Bonanza Point, which is the next point to the north-eastward, the coast consists of alternate sand beaches and bluffs. North of Bonanza Point, which is a rocky bluff with a flat-topped hill of moderate elevation just back of it, the coast is a succession of white sand cliffs for about 1¾ miles; at this point there is a mound of boulders close to the shore, and the coast line makes a sharp turn to the east for half a mile, when it turns again sharply to the north; off the point formed by this last sudden change in the direction of the coast line there is a reef of rocks, many of which are above water, extending off a quarter of a mile; in the bight southward of this point, anchorage may be found in 5 or 6 fathoms, protected from the north-westerly winds.

Lobos Point.

Lobos Point is the easternmost point of Espiritu Santo Island, and is a high, rocky bluff, with the land rising abruptly back of it; deep water extends close up to the

shore. From Lobos Point the coast falls away, trending about NW. to the north end of the island; it is generally bluff, with short stretches of sand beach. About 4 miles to the north-westward of Lobos Point there is a rocky point, off which a reef of rocks extends a quarter of a mile. At this point the general coast line is broken by an indentation 1¾ miles deep and a mile wide at its outer part, which, with a corresponding indentation on the western side, nearly divides the island.

Isla Partida.

Isla Partida is the name given to that portion of the island lying north of the two indentations or coves just spoken of. It is joined to the main part of the island by a neck of land less than 300 yards wide and of moderate height. The northern point of the island is a rocky bluff.

Los Islotes.

Los Islotes are three rocky islets lying about half a mile off the northern point of the island. Two of them are from 50 to 60 feet high, with perpendicular sides and flat tops; the third is merely a large rock about 5 feet above water, lying to the westward of the other two; they are separated from each other and from the island by narrow channels, navigable only by boats.

Western side of Espiritu Santo.

The western side of Espiritu Santo Island is in its general character similar to the eastern side, rocky bluffs predominating. About 2½ miles from the north end is a small inlet known as "El Cardonal"; three-quarters of a mile farther south is the cove or indentation already mentioned in connection with a similar one on the eastern side of the island. In the cove on the west side there is said to be snug anchorage for small vessels.

Ballenas Island.

Ballenas Island lies about midway between the northern and southern ends of Espiritu Santo Island, separated from it by a channel a little more than half a mile wide, with from 3 to 8 fathoms water in it. It is about three-quarters of a mile long in a nearly east and west direction and a quarter of a mile wide; its highest point is 228 feet above the sea level. It is entirely barren and surrounded by rocky bluffs.

Gallo and Gallina Islands.

Gallo and Gallina are two small islands lying a short distance to the south-eastward of Ballenas Island. Between them and the western shore of Espiritu Santo is a partially protected anchorage which is frequently used by the coasting vessels.

Prieta Point.

Two miles to the south-eastward of the southernmost of

the above-named islands is Prieta Point, which is a sharp, bluff point of dark color, descending in several steps from
San Gabriel Bay. the hills behind it. Between this point and the next one to the south-east is a bay of considerable extent, but with very shoal water except in its outer portion. It is known as San Gabriel Bay; vessels anchoring there should be careful to keep outside of the 5 fathom curve.

Dispensa Point. Dispensa Point is the south-western extremity of Espiritu Santo Island and is a rocky bluff of moderate elevation; one third of a mile to the northward of it is a conspicuous red mound 213 feet high, composed of lumps of lava.

Shoal. Between Dispensa and Lupona Points a shoal makes off a short distance from the land, less than 3 fathoms being found at three-quarters of a mile distant from it.

Winds in La Paz Bay. From May to November north-westerly winds prevail during the day, succeeded during the night by light airs from the south-eastward. During the remainder of the year winds from SE. to SW. prevail day and night.

San Josef Channel. San Josef Channel, which lies between the islands of San Josef and San Francisco on the east and the main-land of the peninsula of Lower California on the west, is 20 miles long with an average width of about 4 miles. It is $2\frac{1}{2}$ miles wide in its narrowest part, near the northern entrance. It is much used by sailing vessels when beating up the gulf, as by working through it they avoid the heavy sea found outside, and are able to take advantage of the strong tides which set through the channel. In case of bad weather they can anchor in some one of the numerous bights and coves that are found on both sides of it and find shelter. In using this channel at night or in thick weather, it is recommended to keep well over toward the western shore, as there are no outlying dangers on that side. The tides set strongly through the channel, varying from 1 to 3 knots.

Western shore of San Josef Channel. The coast for a short distance north of Mechudo Head retains its character of high, perpendicular cliffs. About $1\frac{1}{2}$ miles north of the headland the cliffs are replaced by a sand beach which, with the exception of one short bluff, extends northward a distance of $4\frac{1}{2}$ miles, or to within $1\frac{1}{2}$ miles of San Evaristo Point.

Anchorages. Two miles to the southward of San Evaristo Point, a low, sandy point makes out a short distance, immediately south of which is good anchorage in 5 or 6 fathoms, half a mile from the beach. There is another anchorage immediately

south of San Evaristo Point, where a sudden change in the direction of the coast line forms a cove about three-quarters of a mile deep with a sandy beach at its head. Between this sand beach and the long stretch ($4\frac{1}{2}$ miles) before mentioned, there is a mile of rocky bluffs from 20 to 50 feet high.

San Evaristo Point. San Evaristo Point is is a rocky headland 130 feet high projecting three-quarters of a mile from the general coast line. There is a ranch near the beach of the bight on the northern side of the headland.

From San Evaristo Point to Nopolo Point, a distance of $6\frac{7}{10}$ miles N. 28 W. (NW. $\frac{5}{8}$ N.), the land is high and precipitous, with occasional short stretches of sand beach. The soundings show deep water close to the shore. One and a quarter miles to the southward of Nopolo Point there is a slight indentation in the coast line and an estero, where it is said fresh water may be procured.

Nopolo Point. Nopolo Point is a rocky cliff with a rugged peak, 1,578 feet high, immediately back of it. A succession of rocky bluffs from 400 to 500 feet high extends about $3\frac{1}{4}$ miles north-westward from the point.

Eastern side of San Josef Channel. San Francisco Island. San Francisco Island lies on the east side of the southern entrance to San Josef Channel, its nearest point to Mechudo Head bearing N. 65° E. (NE. $\frac{7}{8}$ E. mag.) from it, distant $4\frac{4}{10}$ miles. The island is of an irregular shape, having an area of about $1\frac{1}{2}$ square miles. Its shores consist for the most part of rocky bluffs varying in height from 20 to 150 feet, with intervening sand beaches. The south-east end of the island is a rocky head 300 feet high, connected with the main body by a low, sandy neck. Off the northern and southern points there are numerous outlying rocks, and in a bight on its eastern side there is a rock 4 feet high a cable distant from the shore.

Anchorage. Anchorage may be found in from 5 to 10 fathoms off a sand beach that lies just west of the south-eastern head.

Soundings around the island show from 3 to 9 fathoms close to, except on the NW. side, where it is shoal, $2\frac{1}{2}$ fathoms being found at a quarter of a mile from the shore. (View opposite page 82.)

Channel. Between the islands of San Josef and San Francisco there is a channel $1\frac{3}{10}$ miles wide, with from 4 to 6 fathoms water, but a group of rocks in the centre, called Coyote Rocks, and another group just beyond its western limit, called Seal

Rocks, make it very dangerous, and its passage should never be attempted unless in an emergency.

Coyote Rocks. The Coyote Rocks, the highest of which is 40 feet high, lie three quarters of a mile NW. of the northern point of San Francisco Island, the channel between having from 3 to 5 fathoms water. The channel between the rocks and San Josef is less than half a mile wide, with from 6 to 7 fathoms water. There are some outlying sunken rocks to the north of the main group. If obliged to pass between San Josef and San Francisco Islands, it is safest to keep the shore of San Josef close aboard.

Seal Rocks. The Seal Rocks lie $1\frac{3}{4}$ miles west of the north point of San Francisco Island, and consist of two flat rocks about 5 feet above the surface of the water, with several outlying ones below the surface. The soundings between them and the point, as well as between them and the Coyote Rocks, show a depth of 11 fathoms.

San Josef Island. San Josef Island, which bounds San Josef Channel on the east, is of volcanic origin, $16\frac{1}{2}$ miles long and from 2 to 6 miles wide, being narrowest at its northern end, which terminates in a sharp point. It is rather higher than Espiritu Santo, some of its peaks having an altitude of over 2,000 feet. It is covered in most parts with vegetation, especially on the high land and in the numerous deep arroyos of its north-eastern portion. Large numbers of deer are found on it, which are hunted in many instances only for their skins.

Deer.

From the south-eastern point of the island, the south coast, which is for the most part a sandy beach, with hills from 100 to 500 feet high back of it, trends about W. by S. for $3\frac{6}{10}$ miles to the south-western extremity, which is a low sand spit making out $1\frac{1}{4}$ miles from the body of the island. A lagoon of considerable size extends to within half a mile of the point, having an opening to the sea on the northern side of the sand spit.

From the south-western point, which may be approached close to, there being 20 fathoms water within a cable's length of it, the coast turns sharply to the north-eastward, trending in that direction for about $1\frac{1}{2}$ miles, where the Rio San José empties its waters; thence it assumes a north-westerly direction.

Amortajada Bay. Amortajada Bay, which is formed by the receding of the coast line between the south-western point of the island and

Salinas Point, is about 4 miles in extent between the two points and $1\frac{1}{2}$ miles deep from a line drawn between them. In its southern part there is good anchorage in 7 or 8 fathoms water, protected from every wind, especially from the dreaded *cordonazos* or south-easterly gales.

Anchorage.

Fresh water may be obtained here.

Fresh water.

Cayo Island is a small islet lying 8 cables N. 50° W. (NW. by W. $\frac{3}{8}$ W. mag.) from the south-western extremity of San Josef, and protects to a considerable extent the anchorage in Amortajada Bay from the north-westerly winds. It is about a quarter of a mile long and 100 yards wide. It is 40 feet high at its southern end and from 10 to 15 feet at the northern, with a break near the centre, over which the sea washes at high water. A reef extends off from the northern end about a quarter of a mile. (View opposite page 82.)

Cayo Island

Salinas Point is sandy, with a steep sand hill 50 feet high immediately back of it. It lies nearly due east from San Evaristo Head, the channel between them being 3 miles wide. Near the point are two lagoons, which produce large quantities of salt, the land back of them rising in broken ridges to a height of 1,830 feet. For a distance of $3\frac{1}{4}$ miles northward of the point the coast is a low sand beach, at the northern end of which is a ranch. Nearly east of this ranch the island attains its greatest elevation in a conspicuous knob of the main ridge that is 2,078 feet high. For 2 miles north of the ranch, steep hills rise immediately from the water. Winding between them, its mouth about a mile north of the ranch, is a deep arroyo which extends half way across the island. At the end of 2 miles the coast again becomes a low sand beach, which, with the exception of one bluff, extends to a point opposite Nopolo Point. This is the narrowest part of the channel, it being only $2\frac{1}{2}$ miles wide between the points.

Salinas Point.

Southward of the above-mentioned point is a bight, formed by the sudden change in the direction of the coast line, where good anchorage may be found in from 5 to 10 fathoms 200 to 300 yards from the shore. The land back of the coast, which for 3 or 4 miles to the southward has been lower, commences here to rise again.

Anchorage.

Just north of the point is a lagoon which has a shallow opening to the sea. Thence to the north point of the island, a distance of about 4 miles, the coast trends nearly north,

and is an unbroken line of steep, rocky bluffs of dark color. A reef of rocks, some of which are above water, extends off from the northern end of the island about a quarter of a mile. A mile and three-quarters from the northern extremity is a sharp peak 1,382 feet high, whose sides descend steeply to both shores.

Eastern side of San Josef.

No detailed examination of the eastern side of San Josef Island has been made. It is in general a succession of high rocky bluffs, with some intervening sand beaches.

Red Point.

Red Point, which is $8\frac{9}{10}$ miles S. 57° E. (ESE. mag.) from the northern extremity of the island, is the first prominent point from that extremity, the intermediate coast receding somewhat.

South-east Point.

From Red Point to the south-eastern extremity of the island, a distance of 9 miles, the general trend of the coast is S. by E. $\frac{1}{4}$ E. There are several outlying rocks off the south-eastern point, and a hill 400 feet high rises abruptly just back of it. For a distance of 5 miles northward from the point the coast is a series of inaccessible bluffs from 50 to 500 feet high. (View on opposite page.)

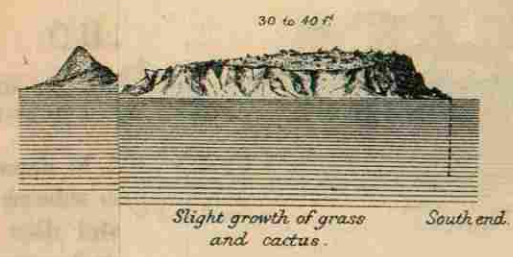
Soundings.

The soundings along the eastern side of the island show a depth of over 50 fathoms a short distance from the shore.

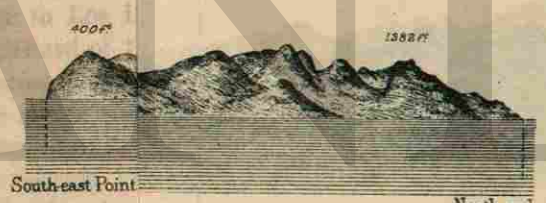
Las Animas.

Las Animas are a group of rocky islets not over a quarter of a mile in extent, including the several outlying rocks; the largest and highest is about 90 feet high. They lie $10\frac{1}{2}$ miles N. 87° E. (ESE. $\frac{3}{4}$ E. mag.) from the north point of San Josef, and between them and the island there is a deep clear channel. (View on opposite page.)

Plate X



Vestside.
nnel.)



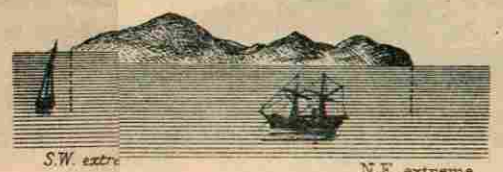
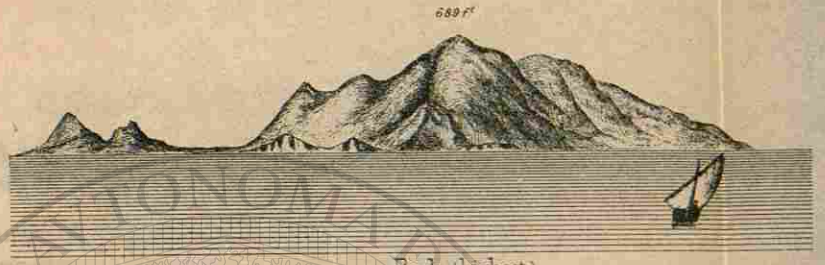
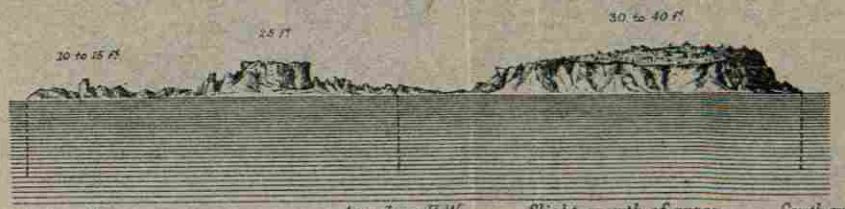


Plate XII.



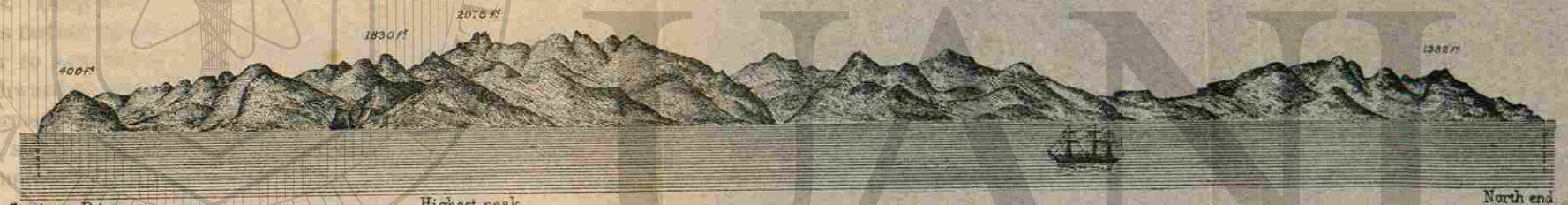
Peak, (highest)
S.W. (mag.) 5m.

San Francisco Island.



North end. Awash at H.W. Slight growth of grass and cactus. South end.

Cayo Island, Westside.
(San Josef Channel.)



South-east Point. Highest peak. North end.

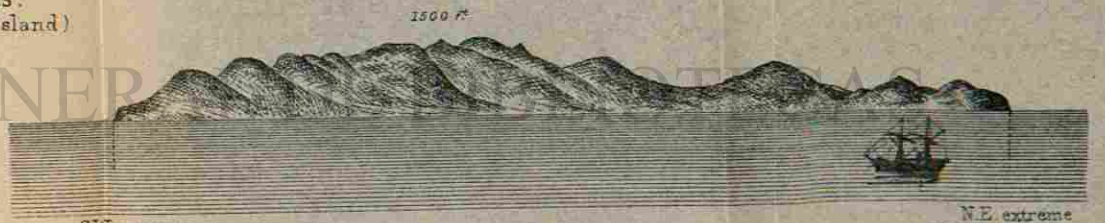
San Josef Island, from the Eastward.

abt. N.E. by N. (mag.)

Las Animas.
(Off San Josef Island)

S.W. extreme N.E. extreme

San Diego Island.



S.W. extreme
N.W. by W. ½ W. (mag.) 14½m.

N.E. extreme
N.W. ½ W. (mag.) 15½m.

Santa Cruz Island.

CHAPTER II.

THE COAST AND ADJACENT ISLANDS FROM THE NORTHERN ENTRANCE TO SAN JOSEF CHANNEL TO CAPE VIRGENES.

The coast north of Nopolo Point, between it and San Telmo Point, recedes considerably, and is a succession of rocky bluffs, with intermediate sand beaches and deep ravines. A range of mountains about 2,500 feet high lies immediately back of the coast, and several prominent islands and rocks lie off it.

Los Burros. Two miles north-westward of Nopolo Point there is a conspicuous, broken, rocky cliff from 300 to 500 feet high, projecting slightly from the general coast line, which is known as Los Burros. Deep water extends close up to the cliff.

Dolores Point and Bay. Three miles farther up the coast is another point of similar character to Los Burros, which is known as Dolores Point. Northward of the point a slight indentation in the coast line forms Dolores Bay. Near the point is a ranch, and a fertile slope, green with vegetation, stretches away toward the mountains. The point and bay take their name from the old mission *Virgen de Dolores*, which is situated a few miles inland. A conspicuous red-colored rocky bluff marks the north-western limit of Dolores Bay.

Habana Island. Habana Island, which is a barren rock about half a mile long east and west, a quarter of a mile wide, and 90 feet high, lies $2\frac{1}{4}$ miles north of the red bluff above mentioned and $8\frac{3}{4}$ miles N. 80° W. (W. mag.) from the north point of San Josef. It is covered with white guano, and between it and the nearest point of the main-land there is a channel a little over a mile wide, with from 10 to 17 fathoms of water.

Tambaliche Roads. West of Habana Island is a small indentation in the coast line, with a gravel beach (sometimes known as Tambaliche Roads), back of which is an open valley.

Moreno Rocks. The Moreno Rocks lie $5\frac{1}{2}$ miles N. 30° W. (NW. $\frac{3}{8}$ N. mag.) from Habana Island and half a mile from the nearest shore. Between them and the main-land the water is shoal. The

highest and largest of these rocks is 40 feet high, and has a reef of rocks above and below water, extending about a quarter of a mile in a south-easterly direction from it. On the main-land, about 2 miles to the southward of the rocks, there is a lagoon.

The coast in this vicinity is a pebble beach, with occasional bluffs of a yellowish and reddish color, from 10 to 25 feet high. A prominent mountain 2,534 feet high, lying 4½ miles from the coast, makes a good land-mark in this part of the gulf.

Black Rock. Black Rock, 55 feet high, lies 2¼ miles northward of the Moreno Rocks and about a mile from the shore of the main-land. The passage between the rock and the main-land is apparently safe for small vessels.

San Carlos Bay. The coast north of Black Rock recedes somewhat, forming the open bay of San Carlos, which affords good anchorage in from 5 to 7 fathoms water. At the bottom of the bay there is a narrow entrance to a lagoon, with a sand beach on either side.

San Telmo Point. San Telmo Point is a sharp, rugged point 30 feet high, projecting a quarter of a mile from the coast. There are numerous outlying rocks off it, close to. The bluffs on either side are of a reddish color. Six and four-tenths miles N. 84° W. (W. ½ S. mag.) from the point, there is a conspicuous table mountain 2,818 feet high.

San Diego Island. San Diego Island, the centre of which lies 5½ miles N. 6° E. (N. ½ W. mag.) from the north point of San Josef, is nearly a mile long north-east and south-west, and its highest point is 722 feet above the sea level. A reef of rocks, many of which are above water, makes off eight-tenths of a mile from its south-western point, ending in a small rock awash, close to which 4 and 5 fathoms were obtained. Nearly half a mile farther off, in the same general direction as that of the reef, viz, south-westerly, 3½ fathoms were found; thence the soundings increased suddenly, 140 fathoms being found within a mile. The sea generally breaks over the reef. (View opposite page 82.)

Reef.

Passage. There is an apparently clear passage nearly 4 miles wide between San Diego and San Josef Islands, with from 30 to 44 fathoms water midway; but it should be used with caution, as it has not been thoroughly examined.

Santa Cruz Island. Santa Cruz is a high, barren, rocky island 3¾ miles long,

in a general NE. and SW. direction, about 1¼ miles wide and 1,500 feet high. Its eastern face is inaccessible, consisting of high, bold bluffs from 300 to 1,000 feet high. Its north-east part terminates in a sharp point. On the western face it slopes at an angle of 45° to the shore. The only landing place is at the south-west extreme, where there is a short stretch of gravel beach. (View opposite page 82.)

Channel. Between Santa Cruz and San Diego, which lies to the southward of it, there is a channel $3\frac{6}{10}$ miles wide which is apparently free from all dangers. No bottom was found at 100 fathoms midway between the two, and 195 fathoms, sand bottom, 1¼ miles from Santa Cruz.

The coast between San Telmo and San Marcial Points, a distance of 14 miles, is nearly straight; it is in general rocky, with bluffs from 75 to 350 feet high, and a few short stretches of sand beach. The water is deep close to, from 10 to 30 fathoms and over being found within half a mile of the beach. High mountains rise immediately back of the coast.

Discolored water. In the place marked on former charts "*discolored water*" a sounding of 382 fathoms was obtained, bottom of green ooze, and no indications of hidden dangers could be found. The "*discolored water*" was most likely one of the patches of red water frequently found in the gulf. (See page 56.)

San Marte Bay. Between San Marcial Point and a steep, rocky bluff, 1¾ miles south of it, is the small bay of San Marte, formed by a slight indentation in the coast line. Vessels may find anchorage here in good weather, in from 10 to 12 fathoms, within a third of a mile of the small sand beach at the bottom of the bay. The land back of the bay is extremely mountainous.

Reef. South-eastward from San Marcial Point, the innermost rock, a quarter of a mile distant from it, is a dangerous reef of rocks awash, on which the sea breaks at all weathers. It extends about a third of a mile in a general ESE. and WNW. direction, with deep water close to. Between the reef and the point 9 and 10 fathoms were found and a quarter of a mile outside the reef 30 fathoms.

San Marcia Point and Rock. San Marcial Point is a moderately high, rocky cliff, surmounted by a peak 1,131 feet high.

San Marcial Rock lies 1¼ miles N. 16° E. (N. ½ E. mag.) from the point. It is of small extent and 25 feet high, with

numerous smaller rocks surrounding it, and a small rock awash lying about a quarter of a mile NNW. from it.

Between San Marcial Rock and the nearest point of the main-land there is a passage three-quarters of a mile wide, with from 4 to 8 fathoms water. The magnetic variation at San Marcial Point in 1878 was 10° 35′ E., increasing about 2′ annually. Tides rise about 4 feet.

Variation.

Tides.

Agua Verde Bay.

From San Marcial Point the coast trends nearly north for half a mile and then turns abruptly to the westward. A mile and a half from where the coast turns to the westward is the small bay of Agua Verde, where there is good anchorage in ordinary weather, and fresh water may be obtained from a ranch near the beach. The best landing place is in the eastern part of the bay, near a bluff point, off the NE. side of which, close to, are one or two rocks awash at low water.

San Pasquel Point.

San Pasquel Point, at the western limit of Agua Verde Bay, is a rocky bluff with a large white rock lying a cable's length to the north-eastward of it. A scant mile to the westward of Point San Pasquel is another rocky bluff point, off which to the NW. are two rocks above water. West of this last point is a stretch of sand beach about 2 miles in extent, on which are some ranches and an arroyo. Three-quarters of a mile west of the point the coast line assumes a north-westerly direction.

San Cosme Point.

San Cosme Point is a rocky cliff, rising abruptly to a hill 225 feet high. About a mile to the northward of the point is a group of rocks, the westernmost and highest of which, San Cosme Rock, is 75 feet high. A third of a mile eastward of this is San Damien Rock, 45 feet high, and at about one-third of the distance between the latter and the point are some low rocks, from 2 to 4 feet above water, with some rocks awash near them. The soundings obtained between these rocks and the shore showed *no bottom* at 10 fathoms.

Conspicuous peak.

Four miles to the south-westward of San Cosme Point is a conspicuous, sharp, twin peak, 3,808 feet high, which is an excellent land-mark.

From San Cosme Point to Candeleros Point, a distance of $10\frac{3}{4}$ miles, the coast trends about N. 25° W. (N. W. $\frac{3}{4}$ N. mag.) and is a succession of bluffs and sand beaches; the mountains immediately back of it rise to a height of 2,000 feet.

White Rock.

White Rock, which is 127 feet high and is surrounded by a number of smaller ones, both above and below water, lies 4 miles S. 40° E. (SE. $\frac{1}{2}$ E. mag.) from Candeleros Point, and about 2 miles from the nearest shore. There is a good depth of water on all sides of these rocks, at a short distance from them.

Monserrate Island.

Monserrate, like all the other islands in this vicinity, is of volcanic origin and perfectly barren. It is 4 miles long in a north and south direction and from 1 to 2 miles wide; its highest peak is 734 feet high. The south point of the island bears N. 48° E. (NE. $\frac{3}{4}$ N. mag.) from San Cosme Point, which is the nearest point of the main-land, the channel between them being 7 miles wide, with from 50 to 80 fathoms of water. The southern and eastern shores of the island are a succession of bold, rocky bluffs, off which in several places are projecting rocky ledges, under water, extending from an eighth to a quarter of a mile off shore. Off the north and north-east points there are some outlying rocks, and on the north side there is a small bight, with a short strip of sand beach near the north-western point; the western side has a low, rocky shore with shelving points.

Las Galeras.

Las Galeras are two rocky islets lying $1\frac{3}{4}$ miles to the northward of Monserrate. The easternmost is the larger of the two, and is 70 feet high. A reef of rocks extends off from it to the SE. nearly half a mile. The western islet is about 40 feet high. Between the two is a passage about an eighth of a mile wide, full of rocky ledges, and with varying depths of water. The least water found between Las Galeras and the north end of Monserrate was 7 fathoms.

Rock.

One and a quarter miles north of Las Galeras there is a dangerous rock, which is only about a foot above high water. The soundings between it and Las Galeras show from 11 to 22 fathoms.

Santa Catalina Island.

Santa Catalina lies $11\frac{3}{4}$ miles to the eastward of Monserrate. It is $7\frac{1}{2}$ miles long, north and south, and about 2 miles wide; its highest peak is 1,534 feet high. No detailed examination has been made of this island, but its shores are said to be abrupt, with deep water close to. There is reported to be a landing place on a sandy beach at its southern end. No soundings were obtained in the channel between it and Monserrate.

Candeleros Point.

Candeleros Point is a prominent steep bluff, about 50

feet high, the land back of it rising abruptly. The water is deep close up to the point; 95 fathoms, muddy bottom, were found within half a mile of it.

Los Candeleros. Los Candeleros are three pinnacle-shaped rocks, lying to the northward of the point and between it and Danzante Island. The one nearest to the point (half a mile distant) is about 100 feet high; the second, lying three-tenths of a mile north of the first, is 80 feet high; and the third, three-quarters of a mile north-west of the second and about the same distance from the south point of Danzante Island, is 40 feet high and has some outlying rocks on its south-east side. The soundings between Candeleros Point and Danzante Island vary from 12 to 26 fathoms, and the passage should be used with great caution, as it is thought there may be other rocks in it that have not yet been discovered.

Soundings. Caution.

Soundings. From Candeleros Point the coast makes a sweep to the westward forming an open bay between it and Punta Coyote, in which are several outlying rocks. The soundings along the shore of the bay are irregular; in some places only 2½ fathoms were found at half a mile distant from it. Back of the coast the land rises gradually to high mountains, the southern portion of the Sierra de la Giganta.

Rocks. Three and a half miles N. 51° W. (NW. by W. ½ W. mag.) from Candeleros Point is a group of rocks, varying in height from 15 to 40 feet, the outermost of which is a mile off shore. Between these rocks there is a passage 1¼ miles wide, with about 16 fathoms water, apparently free from dangers; between them and the main-land is foul ground, with from 2 to 3 fathoms water.

Fresh water. About 2½ miles to the southward of Coyote Point there is a strip of sand beach, behind which is a fertile green slope with a ranch at its foot. An abundance of good fresh water may be obtained here from wells 10 to 15 feet deep.

Punta Coyote. Punta Coyote is a steep, bluff head-land 75 feet high, the eastern extremity of a pear-shaped peninsula about 1¾ miles long and seven-eighths of a mile wide at its southern end, on which is a hill 350 feet high. The northern part of the peninsula, where it joins the main-land, is a narrow neck of land on which are some low sand hills.

Puerto Escondido. Puerto Escondido, or hidden port, is a perfectly land-locked and secure harbor for small vessels, in all weathers, the peninsula just mentioned forms its eastern and northern

sides. The entrance, which is only about 75 feet wide, lies between the southern end of the peninsula and the main-land, and only 9 feet of water will be found on the bar at high tide; inside the bar the water deepens to 4 and 7 fathoms. It is of small extent, being about a mile long north and south, and half a mile wide.

Danzante Island. Danzante is a barren island lying a short distance off the coast between Candeleros and Coyote Points, its southern end bearing N. 26° W. (NW. ¾ N. mag.) from Candeleros Point, 2½ miles distant from it, and 1½ miles distant from the nearest point of the main-land. It is 3½ miles long, seven-eighths of a mile wide in its widest part, and its highest peak is 450 feet high. On the south-west side there is a strip of sand beach off which anchorage may be found; with this exception, the shores of the island consist of bold, rocky bluffs from 25 to 75 feet high, with deep water close to. About half a mile of the northern end of the island is detached from the main body by a shallow channel full of rocks, above and below water. Off the southern end is a detached pinnacle rock 25 feet high. Between Danzante and Carmen Islands there is a channel 1½ to 2¼ miles wide, free from all dangers, which is much used by vessels coming from the southward bound to Loreto. The tidal currents are very strong in this channel.

Channel. Currents.

Chuenque Bay. A mile and three-quarters north-westward of Punta Coyote, is a small bay known as Chuenque Bay, which affords protection from all winds except northerly ones. On its eastern side is a small island, about half a mile long and 40 feet high. To enter Chuenque Bay pass to the northward of this island, as the passage between its southern end and the main-land south of it is only three cables in width and quite shoal.

Nopolo Point. Nopolo Point is a bold rocky point 75 feet high, situated about 5 miles to the northward of Chuenque Bay. The intermediate coast consists of pebble beaches, and bluffs from 15 to 75 feet high, with deep water close to, 10 to 15 fathoms being found within a cable's length of the shore, deepening to 120 fathoms at a little more than half a mile distant.

Cove. Westward of Nopolo Point there is a small shallow cove, open to the northward, which is sometimes used by small vessels.

From Nopolo Point to the anchorage off Loreto, a distance

of 5½ miles, the coast is a low sand beach, immediately be-
Primera Agua Point. hind which is a fertile country. A mile and a half south of Loreto is a low sandy point projecting slightly from the general coast line, known as Primera Agua Point, off which shoal water (from 1 to 3 fathoms) extends about half a mile.

Loreto. The mission of Loreto was founded in 1697, and the town was the ancient capital of the two Californias. It is situated at the entrance of a valley which extends inland to the high mountains of the Sierra de la Giganta. At the time of the *Narragansett's* visit it was a straggling village of adobe houses, mostly thatched with palm leaves, and containing about 150 inhabitants. The site was badly chosen, being on the bank of a water-course, often dry for several years in succession, but which after heavy rains in the mountains is apt to become in two or three hours a raging torrent, sweeping everything before it. From time to time portions of the town have been destroyed and the remains carried off by this stream, so that nearly all that now remains of the old town is the mission church and its adjoining buildings. The church, a large stone structure with an arched roof, and a dome at one end, is in pretty good repair. It contains some paintings and other ornaments worthy of notice; the altar and baptismal font are of pure alabaster.

Anchorage. There is good anchorage in ordinary weather, off the town in 8 or 9 fathoms, half a mile from the beach; the best place to anchor is with the church and Sugar-loaf Peak (a conspicuous sharp peak 3,674 feet high) in line. Immediately south of the mouth of the water-course before-mentioned a sand spit with but 2 fathoms water over it makes off nearly a quarter of a mile from the shore.

Supplies. Fresh beef, wood, water, vegetables, and fruit may be obtained at Loreto. Near the town, to the northward, are several small lagoons, which are a favorite resort of wild ducks at certain seasons of the year.

Remarks. There is no fruit or vegetable, either tropical or of the temperate zone, that cannot be cultivated here in the open air; cabbages, cotton, lettuce, tobacco, wheat, corn, and onions were all seen growing together in a garden at Loreto, while the olive, date-palm, orange, lemon, and banana are met with in abundance, and the vineyards produce a wine unequalled by any of the wines of Upper California. The palma-christi, or castor bean, is here a large tree with a woody

trunk. Of the woods useful in the arts, the *uña de gato*, or cat's claw, is found here and at Mulege. It is a leguminous tree, the branches of which bristle with curved thorns resembling cat's claws; the wood is very firm and durable, taking as fine a polish as rosewood, and surpassing the latter in beauty.

Loreto was formerly the centre of a considerable pearl trade, and it is the sea-port of Comondu, with which it is connected by means of a road which passes over the Sierra de la Giganta; there is also a road to Mulege, about 70 miles up the coast.

Variation. The magnetic variation at Loreto in 1878 was 10° 55′ E., increasing about 2′ annually.

Tides. Tides rise from 3 to 4 feet.

Sierra de la Giganta. The Sierra de la Giganta, the highest peak of which, La Giganta, is 5,794 feet high, lies back of this part of the coast. The road from Loreto to Comondu passes over the mountain range, winding by zigzags up to what appear from below to be inaccessible cliffs, whence a slightly descending plain extends to Comondu. A copper mine at the foot of the mountains, known as El Sance, is said to be very rich, but it is not worked at present.

Comondu. Comondu is an ancient mission, and contains the ruins of a church that was doubtless a superior building. Many of the houses in the village are of cut stone; the remainder are of bamboo, covered with palm thatch. The population is variously estimated at from 500 to 1,000. The valley in which Comondu is situated is about 6 miles long and rarely more than a quarter of a mile wide. It is very fertile, and most of it in a high state of cultivation, the principal products being *panoche* (the native sugar), wine, and fruits. A fine perennial stream of water flows through the valley, affording an abundant supply to the village.

At the head of the valley is a cañon cut in solid lava, 100 feet deep, with almost perpendicular sides.

Carmen Island. Carmen Island, which is irregular in its outlines, is 17 miles long in a general NNE. and SSW. direction and 5½ miles wide in its northern portion, is of volcanic origin, and has a range of peaks, varying in height from 500 to 1,500 feet, extending through its entire length.* (View opposite page 98.)

* On the 21st of August, 1873, eighteen violent shocks of earthquake were felt in succession, which would seem to indicate that the volcanic action that gave birth to the island has not yet ceased.

Punta Baja.

Punta Baja, the south end of Carmen Island, bears N. 13° E. (N. ¼ E. mag.) from Candeleros Point, and is 5 miles distant from it. Shoal water, with stony bottom, extends for more than a quarter of a mile off the point, which is a low spit of gravel. The land back of the point slopes gradually toward the hills and is covered with grass and low bushes.

Western side of Carmen Island.

Punta Arena is $2\frac{2}{10}$ miles north-west of Punta Baja, and is a low, sandy point, back of which are some sharp peaks from 600 to 900 feet high. The coast between the two points is a sand and gravel beach, with a few outlying rocks close to the shore, near Punta Arena. There is deep water a short distance off the point and some huts on the beach near it.

Marquez Bay.

Three miles to the northward of Arena Point, the intermediate coast consisting of steep, rocky bluffs and deep ravines, is a small bay, known as Marquez Bay, at the head of which is a short sand beach, with some huts close to. North of Marquez Bay the coast is generally steep and rocky, with moderately deep water close to. Off the point which forms the northern limit of the bay there are a few outlying rocks at a short distance from the shore.

Puerto Ballandra.

Puerto Ballandra is a small bay situated 8½ miles to the northward of Marquez Bay. It is about 4 cables in extent each way, with a depth of from 5 to 5½ fathoms in most parts. The entrance, which is scarcely 3 cables in width, is between high headlands. A small lagoon lies just back of the sand beach at the head of the bay.

Cholla Islet.

A mile and three-quarters to the northward of Puerto Ballandra there is a bluff point (the NW. end of the island), off which, at a distance of a quarter of a mile, there is a small, low sand island about a third of a mile long and 20 feet high, known as Cholla Islet. Off the north-western end of the islet there are some outlying rocks. In the channel between it and the north-western end of Carmen Island the soundings show from 1 to 3 fathoms water, rocky bottom.

Oto Bay.

From the NW. point of the island the coast line turns sharply to the eastward, and at a distance of about a mile and a quarter curves again to the northward, forming an open bay known as Oto Bay, in which vessels may anchor and find shelter from southerly winds. At the head of the bay there are a few deserted huts near an arroyo.

Northern end of the island.

Tintorera Point, which lies 2¾ miles N. 50° 30′ E. (NE. ½ N. mag.) from the NW. point of the island, is a steep bluff about 80 feet high, off which are some outlying rocks.

Puerto de la Lancha.

About 1¼ miles to the eastward of Tintorera Point there is a small open bay, semi-circular in shape, known as Puerto de la Lancha, where anchorage may be had, with protection from southerly winds. The soundings in this bay show from 2½ to 7 fathoms water. The shores are, for the most part, gravel beaches.

Cove.

A short distance eastward of Puerto de la Lancha, at the mouth of an arroyo, is a small, land-locked cove, a quarter of a mile long and a cable wide at the entrance, with from 3 to 5 fathoms of water; near its head are some deserted huts.

Lobos Point.

Lobos Point, the north-eastern extreme of the island, is a rocky headland 125 feet high, surrounded by detached rocks and connected with the body of the island by a low, narrow strip of land.

Eastern side of Carmen Island.

From Lobos Point the coast turns abruptly to the southward, and for over 6 miles, to Perico Point, is a succession of rocky bluffs with occasional detached rocks, the hills immediately back of the coast rising to heights varying from 400 to 700 feet.

Perico Point.

Perico Point, so named from its supposed resemblance to a parrot's beak, is a sharp, rocky cliff, surmounted by a peak of reddish color 460 feet high. A round detached rock, 30 feet high, lies very near the point, and 150 yards to the southward of the rock is another, *below* the surface of the water.

Salinas Bay.

From Perico Point the coast turns to the north-westward and runs in that direction for about 2½ miles, when it turns to the westward and, gradually curving to the southward, forms Salinas Bay, where good anchorage may be found in from 5 to 6 fathoms, protected from all winds except those from the south-east.

Salt Pond and Village.

Near the head of the bay, separated from the sea by a strip of shingle beach a little over a quarter of a mile wide, over which the water never flows, is a salt pond or lake, about 1½ miles long and a mile wide, the water in which rises and falls with the tide, although there is no perceptible communication with the sea. The supply of salt (which is perfectly pure) from this pond seems inexhaustible, as what is taken away in one week is reproduced in the next. The salt is precipitated in the form of pure crystals and has only

to be raked from the bottom, packed, and shipped to San Francisco, where it is ground and sold without any purification as the finest table salt. The pond is connected with a landing-place in Salinas Bay by a railway. There is a small village situated on the shingle beach that intervenes between the salt-pond and the head of the bay.

Cave. At the top of a high cliff near Perico Point there is a natural cave, which is resorted to by the inhabitants of the village during the summer months to escape the heat, mosquitoes, and gnats.

Fish, turtle, and oysters. Fish and turtle abound in the bay and beds of the long-shelled oyster are found there.

Variation. The magnetic variation in 1878 was 10° 55′ E., increasing about 2′ annually.

Tides. Tides rise about 3½ feet.

White Point. White Point, at the south-western extremity of Salinas Bay, is a steep bluff point with a hill surmounting it; some outlying rocks extend off about a cable's length from it.

Gavelones Point. Two miles south of White Point, the coast between being steep and rocky, is Gavelones Point, back of which, bearing about NW. by W., distant 1 mile, is a sharp peak, 1,491 feet high.

South of Gavelones Point the coast recedes somewhat and consists for the most part of steep bluffs. About 2⅘ miles from the point there is a small stream where it is said fresh water may be procured; there is a short strip of sand beach on either side of the mouth of the stream. A mile and a quarter farther south is the mouth of an arroyo known as Arroyo Blanco.

Colorado Point. Colorado Point, which is a little over 1¼ miles south of Arroyo Blanco, is a bluff point of moderate elevation and a reddish color. A sunken rock reported to lie off the point was carefully searched for, but could not be found; there are some detached rocks close to the point.

San Francisco Bay. South of Colorado Point the coast recedes considerably, forming the open bay of San Francisco. After passing the point the bluffs become lower, finally terminating in a sand beach which extends to Punta Baja. As Punta Baja is approached shoal water makes off some distance from the land.

Coast north of Loreto. North of Loreto the coast is low and sandy for a distance of about 4 miles, affording good anchorage anywhere, within half a mile of the beach, in from 3 to 7 fathoms of water.

Tierra Firma Point. Shoal. At Tierra Firma Point a shoal with 3 fathoms water at its outer edge extends off about a quarter of a mile. Outside this shoal the soundings increase rapidly, 120 fathoms, rocky bottom, being found 1½ miles from the point. Three-quarters of a mile to the northward of Tierra Firma Point low bluffs commence to take the place of the sand beach, and a mile farther on is a low bluff point, with an arroyo on its southern side.

Coronados Island. The nearest point of Coronados Island lies 1½ miles to the eastward of the low bluff point just mentioned. The island is irregular in form, being about 1¾ miles long, north and south, by 1½ miles wide at its widest part; near the northern end it attains a height of 928 feet. A low spit of sand and stones extends three-quarters of a mile from its south-west side. Off the point of the spit there are some outlying rocks. With the exception of the sand spit just mentioned the shores of the island consist of steep rocky bluffs.

Passage. Nearly in the centre of the passage between Coronados and the main-land is a low islet 3 cables in length by 1½ in breadth, surrounded by shoals. Between this islet and the main-land is a passage four cables in width, with a least depth of 3½ fathoms; to pass through, it is only necessary to keep in mid-channel. Between the islet and the SW. point of Coronados Island there is a passage a quarter of a mile wide, with 4 and 5 fathoms, rocky bottom. These passages are not recommended for vessels of any considerable size.

Anchorage. To the northward of the low sand spit which makes off from the south-west side of Coronados Island is an excellent anchorage in which to ride out a south-easter.

Coast north of Coronados Island. The coast north of Coronados Island is generally bold and rocky, with the exception of the fertile valley and plain of San Bruno; the land immediately back of it rises to a height of from 1,500 to 2,000 feet.

San Bruno Creek. The mouth of San Bruno Creek lies 7 miles N. 51° 30′ W. (NW. by W. ½ W. mag.) from the north point of Coronados Island. The course of the creek being, for 1½ miles above its mouth, nearly parallel to the coast line, and behind a narrow strip of land on which are some high hills, it is somewhat difficult to recognize unless close in. The entrance is very narrow and shoal water extends off from it about a quarter of a mile.

Mangles Point. Mangles Point is a moderately high bluff, with a bold hill, 100 feet high, rising abruptly from it. The point is the southern end of a succession of cliffs of variegated color, varying in height from 200 to 300 feet.

Anchorage. To the southward of the point there is good anchorage, with protection from north-westerly winds, in from 5 to 9 fathoms of water, a scant half mile from the shore.

Rocks. In making for the anchorage care must be taken to avoid some rocks, the highest of which is only 2 feet above high water, that lie $2\frac{1}{4}$ miles S. 16° E. (SSE. $\frac{1}{2}$ E. mag.) from the point, and about a mile from the nearest land to the westward. Coming from the northward and intending to anchor, vessels may haul close around the point, as there is plenty of water and no hidden danger.

Wood and water. Mangles anchorage is well known on the coast for the superior quality of wood that grows in the valleys near by. It is said that fresh water can be obtained.

Variation. The magnetic variation in 1878 was 11° 05′ E., increasing about 2′ annually.

Tides. Tides rise from 3 to 4 feet.

A conspicuous double peak, $2\frac{3}{4}$ miles to the westward of Mangles Point, makes an excellent land-mark.

From Mangles Point to Pulpito Point, a distance of $14\frac{1}{2}$ miles, the coast is generally steep to, with rocky bluffs and outlying rocks, the coast-range of mountains rising immediately back. The shore-line is very irregular, forming several prominent points, with intervening bays, where anchorage may be found.

Mercenarios Point. Mercenarios Point, lying $4\frac{1}{4}$ miles to the northward of Mangles Point, is a rocky cliff of dark sand-stone, surmounted by a red cone 519 feet high. Three-quarters of a mile north-westward of Mercenarios Point is a short sandy point, with a jagged, rocky bluff 50 feet high at its end.

Islets. Off this point, close to, are two small islets from 10 to 30 feet high, and a quarter of a mile east of it is a rock 6 feet above water.

Rock. Between this rock and the shore $7\frac{1}{2}$ fathoms of water were found.

The coast between the two points recedes a little and is a sandy beach, with an arroyo a little more than half way from Mercenarios Point.

San Basilio Point. San Basilio Point is a rocky cliff of red sand-stone, about 50 feet high, surmounted by a hill 450 feet in height. There

are a few outlying rocks near the point, with deep water close to them.

San Juanico Cove. South of San Basilio Point there is a small open bay called San Juanico Cove, on the shores of which are some yellow bluffs and sand beaches; behind one of the latter there is a fine-looking valley, where, it is said, fresh water may be procured. In the northern and western parts of the bay there are a number of detached rocks, both above and below water.

San Basilio Bay. Northward of San Basilio Point the coast recedes considerably, forming the open bay of San Basilio, of which Gull Rock, $2\frac{1}{2}$ miles S. 21° W. (S. $\frac{7}{8}$ W. mag.) of Pulpito Point, may be considered the northern limit. The shores of the bay are low bluffs, alternating with sand and pebble beaches. Soundings a mile off shore gave no bottom at 15 fathoms.

Pulpito Point. Pulpito Point, so called from its imagined resemblance to a pulpit, is a bold headland about 500 feet high, and, when first seen from the southward, appears like an island, the land connecting it with the coast-range being low. There are some detached rocks, both above and below water, extending a cable's length off the point; outside of the rocks the water deepens suddenly to 15 and 20 fathoms. (View opposite page 98.)

Anchorage. There is an excellent anchorage to the southward of the point, in from 5 to 10 fathoms of water, about a quarter of a mile from the beach, where a vessel will be well sheltered from the north-westerly winds. Along the western shore of the anchorage there are numerous outlying rocks, some of them over 300 yards off. In the northern bight there is a sand-beach and good landing place.

Land-mark. A remarkable triple-peaked mountain, 1,640 feet high, lies $3\frac{7}{10}$ miles S. 51° W. (SW. $\frac{1}{2}$ S. mag.) from the highest part of Pulpito Point, affording a good land-mark.

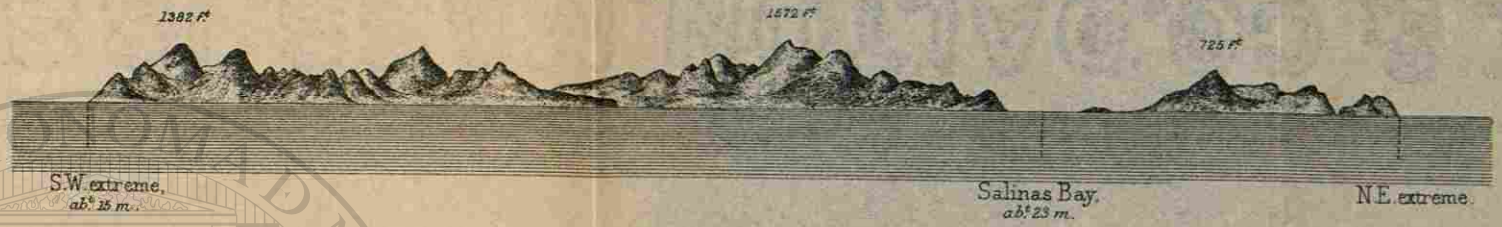
Variation. The magnetic variation at Pulpito Point in 1878 was 11° 10′ E., increasing about 2′ annually.

Tides. Tides rise about 4 feet.

Santa Antonita Point. Santa Antonita Point, which is the south-eastern limit of San Nicolas Bay, is $1\frac{1}{4}$ miles north-west of Pulpito Point. It is a low, rocky bluff, 15 feet high, with shoal water extending off it to the northward a quarter of a mile.

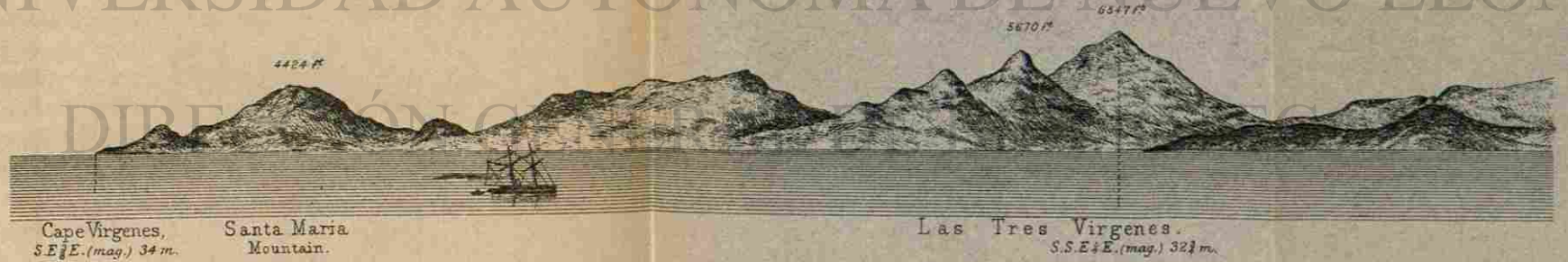
San Nicolas Bay. Northward of Santa Antonita Point the coast falls away to the westward, forming the large open bay of San Nicolas. The southern shore of the bay is low, the low-land extend-

Plate XIII

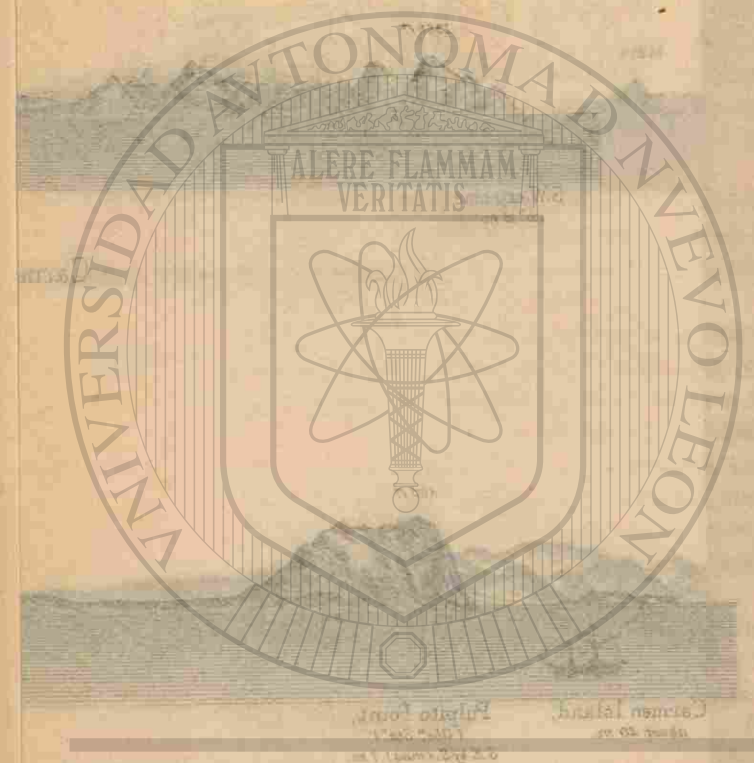


Carmen Island, from the Southward.

Pulpito Point and adjacent land.



Las Tres Virgenes, from near San Carlos Point.



which a reef of rocks extends a little more than a quarter of a mile, with shoal water some distance outside of the reef. Five and a half miles westward from this point is a conspicuous mountain, of a whitish appearance, 2,434 feet high. Between the point just mentioned and Concepcion Point, a distance of over 11 miles, there are several minor points with outlying rocks a short distance off them. Soundings taken along this part of the coast, a mile off shore, show from 20 to 40 fathoms of water.

Conspicuous Mountain.

Concepcion Point is the northern extreme of the peninsula forming the eastern shore of Concepcion Bay. It is an ill-defined bluff point about 30 feet high, with numerous rocks lying off it to the northward and westward.

Concepcion Point.

From Concepcion Point the coast trends to the south-westward about 2 miles, receding slightly to Aguja Point, which with San Domingo Point, four-tenths of a mile farther to the south-westward, forms the north-eastern point of the entrance to Concepcion Bay.

Aguja Point is a sharp rocky bluff with some detached rocks and shoal water a short distance off it.

Concepcion Bay, the entrance to which, between Aguja and Gallito Points, is $3\frac{1}{4}$ miles wide, extends over 22 miles in a south-south-easterly direction and varies in width from 2 to 5 miles. There are several small islands in its western part and a number of anchorages where vessels may lie sheltered from all winds.

Concepcion Bay

The eastern shore of the bay is regular in its outline, consisting of sand and pebble beaches, back of which the land slopes gradually toward the mountain range in the interior of the peninsula that lies between the bay and the Gulf of California. There are several low, projecting points, the most marked of which is San Ignacio Point, lying $9\frac{3}{4}$ miles S. 13° 30′ E. (SSE. $\frac{1}{4}$ E. mag.) from San Domingo Point. Half a mile south-eastward from San Ignacio Point there is a ranch, near which is a small stream of fresh water. Except off Las Ornillas Point, and for a short distance on either side of it, where deep water is found close up to the shore, shoals extend off the entire length of the eastern shore for distances varying from a quarter to three-quarters of a mile.

The southern shore of the bay, known as La Pasajera, is like the eastern shore, low and sandy, the water shoaling

La Pasajera.

gradually toward the beach. The road between Loreto and Mulege passes close along the southern shore and follows the general direction of the western shore of the bay, generally within a mile of the coast.

The western shore of the bay is very irregular in its outline, with many bluff points and intervening bights. Near the junction of the western with the southern shore of the bay there is a lagoon, at the entrance to which are some small islands and shoal water making off about half a mile. Near the western shore of the lagoon is a ranch and *well*.

La Tinaja Point. Well.

La Tinaja Point, about a mile to the northward of the entrance to the lagoon just mentioned, is famous for a well which supplies the best fresh water found near the shores of the bay. The well is situated just above the high-water mark, and is 2½ feet deep by 20 inches in diameter; the sides are of clay and gravel, and the bottom of rock. The water in the well rises and falls with the tide, but is quite fresh. The road between Mulege and Loreto passes close by the well, which is a favorite halting place for travelers.

Road.

From La Tinaja Point the coast-line is nearly straight, and is low and sandy with deep water close to the shore for a little over 3 miles, to Frigoli Point, which is a sharp bluff point 40 feet high. After passing Frigoli Point the coast becomes low and sandy again, with shoal water extending off nearly half a mile; near the point are several openings to an *estero*.

Frigoli Point.

Ricason Island lies 1½ miles in a north-westerly direction from Frigoli Point. It is half a mile long NW. and SE., about a cable in width, and 50 feet high. A narrow sand-spit, which is only partially covered at ordinary high tides, connects it with the main-land. To the westward of the island, on either side of the sand-spit, the water is shoal.

Ricason Island.

Four-tenths of a mile west of Ricason Island is a low, bluff point at the foot of some hills, known as Ranada Point. From this point the coast makes a sweep to the westward, forming a small bay, the shore of which is a sand beach. There is a ranch near the beach in the northern part of the bay, just south of which is the mouth of an estero. Fresh water of an inferior quality may be obtained near the estero. The coast for about 3 miles to the north-westward of the small bay just mentioned is a series of bluffs, with hills from 100 to 300 feet high, back of them.

Ranada Point.

Coyote Bay, which is about 3½ miles in extent north and south, and 1½ miles east and west, has a number of islets and rocks with surrounding shoals within its limits, making its navigation, especially in the northern part, somewhat difficult.

Coyote Bay.

Bargo Island is a barren rocky islet, 100 feet high, lying in the southern part of Coyote Bay, 4 cables from the nearest land to the southward. In the passage between it and the main-land there is from 7 to 10 fathoms of water. There are some large outlying rocks to the westward of the island. Guapa Island lies three-quarters of a mile directly east of Bargo Island. It is 80 feet high and is surrounded by sunken rocks.

Bargo and Guapa Islands.

To the southward of the two islands just mentioned, about 6 cables distant from either, and 3 cables from the point at the southern limit of Coyote Bay, is a solitary rock about 50 feet high.

Rock.

In the northern part of Coyote Bay, there are several small islets surrounded by reefs and sunken rocks. They are generally from 30 to 40 feet in height, and in the channels between them, which are narrow and not thoroughly surveyed, the soundings show from 5 to 10 fathoms water.

Islets and rocks.

At the northern limit of Coyote Bay is a point formed by a bold, rocky hill 200 feet high, connected with the main-land by a low, narrow strip of sand. Shoal water extends for some distance off this point in all directions.

San Pedro Point is a bold headland about 100 feet high lying 3 miles to the northward of the point at the northern limit of Coyote Bay, at the narrowest part of Concepcion Bay. Shoals make off a considerable distance on either side of the point, and for a distance of about 2 miles north and south of it the navigable channel is not over 1¼ miles wide. For about 2 miles to the northward of San Pedro Point the shore is a low pebble beach, then come bluffs of a moderate height for about 1½ miles, succeeded by a sand beach that extends to within a mile of Gallito Point.

San Pedro Point.

Gallito Point is the north-western point of the entrance to Concepcion Bay. It is a conically shaped rock connected with the main-land by a low strip of sand, and surrounded by shoal water.

Gallito Point.

A sunken rock, with 3 fathoms of water over it, is reported

Reported rock.

as lying about a mile to the north-eastward of Gallito Point, and nearly on a line between Aguja and Sombrerito Points. Diligent search was made for it without success, the soundings in the vicinity showing from 15 to 19 fathoms of water.

Equipalto Rock. From Gallito Point the coast for 2¼ miles, to Equipalto Rock, is low and sandy. Equipalto Rock, which is at the south side of the mouth of the Santa Rosalia River, is similar in character to Gallito Point. The land back of it is low and swampy, with several small lagoons. An extensive

Shoal. shoal which makes off from the mouth of the river extends along the shore to the south-eastward 1¼ miles from Equipalto Rock, its outer edge being full three-quarters of a mile from the land throughout the entire distance.

Sombrerito Point. Sombrerito Point is a pyramidal shaped rock 119 feet high, standing on a round pedestal, at the north side of the mouth of the Rio Santa Rosalia. The land back of the point is low and sandy for a short distance.

Colorado Peak. Colorado Peak, 836 feet high and of a reddish color, lies about 1¼ miles to the westward of Sombrerito Point, and is an excellent land-mark when making for Mulege anchorage.

Mulege anchorage. Between Sombrerito Point and Prieta Point, which lies three-quarters of a mile to the northward, is the anchorage of Mulege. In standing in for the anchorage, as soon as Colorado Peak is made out, steer for it, being careful not to get it on a bearing south of N. 84° 22′ W. (W. ½ S. mag.), as there is much foul ground near the coast south of that line of bearing, and anchor in from 5 to 7 fathoms, half a mile from the beach.

Mulege. Mulege was formerly the mission of Santa Rosalia de Moleje, and is situated on the bank of a fresh-water stream (Rio Santa Rosalia), a little over 2 miles from its mouth. It is a small, straggling village, the inhabitants of which, variously estimated at from 500 to 1,000 in number, are engaged principally in mining, pearl-fishing, and raising and exporting fruits. They are much more enterprising than the majority of the inhabitants of the peninsula.

Supplies. Wood, water, and excellent fresh beef may be procured at all times, as well as many varieties of vegetables and fruit in their season. Game is abundant in the mountains back of the village, and the wines of Mulege are famous, resembling heavy port and claret.

Remarks. Moderate quantities of sulphur are found in the vicinity,

and gypsum, generally in its crystallized form of selenite, occurs in many places. The mining districts are said to contain gold, silver, and alabaster. Pearl-fishing was formerly carried on to great advantage, many beds of pearl oysters having existed in the neighboring waters.

Tides. It is high water, F. and C., at the mouth of the Rio Santa Rosalia at VII^h (approx.). Tides rise about 3½ feet. The

Variation. magnetic variation in 1878 was 11° 15′ E., increasing about 2′ annually.

Prieta Point. Prieta Point, just north of Mulege anchorage, is a low bluff of dark color, with shoal water extending off it a short distance to the north-westward.

Colorado Point. Colorado Point, which may be considered the southern limit of Santa Inez Bay, is a mile to the north-westward of Prieta Point, and is a reddish bluff of moderate height lying at the foot of a lateral spur of hills.

Santa Inez Bay. North of Colorado Point the coast sweeps to the westward, forming the large open bay of Santa Inez, of which Santa Inez Point is the northern limit. The shore of the bay is generally low and sandy, with low hills a short distance back. Near Santa Inez Point there are some conspicuous barren table hills, the highest of which, known as Bar-

Barracas Table. racas Table, is about 300 feet high. The soundings in the southern part of the bay show from 5 fathoms near the shore to 18 or 20 fathoms or over at about 1½ miles off; in the northern part the water is much shoaler; not more than 3 fathoms will be found at three-quarters of a mile from the shore, deepening to 5 and 8 fathoms between the main-land and the Santa Inez Islands.

Monument. Five and a half miles N. 26° 15′ W. (NW. ⅝ N. mag.) from Colorado Point there is a monument standing on the beach, which marks the southern boundary of a tract of land (Santa Magdalena plains) which has been acquired by a company organized in San Francisco for the purpose of founding a colony.

Santa Magdalena Plains. The plains of Santa Magdalena are several miles in width and extend along the coast to the northward. It is said that there is not a drop of fresh water to be found on them, and not an acre of land that can be cultivated, so thickly is the surface covered with rocks. It is hardly necessary to say that the proposed colony has never been established.

Mission of Guadelupe. The old mission of Guadelupe was situated on the north-

ern edge of Magdalena plain, at the mouth of San José Cañon. The remains of an extensive aqueduct, constructed for irrigating purposes, are still to be seen there. The mission buildings are entirely destroyed.

Santa Inez Point.

Santa Inez Point, sometimes called Cape Barracas, marks the northern limit of Santa Inez Bay. It is low and rocky, with a small hill surmounting it. Half a mile to the westward of the point, in the bay, are some outlying rocks.

Anchorage.

Anchorage may be obtained under the lee of the point, sheltered from the north-westerly winds, in from 4 to 5 fathoms water, half a mile from the shore.

Santa Inez Islands.

The Santa Inez Islands, three in number, lie to the southeastward of the point of the same name. They are surrounded by shoals and sunken rocks, but between them and the point there is a clear passage, through which from 4½ to 5 fathoms may be carried. The southernmost and largest of these islands is seven-eighths of a mile long, a third of a mile wide, and 30 feet high. Its southern point is low and rocky, with shoal water extending some distance off from it.

The northernmost of the islands is 15 feet high and small in extent; its centre bears S. 69° E. (E. ⅞ S. mag.) from Santa Inez Point, distant 2 miles.

Shoal.

Directly west of the south-easternmost island, its centre about a mile distant from it, is a shoal 1¼ miles long NNW. and SSE. and half a mile wide, with only 3 fathoms of water over it.

Eastward of this group of islands the water deepens quickly.

Chivato Point.

Chivato Point is a low bluff, with many detached rocks lying off it, and table-land from 40 to 60 feet high back of it. It lies 1¾ miles to the northward of Santa Inez Point, the intermediate coast being bluffy, with a few outlying rocks.

From Chivato Point the coast falls away to the westward, its general trend as far as the entrance of San Lucas Cove, a distance of 14½ miles, being N. 65° W. (WNW. ¾ W. mag.). The shore is generally low and sandy, with occasional bluffs; back of it the land slopes gradually to the mountains in the interior, which are upwards of 3,000 feet high.

San Marcos Island.

San Marcos Island lies off this part of the coast. It is a barren, extremely hilly island, about 5½ miles long in a general NNW. and SSE. direction, varying in width from 1¼ to

2½ miles. The highest peak, nearly in the centre of the island, is 891 feet high.

East side.

The east face is for the most part composed of rocky bluffs, varying in height from 20 to 300 feet. Near the SE. extremity there is a strip of sand and gravel beach about a mile long, and there is a similar one, three-quarters of a mile long, on the NE. face. Off this latter beach are a number of outlying rocks, and a rocky reef extends a short distance off from the easternmost point.

North Point.

Off the north point, which is surmounted by a sharp hill, are three white islets, varying in height from 20 to 40 feet, and a number of detached rocks which extend northward nearly half a mile.

West side.

The NW. face is of steep bluffs, with many outlying rocks, of which the two most conspicuous are 25 and 40 feet high. From the western extremity of the island to the south point the coast is of sand beaches and bluffs from 15 to 20 feet high, the land sloping from the hills in the interior.

South side.

The south point of the island is a low sand-spit nearly half a mile long, from which a rocky shoal extends 1¼ miles to the southward. Eastward of the low sand-spit the south coast of the island is a series of perpendicular bluffs about 30 feet high, with shoal water extending off nearly half a mile.

Anchorage.

There is good anchorage off the south end of the island, eastward of the low sand-spit, in from 5 to 7 fathoms of water.

Fresh water.

Fresh water may be obtained near the northern end of the island, and an abundance of goat's flesh may be had for the trouble of shooting the animals.

Remarks. Gypsum, pumice stone, &c.

There are extensive deposits of gypsum on the island. It is massive and crystalline (alabaster), in layers entirely exposed, from 25 to 50 feet thick. It could be worked with great facility and would probably yield large profits. Pumice stone is found in several localities, and one of the hills is said to be composed entirely of talc. In the waters surrounding the island are several beds of the pearl oyster.

Lobos Rock.

Lobos Rock, which is about a quarter of a mile long NNW. and SSE., and 20 feet high, lies half a mile S. 38° E. (SE. ½ E. mag.) from the southern point of San Marcos Island. Numerous sunken rocks surround it, and not over 1½ fathoms can be carried through the passage between it and San Marcos.

Craig Channel. Craig Channel separates San Marcos Island from the main-land. It is a little over a mile wide in its narrowest part and 4 fathoms of water may be carried through it. In using it, care must be taken to avoid the shoal that makes off from the south point of San Marcos Island, which has 3 fathoms on its southern edge, quickly shoaling to 2 and 1 fathoms.

Variation. The magnetic variation at San Marcos Island was 11° 20′ E. in 1878, increasing about 2′ annually.

Tides. Tides rise about 4 feet.

San Lucas Cove. San Lucas Cove is a safe anchorage in all weathers for boats or small craft drawing *less than 6 feet of water*. It is about 2 miles in extent, north and south, and from a half to three-quarters of a mile wide. The entrance is narrow and shoal, with a small sand island nearly in the centre, which bears S. 55° W. (SW. mag.) from the north end of San Marcos Island, distant 6 miles. The channel is on the north side of the island, and has from 1 to 1½ fathoms of water in it at low tide; inside the cove the depth of water varies from half a fathom to a fathom.

The coast from San Lucas Cove to Santa Maria Cove. From the entrance to San Lucas Cove the coast trends northerly and is low and sandy for 3 miles, to a prominent point surmounted by a red mound 60 feet high. Thence to Santa Maria Cove, a distance of 12½ miles N. 30° W. (NW. ¼ N. mag.), the coast is a succession of bluffs of moderate height, with intervening sand beaches. The land back rises gradually to a high range of mountains in the interior. Las Tres Virgenes, over 6,000 feet high, are plainly visible to the north-westward. The soundings along this part of the coast show, with one or two exceptions, deep water close to the shore, from 20 to 40 fathoms being found a mile off.

Santa Agueda Point. Santa Agueda Point is five miles to the north-westward of the point at the foot of the red mound before mentioned, and is the eastern point of entrance to a lagoon and cañon of the same name. It is low and sandy, with a shoal extending half a mile off it, and across the entrance to the lagoon; outside the shoal the water deepens quickly, 60 fathoms being found half a mile off. A short distance north of the point is a large rock 15 feet high.

Six cañons. Cañon de Santa Agueda is the southernmost of six similar valleys, or cañons, between Santa Agueda Point and Santa Maria Cove. These cañons are widely known for their yield of rich copper ore, which comes from some distance in the interior. The mines were being worked at the time of the *Narragansett's* visit, and during that year 18 ships were loaded with the ore from these cañons, principally for European markets. The ore taken away (malachite) is mostly surface ore.

Cañon de Providencia, Cañon de Purgatorio, Cañon de Soledad, and Cañon de Santa Rosalia lie to the northward of Cañon de Santa Agueda, distant about a mile from each other. At the two first mentioned there are landing piers, and a short distance to the northward of Cañon de Santa Rosalia there is a ranch close to the beach.

Anchoring. Caution. In anchoring off these cañons the lead must be kept constantly going, as the water is deep to within a quarter of a mile of the shore and then shoals suddenly.

Santa Maria Cove and Cañon. Santa Maria Cove lies 3 miles to the northward of Cañon de Santa Rosalia. It is about three-quarters of a mile wide and a quarter of a mile deep; the southern shore is rocky, with bluffs and low hills back of it; on the north side the land is hilly, ending in a sharp, bluff point, with numerous outlying rocks off it; at the head of the cove is a shingle and sand beach. Santa Maria Cañon opens into the cove.

Anchorage. Anchorage may be had in Santa Maria cove, about a quarter of a mile from the beach, in 5 or 6 fathoms of water, with shelter from NW. winds, but open to south-easters. The southernmost and highest of Las Tres Virgenes, 6,547 feet high, lies 15½ miles N. 83° W. (W. ½ S. mag.) from the anchorage, and is a good mark when making for it.

Variation. The magnetic variation at Santa Maria Cove was 11° 40′ E. in 1875, increasing about 2′ annually.

Tides. Spring tides rise about 6 feet.

Tortuga Island. Tortuga Island lies 23 miles nearly due east of Santa Maria Cove, its highest peak bearing N. 48° E. (NE. ¾ N. mag.) from the north end of San Marcos Island, distant 15½ miles. It is mountainous and barren, about 2 miles long ESE. and WNW. by a mile in width at the centre, narrowing towards the ends. The highest peak, near the southern shore, is 1,016 feet high.

Coast from Santa Maria Cove to Cape Virgenes. From the northern limit of Santa Maria Cove the coast first trends nearly north for 3½ miles, and then gradually falls away to the north-westward for 3 miles farther, to Cape

Virgenes. The land comes down to the coast in steep slopes from Santa Maria Mountain, which is about 3½ miles inland and 4,424 feet high, its ridge running parallel to the coast for several miles. The shore is of broken bluffs, varying in height from 30 to 200 feet, with occasional gravel beaches and deep arroyos.

The depth of water off this part of the coast is very great, soundings within 1¼ miles of the shore showing no bottom at 300 fathoms.

Las Tres Virgenes. From 12 to 14 miles inland are three remarkable mountains lying nearly parallel to this part of the coast, known as Las Tres Virgenes, the highest of which reaches an altitude of 6,547 feet. They are the north-eastern end of a continuous belt of volcanic peaks extending toward San Ignacio. (View opposite page 98.)

Sulphur. Sulphur is said to be found in abundance in the vicinity of these volcanoes.

CHAPTER III.

FROM CAPE VIRGENES TO THE ANCHORAGE OFF PHILIP'S POINT, COLORADO RIVER.

Cape Virgenes. Cape Virgenes is a rocky cliff about 200 feet high, surmounted by a hill 600 feet high, the high coast-range lying a short distance inland. Soundings off the point gave 5 fathoms close to, deepening rapidly to 130 fathoms a mile off. North-westward of Cape Virgenes the coast is generally low, the mountain range being several miles in the interior.

Punta Baja. Punta Baja, which is 4½ miles from Cape Virgenes, is of shingle, with a shoal extending off a short distance. Just south of the point is the mouth of a cañon which leads up to a silver mine, known as *Reforma*. About three-quarters of a mile to the south-eastward of the point is a landing place, marked by a flag-staff with a white flag.

Santa Ana Point and Bay. Santa Ana Point, seven and a quarter miles farther up the coast, is steep, with hills 400 feet high immediately back of it. It forms the eastern limit of Santa Ana Bay, which is about 3½ miles wide and from a quarter to three-quarters of a mile deep. The southern and western shores of the bay consist of sand and shingle beaches, the low-land back of them sloping gradually from the mountains. The water is very deep to within a short distance of the shore.

Anchorage. Anchorage may be had, with shelter from south-easters. The western limit of the bay is a low shingle point, off which a shoal extends for over a quarter of a mile. On the point is the opening to a small lagoon, into which Santa Ana Creek flows. This *fresh-water creek* may be recognized by the grass and trees on its banks. Fresh water.

Two and three-quarter miles north-westward is another low point and opening to a lagoon, with a shoal surrounding it.

Trinidad Point. Trinidad Point is 7 miles from the point last mentioned; the intermediate coast assumes a more northerly trend and

Virgenes. The land comes down to the coast in steep slopes from Santa Maria Mountain, which is about 3½ miles inland and 4,424 feet high, its ridge running parallel to the coast for several miles. The shore is of broken bluffs, varying in height from 30 to 200 feet, with occasional gravel beaches and deep arroyos.

The depth of water off this part of the coast is very great, soundings within 1¼ miles of the shore showing no bottom at 300 fathoms.

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Santa Ana Point and Bay. Santa Ana Point, seven and a quarter miles farther up the coast, is steep, with hills 400 feet high immediately back of it. It forms the eastern limit of Santa Ana Bay, which is about 3½ miles wide and from a quarter to three-quarters of a mile deep. The southern and western shores of the bay consist of sand and shingle beaches, the low-land back of them sloping gradually from the mountains. The water is very deep to within a short distance of the shore.

Anchorage. Anchorage may be had, with shelter from south-easters. The western limit of the bay is a low shingle point, off which a shoal extends for over a quarter of a mile. On the point is the opening to a small lagoon, into which Santa Ana Creek flows. This *fresh-water creek* may be recognized by the grass and trees on its banks. Fresh water.

Two and three-quarter miles north-westward is another low point and opening to a lagoon, with a shoal surrounding it.

Trinidad Point. Trinidad Point is 7 miles from the point last mentioned; the intermediate coast assumes a more northerly trend and

is generally bluff. There are several outlying rocks off this part of the coast, and a range of hills rises immediately back of it. The point itself is a prominent head-land 250 feet high, surmounted by moderately high bluffs; several detached rocks lie off it.

San Carlos Bay. San Carlos Bay is an open bay formed by the falling away of the coast line to the northward of Trinidad Point. About 1¾ miles to the northward of the point is a small, rocky islet of whitish color, the highest part of which is 6 feet above high water; shoal water is found a short distance off it on all sides. Between the islet and Trinidad Point is a sandy bight, with shoal water extending nearly half a mile off shore.

Three and three-quarters miles N. 25° W. (NW. ¾ N. mag.) from the islet just mentioned is a rocky point surrounded by numerous detached outlying rocks, one of which, nearly three-quarters of a mile north of the point and half a mile from the nearest shore, is a quarter of a mile long and 6 feet high.

San Carlos Point. San Carlos Point is low, composed of sand and shingle, and may be recognized by a peak about 5,000 feet high, known as Sharp Peak, which lies 9½ miles nearly west (true) from it.

Red water. Along this part of the coast extensive patches of the red water before mentioned were met with. Soundings made while steaming through them gave no bottom at 55 fathoms.

Variation. The magnetic variation at San Carlos Point in 1875 was 11° 45′ E., increasing about 2′ annually.

Tides. Tides rise about 5 feet.

From San Carlos Point to Cape San Miguel, a distance of 12 miles, the general direction of the coast line is nearly north. The coast is for the most part low, with sand and gravel beaches and an occasional low bluff, until within about 2½ miles of Cape San Miguel, whence to the cape the shore line is an almost continuous bluff about 50 feet high. Back of the coast the land slopes gradually to the hills and is covered with low bushes and cactus.

San Juan Bautista Point and Bay. San Juan Bautista Point lies 4¾ miles to the northward of San Carlos Point. It is low and composed of sand and gravel. Shoal water extends off it a quarter of a mile.

Between the two points the coast recedes about a mile, forming the open bay of San Juan Bautista, the soundings in which are very regular.

A little to the northward of San Juan Bautista Point the hills approach the coast, ending in bluffs.

Cape San Miguel. Cape San Miguel is a bold, rocky bluff, 150 feet high, with several outlying rocks a short distance to the eastward of it. Back of it, not over 5 miles distant, is a group of conspicuous mountains, varying in height from 2,000 to 3,500 feet.

Anchorage. Anchorage, sheltered from the NW. winds, may be found just south of the cape, in 7 or 8 fathoms of water, half a mile from the shore.

A mile south of the cape is the northern end of a shoal that extends nearly 2 miles along the shore to the southward, and has only 2¼ fathoms of water on its outer edge, which is from a quarter to half a mile off shore.

From Cape San Miguel to Santa Teresa Point, a distance of 13½ miles N. 12° W. (NNW. ¼ W. mag.), the coast is generally low, being formed of alternate sand beaches and low bluffs, the coast range lying a short distance inland.

Just north of Cape San Miguel the coast sweeps to the westward, forming an open bay.

Santa Teresa Point and Bay. Santa Teresa Point is a rocky bluff about 30 feet high, the land back of it rising abruptly to a height of 567 feet. South of the point is the small open bay of the same name. At the bottom of the bay there is a sand beach, with low land back of it, extending to San Francisquito Bay. In the southern part the shore consists of rocky bluffs, with hills about 150 feet high rising immediately back of them and some outlying rocks fronting them. The magnetic variation in 1875 was 12° E., increasing about 2′ annually.

Variation.

Tides. Spring tides rise 10 feet; neaps, 6 feet (approx.).

Anchorage. Good anchorage, sheltered from the NW. winds, may be found about a quarter of a mile from the beach in 8 or 9 fathoms of water, the point bearing N. 28° E. (N. by E. ½ E. mag.), distant from 3 to 4 cables.

On the low neck of land between Santa Teresa and San Francisquito Bays is an extensive bed of a fresh-water pond, which is dry during 8 months of the year.

A prominent, sharp peak, 6,258 feet high, lies 32 miles nearly due west from Santa Teresa Point, and is plainly visible when off the coast in this vicinity.

San Pedro Martir Island. San Pedro Martir Island lies off this part of the coast and nearly midway in the gulf. It is a barren, triangular rock, less than a mile in extent either way, its highest point hav-

ing an altitude of 1,052 feet. Off its southern face are several detached rocks, some of them half a mile from the shore.

The highest point of the island bears S. 85° E. (E. ⅝ N. mag.) from Santa Teresa Point, distant 28 miles.

Northward of Santa Teresa Point, and intervening between it and San Francisquito Bay, is a prominent headland, having a rugged, bluff coast, with barren hills from 300 to 500 feet high back of it.

San Gabriel Point.

San Gabriel Point lies 1$\frac{2}{10}$ miles north of Santa Teresa Point, and is a rocky bluff 45 feet high, with high volcanic hills just back of it and numerous detached rocks surrounding it. Just west of the point is a strip of sand beach a quarter of a mile long, and adjoining the western end of the sand beach is a rocky point similar in character to San Gabriel Point.

San Francisquito Bay.

The point just mentioned is the eastern point of the entrance to San Francisquito Bay, which is about a mile in width between the heads at the entrance, and the same in depth from a line drawn between them. It is open to the north and north-east, but affords good shelter from either north-west or south-east winds, which are the prevailing ones in the gulf.

Anchorage.

The best anchorage is in the SW. part of the bay in from 5 to 6 fathoms of water, about a quarter of a mile off a sand beach half a mile long and flanked on either side by rocky bluffs.

A small cove opens into the southern part of the bay. The water in the cove is shoal and the entrance narrow, being between two rocky points 300 yards apart with numerous outlying rocks off them, narrowing the passage to about 100 yards.

The country in the vicinity of the bay is extremely barren and stony.

From the NW. point of the entrance to San Francisquito Bay to San Francisquito Point, a distance of 2 miles N. 42° W. (NW. ¾ W. mag.), the coast consists for the most part of steep rocky bluffs, with table-land from 300 to 400 feet high immediately back of them.

San Francisquito Point.

San Francisquito Point is a low rocky bluff, with a number of detached rocks lying off it, close to. A short distance west of the point there is said to be a place at the foot of the hills where *fresh water* may be found.

Sal-si-puedes Channel.

Sal-si-puedes Channel, which lies between the main-land on the west and the islands of San Lorenzo, Sal si-puedes, Raza, and Partida on the east, is a wide, deep channel through which the current sets strongly, especially with an ebb-tide and a north-westerly wind, against which, sailing vessels find it almost impossible to make any headway.

Anchorage.

Owing to the great depth of water in most parts of the channel there are few places where a vessel may anchor, but anchorage *may* be found near the western shore and also in the vicinity of the islands Raza and Partida.

Soundings obtained in the northern part of the channel, 2½ miles from the shore of the main-land, gave a depth of 716 fathoms, bottom of green ooze, and in several places between the island of San Lorenzo and the main-land, no bottom was found at a depth of 320 fathoms.

San Lorenzo Island.

San Lorenzo Island is the southernmost and largest of the islands forming the eastern side of Sal-si-puedes Channel. It is 12¼ miles in length and between one and two miles wide.

Like most of the islands in the gulf it is of volcanic origin, high and barren. The highest peak, near the southern end, has an elevation of 1,592 feet.

Boat passage.

Three miles from the north-western end of the island is a narrow boat passage, really making two distinct islands.

Landing places.

Three miles to the south-eastward of the boat passage, on the channel side of the island, is a slightly projecting sand beach where a landing may be effected in smooth weather, and at the SE. extreme of the island is another small strip of sand-beach which with the prevailing north-westerly winds affords a good landing place.

With the exception of the above-mentioned sand beaches the shores are bold, rocky bluffs predominating.

Rock.

About a mile and a quarter nearly due east of the north-western point of the island, and 1½ cables from the nearest shore, is a detached white rock 20 feet high.

Sal-si-puedes Island.

Sal-si-puedes Island, lying a mile to the north-westward of San Lorenzo, is about 1½ miles long SE. and NW., with a greatest width of half a mile. The highest peak, near the southern end, is 376 feet high. Several detached rocks lie off the island, one of which, near the north-western end, is 50 feet high.

Rock awash.

Nearly midway between Sal-si-puledes and San Lorenzo

Islands, a little nearer the former, is a rock awash, and it is probable that there are other hidden dangers in the passage, which has not been examined, and its use is not recommended.

Isla Raza. Isla Raza lies 4¾ miles N. 7° W. (N. by W. ¾ W. mag.) from the NW. point of Sal-si-puedes. It is about three-quarters of a mile long east and west, half a mile wide and about 100 feet high, presenting a whitish appearance, from the deposit of guano on it. Its shores consist for the most part of moderately high bluffs, with outlying rocks close to.

Anchorage. Anchorage in from 5 to 8 fathoms, gravel and rocky bottom, will be found on the south side of the island, about 3 cables distant from the shore. There is a landing pier, house and flag-staff on the island, abreast of the anchorage. A reef of rocks extends a short distance off from the south-eastern end of the island, and vessels anchoring should be careful to give it a good berth.

Raza Rock. Raza Rock is a small white rock 75 feet high, lying a little over a mile N. 53° W. (NW. by W. ¾ W. mag.) from the NW. point of Raza Island. There is deep water, free from dangers, on all sides of it except the south-west, where at a distance of 2 cables is a rock awash, with 20 fathoms of water close to.

Remarks. The tidal sets in the vicinity of these islands are very strong, causing heavy tide rips occasionally. North-westerly winds frequently blow with great violence for 2 or 3 days at a time.

Guano. Raza Island is widely known for its valuable deposit of guano, which is not, as in some other places, composed of the excrement of birds, but of an igneous rock, which has undergone a chemical change by the action upon it of the phosphate and ammonia contained in their excrement.

The surface guano is collected in the form of dust and shipped in bags. The layer succeeding it is composed of "clinkers," which require crushing before using. These "clinkers" are richer in the phosphates than the pulverized guano and are more easily gathered and shipped. The birds that frequented the island at the time of the *Narragansett's* visit were principally gulls, and were present in such numbers as to literally cover the ground.

The island has been worked by a company for several years past. They removed in the first two years over

10,000 tons of the guano, shipping it principally to European ports.

Isla Partida. Isla Partida, so called from its appearing, when seen from a distance, like two islands, is 4½ miles N. 42° W. (NW. by W. mag.) from Raza Island. It is about 1¼ miles long, half a mile wide, and has two peaks, each 400 feet high, joined by a low, narrow, strip of land.

Cove, rock. On the western side of the island is a small cove or bight, open to the northward, in which there are from 3 to 8 fathoms of water. A rock 85 feet high lies off the steep bluff point which forms the western side of the bight.

Islet. Anchorage. Off the eastern side of the island, about a third of a mile distant from it, is a small islet 75 feet high. Between this islet and Isla Partida, anchorage may be found in from 5 to 20 fathoms, with shelter from the north-westerly winds.

White Rock. Six-tenths of a mile to the northward of Isla Partida is a rock 175 feet high called White Rock, from which a reef makes off to the northward about a third of a mile, ending in a rock two feet above water at low tide. The soundings are irregular, with rocky bottom, for about 1¼ miles farther north, whence they increase rapidly.

The southern point of Angel de la Guardia Island bears N. 42° W. (NW. ⅞ W. mag.) from White Rock, distant 5½ miles.

San Esteban Island. See page 145.

From San Francisquito Point the coast sweeps to the westward for about 10 miles, and then again assumes a northerly direction as far as Las Animas Point.

San Rafael Bay. San Rafael Bay is an open bay formed by the receding of the coast-line north of San Francisquito Point, and affords good protection from southerly winds. Its shores consist for the most part of sand beaches, with occasional low bluffs. The land slopes gradually from the interior, with numerous ravines, and is covered with vegetation. Soundings in the southern part of the bay gave 40 fathoms at a mile distant from the shore, while in the northern and western portions, at the same distance off, from 10 to 20 fathoms were found.

From the north-western limit of San Rafael Bay to Las Animas Point the coast consists of rocky bluffs, with mountains rising immediately back of it.

Peaks. Seven miles to the southward of Las Animas Point is a conspicuous group of peaks over 3,000 feet high.

Barnabé Rocks. The Barnabé Rocks, two in number, lie 3½ miles to the south-eastward of Las Animas Point, and from 3 to 4 cables off a low, slightly projecting point. They are only 2 feet above water, and between them and the shore there is a shallow passage with a rocky bottom, fit only for boats.

Anchorage. There is a fair anchorage to the southward of the rocks in 7 or 8 fathoms of water, coarse, sandy bottom, about a quarter of a mile from the beach.

Variation. The magnetic variation was 12° 15′ E. in 1877, increasing about 2′ annually.

Tides. Tides rise about 9 feet.

Las Animas Point. Las Animas Point is a bold rocky bluff, from 75 to 125 feet high, with several detached rocks close to. Back of it steep hills of a reddish color rise abruptly to heights varying from 300 to 500 feet, with mountains over 2,000 feet high a short distance inland. The water off the point is very bold, 60 fathoms being found within less than half a mile. This point forms the south-western point of entrance to Ballenas Channel.

Ballenas Channel. Ballenas Channel, which lies between the main-land and Angel de la Guardia Island, is about 45 miles long, varying in width from 8 to 15 miles. The north-westerly winds sometimes blow through the channel with great force, raising a heavy sea, against which a vessel can make but little headway. The tidal currents are very strong at times. A current of 3 knots was experienced by the *Narragansett*.

Soundings obtained within less than a mile from the shore of Angel de la Guardia gave 205 fathoms, and the water throughout the channel is believed to be very deep.

Las Animas Bay. From Las Animas Point the coast turns suddenly to the south-westward and maintains that general direction for a distance of 5½ miles, to the mouth of a small lagoon, whence it sweeps around to a point (not named) bearing N. 69° W. (W. ¾ N. mag.), 6¼ miles distant from Las Animas Point, forming a bay of considerable extent, known as Las Animas Bay, where good anchorage may be had, with protection from either of the prevailing winds.

The shores of the bay consist for the most part of sand beaches, with a few bluffs on that part lying between Las Animas Point and the entrance to the lagoon before mentioned.

About 2 miles north-westward from the lagoon entrance is a steep, bluff point, surmounted by a brownish-colored

mound 80 feet high. Off this point are several islets, varying in height from 30 to 75 feet.

Anchorage. The best anchorage is in the southern part of the bay, in from 6 to 12 fathoms of water, nearly on a line between the above-mentioned point or islets and the lagoon entrance, taking care not to approach the latter within three-quarters of a mile.

The point at the north-western limit of the bay is a sharp, rocky bluff from 25 to 40 feet high, surmounted by a dark hill 100 feet high, the mountains back of it rising abruptly to a height of 3,000 feet and upwards.

Off the point in a northerly direction, about half a mile distant and connected with it by a rocky shoal, is a low islet, only 2 feet above high water.

About 1½ miles N. 21° W. (NW. by N. mag.) from the point just mentioned is another prominent, sharp, bluff point (not named), formed by a spur of reddish hills from 200 to 300 feet high. The coast between the two points forms a bight a mile deep, with a sand beach at the bottom.

Rocky Island. Rocky Island, which lies 1½ miles farther up the coast, is a barren rock 75 feet high, lying half a mile off shore, with a three-fathom passage between it and the beach, which is of sand.

From here to the entrance to Angeles Bay the coast is a succession of sharp, rocky points, with outlying rocks close to, the land back rising abruptly to a height of several thousand feet.

Angeles Bay. Angeles Bay is a fine sheet of water, which covers an area of about 25 miles. It is almost completely land-locked, having for its protection on the east and north-east no less than 15 islands and islets. The shores of the bay are for the most part sand beaches, with one or two rocky bluffs. In the southern part, shoal water extends off some distance from the shore.

There are several safe passages into the bay, which will be described in detail.

Passages. The southernmost passage is between Red Point (which is a reddish colored, rocky bluff) and two small islands, 50 and 70 feet high, which lie about 3 cables to the northward of it. This channel is believed to be entirely free from hidden dangers, and has a depth of water varying from 20 to 30 fathoms.

Another passage, which is considered perfectly safe, lies to the northward of the two islands just mentioned, between them and a larger island of a dark reddish color, on the southern face of which is a hill 225 feet high, with a stone monument on it. This channel is half a mile wide, and has from 20 to 30 fathoms of water through its centre.

Northward of the last-mentioned island is another passage, *which is not recommended and is marked dangerous* on the charts of the United States Hydrographic Office. It contains many sunken rocks and rocks awash, with deep water close to them. On the north side of this passage is a group of islands, varying in height from 90 to 125 feet, with deep water and no dangers, between them and the mainland.

The northern passage lies between Smith's Island, (which is the northernmost and largest of the islands lying off the entrance to Angeles Bay), and a long narrow neck of land that makes off in a south-easterly direction from the mainland, and is terminated by a rocky bluff. When up with this bluff, the passage lies between it and the group of islands before mentioned.

The northern passage is over a mile in width and free from dangers, except at a point about midway of the length of Smith's Island, where some dangerous rocks, lying three-quarters of a mile from the island, narrow the channel to nine-tenths of a mile. Over 10 fathoms water may be carried through it.

Neither of these passages should be attempted, unless in an emergency, when the land cannot be plainly distinguished, as that is the only guide for using them.

Directions for entering.

When coming from the southward it is best to follow the coast, using the southernmost passage (that between Red Point and the two small islands). Keep in mid-channel until past Red Point, then steer west (mag.) for the best anchorage, which is at the mouth of a small cove formed by a low sand-spit which projects over half a mile from the mainland in a southerly direction. In standing in for the southern most passage, bring a conspicuous mountain, 3,423 feet high, called Round Top, which is 2 miles from the western shore of the bay, to bear S. 71° W. (SW. by W. ¼ W. mag.) and steer for it, keeping it on that bearing until nearly up with Red Point, when keep in mid-channel until past the point.

Coming from the northward and intending to anchor in Angeles Bay, follow the coast, passing between it and Smith's Island and keeping well over toward the high bluffs at the south-eastern end of the narrow neck of land before mentioned, to avoid the dangerous rocks lying three-quarters of a mile to the westward of Smith's Island. Upon arriving off the extremity of the narrow neck, steer SSW., passing between it and the group of islands to the southward. When inside the islands, follow the coast line, taking care to keep rather nearer the islands than the mainland, and at least a mile from the latter, to avoid a shoal that makes off from it; there are no hidden dangers outlying from the islands. When the point of the low sand spit, which forms the cove before mentioned, bears west (mag.), haul up for the anchorage.

To pass through the channel to the northward of the two islands which form the north side of the southernmost passage, it is only necessary to keep a reasonable distance off the land on either side.

Fresh water.

Fresh water may be obtained from springs, near the anchorage, at the foot of the round-topped mountain, 3,423 feet high; their situation is marked by a growth of weeds and bushes.

Fish, turtle, oysters, &c.

The bay abounds in fish and turtle, and good oysters may be gathered along the rocky shores. Banks of pearl oysters are also reported to exist.

Minerals.

The country in the vicinity is said to be rich in copper ores, sulphur, and argentiferous lead.

In the northern part of the bay is a deep bight, formed by a narrow neck of land that projects 3¼ miles in a south-easterly direction from the main-land. This bight has not been examined.

Variation.

The magnetic variation in Angeles Bay was 12° 20′ E. in 1877, increasing about 2′ annually.

Tides.

Spring tides rise about 12 feet.

Smith's Island.

Smith's Island is the northernmost and largest of the islands lying off the entrance to Angeles Bay. It is high and flat topped, nearly 4 miles long, from one-quarter to over three-quarters of a mile wide; and, at its north-western extreme, 1,554 feet high. An islet 60 feet high lies off its north-western point, separated from it by a narrow boat channel. Off its western face, about midway of its length and con-

nected with it by a rocky shoal, lies an islet 75 feet high; about half a mile to the northwest of which are some dangerous rocks. (See page 118.)

Rock. A white rock 40 feet high, with deep water all around it, lies a little over half a mile to the southward of Smith's Island, and a mile and a quarter to the south-eastward is a small, flat-topped island from 90 to 125 feet high.

The coast north of Angeles Bay to within 3 miles of Remedios Point is composed of rocky bluffs, with short pebble beaches intervening. The land back of the coast is very much broken, with mountains from 1,500 to 2,000 feet high. Off this rocky strip of coast, near its northern extreme and close to the shore, are three small islets, varying in height from 15 to 30 feet. They are about $1\frac{1}{4}$ miles distant from each other and the two southern ones are of a whitish color.

Islets.

Remedios Bay. Remedios Bay is an open bay lying to the southward of Remedios Point. It has a shore line of sand and pebble beach about 3 miles in extent, just back of which, near its southern limit, is a small lagoon.

Anchorage. Anchorage may be found here, with shelter from the north-westerly winds. The best is off a red hill 200 feet high, a third of a mile from the shore, in 10 fathoms of water, Remedios Point bearing about N. 30° E. (N. by E. $\frac{1}{2}$ E. mag.) distant $1\frac{3}{4}$ miles. The magnetic variation was 12° 25′ E. in 1877, increasing about 2′ annually. Tides rise about 12 feet.

Remedios Point. Remedios Point is low and sandy, with hills rising to the northward and westward, toward the coast range that lies a short distance inland.

From Remedios Point to Bluff Point, a distance of 26 miles, the general trend of the coast is N. 43° 30′ W. (NW. by W. mag.), and it is an almost unbroken succession of high, rocky bluffs ranging from 50 to 150 feet in height, the coast range of mountains rising immediately back of it. It affords no anchorage or shelter throughout the entire distance.

Bluff Point. Bluff Point, the northern point of entrance to Ballenas Channel, is a bold, rocky bluff about 100 feet high, and may be recognized from a distance by Sharp Peak, 3,189 feet high, which lies $6\frac{6}{10}$ miles S. 60° W. (SW. $\frac{1}{4}$ W. mag.) from

it. Double Peak, 5,440 feet high, bears S. 29° W. (S. by W. $\frac{1}{2}$ W. mag.) distant $13\frac{4}{10}$ miles from Bluff Point.

Angel de la Guardia Island. Angel de la Guardia Island, which is high, rocky, and barren, is over 40 miles long, in a direction nearly parallel to the coast line, with a greatest width of about 10 miles. A range of mountains extends throughout its entire length, varying in height between 3,000 and 4,000 feet, being highest in the northern part. A comparatively low ridge about midway of the island separates the higher northern and southern portions.

Western side. The whole western side of the island bordering on Ballenas Channel is inaccessible and without any anchorage.

Humbug Bay. Humbug Bay, nearly opposite Remedios Bay, has a steep, sandy shore, but the water is said to be too deep, even close to the beach, for a vessel to find anchorage. Just north of this bay is a bold, bluff point, between which and Remedios Point, on the main-land opposite, is the narrowest part of Ballenas Channel, it being at this place only 8 miles wide.

Southern extreme. The southern extreme of the island is a sharp bluff point, a mile to the northward of which is a hill 772 feet high, descending abruptly to the shore on the east and west sides.

Eastern side. The eastern side of the island is very irregular in its outline. The shore is generally bold, with rocky bluffs predominating. There are several open bays where vessels may anchor and be sheltered from the prevailing winds.

Starting from the southern extreme of the island, the coast trends nearly north for a distance of about 3 miles, where it becomes low and assumes a north-easterly direction, terminating in a sharp point, from which a rocky reef, partly dry at low water, connects it with Pond Island.

Pond Island. Pond Island is about a mile long, with an average width of a quarter of a mile, and over 400 feet high, with nearly perpendicular cliffs, and some outlying rocks on its north-eastern side.

Eastward of the reef connecting the two islands, about 300 yards distant from it, is a high detached rock, with a rock awash between it and the reef.

Anchorage. Anchorage may be had, with protection from the north-westerly winds, off a small strip of sand beach that is situated just where the coast commences to curve to the north-eastward, (about 3 miles from the south point of the island)

in from 7 to 9 fathoms of water, less than a quarter of a mile off shore.

Rock Point. Rock Point is a bold head-land with cliffs over 500 feet high. It is surmounted by a hill 1,943 feet in height, the north-eastern end of a spur of very high and steep mountains projecting from the main range.

Anchorage. The coast between Pond Island and Rock Point recedes considerably to the westward, forming an open bay in its southern part, where good anchorage may be found with protection from *south-easterly* winds. The shore near this anchorage is a sand and gravel beach, and the soundings increase gradually seaward.

Anchorage may also be had just south of Rock Point, close in shore, in from 5 to 8 fathoms of water, where some protection from the north-westerly winds will be found.

Bay. Between Rock Point and the next prominent point to the north-westward, a distance of 12 miles, the coast recedes nearly 4 miles, forming a large open bay, the shores of which are for the most part pebble beaches, with a few small bluff points in its southern portion. The land back slopes from a moderately high table-land toward the sea and is covered with cactus.

About 2 miles south of the northern limit of the bay is a small lagoon with a narrow opening to the sea.

From the northern limit of the bay just described the coast trends about NW. 14¼ miles to Bluff Point, and is a succession of rocky bluffs. Five miles to the north-westward of the northern limit of the bay is a low, slightly projecting point and an arroyo.

Bluff Point. Bluff Point is the north-eastern extremity of the island, and is a bold, rocky headland, with rocky bluffs from 100 to 300 feet in height, extending about a mile on either side of it.

Puerto Refugio. Puerto Refugio, which extends over nearly the whole of the northern side of the island, is a fine large harbor, or more properly two harbors, where good anchorage will be found with shelter from every wind.

These harbors may be entered from three sides, viz: From the east, between Granite Island and the northern point of Angel de la Guardia; from the north, between Granite and Mejia Islands; and from the west, between Angel de la Guardia and Mejia Islands. Either of these entrances may be used with perfect safety.

Eastern Harbor. The eastern and larger of the two harbors is about 1¾ miles in extent either way, and is entirely free from hidden dangers. The best anchorage will be found in the south or south-western parts in from 5 to 10 fathoms of water. Anchorage may also be found south of Granite Island in from 8 to 12 fathoms, but the bottom is mostly of rock.

Granite Island. Granite Island is a little over three-quarters of a mile long E. and W., one-sixth of a mile wide, and varies in height from 172 to 281 feet. It is entirely barren and extremely rocky. The eastern point is low and stony, with a white rock 15 feet high lying close to. Off the south-western end are several detached rocks awash and below water, and a reef, with one rock 13 feet above low water, extends off a cable from the north-western point. The passages on either side of Granite Island are over three-quarters of a mile wide, with from 15 to 25 and 30 fathoms of water.

White Rock. White Rock is a large, rugged rock of whitish color, 41 feet high, lying nearly in the centre of the eastern harbor, with from 7 to 13 fathoms of water close around it.

In the south-western part of the harbor a spur of hills which terminates in a rocky, bluff point, projects a quarter of a mile into the bay, and from its extremity a rocky shoal extends northward about 300 yards.

Directions. To enter the eastern harbor by either the eastern or northern entrance, bring White Rock to bear about midway of the entrance and steer for it, passing it at a reasonable distance, when you may steer for the best anchorage, which is three-quarters of a mile due south from it, in 6½ or 7 fathoms of water, sand bottom.

Mejia Island. Mejia Island is over a mile and a half long in a nearly N. by E. and S. by W. (mag.) direction, and a mile and a quarter wide. With the exception of the SE. side, where there are some stretches of sand beach, the coast is a continuous rocky bluff, which attains on the NW. face a height of 500 feet.

South of the easternmost point is a shallow cove of considerable extent, with some small islets in it. Off all the more prominent bluff points are outlying rocks, and from the northernmost point a dangerous reef of rocks, above and below water, extends four cables in a N. by E. (mag.) direction. Care must be taken to avoid this reef when using the northern passage into the harbors.

The interior of the island is hilly and barren, with a greatest altitude, near the north-western point, of 857 feet.

Between the eastern end of Mejia Island and the north end of Angel de la Guardia, is an island (not named) over half a mile long, with a greatest width of 2 cables, and 250 feet high. It is connected at its southern end by a rocky reef, with Angel de la Guardia, and between its northern end and Mejia Island is a channel 150 yards wide, with from 7 to 10 fathoms of water, which connects the eastern with the western of the two harbors.

Western harbor.

The western harbor is a little over a mile in extent in a NE. and SW. (mag.) direction, with an average width of about half a mile. It may be entered either at its south-western end, between the southern point of Mejia Island, (called Monument Point,) and a group of rocks lying off the NW. point of Angel de la Guardia, or at its north-eastern end, *with a leading wind or in a steamer*, by means of the channel (150 yards wide) that separates Mejia Island from the small island, before mentioned, lying between it and Angel de la Guardia and connected with the latter by a rocky reef.

About a quarter of a mile to the westward of the NW. point of Angel de la Guardia is a dangerous group of rocks, covered and awash at low water; their outer or western limit is about half a mile from the point. It is not recommended to attempt the passage between this group and the island.

Sail Rock.

Sail Rock is a sharp, conical rock 167 feet high, lying $1\frac{3}{4}$ miles S. 49° W. (SW. $\frac{3}{4}$ S. mag.) from Monument Point, with deep water (16 fathoms) close to it.

Directions.

To enter the western harbor from the westward, being north of Sail Rock, steer for the middle of the entrance, keeping White Rock, in the eastern harbor, in range with the south end of the island that separates the two harbors, until the eastern point of Mejia Island bears N. 33° 45′ E. (N. by E. $\frac{7}{8}$ E. mag.), when you will be in the best anchorage, with from 6 to 7 fathoms water, bottom of sand and shells. Wishing to pass through into the eastern harbor from the anchorage just described, steer for the north point of the island separating the two harbors, until the centre of the channel between it and Mejia Island bears N. 26° 34′ E. (N. by E. $\frac{1}{4}$ E. mag.), when you may steer for it. This will lead through in not less than 4 fathoms of water.

Tides.

Spring tides rise about 13 feet, neaps 9 feet.

Variation.

The magnetic variation was 12° 30′ E. in 1877, increasing about 2′ annually.

Iguanas and rattlesnakes.

Angel de la Guardia Island is inhabited by great numbers of iguanas and it also abounds in rattlesnakes, several of which were seen to occupy one hole, near the shore. The interior of the island was not examined and no indications of fresh water were seen.

From Bluff Point, which lies nearly west from the north point of Angel de la Guardia, the coast of the peninsula trends about N. 50° W. (NW. by W $\frac{1}{2}$ W. mag.), and with the exception of a small stretch of low beach, 5 miles from Bluff Point, is high, rocky, and precipitous as far as Point Final, a distance of $20\frac{1}{2}$ miles. Back of the coast steep hills rise abruptly, attaining, at a distance of a mile from it, a height of over 1,900 feet.

Point Final.

Point Final is a rocky, bluff point of moderate height, the land in the interior, south-westward from it, being low.

San Luis Gonzales Bay.

From Point Final the coast turns sharply to the south-westward, and, sweeping around in a semicircle, forms the open bay of San Luis Gonzales, which affords good anchorage, with protection from south-easters, but is open to the northward. The shore of the bay is a low sand and gravel beach. In the southern part is the arroyo Calamujuet, on the bank of which, 12 miles to the southward, are the ruins of the old mission of the same name, near which are some pools of tolerably good fresh water.

Fresh water.

The coast for about 6 miles to the north-westward of San Luis Gonzales Bay consists of rocky bluffs from 25 to 50 feet high, thence to Point San Fermin, a distance of about 33 miles, it is for the most part low and sandy, with but few bluffs. The land back of the coast slopes from broken hills and table lands 1,000 to 1,500 feet high, behind which is a range of rugged mountains from 2,000 to upwards of 3,000 feet in height.

There are several islets off this part of the coast, and the water is comparatively shoal, not more than 12 or 15 fathoms being found 5 or 6 miles from the shore.

San Luis Island.

San Luis is a small island of volcanic origin lying 13 miles to the north-westward of Point Final, with a clear channel

1¼ miles wide between it and the main-land. A low sand-spit extends nearly a mile from the south-western side of the island, with shoal water nearly half a mile off from it, on either side.

Anchorage. Good anchorage may be found on either side of the sand-spit, on the SE. side with north-westerly winds and on the NW. side during south-easters, taking care not to approach on either side within half a mile.

Cantada Island. Cantada Island, about 400 yards from the northern end of San Luis Island, and connected with it by a reef that is bare at low water, is a rocky islet 478 feet high. A mile and a quarter NNW. ⅛ W. (mag.) from Cantada Island there Rock and reef. is a dangerous rock about 3 feet above low water, with 19 fathoms close to it, and 2½ miles NW. by W. (mag.) from Cantada there is a reef, nearly circular and over half a mile in diameter, of rocks both covered and awash at low water, with deep water close to.

Rock awash. Another rock awash at low water, lies a mile nearly due north from the NW. end of San Luis Island.

Islets. Parallel to the coast and from 3 to 4 miles from it are three small islets varying in height from 300 to 600 feet. They are distant from San Luis Island, respectively, 4, 6, and 9 miles. A third of a mile eastward of the southernmost of these islets is a large outlying rock. From the middle islet a low sand-spit and shoal extends over half a mile to the south-westward.

About 5 miles north-westward of the northernmost, and less than a mile from the adjacent main-land, is a large rock, 75 feet high.

Red Bluff. Red Bluff is a conspicuous bluff, of a reddish color, 100 feet high, back of which is a series of table-shaped hills from 1,000 to 1,500 feet high.

From this point the coast line assumes a more northerly direction.

Point San Fermin. Point San Fermin is a low sand point, not well defined. Just southward of it is an anchorage with some protection from the north-westerly winds. A rugged peak, 3,413 feet high, known as Rugged Peak, lying 10¾ miles S. 72° W. (SW. by W. ¼ W. mag.) from Point San Fermin, serves as a Tides. good landmark. Springs rise about 18 feet.

From Point San Fermin the general trend of the coast is N. 4° W. (N. by W. ½ W. mag.) as far as Diggs Point, a distance of 27 miles, whence it falls away to the westward. Point San Felipe, bearing N. 32° W. (NW. mag.) 13 miles distant from Diggs Point. The shore throughout the entire distance is low and sandy, the coast range, a few miles in the interior, rising to a height of about 1,000 feet.

The soundings at from 2½ to 4 miles off shore, show a depth of from 8 to 15 fathoms.

Diggs Point. Diggs Point is low and sandy, projecting only slightly from the general coast line. A range of hills approaches the coast near it.

San Felipe Point and Bay. Point San Felipe is a dark rocky headland surmounted by a dark hill which rises abruptly to a height of nearly 1,000 feet. San Felipe Bay lies just south of the point of the same name; it is small in extent but affords some shelter from the north-westerly winds. The shore of the bay is for the most part, low and sandy, but in the north-western part there are some rocky bluffs, and back of them, rising from a plain, are a number of conspicuous hills of conical shape and moderate height. The water in the bay is quite shoal, less than 3 fathoms (*at low water*) being found a mile off shore.

Anchorage. The best anchorage is in the northern part of the bay, on the following bearings, viz: Dark hill surmounting Point San Felipe N. 35° W. (NW. ¼ W. mag.); sharp white peak, a conspicuous peak 4,288 feet high, S. 64° W. (SW. ½ W. mag.). This will place you in from 4 to 5 fathoms (*at low water*), muddy bottom.

Variation. The magnetic variation in 1877 was 13° E., increasing about 2′ annually.

Tides. Spring tides rise about 20 feet.

It is said that fresh water may be obtained in this vicinity. Game is abundant in the interior.

Calamahue Mountain. Calamahue Mountain, sometimes called Santa Catalina Mountain, from the old mission of that name near its foot, lies 28½ miles S. 84° W. (W. by S. ¾ S. mag.) from Point San Felipe. It has a whitish appearance with a jagged top, and is the highest mountain in Lower California, having an elevation of 10,126 feet above the sea level, and can be seen in clear weather from a distance of over 100 miles (see page 9). Strange as it may appear, it was never laid down on any chart until those of the *Narragansett's* survey, 1873 to 1875, were published. Father Kino speaks of it, in 1702, as

being covered with snow during the winter and spring. (View opposite page 130.)

Lake. There is said to be, in the vicinity of Mount Calamahue, a large mountain lake, which feeds the various small streams that flow toward the Pacific coast.

Indians. Gold. The Cocopa Indians, who inhabit some parts of this region, report the existence of gold there, and they occasionally come to the Colorado River bringing nuggets of pure gold with them, which they trade off. They do not permit white men to enter that part of the country which they inhabit, and thus far have succeeded in keeping undisputed possession of their treasure.

Consag Rock. Consag Rock, sometimes called Ship Rock, from its resemblance to a ship under sail, lies 18½ miles N. 78° E. (NE. by E. ¾ E. mag.) from Point San Felipe. It is small in extent, 286 feet high, and covered with guano, which gives it a whitish color. A number of detached rocks lie from a quarter to half a mile to the westward of it, some of them over 25 feet high. Soundings between it and Point San Felipe show from 10 to 15 fathoms of water, with generally muddy bottom. The tidal currents cause heavy *rips* in this vicinity.

This rock is an excellent mark for shaping a course to the mouth of the Colorado River. (View opposite page 130.)

The coast from Point San Felipe to the mouth of the Colorado River, a distance of about 30 miles, trends nearly due north, and is low, with plains rising gradually toward the mountains in the interior. Mud flats and shoals, which are bare at low water, extend off shore from 1½ to 6 miles. Parts of this coast are subject to overflow at the time of heavy freshets and highest spring tides.

Soundings. Lines of soundings across the gulf, north of Consag Rock, show a greatest depth in the southern part, of 26 fathoms, decreasing rapidly toward the head of the gulf.

Colorado River. The entrance to the Colorado River may be considered as lying between Shoal Point, on the Sonora shore, and a point 27 miles due west from it, on the coast of the peninsula of Lower California. It is much obstructed by mud flats, which are bare at low-water springs, but have navigable channels between them at high water. There are also two islands, called Montague Island and Gore Island, which are subject to overflow at high-water springs.

Main Channel. The main channel, through which 2½ fathoms may be carried at ordinary low water, as far as Philip's Point, lies close along the Sonora shore.

Shoal Point. Shoal Point, at the eastern side of the entrance, lies 28 miles N. 18° 30′ E. (N. ½ E. mag.) from Consag Rock, and is a low, sandy point, with a barren sand hill about 300 feet high immediately back of it. The water is shoal for about half a mile off the point and there is a shoal spot with 2½ fathoms, least water,* lying from 2 to 4 miles about WNW. ½ W. (mag.) from it. Between this shoal and the shore there is a channel over a quarter of a mile wide, with from 5 to 7 fathoms of water.

Tides. Variation. It is H. W., F. and C., at Shoal Point about 0h 30m; springs rise from 25 to 30 feet; neaps rise from 6 to 10 feet. The magnetic variation was 13° 4′ E. in 1876, increasing about 2′ annually.

About 9 miles WNW. (mag.) from Shoal Point the beach projects slightly, and back of it are some sand cliffs at the foot of the hills which form the lateral spurs of a long, barren table-land.

Direction Sand-hill. Direction Sand-hill, which lies back of the above-mentioned projecting beach, is 556 feet high, and easily recognizable from the neighboring hills by a growth of bushes at its foot. (See view on page 136.) It is an excellent mark for entering the river.

Off the point just mentioned is a shoal with only 9 feet of water on its shoalest part. Between it and the shore is a channel three-quarters of a mile wide, through which 6 fathoms may be carried at low water. There is also a channel about a mile wide, with 5 and 6 fathoms of water, west of the shoal, between it and an extensive mud flat which is bare at low-water springs.

Santa Clara Beacon. Santa Clara Beacon is on the west side of the mouth of the river of the same name and consists of a couple of piles driven in the ground, with a piece of board nailed across the top. It is about 10 miles from the low point fronting Direction Sand-hill.

Santa Clara River. Santa Clara River is only navigable at high water. At

* All soundings in the Colorado River or at its mouth are referred to the level of *low-water springs*, unless otherwise stated. To reduce them to *ordinary low water*, 6 feet should be added.

low-water springs it is dry, with the exception of here and there a pool water.

From the junction of this river with the Colorado, the sand hills and table-lands, which up to this point have run parallel with the coast, assume a more northerly direction, following the course of the Santa Clara River.

White Beacon. White Beacon is 5 miles N. 76° 30′ W. (W. mag.) from Santa Clara Beacon. It is of piles, with a triangular cage fastened on them, and stands on a shoal-spit making off from the western side of the mouth of an extensive *slough*.

Cross. On the opposite side of the *slough*, 2 cables N. 19° 15′ E. (N. ½ E. mag.) from White Beacon, is a beacon in form of a cross.

These two beacons serve as guides for entering the *slough* and for avoiding a shoal which extends a short distance off its mouth.

Port Isabel. Port Isabel is situated on the east bank of the *slough* about 2¼ miles from its junction with the Colorado River, and is the first good landing place above the junction, the shore below being of very soft mud. It serves as a repairing place for the river steamers and barges.

Ship-yard. About 2 miles above Port Isabel is a place called Ship-yard, where there are a few frame buildings and facilities for getting a vessel out of water, which is done as follows:

At the highest spring tide the vessel is taken as far as she can be got into one of the numerous narrow inlets of the slough; the receding tide will leave her resting on the bottom, supported on either side by the steep banks of the inlet. As there is about 10 feet difference between the high-water level of springs and neaps, the succeeding high waters will not come up to her, giving ample time for repairs before the next springs, which can be used to float her off.

The river steamers and barges enter the slough when waiting for the steamer from San Francisco, to avoid the strong currents in the river.

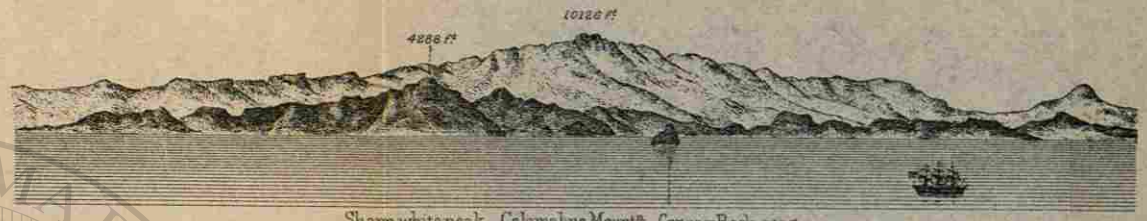
Philip's Point, Black Beacon. The Black Beacon on Philip's Point is 1$\frac{4}{10}$ miles N. 81° 15′ W. (W. ⅜ S. mag.) from White Beacon. It consists of a substantial frame on four posts, the top of which is cased in with boards and painted black.

Philip's Point may be regarded as the head of deep water navigation in the Colorado River. Above it the channel

Pinacate Mountain,
N.E.¼N. (mag.)—63 m.

M Coropah Mountains.

Plate XIV.



Calamahue Mountain.

Consag Rock.

Colorado River.
From the Anchorage off Philip's Point.

soon becomes very shallow and tortuous, navigable only by vessels of about 2 feet draft.

The north shore of the river from the mouth of the Santa Clara to Philip's Point and for several miles beyond, is an almost level alluvial plain, subject to overflow at high spring tides.

Montague Island. Montague Island, lying abreast of Philip's Point, on the south side of the main channel, is a low, flat island about 6 miles long in a NW. and SE. (mag.) direction, with a greatest width of 3 miles. It is covered with coarse grass and scattered drift-wood and logs, the latter giving evidence that it is subject to overflow at the time of freshets.

There is a passage between it and the right-hand, or western, bank of the river, which may be used at high water by small vessels, but is entirely bare at low-water springs. Southward of the island, along the Lower California shore, a mud bank, bare at low-water springs, extends for nearly 9 miles.

Gore Island. Gore Island, similar in character to Montague Island, lies three-quarters of a mile eastward of the southern part of the latter, separated from it by a channel in which there is at all times over a fathom of water, excepting a narrow bar (2 cables wide), where it joins the main channel, opposite Philip's Point, which is just bare at low-water springs. Gore Island is 2 miles long north and south, and three-quarters of a mile wide, and has a mud bank, similar to that south of Montague Island, extending off from it to the southward and eastward.

Channel. About 3 miles eastward of Gore Island, between the mud bank extending off from it and another similar mud bank 13 miles in length, which lies on the SW. side of the main channel, is a channel nearly a mile wide, through which $1\frac{1}{4}$ fathoms may be carried. It joins the main channel nearly opposite the mouth of the slough.

Directions for entering the main channel. After passing Consag Rock, bound into the Colorado River, bring the rock to bear (astern) S. 4° 30′ W. (S. $\frac{3}{4}$ E. mag.) and steer so as to *keep it on that bearing* until Direction Sand-hill is made out ahead, bearing N. 4° 30′ E. (N. $\frac{3}{4}$ W. mag.), when steer for it, *keeping it on that bearing.* It will not do to trust to compass courses, as the currents will sweep you a long way off the line of bearing. The lead

Caution.

must be kept constantly going as the shoals and mud flats are subject to frequent changes.

Do not enter the river with the tide ebbing, but take advantage of the first of the flood.

When within half a mile of the shore, in about 5 fathoms water, sandy bottom, Direction Sand-hill bearing N. 4° 30′ E. (N. ¾ W. mag.) and Shoal Point S. 57° E. (ESE. ¼ E. mag.), change the course to N. 60° W. (WNW. ½ W. mag.), passing inside of a sandy shoal, and continue that course until Direction Sand-hill bears E. by N. (mag.), when you will be a mile from the shore. From this point follow the shore line at the same distance from it, using the lead continually, until you make out Santa Clara Beacon, when you may steer for it until within a half a mile, when (being about the same distance from the shore) steer WNW. ½ W. (mag.) until Range Hill, 813 feet high, with conspicuous white cliffs, 24 miles west of Black Beacon, is just open of the latter. This range leads through the deepest part of the channel. When passing White Beacon, at the mouth of the slough, haul off a little to the southward to avoid the shoal which makes off from it.

Anchorage. The best anchorage is to the eastward of Philip's Point, off the mouth of a small estero that lies about midway between White and Black Beacons, and 2 cables off shore, where you will be in about 3½ fathoms of water at low-water springs, muddy bottom. The name Port Isabel is frequently applied to this anchorage.

Tidal currents. The tidal currents run with great strength at full and change of the moon, sometimes as much as six knots an hour, and there is no such thing as slack water. (View opposite page 130.)

When leaving the anchorage, bound out of the river, start on the last of the ebb and be guided by the directions for entering, applying them in a reversed manner.

Caution. Too much reliance must not be placed in the foregoing directions, as the beacons referred to may from one cause or another be removed, and the mud flats and shoals are subject to frequent changes; the lead is the best guide.

Tides. It is high water, F. and C., at Philip's Point at about 2^h 15^m. Spring tides rise from 25 to 30 feet; neaps, from 6 to 10 feet. The magnetic variation was 13° 4′ E. in 1876, increasing about 2′ annually.

Variation.

Remarks. The Colorado River is navigable for light-draft vessels as far as Colville, Nev., which is about 600 miles above Philip's Point. The influence of the tide is felt for about 40 miles, up to a place a few miles above Heintzelman's Point, and at a short distance above Philip's Point, at or near the time of spring tides, comes in with a bore or bank of water 4 feet high, extending in one huge breaker clear across the river, while the ebb is still running out.

Above Philip's Point the channel is crooked and obstructed in places by sand bars, some of which have at times not more than 2 feet of water over them. The channel retains an average width of nearly a half mile the entire distance to Colville. The winds at the mouth of the river are mostly from the north-west and in summer are very dry and hot.

The principal exports from the river are hemp, which grows wild in great abundance, argentiferous lead ores and copper ores. The river trade is in the hands of the Colorado Steam Navigation Company, which has three river steamers and three barges of from 70 to 100 tons burthen employed. These vessels draw about 1 foot of water when light and two feet when loaded.

PART III.

THE COAST OF MEXICO AND ADJACENT ISLANDS FROM THE MOUTH OF THE COLORADO RIVER TO CAPE CORRIENTES.

General description.

The coast of Mexico from the mouth of the Colorado River to Cape Corrientes, bordering partly on the Gulf of California and partly on the Pacific Ocean, is for the most part low and sandy, although there are many places where the mountains approach it closely. In the distant interior may be seen the summits of the Sierra Madre and of the high mountain ranges branching off from it.

The Mexican provinces bordering on this coast are, commencing at the Colorado River, Sonora, Sinaloa, and Jalisco, having together a population of 1,255,000. The climate is temperate and the interior of the country is fertile, but the principal sources of wealth are the mines of gold and silver that are found almost everywhere.

There are many places along the coast where vessels may anchor, and several important ports, among which are Guaymas, Mazatlan, and San Blas.

The depth of water off this coast is in general much less than that off the western coast of the Gulf of California.

The islands off the coast are generally barren and uninhabited. Tiburon Island, in the upper part of the gulf, is inhabited by the Seris tribe of Indians.

Winds and weather.

For a description of the winds and weather of the Gulf of California, see pages 53–54. The same remarks apply to the Mexican coast as far south as Cape Corrientes.

Currents.

The information regarding the currents along this coast is rather meagre, and the statements somewhat contradictory. They probably depend almost entirely on the winds, southerly currents predominating.

Between Guaymas and Cape Corrientes, during the rainy season (from May to November), they are strong and irregular. Northerly currents are frequently encountered at that season. Tide rips are often seen along the edge of the shoals that lie off this part of the coast.

CHAPTER I.

THE COAST AND ISLANDS FROM THE MOUTH OF THE COLORADO RIVER TO TOPOLOBAMPO HARBOR.

From Shoal Point, the eastern point of entrance to the Colorado River, the coast trends about S. 65° E. (E. by S. mag.) for a distance of 10 miles, and is generally low, with here and there a sand hill of moderate height. Shoal water extends off this part of the coast to distances varying from half a mile near Shoal Point to 2 miles at a point 10 miles to the eastward of it.

Adair Bay.

Adair Bay is a large bay entirely open to the southward, and is not navigable for even the smallest coasters, being full of dangerous, shifting shoals. Its western limit is 10 miles eastward of Shoal Point, from whence Rocky Bluff, the eastern limit, bears S. 69° E. (E. ¾ S. mag.), distant 25½ miles, the coast between falling away 10 miles from a line drawn between the two limits. The shore of the bay is low and sandy, with occasional rocky patches. In its northern part is a lagoon opening into the bay, with several sand-spits at its entrance which project 2 or 3 miles into the bay and are dry at low water. Low plains with surface deposits of soda extend far into the interior.

Variation.

The magnetic variation was 13° 05′ E. in 1877, increasing about 2′ annually.

Tides.

Spring tides rise about 22 feet.

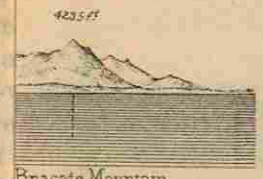
Pinacate Mountain.

Pinacate Mountain lies about 19 miles in a north-easterly direction from Adair Bay. It is 4,235 feet high, and is the last *high* mountain seen on this coast when coming from the southward. (View on opposite page.)

Rocky Bluff.

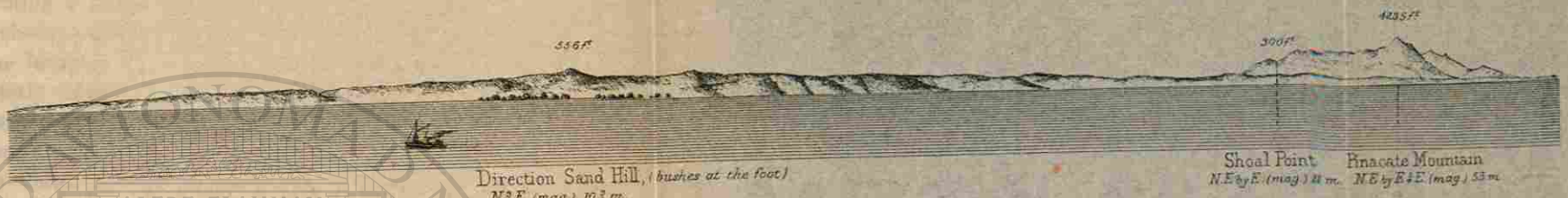
Rocky Bluff is a bold, rocky point of a dark color, surmounted by a sharp hill 408 feet high.

A small bight on its northern side is shoal and partly dry at low-water springs, but on its western and southern face 5 and 6 fathoms will be found close to, with no outlying dangers. The land back is low and sandy. A conspicuous, dark-colored, solitary hill 426 feet high, called Flat Hill, lies 4½ miles to the north-eastward of the point.



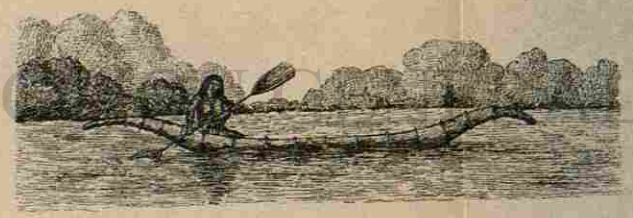
Pinacate Mountain
N.E by E ¼ E. (mag.) 53 m.

Plate XV.



The Sonora Coast at the entrance to Colorado River.

Pinacate Mountain.



Tiburon Canoe.

Section through middle.

Rocky Point lies 5 miles S. 66° E. (E. by S. mag.) from Rocky Bluff, and is like the latter in its general character. The hill surmounting it is 226 feet high. Rocky Point and Rocky Point Bay.

Between Rocky Bluff and Rocky Point the coast recedes somewhat, forming a small open bay called Rocky Point Bay, where anchorage may be had in from 5 to 7 fathoms of water, on a line between the two points, with shelter from the north-westerly winds. The shore of the bay is sandy and covered with bushes. Shoal water makes off from it about half a mile.

From Rocky Point the coast falls away to the eastward, having a general trend S. 72° E. (E. ½ S. mag.) for a distance of about 22 miles, and then gradually assumes a southerly trend, forming a large open bay, known as George's Bay. George's Bay.

The shores of the bay are low and sandy; back of them are plains reaching to the foot of mountains well in the interior.

Six miles eastward of Rocky Point is the entrance to a lagoon, into which small vessels may pass at high water; and from 9 to 10 miles farther east are some salt lagoons lying a short distance back of the beach and having no apparent communication with the waters of the bay.

South-eastward from these lagoons the water is shoal for from one to three miles off shore.

A mountain range approaches to within 5 or 6 miles of this part of the coast, the most conspicuous peak of which, called Table Peak, is 1,366 feet high and flat-topped.

George's Island lies 23 miles S. 43° E. (SE. by E. mag.) from Rocky Point. It is a barren rock about 6 cables in length and 3 in width; its highest peak, near the SE. extremity, is 206 feet high. Some rocks above water and awash, extend a little over half a mile from it, in a northwesterly direction. George's Island.

This island is covered with guano, which has been worked to some extent. Immense numbers of sea-fowl inhabit it, and a great many seals were seen along the rocky shore. Guano.

A fair anchorage, with protection from a south-east wind, may be found to the northward of the island, in 3½ fathoms water. Anchorage.

The magnetic variation was 13° 05′ E. in 1877, increasing about 2′ annually. Spring tides rise about 18 feet. Variation. Tides.

Shoal.

Four miles to the north-eastward of George's Island is an extensive and dangerous shoal, which makes off 3 miles from the western side of a low, sandy point that projects from the south-eastern shore of George's Bay. There are from 3 to 6 *feet* of water over this shoal at low-water springs. Between it and the island is a channel, with from 4 to 7 fathoms of water.

Coast south of George's Island.

From abreast of George's Island the coast trends nearly south for 20 miles and then gradually falls away to the eastward, Cape Tepoca, 49¼ miles from the observation spot on George's Island, bearing S. 24° E. (SE. ⅝ S. mag.) from it. As far as San Ignacio River (31 miles) it is low and sandy, with sand hills from 20 to 60 feet high. Southward of San Ignacio River the coast is higher, the hills approaching nearer the sea.

Soundings.

The soundings off shore increase gradually, the three-fathom line being from half a mile to a mile and a half from the beach.

Six and a half miles S. 72° 45′ E. (E. ⅜ S. mag.) from the observation spot on George's Island is the mouth of a small estero, which was not examined. It is said to extend about 2 miles inland, and that fresh water may be found just back of it.

Shoal.

Seven miles S. 20° E. (SE. by S. mag.) from George's Island and 5 miles from the main-land, a shoal spot on which there were from 4¾ to 6 fathoms of water, was passed over, there being 8 and 9 fathoms north and south of it, at the same distance from the shore of the main-land.

San Ignacio River.

San Ignacio River, the mouth of which lies 31½ miles S. 24° E. (SE. ⅝ S. mag.) from George's Island, has an extensive shoal off it, over which the sea breaks heavily at times. The river as it approaches the coast loses itself during the dry season, in the sand, only breaking through to the gulf during the rainy season.

Fresh water.

Near the south bank of the river, about a mile from the coast, are some Indian huts and a well; fresh water may be procured at all times just back of the sand hills.

Game.

The banks of the river are covered with vegetation, and game is plentiful in the vicinity. About 75 miles from its mouth is the town *El Altar*, and 60 miles beyond is *San Ignacio*, with its renowned mining district (gold and silver).

The mouth of the river may be readily distinguished by the break in the sand hills, through which it passes to the gulf. The northern extremity of the coast range of mountains is just south of the river.

Cape Tepoca.

Cape Tepoca, or Tepoca Hill as it is sometimes called, lies 17¾ miles south-eastward of the mouth of the San Ignacio River, the coast between sweeping about 3 miles to the eastward. It is of a reddish color and 300 feet high; when first seen from the northward it appears like an island.

Tepoca Bay.

From Cape Tepoca a low, rocky point makes out to the south-eastward about half a mile, having a reef and large rock partly covered at high water extending off from it about a quarter of a mile farther in the same direction. This point and reef form the western limit of Tepoca Bay, which is entirely open to the southward and about 2½ miles in extent east and west. The northern shore of the bay is low and sandy, covered with bushes; the eastern shore is bluffy, with the coast range rising a short distance back.

Anchorage.

There is good anchorage in Tepoca Bay, sheltered from the north-westerly winds, in 5 or 6 fathoms at low water, half a mile from the shore. Spring tides rise about 15 feet, neaps about 12 feet. The *magnetic variation* was 12° 35′ E. in 1875, increasing about 2′ annually.

A flat-topped hill 1,575 feet high, bearing N. 60° E. (NE. ¼ E. mag.), 6½ miles distant from Cape Tepoca, is an excellent guide to the anchorage in Tepoca Bay, when coming from the southward.

From Cape Tepoca the coast turns sharply to the eastward and trends in that direction for 2½ or 3 miles, when it again assumes a southerly trend, Cape Lobos bearing S. 18° E. (SSE. ¾ E. mag.), 23 miles distant from Cape Tepoca. For about 10 miles southward of the eastern limit of Tepoca Bay, sand cliffs from 25 to 50 feet high lie just back of the beach; thence to Cape Lobos the coast is generally low and sandy, the coast range approaching the shore. Fourteen and a half miles S. 27° E. (SE. ½ S. mag.) from Tepoca Point a peak, 1,642 feet high, rises immediately back of a steep shore. Lobos Peak, 3 miles north of the cape of the same name, is 1,186 feet high and somewhat less than half a mile from the shore.

Cape Lobos.

Cape Lobos is a rocky headland of the same character as Cape Tepoca; near it are three hills, close together, the westernmost and highest of which is 669 feet high.

Vessels may approach the cape closely, 5 and 6 fathoms of water being found at a cable distant from it.

The entire distance from Cape Tepoca to Cape Lobos appears to be free from outlying dangers, the water shoaling gradually toward the shore.

Libertad anchorage.

At Cape Lobos the coast again turns sharply to the eastward, trending in that direction for 3½ miles, when it assumes a south-easterly trend. The open bay or bight thus formed is known as Libertad anchorage, where a vessel will be well protected from the north-westerly winds, but exposed to south-easters. The best place to anchor is from three-quarters of a mile to a mile eastward of the cape and a scant half mile off shore, in 8 or 9 fathoms.

Two and a half miles eastward of the cape, a sandy beach intervening, is a low projecting point, from which a shelving, rocky ledge and numerous detached rocks extend 2 cables in a southerly direction. Back of this point are some houses, one of which is used as a custom-house.

Custom-house.

Tides.

Variation.

Three fathoms of water are found close to the sandy beach just mentioned. Spring tides rise 12 feet, neaps 9 feet. The magnetic variation was 12° 30′ E. in 1875, increasing about 2′ annually.

Libertad is a shipping port for some of the agricultural and mineral products of the province of Sonora.

From Cape Lobos to Cape Tepopa, a distance of 36½ miles, the general trend of the coast is S. 28° E. (SE. ⅜ S. mag.). The shore consists for the most part of sand and shingle beaches, with occasional rocky bluffs intervening, the coast range rising to elevations varying from 500 to 2,300 feet, a short distance back of it. One or two small patches of kelp were met with along this part of the coast, close to the shore.

Shoal.

Eight and a half miles north of Cape Tepopa is a low slightly projecting point, off which a shoal, with from 2½ to to 3 fathoms of water on it, extends nearly three-quarters of a mile. With this exception the coast is clear, the water shoaling gradually toward the shore, from 15 to 30 fathoms being found a mile off.

Northward of Cape Tepopa a curve in the coast line forms a sort of open bay, which, however, affords no protection whatever from the prevailing winds. The shore of this bay

is low and sandy; back of it, low plains covered with bushes stretch far into the interior.

Cape Tepopa is a bold rocky headland surmounted by a peak 1,857 feet high.

Cape Tepopa.

Tepopa Peak is the northernmost and highest of a small group of hills that lie parallel to the coast, and are separated from the coast range, which lies 5 miles to the eastward, by low sandy plains.

Sargent's Point is 6½ miles to the south-eastward of Cape Tepopa. It is a barren, rocky hill 150 feet high, at the southern extremity of a low, narrow neck of land that is subject to partial overflow at high-water springs; the coast between it and Cape Tepopa is low.

Sargent's Point.

Just west of the point a curve in the coast line forms a small bight, where tolerable anchorage may be found in 7 fathoms of water, half a mile from the shore.

Anchorage.

East of Sargent's Point is a small bay, but the water in it is too shoal for it to be of any value. The beach of this bay is very flat, the low-water line being from half a mile to a mile outside that of high water.

At the north-west side of the bay is the outlet of a lagoon that lies parallel to the north shore, a narrow strip of sand intervening between it and the waters of the bay. Back of the lagoon is the low sandy plain before mentioned as intervening between the group of hills near Cape Tepopa and the coast range.

The main-land, from Sargent's Point to San Miguel Point, a distance of over 20 miles, has a south-easterly trend, and is for the greater part of the distance low and sandy, with a scattered growth of bushes.

Patos Island, the north-west point of which lies 5¾ miles S. 20° W. (S. ¾ W. mag.) from Cape Tepopa, is small in extent, and, except on the northwest side, where it rises in a conical hill to a height of 274 feet, is low. A deposit of guano gives it a whitish appearance.

Patos Island.

The passage between Patos Island and the main-land, as well as that between it and Tiburon Island, is perfectly safe, with a least depth of 7 fathoms, near the land.

Passage.

There is a tolerable anchorage on the southern side of Patos Island, with some protection from a north-westerly wind, in 5 fathoms of water, sandy bottom, a quarter of a mile from the beach. In using this anchorage care should

Anchorage.

be taken not to approach the low shingle point that makes off from the SW. side of the island, nearer than a quarter of a mile, as shoal water extends off some distance from it.

Tides. Spring tides rise 10 feet, neaps 7 feet. The magnetic

Variation. variation is 12° 30′ E.

Tiburon Island. Tiburon is the largest island in the Gulf of California, being about 29 miles long, nearly north and south, with an average width of 15 miles. It is high and rugged, with peaks varying in height from 1,000 to nearly 4,000 feet. A narrow, intricate channel called El Infiernillo separates it from the main-land to the eastward.

Northern side of Tiburon. The north-west extreme lies 10½ miles S. 12° 30′ W. (S. mag.) from Cape Tepopa, and is a rocky bluff surmounted by a steep hill 1,123 feet high. Some detached rocks lie a short distance off. Five and three-quarters miles to the eastward of this is a high bluff point, the northern extremity of the island, between which and Sargent's Point is a channel $4\frac{1}{10}$ miles wide with 7 and 8 fathoms of water.

Fresh-water Bay. Fresh-water Bay is formed by a curve in the coast line between the north and north-west extremes of the island. It affords an anchorage in from 5 to 7 fathoms of water, three-quarters of a mile from the shore, with shelter from south-easters, but is entirely open to the north-west.

The land back of the bay slopes gradually toward the mountains in the interior of the island and presents a fertile appearance.

The NE. point of the island, is $3\frac{4}{10}$ miles eastward of the north extremity and the same distance from the nearest main-land to the north-eastward. A sandy islet 5 feet high lies in the prolongation of the point, connected with it by a shoal over which the water breaks. In the channel between the islet and the main-land are 3 and 4 fathoms of water, near the islet.

Channel.

Eastern side of Tiburon. The eastern side of the island, from the NE. extreme to a low projecting point opposite San Miguel Point on the main-land, a distance of about 15 miles, is with the exception of a short stretch of bluffs, 10 to 20 feet high, low, sandy, and covered with a scanty growth of bushes.

El Infiernillo. This part of Tiburon Island is separated from the main-land by a channel varying in width from one to three miles, and called El Infiernillo. In its southern part from 5 to 7 fathoms of water are found, and it is comparatively free

from shoals, but in its northern part the water is shallow and it is full of shoals and sand-spits. It is unsafe for navigation by any except the smallest class of vessels. Half a mile northward of San Miguel Point is a small lagoon with shoal water off its mouth.

From the low point (before mentioned) opposite San Miguel Point, to the south-eastern extreme of the island, it is 13½ miles, the shore-line trending S. 12° 30′ W. (S. mag.). For the first 8 miles of this distance the shore is low and sandy, with shoals and sand bars extending from a half a mile to a mile and a quarter off from it. The remainder is a steep coast, with rocky bluffs near the SE. point of the island, and the water near the shore is deeper, from 5 to 7 fathoms being found a quarter of a mile off shore.

The SE. point of the island is a high headland situated at the extremity of a peninsula that projects a mile from the main body and is half a mile in width. There are two hills on this peninsula, separated from each other by a strip of low land which forms a shallow basin for the reception of water during the rainy season.

Anchorage. On the north side of the peninsula just mentioned, good anchorage will be found in 5 or 6 fathoms of water, sheltered from the prevailing winds. A sand beach at the junction of the peninsula with the main body of the island affords a landing place.

Huts. Five and a half miles north of the anchorage is a collec-

Fresh water. tion of Indian huts, near which it is said fresh water may be obtained.

Southern coast of Tiburon. Monument Point, the southernmost point of Tiburon Island, is a rocky, bluff point, situated 3¾ miles S. 69° W. (SW. by W. mag.) from the SE. extremity of the island. The intervening coast is a sand beach and recedes half a mile from a line drawn between the two points.

From Monument Point the coast trends about N. 64° W. (WNW. ¾ W. mag.) 15½ miles to Willard's Point, the SW. extremity of the island, and is with the exception of a small bight situated just west of Monument Point, a succession of rocky bluffs which project in places beyond the line of bearing. Back of the coast the mountains rise abruptly. This part of the coast appears to be free from hidden dangers, with deep water close to the shore.

Turner's Island. Turner's Island is a small barren island about 1¼ miles

in length north and south, half a mile wide, and 550 feet high, lying 1¼ miles to the south-eastward of Monument Point. A reef of rocks, both above and below water, extends half a mile off from its northern end, leaving a narrow boat passage between it and Seal Rock.

Seal Rock. Seal Rock is a rocky islet 150 feet high, lying between Turner's Island and Monument Point. There are numerous outlying rocks surrounding it, but there is a clear channel a quarter of a mile wide, through which 5 fathoms of water may be carried, between it and Monument Point.

Rock. Six cables to the south-westward of the above-mentioned islet there is a dangerous rock, awash at high water.

Red Bluff Point. Red Bluff Point is a sharp, rocky point of a reddish color and about 150 feet high, situated 2½ miles to the westward of Monument Point.

Anchorage. Between Monument and Red Bluff Points the coast recedes about three-quarters of a mile, forming a small bay, open to the southward, in which good anchorage may be found in 5 or 6 fathoms, a quarter of a mile from the shore, which is a sand beach, with shelter from the north-west winds. The magnetic variation was 12° 05′ E. in 1877.

Variation.

Tides. Tides rise 6 to 8 feet. About midway between the two points mentioned above there is a slightly projecting rocky point with an arroyo just east of it.

Willard's Point. Willard's Point, the south-western extreme of the island, is a bold cliff over 300 feet high, surmounted by a hill about 800 feet in height. There is said to be a tolerable anchorage about 1½ miles eastward of it, in 7 fathoms of water, close to the shore.

Three and a quarter miles eastward of Willard's Point, and 1½ cables from the shore, there is a large, detached white rock 30 feet high.

Western shore of Tiburon. The western shore of the island from Willard's Point to its north-western extremity, a distance of 21 miles, is for the most part steep, with rocky bluffs, the mountains rising abruptly just back of the coast.

The general trend of the coast from Willard's Point is N. 16° E. (N. ⅜ E. mag.) and it is for the greater part clear of dangers, with deep water close to. One and a half miles northward of Willard's Point and less than a cable off shore, there is a detached rock 8 feet high, and 11½ miles farther north is another similar rock. Near the NW. extreme of

the island there are a number of outlying rocks close to the shore.

Remarks. During the greater part of the year Tiburon Island is resorted to by the Seris (or Ceres) tribe of Indians, who inhabit the adjacent main-land, and their huts and encampments may be seen in many places along the shore, principally on the eastern side of the island. They are reputed Hostile Indians. to be exceedingly hostile and to use poisoned arrows in opposing the landing of strangers on what they consider their domain, but during the stay of the *Narragansett* in the vicinity they were very friendly. At first they were shy and made threatening gestures, but soon finding that our intentions were peaceable, became friendly and returned our visits to the shore by frequent and lengthy calls on board ship. They are very expert in hunting with the bow and arrow and in catching fish and turtle, which abound in the surrounding waters.

Canoes. The canoes of these Indians deserve especial mention. They are made of long reeds, which are bound together with strings after the manner of fascines, three of which when fastened together as shown in the sketch opposite page 136, have sufficient buoyancy to support one or two persons. They kneel in these canoes when paddling, the water being at the same level in the canoe as outside of it. One of these canoes was purchased for a pint of alcohol, largely diluted with water, and a couple of pairs of old trowsers.

Deer. A species of large deer is found in great numbers on the island, one of which we succeeded in killing.

Pearl oysters. A rich bed of pearl oysters is *said* to exist in the channel between the island and the coast of Sonora, and there are Gold mines. reports of rich gold mines on the island, but these reports need confirmation.

San Esteban. San Esteban is a barren, rocky island lying 7¾ miles south of the south-western point of Tiburon. It is 4 miles long north and south, about 3 miles wide, and from 1,000 to 1,800 feet high. On its eastern side, a mile from the south-east point, is a rock 25 feet high, a quarter of a mile from the shore, to which it is connected by a rocky reef. Just north of this rock and reef is a gravel beach, from which a valley slopes toward the interior of the island. From the south-western part a low shingle spit makes off three-quarters of a mile, the soundings on either side of it increasing rap-

idly. The remaining shores of the island consist of almost perpendicular bluffs, varying in height from 100 to 500 feet, with short stretches of gravel and shingle beaches intervening.

Channels. The channels between San Esteban and Tiburon on the north and San Lorenzo on the west, are free from dangers, with soundings of 100 fathoms and upwards.

San Miguel Point. San Miguel Point, on the Sonora coast, is low, sandy, and covered with bushes. A shoal with 3 fathoms of water at its outer edge makes off three-quarters of a mile from its southern side.

From here the general trend of the coast is S. 42° E. (SE. ¾ E. mag.). Just south of the point it lies nearly east and west, and for a distance of 4 miles is low and sandy. Then follow steep bluffs, terminating in Dark Bluff, 175 feet high, back of which, a short distance inland, a sharp peak rises to a height of 1,480 feet. After passing Dark Bluff the coast becomes low again.

Kino Point and Bay. Kino Point bears S. 42 E. (SE. ¾ E. mag.) 17¾ miles distant from San Miguel Point and S. 88° 30′ E. (E. by N. mag.) 15¾ miles distant from the south-east extremity of Tiburon Island. It is a prominent point, of moderate elevation, with a group of hills, the highest of which reaches an altitude of 1,336 feet, rising a short distance back of it.

The soundings between Kino Point and Tiburon are very regular, but show comparatively shoal water, 14 fathoms being the greatest depth obtained.

Kino Bay lies just north of the point of the same name. Throughout the greater part of its extent the water is shoal, but small vessels may anchor in it and find shelter from the prevailing winds. Tides rise about 6 feet.

Tides.

Pelican Island. Pelican Island, in the northern part of Kino Bay, lies 3 miles N. 10° W. (NNW. mag.) from Kino Point and a little over a mile from the nearest main-land to the eastward, the channel between it and the main-land having a greatest depth of 1¾ fathoms. It is small in extent and 540 feet high. Its shores, with the exception of the south-western face, which is of rocky bluffs, are low and sandy. In its northern part is a small lagoon.

La Cruz Lagoon. La Cruz Lagoon, which has several branches spreading out through a low, flat country, opens into the head of Kino Bay. The entrance, which is half a mile wide, has a greatest depth

of 2 fathoms, but a bar which extends off from it a short distance has only 1½ fathoms on it; the depth of water inside the lagoon was not examined.

Rio Sonora. The Sonora River, which rises near the southern boundary of Arizona, and with its tributaries drains the greater part of the province of Sonora, divides into several branches, which disappear in the low country surrounding La Cruz Lagoon. Ures, the capital of Sonora, and Hermosillo, an important city (see page 157), are situated on the banks of the Rio Sonora.

Ures, Hermosillo.

The coast south-eastward of Kino Point is for about 5 miles rocky, sloping from the hills a short distance back. There are several small outlying rocks near the shore.

San Juan Bautista Flats. Five and a quarter miles south-eastward of Kino Point the shore becomes low and sandy, with a scanty growth of bushes, and sand hills from 25 to 50 feet in height. It retains this character for a distance of 30 miles, and is known as the San Juan Bautista Flats.

Rio de la Poza. The Rio de la Poza, which, like the Rio Sonora, divides and disappears in the San Juan Bautista Flats during the dry season, overflows them in the wet season, carrying vast quantities of sand into the gulf and creating extensive *shoals* along this part of the coast.

Shoal. Twenty-two and a quarter miles south-eastward of Kino Point, a low, sandy point projects over a mile from the general coast line, and a sandy shoal, with 3 fathoms of water on its outer edge, extends over 3¾ miles off from the point to the south-westward. The SW. point of the shoal lies on the following bearings, viz: Highest peak of San Pedro Martir Island (1,052 feet high) S. 86° W. (WSW. ½ W. mag.), distant 30 miles; hill back of Kino Point (1,336 feet high) N. 21° W. (NW. by N. mag.), distant 20¾ miles.

Caution. Care should be taken to give the shoal just mentioned a good berth, as appearances seem to indicate that it is increasing in extent to the south-west and west. Only 6 fathoms of water are found 5 miles to the westward of the low sand point.

Estero de Tastiota. The Estero de Tastiota, which is situated at the southern limit of the San Juan Bautista Flats, has a narrow entrance, through which only 3 feet of water can be carried at high tide. Outside the entrance the water is shoal for about a

mile off shore; inside it expands to a considerable size, trending to the northward, a range of hills rising behind it.

Fresh water. Fresh water may be obtained near the head of the estero.

Anchorage. Anchorage may be had in *good weather* off the mouth of the Estero de Tastiota in 6 or 7 fathoms of water, half a mile off shore.

Morro Colorado. Morro Colorado is a remarkable head-land 758 feet high and of a reddish color. It is situated a little less than 5 miles south-eastward of the entrance to the Estero de Tastiota, the intermediate coast consisting of steep bluffs from 50 to 75 feet high, with a number of outlying rocks. Hills rise immediately back of the coast.

From Morro Colorado to San Pedro Point, a distance of 17½ miles, the coast trends S. 32° E. (SE. ⅛ S. mag.) and is high and barren; rugged, bluff points from 300 to 500 feet high alternating with short, steep stretches of sand beach. Throughout the entire distance there is no shelter from the prevailing winds, nor any safe anchorage. A number of detached rocks awash and above water lie off this part of the coast.

Las Piedras Blancas. Las Piedras Blancas are three white rocks, one of which is 60 feet high, and the other two 15 feet in height. The largest of these rocks lies 7 miles south-eastward of Morro Colorado, and a little over three-quarters of a mile from the shore; the other two lie from 1¼ to 1¾ miles on either side of it—one to the northward, the other to the south-eastward.

Another group, consisting of 4 rocks, varying in height from 15 to 100 feet, lies between 3 and 4 miles to the northward of San Pedro Point and less than a quarter of a mile from the shore.

San Pedro Point and Bay. San Pedro Point is a bold, rocky head-land 525 feet high.

San Pedro Bay is a small cove lying to the south-eastward of the point of the same name. The entrance, which is three-eighths of a mile wide, lies between two steep, rocky heads, and has a depth of from 5 to 8 fathoms. The head of the bay, which is somewhat less than half a mile from the entrance, is a sand beach, with a range of hills lying back of it. The soundings decrease gradually toward the shore.

Anchorage. Anchorage in from 5 to 6 fathoms of water, with shelter from the north-west winds, will be found about midway of the entrance.

Variation. The magnetic variation was about 11° 30′ in 1877, increasing about 2′ annually.

Tides. Tides rise about 5 feet.

San Pedro Nolasco Island. San Pedro Nolasco Island is a barren rock of volcanic origin, lying 8¼ miles to the south-westward of San Pedro Point. It is 2¼ miles in length, parallel with the coast, three-quarters of a mile wide in the centre, and varies in height from 500 to 1,071 feet. There is a place on the SE. side where a landing may be effected; in every other part it is inaccessible. Some deposits of guano are said to exist on it. Off the southern extreme there are some outlying rocks close to, elsewhere the water is deep close to the bluffs. Soundings of 35 and 40 fathoms were obtained along the eastern side, a cable's length off shore.

South-eastward of San Pedro Point the coast has the same rugged character as above it, for a distance of 5¼ miles, or as far as Point San Eduardo, which is a rocky, bluff point 60 feet high, the land back of it sloping from a mountain 2¼ miles distant and 2,422 feet high, known as Algodones.

Three-quarters of a mile to the south-eastward of Point San Eduardo, and close to the shore, is a small islet, or rock, 40 feet high, with a rock awash just outside of it.

Between Point San Eduardo and Point San Antonio, a distance of 5¼ miles, the coast is low and generally sandy. Southward of Algodones Mountain, close to its foot and half a mile from the beach, is a ranch, with *fresh water* and considerable cultivated ground in the vicinity. Fresh water.

Algodones Islands. The Algodones are three small islands lying about 1½ miles to the north-westward of Point San Antonio. They extend about a mile in a line nearly at a right angle with the coast line, and the largest is a little over a cable in width.

Venado. Venado, the outermost and largest of the three, is about 150 feet high, steep and rocky. About four cables east of its SW. extremity lies a solitary rock 5 feet above water.

San Luis. San Luis, the second in size of the Algodones Islands, is about 30 feet high, with a passage less than 150 yards wide between it and the main-land.

Doble. Doble, the smallest of the three, lies between the other two.

A cable to the northward of the NE. end of San Luis is the entrance to a small lagoon.

Point San Antonio. Point San Antonio is low and rocky, the hills back of it rising to a moderate height. On its NW. side, close to, is an outlying rock 30 feet high.

Along this part of the coast the soundings show deep

water close to the shore, 23 fathoms being found within half a mile of the point, increasing to over 100 fathoms 3½ miles off.

From Point San Antonio the coast trends about east for 2¼ miles, and is of a rocky formation, with many outlying rocks both above and below water.

Tetas de Cabra. The Tetas de Cabra are two remarkable peaks, 1,633 feet high, situated about a mile and a half to the eastward of Point San Antonio and less than half a mile back of the beach. They resemble, as their name implies, a goat's teats, and are a valuable land-mark in making the port of Guaymas. (View opposite page 155.)

Point Doble. Point Doble, 2¼ miles east of Point San Antonio, is a head-land from 200 to 300 feet in height, and of an average width of 1½ cables; it projects to the southward from the general coast line nearly a mile. The southern extremity of this head-land, which is 50 feet high, is called Point Doble.

On the west side of the head-land, where it joins the coast, is a small open bay with a sandy shore, known as the Ensenada de las Tetas.

Point San Guillermo. Point San Guillermo is a rocky point projecting from the east side of the head-land just mentioned. A number of detached rocks lie off the point, and about half way between it and Point Doble is a *rock* 150 feet high, known as Santa Catalina Island.

Santa Catalina.

Point Paredones. Point Paredones is a bluff point situated at the eastern side of the entrance to Puerto San Carlos. The extremity of the point is 3 cables north of Point San Guillermo, and 1½ cables east of the nearest part of the head-land of which Point Doble is the southern extremity.

Puerto San Carlos. Puerto San Carlos is a small land-locked harbor which affords an excellent anchorage, with perfect shelter, for small vessels. The entrance, which is between Point Paredones and the head-land mentioned above, is only a cable in width at its narrowest part, with from 4 to 8 fathoms of water. Inside, the width of the harbor increases to a quarter of a mile, the water shoaling gradually toward its head, 3 fathoms being found 4 cables from the narrowest part of the entrance.

San Nicolas Island. San Nicolas Island is a small islet about 50 feet high, and surrounded by detached rocks. It lies a scant half mile eastward of Point San Guillermo, and about the same distance from the nearest land to the northward. In the channel between it and Point San Guillermo there are from 9 to 11 fathoms of water.

The passage between it and the main-land to the northward is considered dangerous, being full of rocks and islets.

Punta de las Cuevas. Punta de las Cuevas is a sharp bluff point situated half a mile eastward of Point Paredones. Between the two points and San Nicolas Island are some outlying rocks and islets, making the channel dangerous, as mentioned above.

Ensenada de San Francisco. The Ensenada of San Francisco is a large open bay formed by a sweep to the northward of the coast line east of Punta de las Cuevas. The shore in the western portion of the ensenada is hilly, in the eastern portion of the north shore it is low and sandy, the low-land extending well into the interior. The eastern shore is for the most part rocky, with bluffs, high land rising immediately back.

Estero Soldado. An extensive lagoon known as the Estero Soldado opens into the north-eastern part of the bay, and there are several islets and rocks within its limits.

Chapetona, Medio, and Candelero Islands. Chapetona lies in the north-western part of the Ensenada de San Francisco, and is a barren islet about half a mile long and 40 feet high, with steep bluffy shores and numerous outlying rocks.

Medio and Candelero Islands, in the eastern part of the ensenada, are respectively 20 and 35 feet high. About a cable north of Medio is a detached rock 40 feet high, and about the same distance north of Candelero is one 8 feet high, between which and Medio is a channel nearly half a mile wide and apparently free from dangers. All three of these islands are surrounded by outlying rocks close to.

Rocks.

Ensenada de Bocochibampo. The Ensenada de Bocochibampo is an open bay a little more than a mile in extent either way, lying north of Colorado Point. There is from 8 to 10 fathoms of water at the outer limit of the bay, decreasing rapidly toward the head.

Anchorage. Good anchorage may be had in 4 or 5 fathoms, half a mile from the beach in the north-eastern part of the bay.

Supplies. Fresh water, fresh beef, fruit, &c., may be obtained.

Just back of the eastern shore of the bay is a shallow lagoon, into which only boats can enter.

Cerro Bocochibampo. Cerro Bocochibampo (two peaks), 1,643 feet high, lies about a mile to the northward of the northern shore of the ensenada of the same name.

Point Colorado. Point Colorado is a prominent head land 60 feet high, connected with the main-land by a low, narrow strip of sand beach. Off its southern side are numerous detached rocks.

Blanca Island. Blanca Island, lying about 300 yards to the north-westward of Point Colorado, is about 230 yards long and 100 feet high.

The coast from Point Colorado to Cape Haro is irregular in its outline, high and barren, with numerous projecting head-lands and outlying rocks.

Cape Arco. Cape Arco, two and a half miles S. 25° E. (SE. ¾ S. mag.) from Point Colorado, is a high, rocky bluff, with a hill 862 feet high, rising abruptly back of it. About half way between the two points, a little nearer Cape Arco, and a quarter of a mile from the nearest shore, is a solitary rock 30 feet high.

Lobos Island. Lobos Island is a large rock 125 feet high, lying 2 cables to the north-westward of Cape Arco and close to the shore. From 3 to 5 cables northward of Lobos Island is a group of rocks lying a short distance off the land, some of which are from 30 to 40 feet high.

Mesquite Point. Mesquite Point, which is 250 feet high, is a little more than 1¼ miles eastward of Cape Arco.

Ensenada Carisel. Between Cape Arco and Mesquite Point there is a deep bight, known as Ensenada Carisel. It is entirely open to the southward and has a short strip of sand beach in its most northern part. Part of its northern shore is of rocky bluffs, with outlying rocks.

San Rafael Point. San Rafael Point is a rocky, bluff point, situated about midway between Mesquite Point and Cape Haro. Mount San Rafael, 1,200 feet high, bears N. 25° E. (N. by E. ¼ E. mag.) from it, distant 5 miles.

Cape Haro. Cape Haro is the southern extremity of the peninsula upon which Guaymas is situated.

It is a prominent, rocky head-land, surmounted on its western end by a bold hill 365 feet high, and may be closely approached, upwards of 20 fathoms of water being found within a cable's length of it. There are many conflicting reports regarding the strength and direction of the currents off this part of the coast, but it is evident that they depend greatly, if not entirely, on the force and direction of the wind.

Currents.

The south point of the island of San Pedro Nolasco bears N. 74° W. (W. ⅜ N. mag.), 27 miles distant from Cape Haro.

Bay Eastward of Cape Haro is a large bay 13 miles in extent, from the cape to the nearest point of land to the eastward, and about 4½ miles deep from a line drawn between the two points. Throughout its extent the water is of moderate depth.

The harbor of Guaymas opens into the north-western part of this bay.

From Cape Haro to San Vicente Island the coast is steep and rocky, with an irregular and broken outline.

Point Narisson. Point Narisson, the first prominent point north of Cape Haro, is 8 cables distant from it, and is composed of high, rocky bluffs.

Catalina Bay. Catalina Bay is a small cove, open to the eastward, the entrance being between Points Maria and Ventana, the former of which is a little more than half a mile north of Point Narisson. The soundings in the bay are regular, varying from 3 fathoms near the shore at its head, to 8 and 10 fathoms at the entrance.

San Vicente Island. San Vicente Island, formerly known as Trinidad, is the western point of the entrance to the harbor of Guaymas. It is separated from Paz Point on the main-land by a channel 100 yards wide, through which 2½ fathoms of water may be carried. The name Trinidad was probably given to this island from the fact that, in connection with a large outlying rock to the northward, it appears from a short distance like three separate islands.

Pitahaya Island. Pitahaya Island, lying just north of Paz Point, is high, rocky, and of small extent. The channel between it and the point is a little over a cable in width, with from 2 to 3 fathoms of water. On the main-land to the eastward of Pitahaya is a small stream emptying into the bay. It is said that fresh water may be obtained a short distance up this stream.

Pajaros Island. Pajaros is a long rocky island, the highest point of which is 212 feet high. It forms the eastern side of the entrance to Guaymas harbor, the channel between it and San Vicente being 8 cables in width, with 6 fathoms of water. From its SW. extremity a rocky reef makes off a short distance to the northward, and a similar one makes off from its NE. extreme.

Guaymas Harbor. Guaymas Harbor may be considered as divided in two parts, viz: An outer harbor, where vessels of 20 or 22 feet draught may anchor, and an inner one where those of not over 15 feet draught may lie.

Outer Harbor. The outer harbor occupies a space inclosed between Punta Baja and Morro Ingles on the east and the islands of Almagre Grande and Ardilla on the west.

Inner Harbor. The inner one lies inside of the islands just mentioned, between them and the main-land.

Punta Baja. Punta Baja lies about 8 cables to the north-westward of the SW. extreme of Pajaros Island, the channel between having a depth of from 5½ to 7 fathoms. It is a rocky, bluff point, with some outlying rocks close to; back of it the land rises gradually.

Morro Ingles. Morro Ingles is a solitary, rocky hill situated at the western extremity of a long, low, narrow strip of sand beach, known as the Playa de las Dolores. It bears N. by E. (N. mag.) from Punta Baja and is three-quarters of a mile distant from it, the navigable channel between them being half a mile wide, with a depth of from 3 fathoms near the shore on either side to 5½ and 6 fathoms in the middle.

Shoal. A shoal which is partly bare at low water extends 3 cables westward from the Morro Ingles.

Boca Chica. Between Pajaros Island and the Playa de las Dolores is a passage through which 12 feet draught may be carried. This passage is known as the Boca Chica.

Almagre Grande. The centre of Almagre Grande bears S. 78° W. (SW. by W. $\frac{7}{8}$ W. mag.) from Morro Ingles, and with Ardilla, which lies directly north of it, distant 350 yards, forms the western boundary of the outer harbor.

Ardilla. Ardilla is somewhat smaller than Almagre Grande and 112 feet high. On its eastern end is a fort.

The passage to the inner harbor lies between Almagre Grande and Ardilla, and is about 1½ cables in width at the narrowest part.

Almagre Chico. Almagre Chico lies west of Almagre Grande and is 158 feet high.

Anchorage. The best anchorage for large vessels is on or just inside of a line between the highest points of Almagre Grande and Morro Ingles, in 3½ to 4 fathoms of water, where good holding ground will be found, with protection from every wind. Smaller vessels having a draught of not over 12 or 13 feet may proceed farther in, passing between Almagre Grande and Ardilla, and anchor in 2½ to 2¾ fathoms, half a mile from the landing place. The inner anchorage is perfectly land-locked. Vessels of over 22 feet draught should

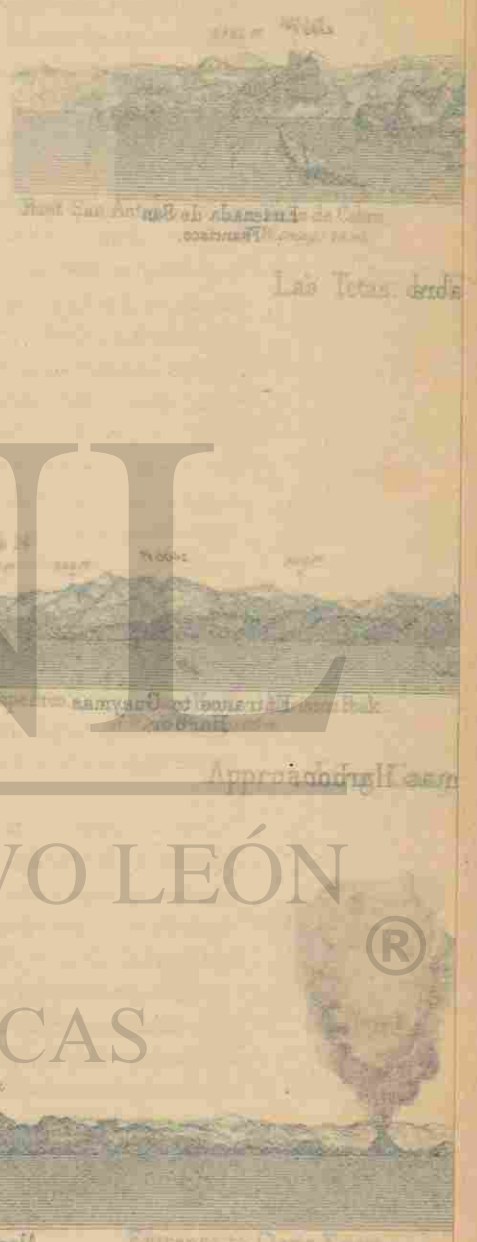
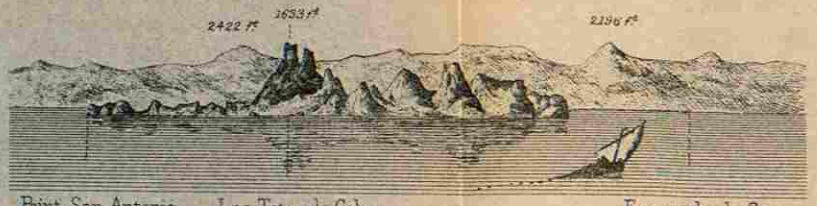


Plate XVI.

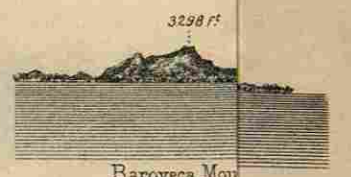


Las Tetas de Cabra.

Approaching Guaymas Harbor.

From the Anchorage off Ciaris Island.

Plate XVI.



anchor between Pajaros Island and Punta Baja, in 6 fathoms of water.

Directions

The land in the vicinity of Guaymas having been once seen cannot, with ordinary care, be mistaken. Cape Haro and Las Tetas de Cabra are probably the best land-marks and are not easily mistaken even by an entire stranger. (View on opposite page.)

It is advisable to make the land to windward of Cape Haro (the prevailing wind being from the north-west), keeping it under the lee until close in, when it may be rounded close to, deep water extending close up to the rocks. After rounding Cape Haro the entrance between San Vicente (or Trinidad) and Pajaros Islands will be readily distinguished. Steer so as to leave Pajaros on the starboard hand, giving the points on either side a berth of a cable. After passing Punta Baja, being in about 6 fathoms of water, steer for the fort on the eastern end of Ardilla Island and anchor in 4 fathoms, about on a line between the highest parts of Morro Ingles and Almagre Grande. The lead is a safe guide in entering, and after passing the south-western end of Pajaros Island must be kept going, to avoid getting in the shoal water on the east side of the channel. With a leading wind this shoal may be easily avoided by keeping well over toward Punta Baja. In beating in care must be taken not only on account of the shoal just mentioned, which may easily be avoided by a proper use of the lead, but also to avoid the shoal (which partly uncovers at low water), lying off Morro Ingles.

To avoid this last shoal, do not bring the fort on the east end of Ardilla to bear anything to the westward of N. 57° W. (WNW. $\frac{1}{8}$ W. mag.), or do not open the cemetery that is situated in the eastern outskirts of the town, east of the fort. Wishing to enter the inner harbor, if with a leading wind or a steamer, steer from the outer anchorage toward the highest part of Ardilla until on a line between Morro Ingles and the white fort on Point Cantara, then steer for the latter (passing between Almagre Grande and Ardilla), until clear of the islands, when haul up for the centre of the town and anchor as soon as well clear of the passage, or, if desirable, stand in as far as the vessel's draught will permit. The soundings decrease regularly from the passage between the islands toward the shore. With a head wind

the eye and lead are safe guides, care being taken not to approach the shores of the islands too closely. The magnetic variation was 11° 45′ E. in 1878, increasing about 2′ annually. H. W., F. and C., at VIII^h. Tides rise about 4 feet.

Variation.

Tides.

Guaymas.

Guaymas is surrounded by high mountains, and is extremely hot in the rainy season. The fevers prevalent at San Blas and Mazatlan prevail here, but in a lesser degree. The population in January, 1874, was about 4,000, most of whom were in a state of wretched poverty, the entire business of the place being monopolized by a few wealthy firms and individuals. There is a regularly appointed sanitary commission, a military and civil hospital, and a garrison of 250 men. A number of Yaqui Indians (about 500) occupy one section of the city. These Indians are very intelligent, and possess considerable mechanical ingenuity. They are experts in saddlery and the manufacture of straw goods; their earthen ware is of good quality, and the *serapes* (shawls), which they weave by hand, are unsurpassed for beauty and fineness of texture.

Within the city are a number of fine structures of the architecture peculiar to the country, and a few of the American style. The climate from November to April is pleasant, but the heat during the summer months, from June to September, is excessive, the mercury reaching 105° to 110° and seldom falling below 97° or 98°. When the hot winds visit the town, as they often do in the summer months, it frequently reaches 135°.

Supplies.

Fresh water of an indifferent quality may be procured, but the price is exorbitant; the same may be said of wood. Excellent flour, fresh bread and beef may be obtained in any quantity at moderate prices. Good oysters from the Yaqui River are found in the market at the proper season. No salt provisions or ship's stores can be purchased. At the time of the *Narragansett's* visit the Colorado Steam Navigation Company had a small amount of coal for steaming purposes on deposit here.

Commerce.

The exports are wheat, corn, flour, cotton, tobacco, unrefined sugar, aguadiente, dried beef, hides, gold, silver, and copper. The imports are the products of the more southern provinces, with East Indian and European manufactured goods.

La Laguna.

La Laguna is an extensive sheet of water lying to the

northward of the outer anchorage of Guaymas and the Playa de las Dolores, with an average depth of 2 fathoms in its southern part. The northern part is full of shoals and sand bars, with a narrow channel, in which there is from 6 to 8 feet of water, extending as far as Blanco Point, which is 2½ miles nearly north of Morro Ingles. At Blanco Point a sand-spit makes off to the eastward half a mile, nearly joining one making off the same distance from the opposite shore, the channel between them being less than 100 yards in width. Northward of this, La Laguna is with the exception of a few narrow boat channels, dry at low-water springs. A fresh-water stream, known as the Estero del Rancho empties into La Laguna a short distance north-westward of Blanco Point.

San José de Guaymas.

San José de Guaymas lies on both sides of the Estero del Rancho 1½ miles from its mouth. It is inhabited by civilized Indians of the Yaqui tribe. The country in the vicinity and far into the interior is level and sandy.

Hermosillo.

Hermosillo is the principal town in this part of Sonora. It is situated north of Guaymas, distant from it by the road 84 (statute) miles, and lies in a gap which the Rio Sonora has cut through the western range, surrounded by high hills. It has a population of about 15,000, and is the centre of an important silver mining region. There is a mint for coining silver dollars, and cotton goods and brandy are manufactured to some extent. Maize, cotton, and fruit are exported by way of Guaymas, which is its sea-port.

El Cochore.

From Morro Ingles the coast trends nearly east for a distance of 12 miles, to another conical hill, 379 feet high, known as Cerro Yacicoris. This part of the coast, which is a smooth sand beach, is called El Cochore.

Estero Cochore.

Two and a quarter miles east of Morro Ingles, separated from the waters of the gulf by a narrow strip of sand beach, is a small lagoon, called Estero Cochore, which has an opening into La Laguna. Three and a half miles farther east is a deserted village in a conspicuous grove of palm trees, close to the beach.

Soundings.

Soundings obtained off this part of the coast show a less depth of water than is given on charts made from former surveys. Four and five fathoms only were found in places where the charts gave 6 and 7 fathoms. This would seem to indicate that the mud and sand brought down by freshets

in the streams of this vicinity is deposited in the outer bay of Guaymas, and not carried off by the coast currents.

Cerro Tordillo. About midway between Morro Ingles and Cerro Yacicoris is a bluff point, with a conspicuous hill a short distance back of it, known as Cerro Tordillo.

Viejo Yaqui. Eastward of Cerro Yacicoris is a deep indentation in the coast line, filled with shoals and sand bars, and navigable only for boats. The river known as Viejo Yaqui, or Rio de Matape, which takes its rise in the Sierra Yaqui, and is dry during the greater part of the year, empties into this bay or indentation.

Coal mines. San Marcial, 60 miles up the Rio de Matape, is the nearest place to Guaymas where coal is found, and in the future it may be of importance to the prosperity of that place. At present the difficulties of transportation are too great to make working the mines profitable.

Bacatete. Seventeen and a quarter miles N. 62° E. (NE. ½ E. mag.) from Cerro Yacicoris is a conspicuous peak of the Sierra Yaqui, known as Bacatete Mountain or Guaymas Peak.

From Cerro Yacicoris to Lobos Point, a distance of 31 miles, the coast trends nearly south, and is low and sandy, being merely a strip of sand separating the waters of the gulf from the numerous lagoons that lie back of it. None of these lagoons are navigable except by boats or vessels drawing less than 6 feet of water. Sandy shoals extend off this part of the coast from half a mile to a mile and a quarter, with not more than 3 fathoms of water on their outer edge. Outside the shoals the soundings increase regularly until about 6 miles off and about on a line between Cape Haro and Lobos Point, when they increase suddenly from about 40 to 190 and 200 fathoms.

Yaqui River. The Yaqui River is the largest stream in the province of Sonora, and is indeed the only one deserving the name of river. It rises in the mountains near the Arizona boundary and, flowing in a southerly direction, empties into the Gulf of California about midway between Cape Haro and Lobos Point. The mouth of this river is filled with shoals and sand bars, and in the dry season it is navigable only by the smallest coasters. It has three outlets, which from a short distance appear like lagoons. A sand bank over 2 miles long and from a quarter to half a mile wide, over which the

sea breaks, extends across its mouth, having passages at either end between it and the shore.

Indians. The banks of the Yaqui for some distance from the coast are inhabited by the tribe of Indians of the same name.

Coal. There are said to be extensive fields of an excellent quality of coal on both sides of the Upper Yaqui, which may give it some importance in the future.

Baroyeca. Baroyeca Mountain, which lies 50 miles S. 85° E. (E. ½ N. mag.) from the centre of the sand bar off the entrance to the Yaqui River, affords a good land-mark. It is 3,298 feet high.

Lobos Point. Lobos Point, at the south-western extreme of Lobos Island, is low and sandy, with a dangerous shoal making off nearly 2½ miles to the north-westward. At the outer edge of this shoal from 5 to 7 fathoms of water were found, the soundings increasing within less than a tenth of a mile to 95 fathoms and over; bottom of fine, dark sand. Southward of the point vessels may anchor in good weather in 6 fathoms, half a mile from the shore.

Lobos Island. Lobos Island is low and sandy, 4½ miles long nearly ESE. and WNW., and about 1½ miles wide. It is separated from the main-land by the Estero de la Luna, which has openings to the gulf on its north and east sides. The highest part of the island is a remarkable green mound, Monte Verde, 75 feet high, situated about a mile and a half eastward of Lobos Point. Between the hill and the point is a solitary palm-tree, which serves as a land-mark for the coasters.

Monte Verde.

Palm tree.

Variation. The magnetic variation at Lobos Point was 11° 20′ E. in 1877, increasing about 2′ annually.

Tides. Tides rise about 4 feet.

Currents. Strong currents, variable in direction, are often encountered in this vicinity, and fogs are of frequent occurrence.

The coast from Lobos Point to the north-western end of Ciaris Island, a distance of 42 miles, trends S. 60° E. (ESE. ⅜ E. mag.), and has the same general character as above the point, viz: low, sandy, covered with bushes, and cut up by lagoons, off the entrances to which, shoal water extends from one to two miles. The soundings 3 miles off shore show a depth of from 6 to 10 fathoms.

Viejo Mayo About midway between Lobos and Ciaris Islands is the former mouth of the Mayo River, Viejo Mayo, off which there is a bar over which the sea breaks.

Island. Eight miles north-westward of Ciaris Island and about a

mile off the entrance to a lagoon is a small sand island, 3 feet above the level of the water. At this point shoal water extends over two miles off shore.

Ciaris Island. Ciaris Island is similar in appearance to Lobos Island and can only be distinguished from it by the absence of the solitary palm-tree. It is a little over 12 miles long, parallel with the coast, and from half a mile to a mile in width. It is separated from the main-land by a narrow estero of the same name, the entrance to which, at the north-western end of the island, is over a mile and a half wide, but shoal, with heavy breakers clear across it.

Just west of the north-west point of Ciaris is a low, sand islet a mile long and about 2 feet above water. A shoal makes out to the westward from it over 1½ miles.

Anchorage. Vessels may anchor anywhere along the coast between Lobos Point and Ciaris Island, in fine weather, taking care not to approach the land within 3 miles, or to get in less than 6 fathoms of water. A view from the *Narragansett's* anchorage off the NW. point of Ciaris Island is given opposite page 155.

Variation. Tides. The magnetic variation at the NW. end of Ciaris Island was 11° 15′ E. in 1877, increasing about 2′ annually. Tides rise about 4 feet.

Alamos Peak. Alamos Peak is a conspicuous sharp mountain, 5,877 feet high, bearing S. 88° E. (E. ¾ N. mag.), 51 miles distant from the north point of Ciaris Island.

Arboleda Point. Arboleda Point is an indefinite rounding point situated 13½ miles to the south-eastward of the NW. point of Ciaris Island, on an island 2¾ miles long in a north and south direction, and something more than half a mile wide, separated from the main-land by the continuation of Ciaris Estero. There are some clumps of scrubby trees on this island which serve as an excellent land-mark for the coasters, being the only ones in the vicinity.

From Arboleda Point the coast trends somewhat more to the eastward. Four and a half miles to the south-eastward Estero de Santa Lugada. of the point is the narrow entrance to the Estero de Santa Lugada, which is of considerable extent. There is a bar with very shoal water at the entrance.

From the entrance of the estero to Punta Rosa the coast is a bare sand beach with a few bushes, and back of the beach is a series of yellowish sand hills from 50 to 85 feet high.

Punta Rosa and Santa Barbara Bay. Punta Rosa is a low, reddish point. From here the coast turns sharply to the north-eastward for about a mile, and then trends nearly east for 8½ miles, to the mouth of the Mayo River. The bight just east of the point is known as Santa Barbara Bay.

Anchorage. Santa Barbara Bay affords an excellent anchorage in north-west winds, but is entirely open to south-easters. The best anchorage is about a mile east of the point, and the same distance off shore, in about 7 or 8 fathoms of water.

Variation. Tides. The magnetic variation was 11° 10′ E. in 1877, increasing about 2′ annually. Tides rise about 4 feet.

Fresh water. Game. Indian villages. The country in this vicinity is well watered, fertile, and quite thickly populated. There are several fresh-water lakes or ponds in the vicinity, and a small stream empties into Santa Barbara Bay. Game is very abundant, large numbers of deer, rabbits, wild geese, and ducks were seen. The Indian villages of Vacamora and Santa Cruz, the latter on the right bank of the Mayo River, lie about 4 miles to the northward of the north shore of the bay. The Indians of this vicinity belong to the Mayo tribe.

Rio Mayo. The entrance to the Rio Mayo lies about 9½ miles east of Punta Rosa. It, like all the rivers on this coast, is closed by a bar, leaving a narrow channel on the eastern side through which 2 fathoms may be carried in the dry season. The entrance, which is a mile wide, may be recognized by a bare sand mound 85 feet high on its western side, and a mound 75 feet high, on which there is some vegetation, on the eastern side. Shoal water extends off it for nearly 2 miles. Shoal water.

Cove. Just inside of the entrance, on the eastern side, is a snug little cove where small vessels may anchor in 3 fathoms of water and be well sheltered from every wind. The Indian town of Santa Cruz de Mayo lies on the right bank of the river, about 8 miles from its mouth.

Land-mark. Alamos Peak, 5,877 feet high, bears N. 57° E. (NE. ⅛ E. mag.) 32 miles distant from the eastern point of the entrance to the Mayo River, and is a good land-mark.

The coast from the eastern point of entrance to the Rio Mayo trends about ESE. for a distance of about 9 miles, to an Indian village near the shore, thence to the main entrance to the Estero de Agiabampo, a distance of 16 miles, it trends nearly south, and is throughout the entire distance low,

sandy, covered with a growth of bushes, and cut up by lagoons. Mountain ranges lie from 15 to 18 miles back of the coast.

Estero de Agiabampo.

The Estero de Agiabampo is an extensive lagoon, the entrance to which is narrow and intricate, being obstructed by shoals and sand bars, which extend about a mile off from the general coast line. The least depth found in the channel at low water was 2 fathoms. On either side were shoal patches, with from 3 to 5 feet of water, over which the sea broke heavily.

At the southern point of the entrance is a sand hill 75 feet high, on top of which is a wooden cross that serves as a mark for entering.

Directions.

To enter the estero, bring the cross on the hill to bear S. 84° E. (E. ¼ N. mag.) and steer directly for it until inside of the shoal on the north side of the channel, on which there is but 3 feet of water, then haul up, running parallel to the southern shore and heading for the eastern side of the north point of entrance. This will carry you along the south-eastern side of the outer shoal (on which the sea breaks continually) in from 3 to 5 fathoms of water. There is another channel, with from 2 to 3 fathoms, that may be taken after passing the bar. It lies along the southern shore of the entrance, separated from the one first mentioned, in which there are from 3 to 5 fathoms, by a narrow shoal. Between the north-eastern end of the outer shoal and the north point of the entrance, there is a narrow channel into the estero, with a least depth of 6 feet.

Channel.

At the time of the *Narragansett's* visit there was another passage over the bar through which 2 fathoms might be carried. It was less than a cable in width, between the SW. end of the long outer shoal and the small one, (with 3 feet of water on it,) lying on the north side of the channel first described. To enter this channel bring the cross to bear S. 66° E (ESE. ¾ E. mag.) and steer for it until inside the line of breakers, then proceed as before. The bar and channels are undoubtedly subject to change and the greatest care is necessary. The best time to enter the estero is with the first of the sea-breeze.

Anchorage.

The best anchorage outside the estero is in about 7 fathoms of water 1¾ miles off shore, the cross on the hill bearing E. (E. by N. mag.), Alligator Hill S. 7° 30′ W. (S. ¾ E. mag.), and Alamos Peak N. 23° E. (N. by E. mag.) The

two latter are the best guides for finding the entrance to the estero when off shore, the coast being a long line of sand hills without distinguishing marks.

Variation.

The magnetic variation was 11° E. in 1877, increasing about 2′ annually.

Tides.

Tides rise about 4 feet.

Agiabampo.

The town of Agiabampo is situated on the north shore of the estero, about 10¼ miles from the bar, and is a place of some importance, being the sea-port of the cities of Alamo (40 miles distant) and Fuerte (45 miles distant), with both of which it is connected by roads. It has a custom-house,

Exports.

and exports treasure, silver ore, and dye-wood.

The coast south of the Estero de Agiabampo trends about S. 25° W. (S. by W. ¼ W. mag.), to the outer edge of the shoal off the mouth of the Rio del Fuerte, a distance of 22½ miles. It is similar in character to that north of Agiabampo, being low, sandy, and, that part of it lying south of the Alamos River, cut up by lagoons.

Alamos River.

The mouth of the Alamos River, which is narrow and has shoal water extending off from it a quarter of a mile, lies 10½ miles to the southward of the cross on the south side of the entrance to the Estero de Agiabampo. It is navigable only for the smallest coasters. The sea breaks almost continually over the bar at its mouth.

Rio del Fuerte, or de Santa Maria de Ahome.

The Rio del Fuerte, or de Santa Maria de Ahome, forms part of the boundary line between the provinces of Sonora and Sinaloa. The entrance, which, like that of all the rivers along this coast, has a bar extending across it, lies 12 miles to the southward of that of the Rio del Alamos.

Channels.

Fronting the mouth of the river is a sand island a mile long and half a mile wide; at either end of the island are shallow channels leading into the river, which are navigable only by the small coasters. Two or three miles up the river, on either bank, are thick clumps of green trees and bushes. The village of Ahome is on the left bank of the river, about 10 miles from its mouth, and the town of El Fuerte, in an important mining region, is about 75 miles from the mouth of the river.

Dye-wood.

During the rainy season the river is swollen considerably, and large quantities of dye-wood are floated down in rafts or on flat-boats.

Ahome Point.

Ahome Point is the north point of entrance to the river just described and is a low sand point projecting over a mile

from the general coast line. An extensive shoal, over which the sea breaks, extends off from it in all directions, from a mile to a mile and a half.

Alligator Hill. Alligator Hill is a remarkable flat-topped hill situated 6 miles N. 45° E. (NE. by N. mag.) from Ahome Point and is a good land-mark.

Eastward of Alligator Hill and about 18 miles from the coast is the Sierra de San Pablo, 2,000 feet high.

Lagoon. A lagoon, lying parallel to the coast and having two shallow openings to the gulf, extends 8 or 9 miles northward from Rio del Fuerte.

From Rio del Fuerte to Point San Ignacio, a distance of 19 miles, the coast trends about south, and is low and sandy, consisting of a series of islands, on which are some low sand hills and a scanty growth of bushes. The islands are separated from the main-land by lagoons that lie parallel to the coast.

Estero de las Piedras. The Estero de las Piedras is the northernmost of the two entrances to the lagoons lying between Rio del Fuerte and Point San Ignacio. It is about half a mile in width and has a narrow bar extending a short distance off, over which the sea breaks. The bar is 6 miles south of the sand island off the entrance to the Rio del Fuerte.

Lechuguia. The island of Lechuguia lies south of the Estero de las Piedras. It is 8½ miles long N. and S. and from 1 to 2 miles wide, with a ridge of sand hills from 25 to 50 feet high and some scattered bushes. At its southern end is an entrance to the lagoons, known as Lechuguia Estero, which is 1¼ miles wide, and has an island a mile long and a quarter of a mile wide in its outer part.

Shoal. Off Lechuguia Estero and extending around Point San Ignacio, is a dangerous shoal, over which the sea breaks heavily. Soundings of 5½ fathoms were obtained 4½ miles N. 62° W. (WNW. ½ W. mag.) from Point San Ignacio, the depth increasing suddenly to 60 and 100 fathoms a short distance to the south-westward.

Directions. To clear this shoal, keep the Farallon de San Ignacio on a bearing to the eastward of S. 15° E. (SSE. ¼ E. mag.); when the southern and highest peak of the Sierra de San Pablo bears N. 50° E. (NE. ½ N. mag.) you are to the northward of the shoal.

San Ignacio Point and Bay. Point San Ignacio is a low, sandy point at the southern

end of a small sand island, which lies off the western end of Santa Maria Island, separated from it by a narrow, shoal channel.

From San Ignacio Point the coast turns sharply to the northward for about 2 miles and then curves around to the south-eastern point of Santa Maria Island, known as Santa Maria Point, forming the open bay of San Ignacio.

Anchorage. There is good anchorage in San Ignacio Bay in 5 or 6 fathoms of water, from half a mile to a mile from the northern shore, with protection from the north-westerly winds, but it is entirely open to winds from the southward.

Santa Maria Island. Santa Maria Island, which forms the north shore of San Ignacio Bay, is a sandy island 13½ miles long, with an average width of about a mile. It has a steep beach, with a range of sand hills from 50 to 100 feet high back of it, and a scanty growth of bushes. It is separated from the main-land by a lagoon.

Santa Maria Point. Santa Maria Point, the south-eastern extreme of the island of the same name, is the northern point of the entrance to Topolobampo Harbor. It bears S. 71° E. (E. ¾ S. mag.), 11½ miles distant from Point San Ignacio.

CHAPTER II.

THE COAST AND ADJACENT ISLANDS FROM TOPOLOBAMPO HARBOR TO CAPE CORRIENTES.

Farallon de San Ignacio.

The Farallon de San Ignacio is the best land-mark for making the entrance to Topolobampo Harbor. It lies 13¼ miles S. 60° W. (SW. ⅜ W. mag.) from Santa Maria Point, and is a small barren rock of a whitish color (from a deposit of guano), about a third of a mile in extent either way, and 465 feet high. There is deep water close to, on all sides of it except the northern, where there are a few outlying rocks, close to. (View opposite page 167.)

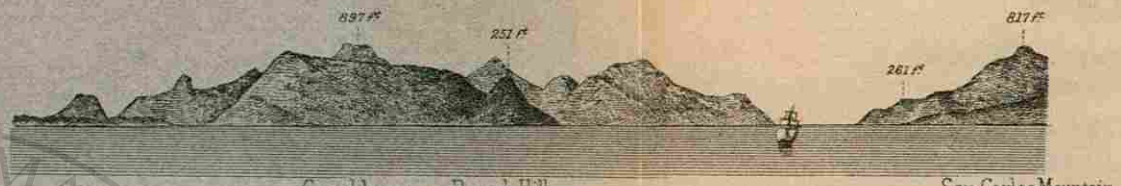
Topolobampo Harbor.

The entrance to Topolobampo Harbor is between two lines of breakers, and is exceedingly narrow and intricate. The bar is 2¼ miles from the nearest land (Santa Maria Point), and is less than half a mile wide at its deepest part, with from 2½ to 2¾ fathoms of water on it at low tide. Inside the bar the depth of water in the channel increases gradually until abreast of Sand Island, where 10 to 12 fathoms are found.

Sand Island.

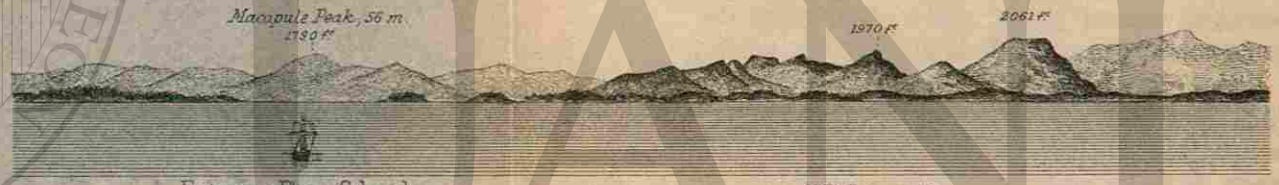
Sand Island bears S. 59° E. (ESE. ¼ E. mag.) one mile distant from Santa Maria Point, and may be considered the southern point of the entrance, although Shell Point, 1½ miles N. 84° E. (ENE. ½ E. mag.) from it, is the first point of the main-land, on the south side of the entrance. A little over half a mile to the westward of Sand Island, on the opposite side of the channel, there is an isolated shoal which is just bare at low water. After passing Sand Island, the channel, which averages something less than half a mile in width, leads to the eastward for about 3 miles, having a depth of from 5 to 8 fathoms, sandy bottom, and then assumes a north-easterly direction, passing close to the rocky heads that project from the main-land on its south-eastern side. Toward the north-eastern limit of the harbor the channel narrows to a width of about a quarter of a mile, and deepens considerably, 15 and 16 fathoms being found in it. After passing a high head-land, surmounted by a hill

Plate XVII.



Topolobampo high lands, from the Bar.

Farallon of San Ignacio.

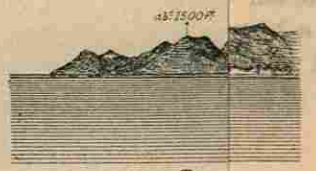


At anchor off Playa Colorada.

Off Altata estero.

Plate XVII.

Farallon of



Agua Pepa
N. by E. (mag.) 2

817 feet high, known as Mount San Carlos, it enters a large bay called San Carlos Bay.

The *channel* is the only part of Topolobampo Harbor that is navigable for vessels of any size, the other parts of it being very shallow and full of shoals.

Anchorage. There is excellent anchorage inside the shoals in 7 or 8 fathoms, sheltered from every wind. The best anchorage outside the bar, which is safe only in moderate weather, is in 8 or 10 fathoms of water, with Round Hill, a conspicuous sharp hill on the northern shore of the harbor, bearing N. 45° E. (NE. by N. mag.). The nearest breakers will then be half a mile to the eastward.

Directions. The following directions will be found of service in entering the harbor of Topolobampo, but should not be too much relied on, as the channel and shoals, from the bar to Shell Point, are constantly changing, and no vessel of over 12 feet draught should attempt to enter without first sounding and marking the channel. When off the bar, bring Round Hill (251 feet high), on the northern shore of the harbor, to bear N. 44° 30′ E. (NE. by N. mag.)—view on opposite page—and steer for it, keeping it on that bearing, but taking care as Sand Island is approached, not to *shut in the spur* shown to the left of the north-western slope of the table mountain in the view, until well past the island. To avoid shutting in the spur it is necessary to steer a more northerly course, bringing Round Hill on the starboard bow, and of course changing its bearing. Be careful not to approach Sand Island too closely, as a shoal extends off from it a short distance to the northward and eastward. When Santa Maria Point bears N. 81° W. (W. $\frac{1}{8}$ S. mag.), Round Hill bearing about N. 50° E. (NE. $\frac{1}{2}$ N. mag.) and Sand Island S. 20° E. (SSE. $\frac{3}{4}$ E. mag.), change the course to the eastward, heading for the first rocky, bluff point eastward of Shell Point, and after proceeding three-quarters of a mile in this direction, anchor anywhere in the channel, or if it is desirable to proceed farther in, continue on the same course until Mount San Carlos bears N. 52° 30′ E. (NE. $\frac{1}{4}$ N. mag.), then steer for it, remembering that the deepest water is on the SE. side of the channel, and that the projecting points on that side may be approached to within a short distance. As Mount San Carlos is approached, steer for the middle of the passage between it and the island on the opposite side of

the channel. The water is deep close to the head land on which Mount San Carlos is situated.

The bar and shoals near the entrance appear to have changed considerably since 1869, at which time a survey was made by the *U. S. S. Jamestown*, Commander W. T. Truxton, commanding.

In ordinary weather the sea breaks in 1½ fathoms, but with fresh southerly or westerly winds it breaks entirely across the bar.

Variation. The tidal currents on the bar and in the channel, are strong, and care is required to keep on the ranges. The magnetic variation was 10° 40′ E. in 1876, increasing about 2′ annually.

Tides. H. W., F. and C., IX^h 7^m (approx.). Springs rise 6 feet; neaps 4½ feet.

Remarks. Fresh water, fish, &c. It is said that fresh water may be obtained by sinking wells in the sand near Shell Point. Fish and turtle are abundant in the waters of the vicinity and game is said to be plentiful in the interior. The vegetation in the vicinity of the harbor is very scanty.

San Carlos Bay. San Carlos Bay, is a large bay lying to the north-eastward of Topolobampo Harbor and connected with it by a narrow strait or channel. It has never been surveyed, but is known to extend 9 or 10 miles in a north-easterly direction and to have a width of from 4 to 6 miles.

After rounding the high head land on which Mount San Carlos is situated, a narrow, intricate channel, with a gradually-decreasing depth of water, was followed for about 3½ miles in a north-easterly direction; at that distance 3 fathoms were found. On either side of the channel the soundings were irregular, varying from 3 feet to 3 fathoms, with numerous sand bars and a few small islands.

Coast from Topolobampo Bar to Sinaloa River. The coast from Topolobampo Bar has a general trend S. 68° E. (E. by S. mag.) as far as the mouth of the Sinaloa River, a distance of 41½ miles, and is, with the exception of the high land near Topolobampo entrance, low and sandy, being composed of a series of sand islands, separated from the main-land by lagoons. Four miles to the south-eastward of Shell Point the high land approaches the coast in bluffs from 20 to 50 feet in height, a sharp hill 765 feet high rising immediately back of them. Four miles farther on is an entrance to the extensive lagoon that lies parallel to the coast, extending to and joining the Sinaloa River. Off this

entrance is an extensive shoal, over which the sea breaks. The outer edge of this shoal, on which there is 3 fathoms of water, is 2½ miles from the land. Shoal.

San Ignacio Island. San Ignacio Island is the westernmost of the series of islands before mentioned as forming the coast line between Topolobampo and the Sinaloa River. It is 12¾ miles in extent from the lagoon entrance just mentioned, to Navachista Estero, and from three-quarters of a mile to a mile and a half in width. Back of the lagoon that separates it from the main-land, the peaks of the Sierra de Navachista rise to a height of over 1,000 feet. In the northern part of the lagoon, nearly opposite the center of San Ignacio Island, is a remarkable *white rock* 75 feet high.

Navachista Estero. The entrance to Navachista Estero lies between the eastern end of San Ignacio Island and the island of Vinorama. It is narrow and intricate, with about 2 fathoms on the bar at low water. The outer edge of the bar, which is a quarter of a mile wide in its narrowest and deepest part, lies 1¾ miles from the nearest land; and just west of the channel, the shoals extend two miles off the land, the sea breaking over them continually. Inside the bar the depth of water is from 5 to 7 fathoms.

Directions for entering. Being outside the bar in 5 or 6 fathoms of water, bring the western extreme of Vinorama Island to bear N. 21° 45′ E. (N. by E. mag.) and steer for it until in 3 fathoms of water, on the outer edge of the bar; then steer N. 45° 15′ E. (NE. ⅞ N. mag.) until the western extreme of Vinorama bears N. 8° W. (N. by W. ⅝ W. mag.), when you may steer so as to pass along the western side of Vinorama, within 100 yards of the beach.

These directions apply to the existing state of the entrance in 1875, but as this bar, in common with all others on this coast, is subject to frequent change, they must not be implicitly relied on.

Previous to 1875 the entrance to Navachista Estero had been gradually shoaling and becoming more intricate, and the town of Navachista, some distance in the interior, was, in consequence, fast becoming depopulated, its rival, Playa Colorada, about 24 miles to the south-eastward, increasing to a corresponding extent.

Vinorama Island. Vinorama is a low, sandy island about 1½ miles in length E. and W. and three-quarters of a mile wide. On it are

several cotton farms or ranches, and tolerably good *fresh water* may be obtained by sinking wells. The magnetic variation was 10° 30′ E. in 1876, increasing about 2′ annually. Tides rise about 5 feet.

Variation.

Tides.

Anchorage.

The *Narragansett's* anchorage off Navachista Estero was in 6 fathoms of water, about 2¾ miles from the shore, the westernmost peak of the Sierra de Navachista, 765 feet high, bearing N. 54° W. (NW. by W. ¾ W. mag.).

Boca Macapule.

Boca Macapule lies to the eastward of Vinorama, between it and Macapule Island. It is narrow and shallow, the shoal water extending about a mile off shore.

Macapule Island.

Macapule Island, lying eastward of the Boca Macapule, is 11 miles in length, parallel to the coast, and about a mile wide, a lagoon or estero of the same name separating it from the main-land. Its southern beach is nearly straight, and is free from shoals, having from 3 to 5 fathoms of water close to. At its eastern end is a small island, on either side of which is a narrow opening to the estero.

Sinaloa River.

The Sinaloa River, which empties into the gulf on either side of a small island covered with trees, the centre of which is 4¾ miles from the eastern end of Macapule Island, is useless for the purposes of navigation. A shoal makes off about half a mile from the island at its mouth, and the discolored water from the river is very marked for some distance off.

Sinaloa.

The old town of Sinaloa, built on a hill, is situated on the bank of the river about 40 miles from its mouth. It was formerly of some importance, but is now almost deserted.

Estero de Playa Colorada.

The entrance to Playa Colorada Estero is 7½ miles to the south-eastward of the island at the mouth of the Sinaloa River. Off it are extensive shoals, over which the sea breaks, even in moderate weather. The outer edge of these shoals is 2¾ miles from the land.

Bar.

The depth of water on the bar is said to vary with the seasons, 9 feet being found at low water during the dry season and 12 feet during the rainy season. As the bar is shifting, no directions that will hold good at all times can be given, and the only safe way is to sound out and mark the channel before attempting to enter. The deep water lies between the lines of breakers and they are the best guides.

Directions.

The following directions may be of some assistance, but

should not be implicitly relied on. When off the bar, in 5 or 6 fathoms of water, bring the westernmost point of Saliaca Island (which lies on the eastern side of the entrance) to bear N. 13° 15′ E. (N. ¼ E. mag.) and steer for it until in 3 fathoms, on the outer edge of the bar, when steer N. 3° 30′ E. (N. ⅝ W. mag.) crossing the bar on that course, and continuing it so long as it leads between the lines of breakers. Inside the bar the breakers are the only guide.

Tides rise about 6 feet. The magnetic variation in 1876 was 10° 25′ E.

Tides. Variation.

Saliaca Island.

Saliaca Island lies to the eastward of the entrance to Playa Colorada Estero. It is 3¾ miles long NW. and SE., about a mile wide, low, sandy, and covered with a scanty growth of bushes. An estero of the same name separates it from the main-land.

Anchorage.

The *Narragansett's* anchorage off Playa Colorada Estero was in 6 fathoms of water, sandy bottom, 4 miles from the mouth of the estero, and a mile from the outer edge of the shoals making off from it. Macapule Peak, 7,190 feet high, in the Sierra Madre, bearing N. 48° E. (NE. ⅝ N. mag.) and a conspicuous peak, 1,970 feet high, in the coast range, N. 58° E. (NE. ¼ E. mag.). (View opposite page 167.)

Playa Colorada.

The village of Playa Colorada, containing about 200 inhabitants, is situated 4 or 5 miles from the mouth of the estero of the same name.

Large quantities of dye-wood are annually shipped from here.

From the western end of Saliaca Island the coast assumes a more southerly trend, the entrance to Altata Estero, 39½ miles distant, bearing S. 35° E. (SE. mag.) from that of Playa Colorada. Throughout this entire distance the shore is low and dangerous to approach, as it cannot be seen at night before striking on the shoals that make off from many parts of it. The lead should be used freely, as the soundings are an excellent guide, and it is recommended not to get in less than 13 or 15 fathoms of water when navigating this part of the coast at night.

Altamura Island.

Altamura Island lies eastward of Saliaca Island, separated from it by a shallow opening to the esteros lying between them and the main-land. Shoal water extends off this opening for a distance of nearly 2 miles.

The island is 24 miles long in a direction parallel to the

coast, and from 1½ to 2½ miles wide. Like the other islands on this part of the coast, it is low and sandy, with some sand hills and bushes.

Altamura Point and Shoal.

Altamura Point is a low indefinite point making out from the island of the same name, about 7 miles from its south-eastern end. It is the north-western limit of an extensive shoal which makes off 2 miles from the shore and extends 10 miles to the south-eastward, across the mouth of Tule Estero.

Colorado Point and Tule Estero.

Colorado Point is the southern end of Altamura Island and the northern point of the entrance to Tule Estero, which lies between Altamura and Baredito Islands. The shoal just mentioned as extending 10 miles south-eastward from Altamura Point, extends clear across the entrance of Tule Estero, the sea breaking heavily over it. At the time of the *Narragansett's* visit, in 1875, the wreck of the ship Mary Banks was lying in the breakers near Colorado Point. The small town of Tule is situated on the bank of the Tule River, about 10 miles from the bar.

Tule.

Culiacan Mountains.

The Culiacan Mountains, 2,000 feet high, in which the Tule River takes its rise, are about 25 miles to the eastward.

Land-mark.

When off Tule Estero, Agua Pepa Peak, about 1,500 feet high, and the westernmost of three prominent peaks, will bear N. 42° E. (NNE. ¾ E. mag.).

Baredito Island.

Baredito Island, which is something in the form of a crescent, is about 10 miles long, with an average width of a little over half a mile. It forms the coast line between the entrance to Tule Estero and that of Altata, and is separated from the main-land by a lagoon. Like Altamura, it is low and sandy, with a scanty growth of bushes and some low sand hills.

Shoal.

Off its southern part, a shoal on which there are heavy breakers, makes out nearly 2 miles.

Altata Estero.

The entrance to Altata Estero lies between the south-eastern end of Baredito Island and the north-western end of a long narrow island (not named) that forms the coast line for a distance of 39 miles to the south-eastward. It is only about a cable in width at its narrowest part, and is

Bar.

marked on either side by lines of breakers. The bar had, in 1869, between 3 and 4 fathoms on it at low water, but is probably subject to change, as some reports give only 2¾ fathoms on it.

Shoal.

A detached shoal, with a least depth of 2 fathoms, lies on the south side of the channel leading over the bar. It is about a mile in extent NE. and SW., and half a mile wide, its inner edge 2 miles distant from the centre of the passage between the two islands before mentioned. This shoal *may* have given rise to the reports that there were but 2¾ fathoms on the bar. The sea breaks heavily over it.

Directions for entering.

Bring the saddle of El Dorado, 2,621 feet high, in range with Double Peak, 6,397 feet high, bearing N. 56 E. (NE. mag.)—see view opposite page 167—and stand in, passing to the northward of the detached shoal just described and keeping between the lines of breakers on either side. When inside the estero, steer to the south-eastward, keeping about mid-channel, and anchor off the village of Altata, which is about 3 miles from the entrance of the estero. The magnetic variation in 1876 was 10° 20′ E.; H. W., F. & C., XI^{h} 30^{m}. Tides rise about 6 feet. The tidal currents in the channel occasionally have a strength of 4 or 5 knots.

Variation.

Tides.

Anchorage.

The anchorage off Altata Estero is in 6 fathoms of water, 3½ miles from the entrance, with El Dorado saddle in line with Double Peak, bearing N. 56° E. (NE. mag.)

Altata.

Altata is the sea-port of Culiacan, the capital of Sinaloa, and is situated near the mouth of the Culiacan River, which is reported to be navigable for a distance of 10 or 12 miles from its junction with Altata Estero, having an average depth of about 5 fathoms; large quantities of dye-wood are shipped from here.

Supplies.

There is but a poor supply of drinkable water to be obtained, and provisions are scarce; cattle can be procured from a neighboring ranch.

From the entrance to Altata Estero to the Piastla River, a distance of 87 miles S. 50° E. (SE. by E. ⅜ E. mag.), the coast is, with the exception of the Boca Tavala, off which shoal water extends 1¼ miles, an unbroken, almost straight line of sand beach, covered with bushes and free from outlying dangers, with from 4½ to 6 fathoms of water within half a mile of the beach. The low land stretches far away into the interior and is backed by moderately high ranges of hills or mountains.

Lagoon

A narrow lagoon extends from Altata Estero to a short distance south-eastward of the Boca Tavala, a strip of sand beach, from half a mile to a mile in width, separating it from the waters of the gulf.

Boca Tavala. Boca Tavala is a narrow outlet from the lagoon, probably caused by the rush of water from the Rio Tavala or San Lorenzo, which empties into the lagoon a short distance to the north-eastward. A shoal with 3 fathoms on its outer edge extends 1¼ miles off the entrance.

Anchorage. The anchorage off Boca Tavala is in 6 or 7 fathoms, 2 miles from the beach. Chuchamone Peak, 4,945 feet high, of the Sierra de San Sebastian, bearing N. 77° 30′ (ENE. mag.), distant 28½ miles. See view, page 175. Vessels come here for dye-wood.

Variation. Tides. The magnetic variation is 10° E. (approx.) Tides rise about 5 feet.

Tavala or San Lorenzo River. During the dry season the Tavala River is only navigable for coasters drawing not more than 5 feet. On its right bank, about 15 miles from its mouth, is the small town of Quila, and 8 miles farther up is the town of San Lorenzo.

Elota River. The Elota River approaches the coast and, during the dry season, is lost in the sand 33½ miles to the south-eastward of Boca Tavala. It is a mere creek in the dry season, but during the rainy season becomes a turbid torrent. The village of Elota is situated on its right bank, about 20 miles from the coast, in a thinly-populated and partially-cultivated country.

Sierra de San Sebastian. The Sierra de San Sebastian, with peaks from 1,000 to 5,000 feet high, lies from 15 to 25 miles back of the coast between the San Lorenzo and Elota Rivers.

Land-mark. From the *Narragansett's* anchorage off the mouth of the Elota River, in 9 fathoms of water, a sharp peak of the Sierra Madre, 9,128 feet high and 53 miles distant, was just open south of a conspicuous solitary hill, about 1,100 feet high and 13½ miles distant, called Quoin, the latter bearing N. 86° E. (ENE. ¾ E. mag.) Tides rise about 5 feet. The

Tides.

Variation. magnetic variation in 1874 was 9° 50′ E.

Point San Miguel. Point San Miguel is a rocky point, with some close outlying rocks, situated about 5½ miles to the south-eastward of the mouth of the Elota River. A short distance back of it is the north-western limit of a range of remarkable hills, known as the Cerros de Piastla, one of which, 920 feet high and of a triangular shape, called Cerro de las Vigas, is 2½ miles S. 69° E. (E. by S. mag.) from the point.

Bluff. Four miles to the south-eastward of Point San Miguel is

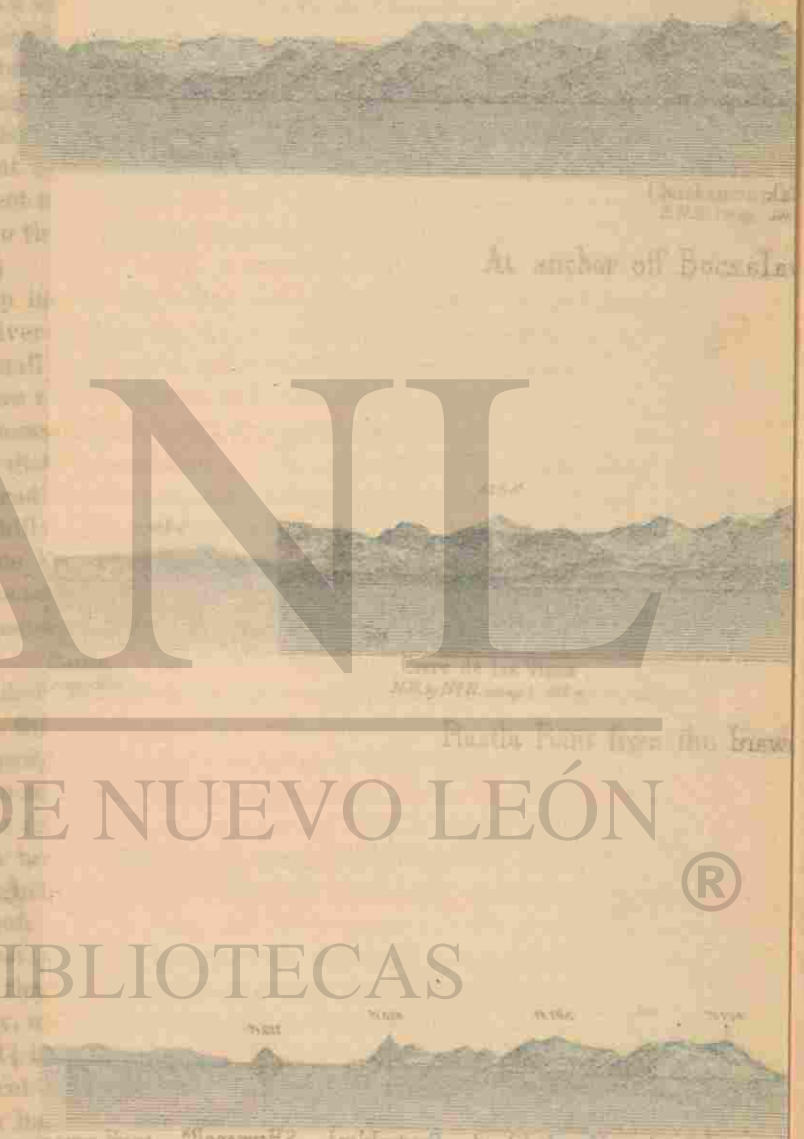


Plate XVIII.

Chuchamone Peak,
E.N.E. (mag.) 28½ m.

At anchor off Boca Tavala.

Point Piastla,
N.W.½N. (mag.) 5 m.

Cerro de las Vigas,
N.W.½N. (mag.) 14½ m.

Piastla Point from the Southward.

Camaron Point,
E.S.E. (mag.) 6½ m.

Pajaros Island,
S.E.½E. (mag.) 9¾ m.

Venado Island.

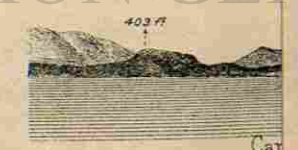
Creston Island,
S.E.½E. (mag.) 15 m.

Lighthouse,
(L^t H. vis. 20 m.)

S. Hermano R^k.

Approaching Mazatlan from the Northward.

Plate XVIII.



a rocky, bluff point of moderate height, with a mound 125 feet high immediately back of it.

Piastla River. The mouth of the Piastla River is 4 miles to the south-eastward of the rocky, bluff point just described and 3 miles N. 12° 30′ E. (N. ¼ E. mag.) from Point Piastla. Like the Elota, it is a mere creek until the rains convert it into a torrent. Near the mouth of the river is a thick growth of trees and bushes, and good water may be obtained there.

Piastla. The village of Piastla is about 20 miles up the river.

Point Piastla. Point Piastla is the southernmost of two rocky head-lands lying about a mile apart, in a NNE. and SSW. direction. It is 156 feet high, and has a reef extending from it a short distance to the southward and westward. (View on opposite page.)

Anchorage. A sweep in the coast line between the mouth of the Piastla River and the northernmost of the two head-lands forms a small bay or indentation, open to the north-westward, where vessels that come here for dye-wood anchor, in 5 or 6 fathoms, about a mile from the shore.

Pier. A short distance eastward of the extremity of the northernmost head-land is a landing pier with some huts back of it. On a hill back of the pier is a signal pole.

Islet. On a line between Point Piastla and the mouth of the river of the same name, a quarter of a mile from the northernmost point before mentioned, is a white, rocky islet 35 feet high.

Supplies. Drinkable water may be obtained at a short distance from the beach, from a lagoon, which is dry during the months of March, April, and May. Two wells sunk on the shore of this lagoon serve as cisterns or reservoirs.

"Not far from the landing-place is a fertile plain, where cattle may be obtained." (*Annales Hydrographiques*, 1867.)

Variation. Tides. The magnetic variation is 9° 45′ E. (approx.). Tides rise about 5 feet.

The coast south of Piastla Point has the same general trend as that to the northward, and is for the most part low, sandy, and free from outlying dangers.

Bluff and shoal. About 1¼ miles south-eastward of Piastla Point there is a bluff 80 feet high, and 2 miles farther on is a shoal extending nearly half a mile off shore, over which the sea breaks.

Grueza Point. Grueza Point, 13¾ miles south-eastward of Piastla Point, is a rocky bluff, surmounted by a hill 77 feet high. About

midway between it and the shoal just mentioned is an arroyo, and 2½ miles south-eastward of the point is another.

Roja Point. Roja Point, about 5 miles below Grueza Point, is a low, very slightly-projecting, bluff point, with low land back of it.

Camaron Point. Camaron Point, a little more than 8 miles south-eastward of Roja Point, is a rocky bluff about 50 feet in height, with a hill of reddish color, 403 feet high, 2 miles to the eastward.

Between Camaron Point and the harbor of Mazatlan are several prominent islands and rocks, the former serving as land-marks in making Mazatlan. (View opposite page 175.)

Pajaros Island. Pajaros Island, the northernmost of the above-mentioned islands, is about 3½ miles south-eastward of Camaron Point and less than half a mile from the nearest point of the main-land (Arenilla Point). It is about 4 cables in extent each way and 467 feet high.

Between Arenilla Point (abreast of Pajaros Island on the main-land) and Mazatlan there are several lagoons, some of which are said to be of fresh water.

Panamá Rock. Panamá Rock, which is shown on some charts about 7 miles westward of Pajaros Point, does not exist.

Venado Island. Venado Island, a mile to the southward of Pajaros, is rather larger than the latter, but of the same character—rocky and barren. Its highest peak has an altitude of 587 feet.

The southern part of Venado is connected with the main body by a narrow neck of land called El Cuello. A detached rock, called Estrella Rock, lies about 75 yards south of the southern extremity of the island.

The channel between Venado and the main land is a little over half a mile wide, and 2½ fathoms of water may be carried through it.

Creston Island. Creston Island forms the western side of the outer harbor of Mazatlan. It is 4 cables in length, nearly N. and S., about 2 cables wide, and 470 feet high, with a shore line consisting for the most part of steep, rocky bluffs. Within a mile to the north-westward of it are several islets and rocks, the most prominent of which are the North and South Hermanos and Tortuga Rock.

Light. A fixed white light, visible about 20 miles, is shown from a square white tower, which rises from the centre of a white building situated on the summit of Creston. Loaded

vessels entering the port are taxed for the maintenance of the light; vessels entering in ballast are exempt.

Azada Island. Azada Island lies north of Creston, between it and Pala Point, the southern extreme of the peninsula on which Mazatlan is situated. The channels on either side of it are not navigable by any except the smallest class of vessels; that on the south side is unsafe even for boats, being full of rocks.

Mazatlan Harbor. The available part of the harbor of Mazatlan is of small extent, and includes the space lying between the islands of Creston on the west and Ciervo on the east.

It affords good protection from the north-westerly winds, but is entirely open to the southward, and is a dangerous anchorage for sailing vessels, during the rainy season.

Inner Harbor. There is an inner harbor which can be used by vessels of 5 or 6 feet draught.

Ciervo Island. Ciervo Island, on the eastern side of the anchorage in Mazatlan Harbor, is similar in appearance to Creston and about half as high; it is partially covered with trees.

Gama Island. Gama Island, 160 feet high, lies 4 cables east of Ciervo.

Black Rock. Black Rock is a small rock about 10 feet above water, over which the sea generally breaks. It lies just outside of Mazatlan Harbor, on the following bearings, viz: Highest peak of Creston Island N. 34° 15′ W. (NW. ⅛ N. mag.); highest peak of Ciervo N. 16° 45′ E. (N. ⅝ E. mag.); highest peak of Gama N. 45° E. (NE. ⅞ N. mag.). The soundings in the vicinity of Black Rock show from 12 to 14 fathoms close to it, shoaling gradually toward Creston and Ciervo Islands and the anchorage between them.

Blossom Rock. Blossom Rock is a dangerous pinnacle rock, with but 1¾ fathoms of water on it (according to some reports it has but 3 feet of water over it) at low water. It lies in the outer part of the harbor, a little east of the best anchorage for large vessels, on the following bearings, viz: Signal station on hill north of Pala Point N. 27° 30′ W. (NW. ⅝ N. mag.); south bluff of Creston Island N. 90° W. (W. ⅞ S. mag.); Black Rock S. 7° W. (S. ½ E. mag.).

Buoy. Blossom Rock is generally marked with a flag buoy, but this mark should not be trusted, as it is frequently out of position. Capt. W. H. Parker, of the P. M. S. S. Co.'s service, says that it disappears at high water.

Guide. A sure guide for clearing the rock is to keep Monte Silla open to the westward of Ciervo Island.

Monte Silla. Monte Silla is a conspicuous saddle-shaped hill 256 feet high, situated on the point of the main-land, a little over half a mile north-eastward of Ciervo Island.

Anchorage and directions. A good berth is in 8 or 9 fathoms of water, with South Bluff (Creston Island) bearing S. 86° W. (WSW. ¾ W. mag.) and the Signal Station on a hill northward of Pala Point N. 16° W. (NNW. ¼ W. mag.). To pick up this anchorage, when coming from the westward, pass the South Bluff of Creston Island at a distance of 100 yards and steer N. 77° E. (ENE. mag.), heading for the highest part of Gama Island; anchor when the Signal Station bears N. 16° W. (NNW. ¼ W. mag.). Black Rock will then be just passing the beam, and bearing S. 11° E. (S. by E. ⅛ E. mag.).

The town will come into view shortly before getting on these bearings.

Coming from the southward, pass west of Black Rock, giving it a berth of 1 cable (200 yards), and steer north (N. ⅛ W. mag.), until South Bluff (Creston Island) bears S. 86° W. (WSW. ¾ W. mag.), when anchor, the other bearings being the same as before.

Caution. It must always be remembered that Monte Silla, open to the westward of Ciervo Island, clears the Blossom Rock. (*View approaching Mazatlan from the southward on opposite page.*) Should it be desirable to anchor nearer to the town, steer N. ¼ E. (mag.) from the anchorage just described and be guided by the lead; the soundings decrease regularly up to 15 feet.

Caution. During the bad weather season, September and October, it may be well to anchor farther out, or to the north-westward of Creston, where there is more room for getting under way, with a chance for sailing vessels to stand out clear of the land, in the event of being obliged to get under way.

Landing. In approaching the pier off the custom-house, strangers should give the shore a good berth and pull for the end of the pier, as there are several sunken rocks lying a short distance off, on which boats would strike at half tide.

Inner Harbor. The inner or northern part of Mazatlan Harbor is full of sand bars and shoals. It can only be used by vessels of the smallest class.

Pilots, harbor dues, &c. The following, relating to pilotage, harbor dues, &c., is

Plate XIX.

abel Island,
W. (mag.) 3½ m.

Isabel Island.

lena,
E. & S. (mag.)

María Cleopha,
E. by S. (mag.) 40 m.

M

s, east from Peñas.

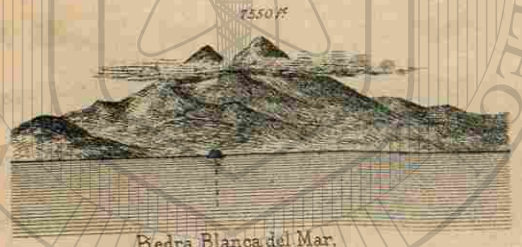
ntes.

Plate XIX.

fig #1.

Approaching Mazatlan from the Southward.

Isabel Island.



Mount San Juan. (San Blas)

Las Tres Marias Islands.

Corveteña Rock.

Cape Corrientes.

taken from Findlay's North Pacific Directory, 2d edition, published in 1870:

"A pilot is always in attendance; pilotage $1.75 per foot and $5.00 for the assistance of a boat. There are 12 feet of water on the bar, but 18 feet inside.* Discharging costs about $1.50 per ton, and is always at the merchant's expense. Tonnage dues $1.00 per ton when loaded; in ballast free. Labor $2.00 per day. Sand ballast $1.50 per ton. Stone $2.25. Water 6 cents per gallon. Beef 12 cents per pound. Weights and measures are the same as those of Spain."

Weather. During the stay of the *Narragansett*, from the 6th to the 18th of February, light north-westerly winds were experienced during the day, succeeded by calms at night. The thermometer ranged from 70° to 75° Fahrenheit. During the summer months calms are of frequent occurrence, and the thermometer reaches 100° and over.

Tides. Variation. It is H. W., F. and C., IX^{h} 40^{m}. Springs rise 7 feet. The magnetic variation in 1875 was 9° 45′ E., increasing about 1′ annually.

Mazatlan. Mazatlan, the official name of which is La Villa de los Castillos, is the only sea-port of importance in the province of Sinaloa. It presents a picturesque appearance, the houses being all light colored, and in the better part of the town handsome and commodious. It is considerably larger than Guaymas, having a population of about 15,000. The population varies with the seasons, being far greater in the dry season than during the rainy one.

Mazatlan is less unhealthy than San Blas, but severe fevers are common during the rainy season. It is the outlet for the products of the valuable mining district of San Sebastian and large quantities of English goods are imported directly from England. The trade is almost entirely in the hands of foreigners, who realize considerable profit from it. The city is well regulated, has a board of health, a civil and military hospital, several public schools, and a reading room organized by the resident foreigners. Next to Acapulco, Mazatlan is the most important city on the Pacific coast between Panamá and San Diego.

Supplies. Everything in the way of equipment or provisions that

* Doubtful.

between the Boca and a low, slightly projecting point 28 miles S. 12° E. (S. by E. ⅞ E. mag.) from it. For over 27 miles from the Boca Tecapan, a lagoon lies nearly parallel to the coast, the strip of sand beach between it and the sea varying in width, from a quarter of a mile near the Boca, to 2¼ miles near its southern limit.

The country for many miles back of the coast is low and level, two or three hills from 900 to 1,600 feet high, lying 15 or 20 miles inland, being the only ones seen throughout the entire distance. A few Indian huts and some patches of green bushes and trees are scattered along the coast.

From the low, slightly-projecting point just mentioned, the coast trends S. 24° E. (SE. by S. mag.) for a distance of 18 miles, to Camichin Estero.

Camichin Estero. Camichin Estero is the outlet of an extensive lagoon which stretches northward from it. Off the entrance is a bar, over which the sea breaks. On the western shore of the lagoon, just north of the entrance, is a small settlement. Vessels come here for cedar and dye-wood.

Settlement.

Anchorage. The usual anchorage is off the mouth of the estero in 5 or 6 fathoms of water about a mile from the shore.

Isabel Island. Isabel Island lies 17¾ miles from the nearest point of the main-land, its highest peak bearing N. 74° W. (W. ⅝ N. mag.) from the bar off Camichin Estero, 22 miles distant from it. It is about 1½ miles long, nearly NNW. and SSE., half a mile wide and 285 feet high. Neither wood nor water can be obtained from it, and it is visited only by sealers. (View opposite page 178.)

There are several detached rocks near the island, the most prominent of which are two pinnacle rocks, nearly white, one 90 and the other 75 feet high, which lie near its north-eastern side.

Landing-place. On the eastern and south-eastern sides of the island are sand beaches, where a landing may be effected in good weather. The soundings between Isabel Island and the coast are regular, decreasing from 20 fathoms near the island, to 6 and 7 fathoms 3½ miles from the coast.

South of Camichin Estero the coast continues its south-easterly trend and is low and sandy. Between the mouth of the estero and San Blas, which is 19 miles to the south-eastward, are the mouths of several lagoons and rivers.

Asadero Estero. The entrance to Asadero Estero is 7½ miles from that of Camichin. It has a shoal of small extent off it.

Anchorage. The anchorage is in 5 or 6 fathoms of water, about half a mile from the beach.

Vessels come here for cedar, dye-wood, &c.

Rio Grande de Santiago, or de Lerma. The Rio Grande de Santiago, or de Lerma, which takes its rise near the City of Mexico, feeds on its course Chapala Lake (over 50 miles long), and draining the larger part of the province of Jalisco, flows into the Pacific about 4 miles to the south-eastward of Asadero Estero. Guadalajara, the capital of Jalisco, is situated on the south bank, about 140 miles from its mouth.

A dangerous shoal, over which the sea breaks heavily, extends nearly two miles off its mouth.

Piedra Blanca del Mar. Piedra Blanca del Mar is a small white rock, 145 feet high, lying 5¼ miles S. 77° 30′ W. (WSW. mag.) from the mouth of the Rio Grande de Santiago. There is a safe passage between the rock and the shoal off the mouth of the river. From 8 to 9 fathoms will be found near the rock.

Land-mark. This rock is a good guide for making the port of San Blas, which is about 12 miles distant in an E. ½ S. (mag.) direction.

From the mouth of the Santiago the coast trends S. 58° E. (ESE. mag.) to the entrance of San Blas Harbor, a distance of 7⅓ miles. Three miles from the mouth of the Santiago is the outlet to a lagoon which is fed by a branch from the river.

Piedra Blanca de Tierra. Piedra Blanca de Tierra is a small white rock 58 feet high, with two smaller ones, one north-east and the other south-west of it. It lies 6 cables S. 41 W. (SSW. ⅞ W. mag.) from the nearest land (Castillo de la Entrada), the channel between having a depth of from 3 to 4 fathoms.

San Blas Harbor. The harbor of San Blas is nothing more than a small estero, having throughout the greater part of its extent, very shoal water. The bar at its entrance has 12 feet of water on it at low tide, and from 16 to 17 feet at high tide. Inside, the depth increases to about 3 fathoms at low water. Vessels must moor, head and stern, in the estero, which is very narrow, and is perfectly sheltered from every wind.

The western shore of the estero is a narrow neck of land, or peninsula, in the southern part of which are some hills over 100 feet high with the ruins of fortifications on them.

It terminates in a low stony point, which, projecting to the eastward from the main part of the peninsula, forms a natural breakwater and makes the harbor a land-locked one.

Directions. The following directions for entering the harbor of San Blas are from Findlay's North Pacific Directory: "There are 13 feet of water on the bar of San Blas, in the shallowest part of the entrance, and very seldom less, even in the neaps. By giving the point which forms the harbor a berth of 15 or 20 fathoms, you will avoid a large stone, which is awash at low water, and is about 8 fathoms from the dry part of the rocks or breakwater. As soon as you are so far in that the innermost or eastern part of the breakwater is in line with the other part of it inside, which runs to the NNE., it may be approached to within 10 or 15 fathoms, and by keeping well off from the low sandy point, as you warp up the harbor, you will have the deepest water. As the sea sometimes, in the rainy season (although seldom), breaks over the natural breakwater which forms the harbor, it is best to moor close under the high part of the land, on which stand the ruins of an old fort, with the ship's head up the river, a bower laid off to the eastward, and an anchor from the starboard quarter, the port side secured to the shore, either by taking out anchors or by making fast to the rocks. In this position it is next to impossible for any accident to happen to the ship; the cargo can be discharged with dispatch, and immediately under the eye of the master or mate, as the landing place would be about 100 fathoms from the ship. The ship's longboat would do more inside than two launches if she were outside, even in smooth weather, and in rough weather, when it would be impossible to work with the launches outside, the discharging could go on with the longboat, if inside.

"As there are no established pilots, it is advisable to engage a person to point out where the large stone before mentioned lies. The captain of the port is the best person to apply to, who, if he will not come off himself, will most likely recommend a suitable person."

San Blas Roadstead. The outer anchorage of San Blas is open and exposed to both the prevailing winds. It is safe in the dry season, and less dangerous than that of Mazatlan in the rainy months. The extent and configuration of the roadstead renders it easy of approach, and when leaving it, the prevailing current often affords considerable assistance. It is recommended to avoid remaining in it during the season of the *cordonazos*.

The best anchorage is in 5½ to 6 fathoms of water, Piedra Blanca de Tierra bearing N. 26° W. (NW. ⅞ N. mag.), distant about half a mile.

Land-mark. Mount San Juan, 7,550 feet high, is an excellent land-mark for making the port of San Blas. It may be seen from a great distance, and is seldom obscured by fog, as the low lands frequently are. When seen from the westward it appears to be saddle peaked, and on a bearing S. 73° E. (E. ¾ S. mag.) is nearly in line with Piedra Blanca del Mar and Piedra Blanca de Tierra. The coast range, from 1,000 to 3,000 feet high, lies between Mount San Juan and the coast. (View opposite page 178.)

The land southward of San Blas is high, while to the northward it is low.

Directions. When coming from the westward, bound to San Blas, pass close to the southward of Piedra Blanca del Mar and shape a course for Piedra Blanca de Tierra, keeping it a little open on the port bow and giving it a berth of 1½ or 2 cables in passing; anchor about half a mile to the south-eastward of it, in 5 or 6 fathoms. If it is desired to anchor nearer the town, pass between Piedra Blanca de Tierra and the Castillo de la Entrada and anchor in 4½ fathoms, a scant half mile eastward of the rock.

Caution. Care must be taken in standing in for San Blas, not to fall to leeward, as there is a strong southerly current setting along the coast during the greater part of the year.

Coming from the southward, steer for the westernmost hill, Castillo de la Entrada, 106 feet high, until approaching Piedra Blanca de Tierra, when anchor as before directed.

Variation. The magnetic variation in 1875 was 9° 05′ E., increasing about 1′ annually.

Tides. H. W., F. and C., IX^{h} 41^{m}. Springs rise 6½ feet.

San Blas. San Blas, the sea-port of the province of Jalisco, was formerly a large and important city, having a population of about 20,000. At present, San Blas proper has scarcely 600 inhabitants, and would be of no importance whatever, were it not the port of entry for Tepic and Guadalajera and the centre of the trade in precious woods, as rosewood, mahogany, cedar, lignum-vitæ, Brazil wood, &c.

The old town of San Blas was situated about three-quar-

ters of a mile from the shore, on the landward slope of a steep hill, about 450 feet high, and almost perpendicular on the side toward the sea.

It is at present a mass of ruins, with trees and bushes growing among them. The ruins of an old monastery, at present inhabited by large numbers of iguanas, are well worth a visit.

The present town of San Blas is situated on the low ground, on the eastern bank of the estero which forms the harbor (called Estero de Arsenal).

Fevers, &c. During the rainy season malignant fevers prevail, the effects of a marsh miasma generated in the numerous surrounding swamps, and there are myriads of mosquitoes and gnats, whose stings often cause painful and serious inflammatory disorders. At this season every one who is able, leaves the town for the interior.

Remarks. The following remarks are from Imray's North Pacific Pilot, Part I: "On November 1st the dry season commences; the temperature rises steadily, and the land yields all its moisture, until, by the month of May, the heat of the atmosphere resembles that of an oven, and the air swarms with mosquitoes and sand-flies; the sky is cloudless, the land and sea breeze regular, but not refreshing.

"Early in June, heavy banks of dark, lowering clouds, charged with electricity, collect on the high lands in the interior; lowering masses of clouds hang to seaward. The change is fast approaching, and before the 16th of June the rains commence and deluge the land, accompanied by heavy squalls and a tumbling swell from seaward.

"All vessels now leave the coast unless able to take shelter in the estero, though of late, men-of-war in eager search of freight, have held on and found that the gales do not in the winter, blow home. At this season all the inhabitants whose means afford it, quit the coast for the interior.

"For the first month or six weeks, the parched land absorbs the rain, but by the middle of August it becomes moist and swampy, the haunt of alligators and aquatic birds. In September the action of the sun on water-sodden land, generates fever of the most violent nature, and it behooves those who arrive early in the dry season to be careful of exposure to the malaria."

Supplies. Fresh beef, vegetables, wood, and water may be obtained

here. The latter, of an excellent quality, is found near the shore of the Ensenada Matenchen, three miles to the eastward of San Blas.

Tepic. Tepic is an important town, situated on the eastern slope of Mount San Juan, distant by the road, about 28 miles from San Blas. It has a population of about 10,000, and is widely known for its manufacture of cigars. It has also a cotton factory.

Guadalajera. Guadalajera, the capital of the province of Jalisco, is about 120 miles from Tepic, with which it is connected by a road. It has a cathedral, government building, theatre, and several convents, and is quite prominent as a manufacturing city, the principal manufactures being leather goods, hardware, and cigars. It has a population of 60,000.

Las Tres Marias. Off this part of the coast, and from 50 to 60 miles distant from it, is a group of islands extending 39 miles in a general NW. and SE. direction, and known as Las Tres Marias. They are of volcanic origin and their western sides are high, inaccessible, barren cliffs, while the eastern sides are generally low and sandy, with some vegetation. (View opposite page 178.)

Maria Cleopha. Maria Cleopha is the southernmost of Las Tres Marias and is nearly circular in form, having a diameter of about 3 miles. The highest peak has an altitude of 1,320 feet. A pinnacle rock 100 feet high lies off the south-east point, distant about 8 cables, and a white rock 225 feet high lies half a mile off the westernmost point. A shoal on which there is a rock awash, extends a third of a mile off from the NE. extreme, and numerous smaller detached rocks lie a short distance off from the bold bluff points. The south-eastern point, which is a yellowish bluff, surmounted by a steep hill 250 feet high, is 57 miles S. 72° W. (SW. by W. $\frac{5}{8}$ W. mag.) from San Blas. A heavy surf beats against all sides of the island.

Maria Magdalena. Maria Magdalena lies to the north-westward of Maria Cleopha, the channel between them being 8 miles in width and free from all dangers. It is 8 miles long, east and west, with a greatest width of $4\frac{1}{2}$ miles, and its highest peak is 1,500 feet above the sea level. Just south of the eastern extreme of the island, which is a yellowish bluff about 200 feet high, is a small bight with 11 fathoms and upwards of water, rocky bottom. The NE. point is low and gravelly;

a short distance west of it is a small lagoon. On the northern face, about midway of its length, shoal water extends off shore about half a mile, and off all the salient bluff points, are outlying rocks, at distances varying from a quarter to half a mile from the shore. The shore of the northern side of the island is a fine sandy beach, the land sloping gradually from the interior.

Vegetation. There is considerable vegetation on this island, although the soil is of a sandy nature. The most valuable of its products is lignum-vitæ, besides which there is an almost impenetrable thicket of small trees and bushes of a thorny nature, together with the prickly pear and some plants of the orange and lemon species. Fish are abundant near its shores.

Fish.

Maria Madre. Maria Madre is the largest of the group, being 11½ miles long nearly NW. and SE., and from 3 to 6 miles wide. The highest peak, near the middle of the island, is 2,020 feet high.

Settlement. On the SE. face there is a small settlement of 15 or 20 people, who are occupied in collecting salt from a lagoon near by. The salt is shipped to Mexico.

The southern extreme of the island is a bold, rocky headland 125 feet high, with several detached rocks lying off it.

Anchorage. Eastward of this headland there is tolerable anchorage, in from 7 to 11 fathoms of water, and a sand beach where boats may land in good weather.

Fresh water. Fresh water of an inferior quality may be procured on this part of the island by sinking wells.

Reef and rock. From the NW. extreme, a dangerous reef extends nearly a mile toward San Juanito Island. Two miles south of the NW. point, and half a mile from the western shore of the island, is a detached rock, 5 feet above water, with a sunken rock between it and the shore.

Channel. The channel between Maria Magdalena and Maria Madre is 4 miles wide and free from dangers.

San Juanito Island. San Juanito, the northernmost and smallest of the group, lies 2 miles north-westward of Maria Madre. It is 2½ miles long, with a greatest width of 1¼ miles, and about 200 feet high at its northern end, whence it slopes gradually to the southward.

Reef. From its southern end a reef extends a mile toward Maria Madre, which, with the reef extending off the NW. point of

the latter, renders the channel between them extremely dangerous.

Rock. A remarkable white rock, 150 feet high, lies a mile off the western shore of San Juanito.

Las Tres Marias were discovered as early as 1532 by Mendoza, and often served as a rendezvous for the buccaneers who scoured these coasts.

Soundings. Caution. The soundings increase rapidly from the shores of these islands, no bottom being found at 100 fathoms, 2 miles distant. Calms, eddy winds, and southerly currents must be guarded against when navigating the channels between them.

The coast from San Blas to Punta Raza is mountainous, and stands in marked contrast with the monotonous sandy plains farther north.

Camaron Point. Camaron Point, lying 2$\frac{4}{10}$ miles to the south-eastward of San Blas, is a sharp, bluff point, with a ridge of hills terminating just back of it. Off it are some outlying islets and rocks. The mouth of the Estero de San Cristobal is a mile north of the point. This estero is of no importance to navigation.

Ensenada Matenchin. At Camaron Point the coast turns sharply to the north-eastward for about 1¾ miles and then curves around to the southward, forming an open bay called Ensenada Matenchen, on the northern shore of which fresh water may be obtained. Shoal water extends half a mile off the shore of the bay, and there are some detached rocks lying to the eastward of Camaron Point.

Shoal water.

Santa Cruz Point. Santa Cruz Point, with the river and village of the same name, are at the southern limit of the Ensenada Matenchen.

Punta los Custodias. Punta los Custodias is 5½ miles to the southward of Santa Cruz Point, several steep, bluff points, from 45 to 75 feet high, intervening. It is a rocky, bluff point about 30 feet high, the coast range of hills rising abruptly behind it. The Custodias River, which empties into the sea just south of the point, has a bar at its mouth, over which the sea breaks.

From Punta los Custodias, a low straight sand beach extends southward for a distance of 8 miles, the land back of it covered by trees and bushes. Near the southern limit of this sand beach is a small stream known as the Chila River.

Chacala Ensenada. Chacala Ensenada is a small cove situated 1¾ miles south of the southern limit of the sand beach just mentioned, a

bluff point 40 feet high intervening. From the shore of the cove hills rise immediately, to a height of over 300 feet.

Tecusitan Point. A mile and a half south of Chacala Ensenada, with some outlying rocks between, is a rocky, bluff point 70 feet high called Tecusitan Point.

Landmark. About 10 miles S. 77° E. (E. $\frac{3}{8}$ S. mag.) from Tecusitan Point, is a prominent peak of the main range of mountains, lying parallel to the coast, known as Cerro Compostella. It is 4,262 feet high and affords a good land-mark.

Jaltemba Bay. Between Tecusitan Point and Punta Raza, 6 miles distant, the coast recedes somewhat, forming the open bay of Jaltemba, in which vessels may anchor and find shelter from south-easterly winds.

The shore of the bay is sandy, and the land back of it, which rises gradually, is covered with a thick growth of trees and bushes. Dye-wood is shipped from here.

Dye-wood.

A line of soundings run from point to point across the bay, showed no bottom at 13 fathoms.

Islet and rock. A small whitish-colored islet 80 feet high, lies about 2 miles to the north-eastward of Punta Raza, in Jaltemba Bay, and about three-quarters of a mile from the shore. South of the islet, distant about half a mile, is a black rock 20 feet high. Vessels that come here to load dye-wood anchor between the islet and the shore.

Punta Raza. Punta Raza is a reddish-colored, bluff point about 30 feet high, with hills rising abruptly, back of it. It bears S. 33° W. (SSW. $\frac{1}{8}$ W. mag.), distant 6 miles from Tecusitan Point. Deep water extends close up to Punta Raza; 20 fathoms were found at a distance of a mile, and *no bottom* at 13 fathoms within a quarter of mile.

Fresh water. A little over a mile to the eastward of Punta Raza, on the shore of Jaltemba Bay, there is a small fresh-water stream.

From Punta Raza the coast has a general trend S. 38° 30′ W. (SSW. $\frac{3}{8}$ W. mag.) for 21$\frac{1}{4}$ miles, to Punta Mita, the northern point of the entrance to Banderas Bay, and is a succession of bluffs alternating with sand beaches. The coast range, varying in height from 300 to 1,000 feet, borders on the sea throughout the entire distance. A short distance back of the coast is a higher range of mountains, the most conspicuous of which is Cerro Vallejo, 5,036 feet high, bearing E. (E. $\frac{3}{4}$ N. mag.), 10$\frac{3}{4}$ miles distant from Monterey Point, and 7$\frac{3}{4}$ miles distant from the nearest part of the coast.

Monterey Point. Monterey Point is 8$\frac{3}{4}$ miles south-westward of Punta Raza, and is a ragged bluff, with some outlying rocks on its NE. side. Three miles to the north-eastward of it is an Indian village, close to the shore.

Santa Cruzita Point. Santa Cruzita Point is 4$\frac{1}{2}$ miles south-westward of Monterey Point, and, like the latter, is a ragged bluff point.

Punta Mita. Punta Mita is a low, narrow, projecting point at the northern side of the entrance to Banderas Bay, and is surrounded by outlying rocks and reefs, which make a near approach to it dangerous. A mile and a half to the north-eastward of the point is a prominent hill 454 feet high, and on the coast northward of the hill is a steep, rocky bluff 60 feet high. From the bluff, the coast sweeps to the eastward 1$\frac{1}{2}$ miles, forming a small bight open to the northward, with low-land, covered with trees and bushes, between it and Banderas Bay, to the southward.

For nearly half a mile to the westward of Punta Mita there are outlying rocks and shoals, outside of which the depth of water increases quickly, to 15 and 20 fathoms.

Rock awash. One mile S. 22° W. (S. by W. $\frac{1}{8}$ W. mag.) from Punta Mita is a dangerous shoal and rock awash, over which the sea breaks in rough weather. In the passage between the rock and the point there are from 2$\frac{3}{4}$ to 4 fathoms of water.

Las Tres Marietas. Las Tres Marietas are a group of small islands, rocks and shoals, extending 5$\frac{1}{4}$ miles in a general ENE. and WSW. direction, the easternmost and largest of which is on a line between Punta Mita and Cape Corrientes, bearing S. 21° W. (S. by W. $\frac{1}{8}$ W. mag.), distant 4$\frac{1}{4}$ miles from the former.

The easternmost island is less than half a mile in extent and 179 feet high, rising in broken white cliffs to the higher parts, which appear flat. A mile to the westward of it is the second of the group, somewhat smaller than the first, but similar to it in character, and 132 feet high. Surrounding this island, and in the channel between it and the first, are numerous detached rocks. A mile and a half farther westward, its centre bearing S. 41° W. (SSW. $\frac{7}{8}$ W. mag.), distant 6$\frac{3}{4}$ miles from Punta Mita, is a reef of rocks above and below water, with deep water close to. The third island of the group is a mile and a half westward of the reef and 8$\frac{1}{10}$ miles S. 48° W. (SW. $\frac{1}{2}$ S. mag.) from Punta Mita. It is merely a white rock, 40 feet high; half a mile to the westward of it

Reef.

is a smaller rock, 15 feet high. There are 40 fathoms of water close to these rocks.

Channel. Between the Tres Marietas and Punta Mita is a clear, safe channel; but in using it, care must be taken to avoid the rock awash, that lies a mile to the southward of Punta Mita. This is easily done by keeping a little nearer the islands than the point.

Anchorage. There is an excellent anchorage during the season of the NW. winds 1½ miles eastward of Punta Mita, in from 5 to 7 fathoms of water, from half to three-quarters of a mile off shore, the hill, 454 feet high, to the north-eastward of the point, bearing N. 20° W. (NNW. ½ W. mag.). The magnetic variation was 9° E. in 1877, increasing about 2′ annually. Tides rise about 4 feet.

Variation. Tides. Fresh water. Game, &c. Fresh water in small quantities may be found near the beach. Game is abundant in the interior. A species of wild turkey, called by the natives *chachalaca*, is found in large flocks, furnishing excellent meat. Parrots of beautiful plumage cover the limbs of the trees and fill the air with their chattering.

Corvetena Rock. Corvetena Rock, which is of a whitish color, 3 cables in length and 25 feet high, lies 16½ miles S. 83° W. (WSW. ⅝ W. mag.) from Punta Mita. It is irregularly shaped, with a very jagged top, and in a clear day can be seen from the deck of an ordinary vessel, at a distance of 8 or 10 miles. There are 40 fathoms of water close to the rock, and from 50 to 100 fathoms between it and Punta Mita.

Current. A strong current was noticed in its vicinity, setting to the SE. (View opposite page 178.)

Banderas Bay. Banderas Bay, sometimes called Valle de Banderas Bay, is formed by a deep indentation in the coast between Punta Mita and Cape Corrientes. It is 20 miles in extent east and west, with an average width of about 15 miles. The northern shore of the bay, as far as Punta Piedra Blanca, 7¾ miles from Punta Mita, is, with the exception of a short strip of sand beach just east of the latter point, composed of broken bluffs from 10 to 20 feet high. From Punta Piedra Blanca to the Rio Real, which empties into the head of the bay, the shore is a sandy beach. The southern shore from the Rio Real to Cape Corrientes is high and precipitous, with occa-

Fresh water. sional valleys and sand beaches, where small fresh-water

streams empty into the bay. The water along the southern shore is very deep.

Pedredero Point. Pedredero Point, 5 miles to the eastward of Punta Mita, is a rocky point, with a large outlying rock off it. Two and a half miles north-eastward from it are some conspicuous hills over 1,800 feet high.

Punta de Piedra Blanca. Punta de Piedra Blanca, which is surmounted by a hill 300 feet high, lies about 3 miles eastward of Pedredero Point. Along this part of the coast are some outlying rocks, close to.

Anchorage. Eastward of Punta de Piedra Blanca is a small ensenada, where excellent anchorage may be found in the season of the north-west winds.

Estero de Tomates. The Estero de Tomates, into which the Rio del Valle or Piginto empties, is 7¾ miles S. 61° E. (ESE. ¼ E. mag.) from Punta de Piedra Blanca, the intermediate coast, which recedes considerably to the northward, being low, sandy, and covered with bushes, the soundings off it increasing regularly, from 3 and 5 fathoms near the shore to 15 and 20 fathoms a mile or so off.

Shoal. Off the mouth of the estero is a shoal, over which the sea breaks. Outside of this shoal the soundings increase very rapidly, 99 fathoms, rocky bottom, being found three-quarters of a mile from the mouth of the estero.

Peñas. The village of Peñas is situated about 4 miles to the south-eastward of the mouth of the Estero de Tomates, on the bank of the Rio Real, which empties into the head of the bay. The hills back of Peñas rise abruptly to a height of over 1,000 feet, and high mountains are plainly visible 10 or 20 miles to the eastward. One and a half miles northward from Peñas is a grove of palms and a lagoon called Estero de Paran.

Anchorage. There is an anchorage in good weather, off the mouth of the Rio Real, close to the beach. The soundings off shore deepen very quickly, *no bottom* being found at 25 fathoms, 2 cables length from the beach. Vessels come here for dye-wood.

Fresh water. Fresh water of excellent quality may be obtained from the river.

The *magnetic variation* was 8° 50′ E. in 1877.

Los Arcos. Los Arcos are three rocks lying near the southern shore of the bay, between 4 and 5 miles to the south-westward of the mouth of the Rio Real. The highest of these rocks is

291 feet high, the other two are 20 and 30 feet high, respectively. From Los Arcos to Cape Corrientes the coast is bold and backed by mountains from 2,000 to 3,000 feet high. Soundings obtained off it, gave *no bottom* at 100 fathoms, a mile from the beach. There are some outlying rocks off the rocky, bluff points, and at the mouths of the several fresh-water streams that flow into the bay, are collections of Indian huts.

Chimo Point. Chimo Point is a rocky head-land, situated 7 miles to the north-eastward of Cape Corrientes. Just east of the point is a reef of rocks, and a short distance westward of it is a white rock 40 feet high. The river Chimo empties into the bay, on the eastern side of the point.

Tabo Point and Bay. Tabo Point is 4½ miles south-westward of Chimo Point, and forms the north-eastern limit of Tabo Bay, which is a small open bay, at the head of which are a few Indian huts, on the banks of a small stream which flows into the bay and is called by the same name. It is impossible to anchor in Tabo Bay on account of the great depth of water, 60 fathoms being found within a ship's length of the shore.

Corrales Harbor. West of Tabo Bay, separated from it by a high hill, is the *so-called harbor* of Corrales, the western limit of which is only half a mile from Cape Corrientes. It is about half a mile in extent either way, but affords no anchorage. A sunken rock, on which the sea breaks in rough weather, lies off the mouth of the harbor, about 3 cables from the shore.

Rock.

Cape Corrientes. Cape Corrientes, the southern point of the entrance to Banderas Bay, is a bold head-land 506 feet high, the land a short distance back of it rising to a height of 2,000 feet. (View opposite page 178.)

There is a large outlying rock close to the cape. Soundings obtained 3 cables distant from it, gave 145 fathoms.

Current. Capt. W. H. Parker, of the P. M. S. S. Co.'s service, cautions against one of the most remarkable currents on this coast, saying: "The current runs from Cape Graham, along the coast toward Cape Corrientes, generally about NW., but sometimes setting north with considerable velocity into Natividad, Tenacatita, and Perula Bays. You may be *cut in a good deal*, and must look out for it."

CHAPTER III.

REVILLA-GIGEDO ISLANDS.

The Revilla-Gigedo group consists of four islands, lying between 18° 20′ and 19° 20′ N. lat. and 110° 45′ and 114° 50′ W. long. They are evidently of volcanic origin, and were discovered by one of the early Spanish navigators, in the beginning of the 16th century. In 1793 Captain Colnett, out of gratitude for the kindness he had received from the Spanish Mexican viceroy, during his captivity, gave that official's name to these islands. It was the intention of the Spaniards to establish a colony on them, but it has never been done.

Socorro. Socorro Island, the largest of the group, is nearly circular in shape, having a greatest diameter of 10¼ miles nearly north and south. It may be said to consist of one mountain 3,707 feet high, which slopes gradually at all points toward the south shore of the island, and is covered with a thick growth of cactus, which renders it almost impossible to penetrate into the interior. Pieces of hardened lava are met with everywhere. A species of bean grows on a vine which runs along the ground. The fruit (from 3 to 5 beans or nuts, for they have a hard shell) is contained in a pod 3 or 4 inches long, and is edible, having a rather insipid taste. "Captain Colnett's men are said to have become very sick in consequence of having partaken too freely of these beans." No indications of fresh water were seen, but it is said that there are goats on the island, which would hardly be the case if there was no fresh water to be found. Fish, turtle, craw-fish, and crabs were abundant.

Braithwaite Bay. There is good anchorage in Braithwaite Bay during the fine weather season, that is, from December to June. This bay is situated on the SE. side of the island and is readily distinguished, being the first inlet east of the southern point of the island and having a *stony beach*, the only one on the south side of the island.

291 feet high, the other two are 20 and 30 feet high, respectively. From Los Arcos to Cape Corrientes the coast is bold and backed by mountains from 2,000 to 3,000 feet high. Soundings obtained off it, gave *no bottom* at 100 fathoms, a mile from the beach. There are some outlying rocks off the rocky, bluff points, and at the mouths of the several fresh-water streams that flow into the bay, are collections of Indian huts.

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Braithwaite Bay. There is good anchorage in Braithwaite Bay during the fine weather season, that is, from December to June. This bay is situated on the SE. side of the island and is readily distinguished, being the first inlet east of the southern point of the island and having a *stony beach*, the only one on the south side of the island.

Wishing to anchor in this bay, bring the highest peak of the island to bear N. 24° W. (NW. by N. mag.) and anchor in 10 or 11 fathoms, a quarter of a mile from the beach. There is a good landing place on the beach at the head of the cove.

Variation. The magnetic variation was 9° 5′ E. in 1877.

Cape Rule. Cape Rule, the southern extremity of Socorro, is a high, rocky bluff, surmounted by a hill 250 feet high.

Cornwallis Bay. Cornwallis Bay, on the SW. side of the island, affords good anchorage in easterly winds. It is necessary to anchor quite near the white coral beach, as the water deepens quickly, off shore. In the western part of the bay are some pinnacle rocks 30 feet high.

Rugged Point. Rugged Point is the western extreme of the island; north of it is a small bay, near the head of which is a double-pinnacle rock 25 feet high.

Cape Henslow. Cape Henslow, at the northern limit of the bay just mentioned, is a perpendicular bluff 100 feet high.

Oneal Rock. Oneal Rock, lying a mile N. 24° 30′ W. (NW. by N. mag.) from Cape Henslow, is about half a mile in extent and 45 feet high, with deep water close to.

Off the NW. face of the island, between Cape Henslow and Cape Middleton, there are several outlying rocks.

Cape Middleton. Cape Middleton is the northernmost point of the island and is a perpendicular bluff 50 feet high. A little over a mile to the north-eastward of it are two small rocks, one 15 and the other 50 feet high.

The eastern side of the island consists of perpendicular bluffs, varying in height from 15 to 150 feet, with no place where a landing might be effected, even in the finest weather.

Cape Pearce. Cape Pearce, the easternmost point, has some outlying rocks close to; back of it is a range of table-mountains about 1,000 feet high.

Four and a quarter miles to the north-westward of Cape Pearce is a detached rock, 6 feet above water, close to the shore.

Remarks. The following remarks are from Findlay's North Pacific Directory: "Captain Colnett considered the safest anchorage, from June to December, to be between the south and SW. points (Cornwallis Bay), opposite to two white coral beaches, which are the first two in succession from the south point toward the west. It is remarkable from the pinnacle

Plate XX.

Roca Partida.

rocks, which lie close off the west point of the bay. This bay is preferable in the bad season, as the wind seldom blows more than two points to the southward of east. In the good season however, that is, from the latter part of December until the beginning of June, the SE. (or Braithwaite Bay) is to be preferred; the anchorage here is better and nearer the cove, and is the only good landing place. It is readily known, being a stony beach at the first inlet in the shore to the eastward of the south point. All other parts of the coast on the south side of the island are iron-bound, which makes it difficult, if not impossible, to land, except in very fine weather."

San Benedicto Island. San Benedicto Island lies 30 miles N. 17° E. (N. ¾ E. mag.) from the highest point of Socorro. It is a barren rock 3 miles long and from a half to three-quarters of a mile wide. The highest peak is near the southern end, and has an altitude of 975 feet. There is another peak somewhat lower, near the middle of the island. These two peaks, when seen from a distance, have the appearance of two distinct islets.

Landing. On the eastern side of the island, near the middle, is a small shingle beach, where a landing might be effected in good weather.

Rocks. There are three small detached rocks, varying in height from 60 to 200 feet, lying close to the western shore of the island, near the northern point, and a dangerous sunken rock lies about a mile westward of the extreme western point.

Roca Partida. Roca Partida is a small, dangerous, barren rock, 110 feet high, lying 67 miles N. 80° W. (W. ⅛ N. mag.) from the highest part of Socorro. It consists of two white pinnacle rocks connected by a low ridge 20 feet high. (View on opposite page.) The low part not being visible very far, it has the appearance of two separate rocks.

It is 300 feet long and 150 feet wide, and from a distance looks like a vessel under jury-masts.

Soundings of 35 fathoms were found all around it, at a boat's length from the rock. At half a mile distant, 50 fathoms were found, and beyond that, no bottom at 100 fathoms.

Clarion Island. Clarion Island is of volcanic origin, and of the same general character as Socorro, from which it bears S. 83° W. (WSW. ⅝ W. mag.), distant 214 miles. It is a little over 5 miles long, nearly E. and W., and from 1 to 2 miles wide,

being widest at its western end. There are three prominent peaks, 1,282, 916, and 996 feet high, respectively, the highest being near the western end. A thick growth of cactus covers the island.

Sulphur Bay

On the south side of the island are two indentations in the coast, with sand beaches, the only two places of the kind on the island. The western of these two indentations is called Sulphur Bay. Its western limit is 1½ miles from Rocky Point (the SW. point of the island), and in it may be found tolerable anchorage, in northerly winds, in 12 or 13 fathoms of water, 3 cables from the sand beach. Near the beach is a salt-water lagoon, but no fresh water was found. As doves are quite numerous, there must be fresh water on the island.

With the exception of the two sand beaches mentioned, the shores of the island consist of perpendicular bluffs, varying in height from 80 to 600 feet.

Shag Rock

Shag Rock, 40 feet high, with numerous smaller rocks close to it, lies off the SE. point of the island, close to a bold bluff.

Off the north side of the island, 1¼ miles from the NW. point, and about 375 yards from the shore, is a detached rock 25 feet high.

Monument Rock.

Off the NW. point of the island is a remarkable monument rock, 200 feet high, with a number of smaller rocks between it and the point. It has an almost square base and is surmounted by a broken pyramidal shaft of alternate layers of red and white conglomerate rock.

Fish, turtle, &c.

Fish and turtle were numerous in the vicinity of the island, also many varieties of sea birds.

Soundings obtained south of Clarion Island, gave 20 fathoms and over, half a mile from shore, increasing to 40 and 50 fathoms, at a mile distant.

Current.

The current in the vicinity of the gronp was southerly, and from half a knot to a knot.

Reported islands and shoals.

Careful search has been made for the many islands and shoals that have been reported in this vicinity at different times, without finding them, or any indications of them.

Table of geographical positions.

Names.	Place referred to.	Latitude north.			Longitude west.		
		°	′	″	°	′	″
Abreojos Point	Extreme of rocky ledge	26	42	28	113	34	54
Adair Bay	Point at west limit of bay	31	29	43	114	8	18
Agiabampo	South-east side of entrance	26	16	35	109	17	30
Alijos Rocks	Summit of South Rock	24	58	6	115	44	47
Altata	North side of entrance	24	38	52	107	59	37
Angeles Bay	Bight on north-west shore	28	56	39	113	34	35
Arena, Point	Extreme	23	32	47	109	28	57
Arena de la Ventana, Point	Extreme	24	3	52	109	50	29
Asuncion Island	North end of island	27	5	58	114	18	21
Boundary Monument		32	31	58	117	7	32
Canoas Point	High bluff	29	25	29	115	12	14
Cerros Island	South-east part, a mile northward of Morro Redondo Point.	28	1	49	115	11	3
Ciaris Island	North-west part	26	58	59	109	57	16
Clarion Island	South side. North-east part of Sulphur Bay	18	20	55	114	44	17
Colnett Bay	Head of bay	30	57	39	116	17	28
Conejo Point	Extreme	24	20	17	111	30	21
Corrientes, Cape	Extreme	20	24	40	105	29	31
Cortez Shoal	Two-and-a-half fathom spot, Bishop Rock	32	25	45	119	6	21
Ensenada Anchorage	Head of bay, close to beach	31	51	10	116	38	5
George's Island	North-east shore	31	0	54	113	16	30
Guadelupe Island	North Point	29	10	50	118	18	30
Guaymas	Signal Station	27	55	53	110	55	13
King Point	Mound	28	45	28	111	58	50
La Paz	South-east extreme of El Mogote	24	10	10	110	20	41
Lagoon Head	Highest point of crater	28	14	33	114	6	24
Las Animas, Boca de	South point of entrance	25	39	44	112	6	36
Las Animas, Point	Extreme	28	50	22	113	15	7
Libertad Anchorage	Beach	29	54	12	112	45	4
Lobos Island	Monte Verde	27	20	15	110	36	35
Lobos Point	Extreme	23	24	42	110	14	7
Loma Point	Light-house	32	40	14	117	14	38
Loreto	Cathedral	26	0	41	111	21	3
Lupona Point	Extreme	24	24	10	110	21	45
Magdalena Bay	Man-of-War Cove	24	38	22	112	8	50
Maria Madre Island	South-east extreme	21	30	45	106	33	14
Mazatlan	Signal Station	23	11	17	106	26	39
Mejia Island	South side	20	33	8	113	35	19
Mita Point	Extreme	20	45	50	105	33	37
Mulege	Equipalto Point	26	53	37	111	58	4
Navachista Estero	West side of entrance	25	23	6	108	49	0
Patos Island	South-east end	29	16	12	112	28	51
Piastla Point	Extreme	23	38	42	106	49	50
Piñas Anchorage	Mouth of Rio Real	20	36	26	105	16	0
Philip's Point	Beacon	31	46	10	114	43	31
Pichilingue Bay	South-east part of San Juan Nepomucino	24	15	31	110	20	34
Playa Colorada	North side of entrance	25	11	42	108	23	37
Playa Maria Bay	Mound on west side	28	54	51	114	31	46
Puerto Refugio	See Mejia Island						
Pulpito Point	Summit	26	30	44	111	27	14
Raza Island	Landing place, south side, near flag-staff	28	49	11	113	0	5
Remedios Bay	Beach on western shore	29	13	51	113	40	0
Roca Partida	Summit	18	57	27	112	31	6
Salinas Bay	Beach in north-east part of bay	25	59	37	111	6	53
San Bartolomé, Port	North side of entrance	27	39	35	114	54	27
San Benedicto Island	South extreme	19	17	35	110	55	33
San Benito Islands	Summit of western island	28	18	8	115	36	10
San Blas	Custom-house	21	32	30	105	18	40
San Carlos Point	Extreme	28	0	7	112	47	36
San Domingo Point	Edge of cliff	26	18	56	112	41	44
San Evaristo	Sand beach about 3 miles south of point	24	52	3	110	41	47
San Felipe Point	Peak (1,000 feet high)	31	2	57	114	50	39
San Fermin Point	Beach north of bight	30	25	16	114	39	47
San Geronimo Island	Bight at east end	29	47	11	115	47	45
San Ignacio Point	Extreme	26	45	45	113	16	25
San José del Cabo	North-east side of entrance	23	3	35	109	40	43
San Juanico Point	Knoll	26	3	18	112	17	52
San Lazaro, Cape	Extreme	24	47	35	112	18	30
San Lucas Bay	Steep sand beach in north-west part	22	53	21	109	54	41
San Luis Island	South-east side	29	57	27	114	25	49
San Marcial Point	Extreme	25	30	17	111	1	25

105°43′

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San Marcos Island	Southern sand-spit	27	10	21	112	5	39
San Martin Island	Hassler Cove	30	28	57	116	6	36
San Pedro Bay	North-east shore of bay	28	3	22	111	16	0
San Quentin, Port	Sextant Point	30	22	15	115	59	7
Santa Barbara Bay	North-west side of bay	26	41	9	109	40	48
Santa Maria Cove	Beach on north-west shore	27	26	6	112	19	56
Santa Teresa Bay	Beach on north side	28	25	3	112	51	58
Santo Tomas	North-west shore of cove	31	33	4	116	40	51
Socorro Island	South-east part	18	42	57	110	56	53
Soledad, Boca	South side of entrance	25	16	26	112	7	48
Tecapan, Boca	Village of Palmita	22	30	26	105	44	25
Tepoca, Cape	Hill (300 feet high)	30	16	5	112	53	26
Tiburon Island	South end, near Red Bluff Point	28	45	55	112	41	56
Todos Santos	Foot of hill forming Lobos Point	23	24	41	110	13	57
Topolobampo	South-east end of Santa Maria Island	25	33	56	109	10	23
Tosco, Cape	Extreme	24	18	11	111	42	54

ALPHABETICAL INDEX.

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