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THE COASTS OF CENTRAL AMERICA, CALIFORNIA, OREGON, FUCA STRAIT, PUGET SOUND, VANCOUVER ISLAND, AND THE ISLANDS AND ROCKS OFF THE COASTS OF CENTRAL AMERICA AND CALIFORNIA.

WITH AN APPENDIX,

CONTAINING VARIOUS REMARKS ON THE WINDS, TIDES, CURRENTS, &c.

CAREFULLY COMPILED
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JAMES IMRAY, 102, MINORIES.

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PREFACE

THE rapid development of the resources of California and Oregon, and the increase of commerce with the countries on the sea-board of Central America, have had the effect of raising into importance many ports which, but a few years since, afforded only an occasional shelter to whalers. Hitherto, there has been but little call for a work of this nature, but as the countries of Western America are daily becoming of more commercial value, and the ports are visited less as harbours of occasional shelter than as places of trade, a work affording some information to the seaman, however scanty, of the ports he is about to visit, has become necessary. In the compilation of this work considerable difficulty has been experienced, from the want of information that could be considered authentic and trustworthy, no complete survey having yet been made of the West Coast of North America, although detached portions of it have been from time to time examined by the various expeditions sent out for that purpose by the governments of Great Britain, the United States, France, and Spain. From the works resulting from these examinations we have obtained much information, although it cannot in every case be considered so satisfactory as we might wish, still, through their means, we have, to some extent, become acquainted with many parts of which we were previously in entire ignorance; we have also embodied much private information with the object of making the work as complete and serviceable as possible. The information thus brought together, it will be seen, cannot be connected so well as might be desired, seeing that

each observer had either a specific portion of coast to examine, or only took a general survey of it without entering into details. All the information, however, which might be useful to the mariner has been collected together, and it only remains for us to add that we shall avail ourselves, in future editions, of any hydrographical information that may tend to the improvement of this work, and shall always thankfully receive communications from correspondents which may contribute to its future usefulness.

Several of the ports of Central America have been examined by Sir Edward Belcher, from whose work we have obtained many remarks; and a survey of the coasts of California and Oregon is now in progress, by order of the United States Government, the completion of which will tend still further to improve our knowledge of these countries. Fuca Strait, Admiralty Inlet, and Puget Sound, have been so well examined by Vancouver, Commander Wilkes, Captain Kellett, and others, that we believe but little remains to add to our acquaintance with these extensive inland waters. It is also right to mention that the pages of the Nautical Magazine have materially assisted us in the completion of the work.

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SAILING DIRECTIONS

FOR THE

WEST COAST OF NORTH AMERICA.

*** THE BEARINGS ARE ALL BY COMPASS, UNLESS WHEN OTHERWISE EXPRESSED. THE SOUNDINGS ARE REDUCED TO THE LEVEL OF LOW WATER, SPRING TIDES.

IT HAS RECENTLY BEEN ORDERED BY THE LORDS COMMISSIONERS OF THE ADMIRALTY, THAT THE WORD "PORT" IS TO BE USED INSTEAD OF THE WORD "LARBOARD," IN ALL H. M. VESSELS, IN CONSEQUENCE OF THE SIMILARITY EXISTING BETWEEN THE WORDS LARBOARD AND STARBOARD.

THE COASTS OF CENTRAL AMERICA, &c.

BEFORE giving a nautical description of the Bays and Harbours of Central America, a few remarks on the geography and natural features of the country, will not be considered out of place.

CENTRAL AMERICA comprehends all the territory lying between Mexico on the north, and the Isthmus of Darien, or Panama, on the south. Its entire length is 1,000 miles, and its breadth varies from upwards of 100 miles to 300; giving an area of 200,000 square miles, or more than twice the extent of Great Britain. Situated in the torrid zone, between 8° and 18° N. latitude, and 80° and 90° W. longitude, it at once separates the Atlantic from the Pacific Ocean, and unites the continents of North and South America; a position as important commercially, as it is geographically remarkable and unique.

It includes the fine independent states of Guatemala, Salvador, Honduras, Nicaragua, and Costa Rica; and also British Honduras, and the Mosquito Shore. It is bounded on the north by Mexico; on the west and south by the Pacific; and on the east by the Caribbean Sea, and the Bay of Honduras.

The five states of Central America nearly correspond, at the present time, with the 'Intendencias,' as they existed under Spanish Colonial rule. Their boundaries are pretty clearly defined, and vary but little. They are subdivided into Provinces, Departments, and Districts; the latter applying to the less peopled, though often extensive tracts, covered with almost impenetrable forests.

The state of Guatemala is by far the most extensive of the five. It includes a considerable and populous highland district to the north, named 'Los Altos de Quesaltenango;' and to the eastward, vast territories, such as those of Vera Paz and El Peten, which are but thinly inhabited. Altogether it occupies full one-third of the whole country. It has also the largest population, and far surpasses the other states in importance. Its growing trade is even now considerable. It is principally carried on with the English. The chief export, which is cochineal, amounted in 1846 to 9,037 "surrones," or bales of 150 lbs. each, valued at £211,804 13*s.* 9*d.*

The state of Salvador is situated on the western coast. Its climate is hot, but more healthy than that of the eastern shores—perhaps because the land is better cleared and cultivated. The chief product of this state is indigo, which used to be extensively cultivated and at one time rivalled, in the number of seroons exported, the cochineal of Guatemala. But so much has it diminished, that in 1846 the number of bales exported did not exceed 1,500, in value about £10,000. The city of San Salvador, its capital, is only a few miles distant from the Pacific Ocean. Its commerce still surpasses that of most towns in Central America. And its political influence, taking as it does the lead in all liberal movements, is considerable. During a certain period it was the seat of the Federal Government, and, like Washington, it had at that time a certain territory around the city, distinguished as the Federal District.

The state of Honduras takes its name from the Bay of Honduras, signifying *depths*, which forms its northern boundary. The first navigators so denominated it, because they with difficulty obtained any soundings in it. The surface of the ground is in this state even more generally uneven than elsewhere. Its population is scanty in comparison with the two former states; and, like Guatemala, it still comprises vast districts of virgin forests, partially peopled by wild Indians. The climate, like that of the other states, is varied, being generally temperate in the interior, which is notable for its mines, and hot near the coasts, which abound with rivers, from the banks of which much mahogany and sarsaparilla are taken. Comayagua, the capital, is still a city of some importance, though said to have been much more so formerly. This state possesses two sea-port towns, Truxillo and Omoa,

which were active as military and commercial depôts of Spain, but they are now fallen into comparative decay.

The state of Nicaragua is exceedingly fertile, and generally salubrious; but, notwithstanding it possesses several advantages over Honduras, it is but little more populous. This may partly be accounted for by the absence of any leading branch of industry, or any considerable activity in its commerce, but still more by its frequent civil wars. In a land surpassingly volcanic, this state is pre-eminently so. The very roads, in some parts, sound hollow under the hoofs of the mules or horses. Leon, the capital, and Granada are large cities, and once enjoyed great wealth and commercial prosperity; but, like all chief towns in Central America, they have suffered much from crime and consequent internal disorganization, as well as from civil wars, political commotions, and misrule. These cities, from the highest rank in repute and influence, are now reduced to little better than heaps of ruins, scantily inhabited, and, where best, affording abundant evidence of both earlier and more recent devastations. Leon, on the Lake of Managua, often called the Lake of Leon, is said to have contained at one time 32,000 people. It is now reduced to less than half that number. Granada may still have about 13,000 inhabitants, It is beautifully situated on the borders of the Lake of Nicaragua. The town of Nicaragua, about 36 miles south-east of Granada, though inferior in size and importance, gives its name to the state and the lake. Like Granada, it is advantageously situated on its banks, not far from the populous island of Ometepe, which is in the lake, and contains an active volcano. Great interest at present attaches to this state and its waters, in connection with the long formed and often talked-of project of connecting the two oceans at this point, which is now about to be put to the test of experiment, if not actually to be realized.

The Central America state which at present enjoys the greatest degree of tranquillity and political prosperity, is Costa Rica. Its isolated position on the narrower part of the Isthmus, making communication with the other states difficult, has preserved it in a great measure from participating in the wars that have desolated the rest of the country: a circumstance which, conjointly with a great accession of commercial vigour, arising out of the successful cultivation of coffee, has given it of late an impulse unknown to the sister states. More than 70,000 quintals (cwt.) of coffee, worth 7½ dollars the quintal in the country, (making a total of £105,000), is now annually exported. While other large cities are decaying, San José, its new capital, has risen into importance within a very few years. It already numbers upwards of 20,000 inhabitants. Cartago, the former capital, and two other towns of some magnitude (Heridia and Alajuela), occupy, with the modern

capital, an extensive table-land stretching almost across the Isthmus. These towns, together with two or three small ports on each ocean, include almost the entire population of this compact and thriving state.

In lat. 14° 46′ N. and long. 91° 46′ W. is Guatemala la Nueva, or the the *new* city, so named because the inhabitants abandoned the old city on account of earthquakes, which is the present capital, and may on many accounts be considered as the principal town in Central America. It is situated on one of the elevated plateaux of the main Cordillera, known as 'Los Llanos de las Vacas,' or the valley of 'Harmita.' This plain is surrounded by bold ranges of mountains, among which stand prominent the two volcanoes of the Antigua, 'De Angua,' and 'De Fuego,' and a third called 'El Volcan de Pacaya,' which is scarcely, if at all, inferior to them. The plain is about 5,000 feet above the level of the sea, and is 15 miles wide and 18 broad. The climate, though considered inferior to that of La Antigua, is mild and salubrious. The thermometer rarely rises above 70°, and still more rarely descends below 64°. The number of inhabitants, who are chiefly Ladinos, the mixed or Mestizo race, and pure Creole-Spaniards, the unmixed descendants of Spanish colonists, is estimated at 36,000 or 40,000; and in importance, wealth, and beauty, it is second, in Spanish America, only to the city of Mexico.

The principal lake in Central America is that of Nicaragua, whose surplus waters descend to the Atlantic by the Rio San Juan del Norte. It is an inland sea, larger than the island of Jamaica, being 180 miles long from east to west, and nearly 100 broad from north to south, and 150 Spanish leagues in circumference. In many places the water is 10 to 15 fathoms deep, and it is stated that there are but few shallows. It contains a small archipelago of islands, and on one fertile and populous island, named Ometepe, there is a volcano. This lake is also connected with that called Managua, itself no inconsiderable body of water. The shores of these magnificent waters, which are likely to afford important facilities for commerce, are of surpassing fertility, and as salubrious as they are beautiful. It is from the Lake of Nicaragua that the canal is proposed to be cut, connecting the lake with the port of San Juan del Sur, on the Pacific.

Not far from the western or Pacific coast, the country is traversed from north-west to south-east by a continuous cordillera or unbroken chain of mountains, unbroken at least as far as the Lake of Nicaragua, which are covered with diversified vegetation. This forms a kind of connecting chain between the Rocky Mountains of the north, and the Andes of the South American continent. Some of the loftiest summits are 17,000 feet high. Frequent spurs or offsets from the 'Sierra

Madre,' the main ridge, intersect the plains at right angles, and sometimes extend to the sea-shore.

At various degrees of elevation along the sides and on the summits of the mountains, are numerous plateaux or table-lands, like so many natural terraces, some of them of great extent, and all delightfully temperate and luxuriantly fertile. These regions especially seem to invite the residence of man, and to invite the culture of his hand. They constitute a distinguishing feature of this and some neighbouring countries. But no one of those countries, and probably no part of the earth, presents a greater diversity of level on a surface of equal extent than does Central America; consequently, no country possesses such variety of climate, or offers such facilities of adaptation to all kinds of productions and to all constitutions of men, from the sun-burnt inhabitant of a tropical plain, to the hardy mountaineer inured to perpetual snows.

Most of the highest peaks and isolated mountains are volcanoes. The rocks are of granite, gneiss, and basalt; but volcanic formations and ejections predominate. Not less than thirty volcanic vents are said to be still in activity. The traces of remote, as well as recent earthquakes are clearly discernible in the fissures and ravines that everywhere abound. Extinct craters, rent rocks, beds of lava, scoriæ, vitrified, charred, and pumice stones, together with hot and sulphureous springs, all mark it as the most volcanic region known. Indeed, shocks of earthquakes, generally slight, are periodically felt at the opening and closing of the wet season.

The productions of Central America are numerous. Abundant materials for exchange with other nations are afforded in cotton, coffee, sugar-cane, arrow-root, ginger, tobacco, and even silk-worms, though but lately imported; but especially in 'anil' (indigo), and 'grana' (cochineal), which, because most lucrative, absorb almost all the attention of the planter. Other marketable productions are not wanting; but both known and unknown sources of wealth decay in the forests, or lie hidden beneath the soil. But, besides these, the more temperate regions yield all, or nearly all, the productions which are raised in Europe. Wheat and barley are cultivated sometimes by the side of the sugar-cane, on the elevated plains; and the markets of the larger towns are supplied at once with the productions of torrid and of temperate climes; so that, at *all seasons*, the green pea, the cauliflower, and cos-lettuce, are sold along with the Avocato-pear, sweet potato, olive, capsicum, or chillies, and many other productions of opposite climates, less delicate, perhaps, but more common and useful. Of edible fruits, those most common are the banana, pine-apple, orange, sweet lemon, lime, shaddock, forbidden fruit, water-melon, musk-melon, sapote, mango, guava, fig,

tamarind, pomegranate, granadilla (fruit of the passion flower), sea-grape, papia, mammæ, star and custard-apples, and cocoa, cashew, and ground nuts. There are said to be in all "more than forty genera," including, probably, those introduced from Europe, such as the apple, pear, quince, cherry, &c., which, though they are found to thrive, are little appreciated, and none of any sort can be said to be cultivated with care. The same remark applies, though with frequent exceptions, to garden flowers, which are still more varied.

It has been well observed by Mr. Frederick Crowe, that "The precious metals of Central America, together with quicksilver, copper, lead, iron, talc, litharge, and most other minerals that are in use, only await the labour and ingenuity of man to extract them from the bowels of the earth, and convert them into objects of convenience and beauty; and seams of coal, ochre, gypsum, sal-ammoniac, and wells of naptha, are also ready to yield their valuable stores. Jasper, opal, and other precious stones are also found; and pearl fisheries have long existed upon the coasts. In fine, there is no lack of any thing that nature can bestow to sustain, to satisfy, and to delight. So abundant are the necessaries of life that none need want: so profuse are the bounties of nature that they are suffered to decay through neglect. The peach-tree and the rose run wild on the borders of the orange grove, whose fruits and flowers are alike simultaneous and perennial; and the pine-apple, the mango, and the water-melon are preferred to the almond, the olive, and the grape. Such is the nature of the soil, that the exuberance of that wealth which rots upon its surface in the less populous parts of Central America, would amply clothe and satisfy with bread thousands of the sons of want who fill our streets and unions, dispelling that squalid wretchedness which penury and destitution have produced, and mitigating some of the woes which embitter the lot of so many of our fellow-countrymen. It may be that the time is not far distant when many such will seek these fruitful shores, and under wise direction, not only benefit themselves, but, while redeeming fertile valleys and plains from desolation, greatly bless the timid natives with higher arts of life."

Lying between the parallels of 10° to 18°, and almost insular as to any influence of the continent on its temperature, the climate of the coasts and lowlands is hot and humid. That of the interior varies with the altitude, and is generally mild, equable, and salubrious. The two seasons, aptly designated the "wet" and the "dry," are well defined. They may be said equally to divide the year, though they vary considerably in different districts. The rains, everywhere copious, are more continual in some parts, and the drought is more severe in others, but the dry season is nowhere uninterrupted by refreshing showers, and the

wet is everywhere relieved by an interval of dry weather, which perceptibly separates "the former" from "the latter rain."

In the highlands of the interior, the seasons are singularly regular. The dry weather commences about the close of October, and terminates on the 12th or 13th of May, rarely varying even a few hours. It is most frequently on the 12th that "the windows of heaven are opened." The sky is then suddenly obscured with thick clouds, which burst simultaneously, often accompanied with thunder, and sometimes with hail. This is confined to the afternoon, and returns on the following days, or perhaps for successive weeks, at the same hour, or a little later. During the whole of the wet season, which is by far the most agreeable, the forenoon is almost invariably cloudless, and the atmosphere clear, elastic, and balmy. The rains are often confined to the evening and night, or to the night hours only. During the dry season, the mornings and evenings are often so cool and bracing as to predispose to active exercise, though fires are never resorted to. Through the day the sky is seldom obscured, and light clouds only are to be seen sweeping rapidly along the plains during the short twilight that ushers in the equinoctial day, thence they rise and hang in clusters round the tops of the mountains till the sun has gathered strength to dispel them: in the evening they return to attend its setting, and add inimitable beauty to the gorgeous scene. At all seasons the entire disc of the moon is distinctly visible through all its phases, but now it shines with such uninterrupted clearness, as entirely to supersede, when above the horizon, the necessity of artificially lighting the streets; and even in the absence of the ruler of the night, the brilliancy of the stars dispels all gloom. In some districts on the eastern coasts, through local influences, it rains more or less all the year; which, however, adapts them for the growth of certain vegetable productions; while the districts where the dry weather lasts the longest are alone suitable for the cultivation of others. On the more elevated plains, such as those of Quesaltenango, in the department of Los Altos, the heat is never so great as during the summer months in England; and though snow is said sometimes to fall in December and January, it immediately dissolves, and the thermometer never descends so low as the freezing point.

Nautical Remarks.—Ships bound from Cape Horn to the ports in Central America, steer to the northward, generally hauling towards the land, when they have reached the parallel of the Islands of Juan Fernandez and Masafuera; they then steer according to the direction of the coast, with the prevailing winds from the S. to S.E., and without following too strictly any given rules as to distance from the land, custom, however, recommends to keep the land just in sight as the breeze is generally brisker, and steadier than at a greater distance off. Nevertheless, Captain Marie, of Bordeaux, states that he has sailed along the coast at

a distance of from 15 to 25 leagues, running at a rate of five to six miles an hour, and that even at 60 leagues from the land, he had met with steadier winds from the S.S.E. than close in-shore, which were less subject to calms, being not so much under the influence of the land and sea breezes.

In the winter season, say from May to October, it is better to keep at the greater distance from the land, because in that season, particularly near the coasts of Chili and Peru, comprised between the parallels of Valparaiso and Lima, there are often light northerly breezes, accompanied with hazy weather and a heavy swell. As you approach the equator the fog and swell of the sea gradually subsides, and is succeeded by light sea breezes and clear weather.

If bound to Acapulco or the ports on that part of the coast, and being unprovided with good instruments, it is best not to make for the port to which you may be bound, because you might be carried to the westward, and thus be uncertain of your true position, but to run for the Island of Cocos, which, according to the observations of Captain Sir E. Belcher, R.N., is in lat. 5° 33′ N. and long. 86° 58′ 22″ W., in order to obtain your true position, and start from a well ascertained point of departure.

If bound to the Gulf of Nicoya, it is advisable to steer for Cape Blanco, the western side of the entrance, taking care to keep to the eastward of it. If bound to Realejo, or to the ports to the westward of that river, a course should be shaped for the volcano of Viego, because it is the most conspicuous object on the coast, and is to windward of every port situated to the westward of the Gulf of Fonseca. This volcano is the most remarkable mountain in Central America; its form is that of an erect cone, hilly towards its summit, having its upper base, or rather its crater, inclined, being less elevated towards the east than towards the west. Viego may generally be known by several hillocks about it, but which are of less altitude.

Having premised these few introductory remarks we will begin the description of the coast, commencing with the Gulf of Panama.

GULF OF PANAMA.—The Gulf of Panama is a spacious bay, about 130 miles wide at the entrance, and extending about the same distance to the northward, the coasts trending in a semicircular direction. The western point of the gulf is called Point Mala, and the eastern, Point Garachine. Its shores form two bays, the eastern of which, called the Bay of San Miguel, is to the northward of Point Garachine, and the western, the Bay of Parita, is to the northward of Point Mala. In the north-eastern part of the gulf is a cluster of islets, named the Columbia Islands, formerly called the Pearl Islands, from the pearls which are found there,

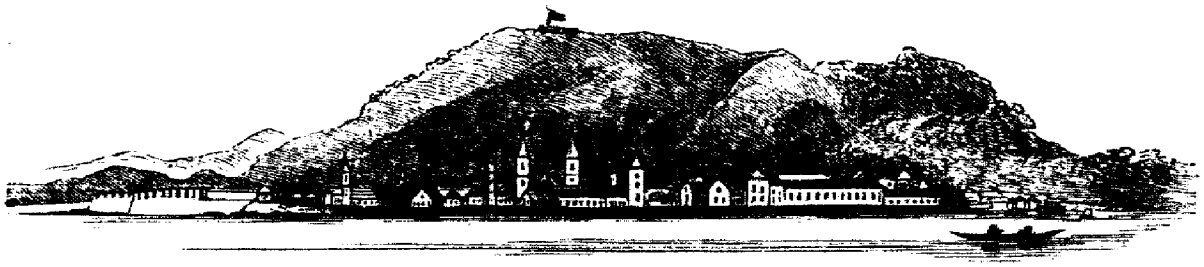
the largest of which is the Isla del Rey; there are also some islands off the city of Panama, which afford some protection to the harbour. The soundings over the gulf are generally pretty deep, shoaling gradually as you advance, from 50 and 80 fathoms at the entrance.

GULF OF SAN MIGUEL.—The southern point of the Gulf of San Miguel, called Point Garachine, is high and barren, and has a rock above water off it, called El Caynelo, within which a good passage is said to exist. Within the point is a cluster of houses called the Village, and about three miles beyond it is the River Sambu. The land to the eastward of the point becomes low and swampy, and bends round to the north-eastward, forming the Gulf of San Miguel, the water in which shoals gradually as you approach the shore.

The Gulf of San Miguel is about 11 miles wide at the entrance, but becomes contracted as you advance within it by the Points of Patino and Lorenzo, which are only four miles apart; here, on the port side, will be seen the Island Iguana, to the northward of which the gulf opens, and receives the Rivers Congo, Sucio, Estero, and Cupunati. A long neck of land here runs out to the southward, beyond which the channel becomes narrower, and has several rocks and islands within it; to the northward is a large island, which divides it into two passages; that to the northward has the deeper water, but that to the southward, or Boca Chica, is narrower, and free from dangers. Having passed these straits the channel runs in a S.E. ½ Easterly direction, towards the River Tuyra, where, in mid-channel, there is a narrow and long sandy island, having a passage on each side; that to the south-westward has the deeper water, and is the broadest; the River Tuyra then winds south-eastward to the little town of Santa Maria, up to which it is navigable, dividing near this town into two branches, one of which continues to the southward, taking its rise near the Cordilerras, and receiving numerous petty streams in its way, some of which serve to support a communication with the Gulf of Darien. The other branch extends N.W. by N., so far as the mountains which run along the northern part of the province of Darien; this is called the River Chuqunaque, and is navigable by canoes. There is also another branch, dividing from the north-eastern part of the gulf, called the River Savanas, which runs up the country about N.N.W., 12 or 13 miles to Fort del Principe. The country about these rivers is generally low, woody, uncultivated, and unhealthy.

BAY OF PANAMA.—From the northern point of the Gulf of St. Miguel, or Point Brava, which is moderately high, the land becomes low and sandy all the way to Panama, with a woody shore, in which are several small streams; some rocky islands lie off it, but the usual passage is to the westward and southward of them all. The passage between the shore and the Archipelago de las Perlas is 20 miles wide, with from 15

to 22 fathoms water, mid-channel. The first islet met with is the Farrallon Ingles, bearing from Point Brava about N. by W. ½ W., distant nearly three leagues; it is a barren rock, lying a mile off the shore. Eight and a half miles N.W. by W. from the Farrallon is the Pajaros, two low rocky islets, 2½ miles from shore; and, in almost the same direction, 7½ miles further, is Manjue, or Tiger Island, which is connected to some small islets near the land by a ridge of sand. Within these islands, and close to the land, are some small islands called the Majaquey, between which and the shore are two fathoms water, and a passage for boats, &c. W. by N. from Tiger Island, 5¼ miles, and S.W. from Majaquey, distant two leagues, lies El Pelado, a small island, near which is 12 fathoms water; the passage between El Pelado and Tiger Island, and also between Tiger Island and Majaquey, is good, and free from danger, with a bottom of mud, and the depth from 12 to 4 fathoms, decreasing toward the latter island. Opposite to this part, the coast is somewhat elevated inland, and the Sierras de Manjue become conspicuous; from hence to the westward, a broad sand bank runs along the coast, the water being shallow, all the way, to the Island Chepillo. This island is low, and lies directly before the entrance of the River Chepo, which is a deep and rapid river, about a mile broad, taking its rise in the lofty mountains, about five leagues distant from the Gulf of St. Blas; by means of this river, a communication is carried on between the Pacific and Atlantic Oceans. The town of Chepo is four miles up the river; but the mouth of the river is, at present, choaked up with sands, and not navigable for ships. W. by N., eight leagues from the Island Chepillo, is the city of Panama.



PANAMA.

Panama is a large and somewhat irregularly built town, having its principal streets extending, from sea to sea, across the peninsula on which it is built. It is represented to be now in a very ruinous condition. The buildings, of stone, are generally substantial, and the larger houses have courts or patios. It has a beautiful cathedral, five or six convents, and a college. The harbour is protected by a number of islands, a short distance from the mainland, and it is said that there is anchorage under all of them. The commerce consists in the exportation

of the produce of the country to Lima and Guayaquil, and there is also intercourse with Jamaica, gold and silver being frequently sent by way of Panama to England. By recent observations, the north-east portion of the town is considered to be in lat. 8° 56′ 56″ N. and long. 79° 31′ 12″ W. It is high water on the days of full and change of the moon at 3h. 23m., and the greatest rise of tide is 22 feet.

Ledges of rocks extend some distance all round the peninsula on which the town is built, outside of which shoal water of from 3 to 15 feet extends about a mile, which is succeeded by some rocky patches, called the Sulphur and Danaide Rocks, lying from 1½ to 2¼ miles from the town. The rocks furthest from the town are the Danaide Patches of 2½ fathoms, having 3½ to 5 fathoms all round them, which may be cleared on the south side by bringing the south steeple of the cathedral half-way between the east and south-east bastions. To the N.W. of the Danaide Patches, and between them and the town, are the Sulphur Rocks of 3 to 9 feet, which may be *just* cleared on the south side by bringing the flagstaff on Mount Ancon in one with the south steeple of the cathedral, a mark that appears also to clear the Danaide Rocks to the northward in four fathoms. About two miles to the southward of the town are five islands, called Ilenao, Culebra, Perico, Flamenco, and San José, about 1½ miles from the shore; between them and the shore there is no passage, the water being shoal. Beyond these, at the distance of 1½ miles, is the small island Changarmi, having a reef all round it, with a rock above water at its north-west extremity, called the Penamarca: this island is about a mile from the shore. To the south-westward of this, at the distance of two miles, are the small islands Tortola and Tortolita.

At about eight miles to the southward of the town of Panama, are the islands, Tobago, Urava, and Taboguilla, the soundings about which are 8 to 15 fathoms. Of these islands, the largest, Taboga, has anchorage on the north-east side in 8 to 10 fathoms, just off the village, where water and provisions can be obtained. The island Urava is immediately off the south end of Taboga, being separated from it by a very narrow channel; it has, off its south end, a small island or rock called Terapa. The island Taboguilla is about 1½ miles to the north-eastward of Taboga, and about half its size; off its south-west end is a cluster of rocky islets, and there are two or three rocks above water, called the Farrallons, off its south extremity, having between them and the island 10 to 11 fathoms. The channel between Taboga and Taboguilla has a depth of water of 13 to 20 fathoms, and is all clear excepting at its southern entrance, where, nearly in mid-channel, there is a sunken rock, with 8 to 14 fathoms close-to all round, lying with the Farrallons, bearing about N. by E. ½ E., and the north end of Urava nearly W. by S. ½ S.

To the southward of the Taboga Islets are the islands Chama, Valla-

dolid, Otoque, and Bana, which last is the furthest from the Taboga group, being distant from them nearly 16 miles. Commander Sir E. Belcher, R.N., recommends vessels, in approaching the town of Panama, and after making Point Mala, to run up between these islands and the main, on the western side of the gulf, as, by doing so, considerable time will be saved.

QUIBO, OR COIBA ISLAND has lately been surveyed by Lieut. John Wood, R.N., from which it appears that it is about 19 miles long, and 12 miles broad in its widest part; and that its south point, Negada, is in lat. 7° 13′ 15″ N. and long. 81° 36′ 10″ W.; variation of the compass, 7° E. It is luxuriantly wooded, and would be fruitful in every tropical production but for the rains, which continue from April to November, and render its climate unhealthy. Calms and variable winds prevail, especially in the rainy season; it is therefore not so well adapted as a place of general rendezvous, although more or less importance will be attached to it whenever a transit by either of the adjoining provinces shall be effected from the Atlantic.

On the eastern side of Quibo Island is Damas Bay, which is five or six miles in extent, and affords a good depth of water and excellent shelter from the eastward. The soundings are from 30 to 15 fathoms, shoaling as you approach the shore; and water may be obtained in the northern part of the bay. Off the southern shore rocky shoals extend nearly a mile out, so that care must be exercised to avoid them. In the middle of the bay the land is low, and here there is a small stream, named the River San Juan, at the entrance to which are some sandy flats.

Damas Bay was stated, by Captain Colnett, to be the most commodious place for cruizers he had met with in these seas, as it abounded with wood and water; also trees of the cedar kind, large enough to make masts for first-rate ships, and of excellent quality; his place of anchorage was in 19 fathoms, the north point of the bay being in a line with the north point of Cebaco Island, bearing N.N.E., the watering-place N.W. ¼ N., and the south point of Quibo S.E. by S.;* but vessels may lay near enough to the shore to be able to haul off their water; the time of anchoring must however be considered, for sandy flats run a long way off, and may deceive you in the distance. It is high water in the bay at half after three o'clock; the flood comes from the northward, flowing seven hours and ebbing five, the perpendicular rise of the tide being two fathoms. The anchorages throughout the bay are good; and five or six miles off you will find 33 and 35 fathoms, good holding muddy ground. Few vegetables or fruits are to be obtained here, but shell-fish, as crabs, cockles, periwinkles, and oysters, may be had in plenty; there are also

* These bearings do not agree according to the new survey of Lieut. Wood.

other fish to be caught, but alligators, sharks, and sea-snakes swarm on the adjacent shores, and seem to harass, destroy, and lessen the quantity; deer and other animals are said to inhabit the island, and birds and monkeys are numerous, but they are very shy, and difficult to get at; which Captain Colnett considers to be owing to the state of agitation they live in, from the wolves, tigers, hawks, and vultures that prey upon them. Turtles also are in great abundance, yet hard to catch. Whales also frequent these shores, but not in any great numbers; some of these are of the spermaceti species.

HICARONS.—Southward from Quibo Island are the Hicarons, two small islands, the southernmost lying in lat. 7° 6′ N. and in long. 81° 48′ W.; this is about one mile long, and the northern island 3¾ miles; they lie north and south of each other, being separated by a narrow passage. The least island is entirely covered with cocoa-trees; and the largest island bears an equal appearance of leafy verdure, but very few trees there are of the cocoa kind. The most extensive look-out, says Captain Colnett, is from the top of Hicaron, for it commands Quibo and the whole of the coast and bay to the northward.

The channel between Hicaron and Quibo is about four miles wide, and has an irregular depth of 6 to 20 fathoms. It is quite clear; but as there are some dangers near the south-east point of Quibo, it will be more prudent to pass to the southward of the islands than to attempt the passage within them. The principal danger to be avoided is the Hill Rock, a small patch of six feet water, lying two miles S. ½ E. from Barca Island, a small islet lying close to the shore of Quibo, and 5½ miles E. ¾ N. from David Point, the eastern point of Hicaron Island. Close to this rock there are 10 to 15 fathoms, so that it is very dangerous.

Off the N.E. point of Quibo Island there are several islands and rocks. The largest island, named Rancheria, is 1½ miles in length, and lies about 1¾ mile from the shore; within it are 7 and 8 fathoms, but, as there are several dangers, it will not be prudent to run through. To the north-eastward of this, about 4½ miles, and separated from it by soundings of 40 to 60 fathoms, are two smaller islands, named Afuera and Afuerita, which appear to be surrounded by rocks.

The western coast of Quibo Island appears, from the survey, to be of moderate height, and bold to, and without any dangers but what are close to the shore. At about half way down there is an open bay, named Hermosa, in which are 14 to 20 fathoms.

Rear-Admiral Sir George Seymour has remarked of Quibo Island, that "it is about the same size as the Isle of Wight. Off the points ledges of rocks generally extend; but there is an appearance of an anchoring-place in the intervening bays on the east side, along which I proceeded in the 'Sampson' steam-vessel. The soil on the coast is good,

but the interior is nearly inaccessible from the steepness of the cliffs and the tangled vegetation. We found traces of pearl-divers having visited the shores; but there are no inhabitants (1847) except at the small islet of Rancheria, between which and the north-east end of Quibo there is good anchorage. A Frenchman, of the name of Sorget, is resident on Rancheria; and this situation, as far as I could judge on a cursory view, seems more favourable for an establishment than any we saw on the larger island."

In the account of Lord Anson's voyage, by Richard Walter, published in 1776, there is a description of Quibo Island, in the following terms. It should be premised that the anchoring place was in Damas Bay.

"The island of Quibo is extremely convenient for wooding and watering, since the trees grow close to the high-water mark, and a large rapid stream of fresh water runs over the sandy beach into the sea: so that we were little more than two days in laying in all the wood and water we wanted. The whole island is of a very moderate height, excepting one part. It consists of a continued wood spread all over the whole surface of the country, which preserves its verdure the year round. Amongst the other wood, we found there abundance of cassia, and a few lime-trees. It appeared singular to us, that, considering the climate and the shelter, we should see no other birds than parrots, paroquets, and, mackaws; indeed, of these last there were prodigious flights. Next to these birds, the animals we found in most plenty, were monkeys and guanos, and these we frequently killed for food; for, notwithstanding there were many herds of deer upon the place, yet the difficulty of penetrating the woods prevented our coming near them; so that, though we saw them often, we killed only two during our stay. Our prisoners assured us that this island abounded with tigers; and we did once discover the print of a tiger's paw upon the beach, but the tigers themselves we never saw. The Spaniards, too, informed us, that there was frequently found in the woods a most mischievous serpent, called the flying snake, which, they said, darted itself from the boughs of trees, on either man or beast that came within its reach; and whose sting they believed to be inevitable death. Besides these dangerous land animals, the sea hereabouts is infested with great numbers of alligators, of an extraordinary size: and we often observed a large kind of flat-fish, jumping a considerable height out of the water, which we supposed to be the fish that is said frequently to destroy the pearl-divers, by clasping them in its fins as they rise from the bottom; and we were told that the divers, for their security, are now always armed with a sharp knife, which, when they are entangled, they stick into the belly of the fish, and thereby disengage themselves from its embraces.

"Whilst the ship continued here at anchor, the Commodore, attended

by some of his officers, went in a boat to examine a bay which lay to the northward; and they afterwards ranged all along the eastern side of the island. And in the places where they put on shore, in the course of this expedition, they generally found the soil to be extremely rich, and met with great plenty of excellent water. In particular, near the north-east point of the island, they discovered a natural cascade, which surpassed, as they conceived, everything of this kind which human art or industry hath hitherto produced. It was a river of transparent water, about forty yards wide, which rolled down a declivity of near a hundred and fifty in length. The channel it fell in was very irregular, for it was entirely composed of rock, both its sides and bottom being made up of large detached blocks; and, by these, the course of the water was frequently interrupted: for in some parts it ran sloping with a rapid but uniform motion, while in others it tumbled over the ledges of rocks with a perpendicular descent. All the neighbourhood of this stream was a fine wood, and even the huge masses of rock which overhung the water, and which, by their various projections, formed the inequalities of the channel, were covered with lofty forest trees."

To the eastward of Quibo Island, in the Bay of Montijo, are the islands Cebaço, Governadora, and others, of which we possess no account.

BAHIA HONDA, on the main, immediately to the north-eastward of Quibo Island, has lately been surveyed by Sir E. Belcher, R.N. It is a small bay, extending about three miles into the land, and widening when inside. In the north part of the bay is a little island named Talon, to the eastward of which are six and eight fathoms. Midway in the entrance are 22 and 23 fathoms. The island, Sentinella, on the south side of the entrance, is estimated to be in lat. 7° 43′ 32″ N. and long. 81° 29′ 1″ W. The variation of the compass, in 1839, was 6° 17′ E.

PUEBLO NUEVO.—This port lies at the back of Quibo Island, on the main. At about 4¼ miles to the westward of the entrance, is a small island, a quarter of a mile in extent, called Magnetic Island, on which the observations were made in the course of Commander Sir E. Belcher's survey of this neighbourhood, by which survey the position of a small rock close to the south side of the island was determined to be lat. 8° 4′ 39″ N. and long. 81° 45′ 30″ W. It is high water on the days of full and change, at 3h. 10m., the rise of tide being 12 feet.

Commander Sir E. Belcher says, "The port consists of the outlet of a large river, which takes its name from a small village of huts, situated on the River Santiago, at some distance from the entrance. It is formed by a neck or island about three miles in length, which affords good anchorage for vessels of any class. Three larger streams discharge themselves into the main basin at the western end of this island, where

the apparent great entrance is situated; but so studded with rocks and shoals, as to be unnavigable for anything larger than boats. It is in fact, an extensive archipelago, as most of the regions towards the Chirique territory will be found to be on future examination.

"Water cannot be procured in any quantity, although it may probably be procured by digging wells. The principal article of trade was sarsaparilla, that of this neighbourhood being esteemed of superior quality. The stream runs fresh at some miles up, but we did not either meet it, or succeed in finding the town. Sugar-cane, of good quality, was offered; and tortoise-shell, one of the articles of trade, can be procured at the season."

The entrance of the river is about three-quarters of a mile wide, but the channel way is very much contracted by a sandy spit, called the Belitre Bank, which runs off from the north side of the river, and mostly dries. The north side of the river is low and swampy, but the south side, Cape Cayado, is high, making in hills of 300 and 400 feet elevation. When running in, steer close round Cape Cayado, in 7, 8, and 10 fathoms; and keep the lead going, taking precaution to avoid the Belitre Bank; which is the more necessary as it is steep to, and gives but little, if any warning by the lead. A spit of 2½ fathoms runs off about a cable's length on the west side of Cape Cayado, and on the south side of the cape are some rocks close to the shore, called the Nueces Rocks, which are above water.

About 1¼ miles N.W. of Cape Cayado is the small island of Silla, from which a spit of three to nine feet runs to the northward towards the main. On the west side of this island the soundings increase from eight to ten fathoms. Var. 7° 37′ E. in 1839.

From hence the coast trends round to the south-westward to the Contreras Islands, and then runs to the westward about 60 miles to Burica Point, from whence it runs to the north-westward to the Gulf of Dulce. Off this coast are the following islands and rocks, of which the principal information we have, has been furnished by Captain James Colnett, R.N. in 1798.

The first islands met with, after passing the Contreras, are the Secas, about two miles from the shore, and 36 miles eastward of Point Burica. Outside of these, at about seven leagues S.E. by E. ¼ E. from Point Burica, is a cluster of barren rocks, called the Ladrones, and S.E. 10 leagues from these, is the Island Montuosa, which is about six miles in circumference, and rises to a considerable height, having its summit covered with cocoa and other trees. Off the east and west ends of the island, rocks and breakers extend out three or four miles; and on the south side of the island the bottom is rocky, so also is the shore near the sea; still, there is a sandy beach behind some small creeks which

run between the rocks, where the landing for boats is safe. Captain Colnett found here plenty of parrots, doves, and guanas, and states that it is probable that refreshments might be had by searching for them; and that this is a place which might be serviceable to whalers and others, whose sick could be landed here; the milk of the cocoa-nut might also occasionally supply the place of water.

GULF OF DULCE.—On the eastern side of the Gulf of Dulce is Point Burica, a narrow headland, the extremity of which is in lat. 8° N. and long. 82° 59′ W. From hence the coast runs to the north-westward about 30 miles, and then turns round towards the south-west about seven miles, forming a large bay called the Gulf of Dulce, in which are said to be several places of excellent anchorage and good water.

From hence the coast runs towards the north-west 70 miles, and has the small islands Cano and Queypo lying off it near the shore. It then turns round to the northward to the Gulf of Nicoya, which is an excellent place for shipping, having many good anchorages within it, but is said to be unhealthy.

Commander Sir E. Belcher mentions that "on the 28th of March they passed the Island of Cano, and on the 29th, between it and the main, found themselves at daylight off the mouth of a large inlet, which they had not time to examine, the current at the same time setting strongly to the eastward, with very hazy weather."

GULF OF NICOYA, occasionally called Punta Arenas, is an inlet extending about 50 miles into the coast. It is about 25 miles wide at the mouth, between Cape Blanco and Port Herradura, but soon begins to narrow, gradually decreasing in breadth to the head of the gulf. There are a few islands in it, among which good shelter may be occasionally obtained, using precaution to avoid the shoal spots.

On the eastern side of the gulf, in lat. 9° 38′ 30″, and long. 84° 36′ 7″ W. is Port Herradura, a small bay, sheltered from south-easterly winds by the small Island of Cano, which lies on the south side of the bay, but open to all winds that blow from the westward; there is no channel between this island and the shore, the space being occupied by a rocky ledge. The north point of the bay, Point Herradura, is high and rocky, and surrounded by a rocky ledge, which partly shows above water. Vessels in running in will find 24 to 18 fathoms at the entrance, but will soon deepen their water to 10 and 8 fathoms, when they will be about half a mile from the head of the bay, and may anchor. Excellent water may be obtained in a small lake at the head of the bay, by rolling the casks into the basin, where twenty can be filled at once. Vessels may ride close to the shore by veering the whole cable with a warp to the beach.

From Herradura Point the coast runs to the northward, about 2½ miles,

to Point Sucia, off which a rocky ledge extends to the westward one mile, and partly shows at low tide. Close-to, on the outside of this ledge, there is deep water of 18 to 25 fathoms. From hence the coast turns round to N.W. ½ N. 4½ miles, and then runs N.E., 10 miles, to Calderas Bluff, a high rocky point, to the eastward of which is Port Calderas, which is the principal port in the gulf, having a custom-house. Calderas is generally considered to be unhealthy to all new residents, and the higher authorities usually manage to excuse residence. Here wood, water, and provisions may be obtained.

From Calderas Bluff the coast runs round to the north-eastward, eight miles, to Arenas Point, off which a bank of 3½ and 4½ fathoms extends 2½ miles to the southward, having a small spot of two fathoms on it, lying with the extremity of the point bearing N. ⅓ W., 1½ mile, and the Pan de Azucar W.S.W. ¼ S., 3¾ miles. This bank is very steep on the western side, deepening suddenly from 7 to 22 fathoms.

Arenas Point has a shelf of mud extending about a mile to the westward of it, which is awash at low water. It forms the south bank of a small stream, which has its outlet immediately to the northward of it. On the north side of this river there is another shelf of mud, which also becomes dry at low water. From hence the gulf runs to the N.W. by W., about 25 miles, and shoals gradually as you approach the head of the gulf. Near the end of the gulf is a large island called Chira.

West side of the Gulf.—Cape Blanco, on the west side of the gulf, is of moderate height, well wooded, even to the beach, and has a small island lying about a mile off it, with a clear channel of 4½ and 9 fathoms between. This island is of a whitish colour, without verdure, and, at a distance, appears to be part of the main land. It is surrounded by a rocky ledge, which dries at low water, and has deep water of 10 to 30 fathoms immediately to the southward of it. Captain Belcher makes the following remarks, on passing round the cape :—

"On the morning of the 30th of March, 1837, we passed the Gulf of Nicoya, and close to the island named Cape Blanco, at its western point. Here we found ourselves obstructed by a point, off which the breakers and rocky ledges above water extended some distance to seaward. The soundings were regular from 25 to 11 and 8½ fathoms, hard sand, in which latter depth we tacked successively within 1½ mile of the shore surf, and an outer roller about half a mile from us on the last tack. The weather, during the whole day, was thick and hazy over the land, followed, at nightfall, by thunder and rain.

These symptoms of the approach of the bad season, rendered me doubly anxious to get to the northward, as our crew were not, at this time, in the best condition, and the moist season we experienced was very oppressive.

At daylight, the weather very hazy, and Cape Blanco still in sight; a short distance to the westward we observed a sandy sloping bluff, off which a shelf, apparently composed of sand, with conical studded rocks, extended a considerable distance to seaward. On a sandy islet near the Bluff, two very remarkable ears jutting up, off which we tacked in 13½ fathoms, sand."

From Cape Blanco, the western side of the gulf runs 11 miles to the N.E. by N. ¼ N., and is pretty clear, excepting that a ledge of rocks, partly above and partly under water, runs one mile off the shore, at about 2½ miles from the cape, having deep water of 17 fathoms close-to outside. At the end of this distance, 11 miles, the coast bends a little inwards, forming a small bay, called Ballena Bay, in which are soundings of 18 and 9 fathoms, shoaling gradually as you approach the head of the bay, which is low land covered with mangroves. The north side of Ballena Bay, called Ballena Head, is of moderate height, and steep-to, having 14 fathoms a short distance off it. From hence, the coast runs N.E. ½ N., about eight miles to the Nigretas Islands, having about midway two islands, separated from the shore by a narrow channel navigable by boats, called Jasper and Alcatraz. The Nigretas are two islands pretty close to each other, which run off 2¾ miles from the coast, having off the eastern one a ledge of rocks extending a quarter of a mile to the eastward, near the extremity of which is a large rock called the Sail Rock.

From the Nigretas Islands the coast runs to the N.N.W., 6½ miles, and has several islands off it, lying more or less near the shore; of these, the largest, about two miles westward of Nigretas Islands, is called Cedro Island. At the end of this distance are the Islands Aves, Pan de Azucar, and San Lucas, surrounded by shoals to a short distance, but separated from each other by soundings of 7 to 11 fathoms. The Pan de Azucar, by the observations of Commander Sir E. Belcher, has been determined to be in lat. 9° 55′ 48″ N. and long. 84° 50′ 2″ W. High water on the days of full and change at 3h. 9m., the rise of tide being 10 feet.

The channel up the gulf, to the northward of the San Lucas Islands, between them and the bank off Point Arenas, is 1¾ mile wide, with a depth of 18 to 27 fathoms, muddy bottom. Hence up the gulf, and failing a pilot, the eye and steady use of the lead will be the best guides.

Directions.—The following, which are the only instructions we have for the gulf, were written in 1843, and are added, as they may prove useful:—

"The entrance of the gulf is safe; the tides, however, at times run strongly, especially at the full and change of the moon. There is ebb

and flood, but the former is of longer continuance and much stronger than the latter.

To run in, keep to the eastward of the meridian of Cape Blanco, which is the westerly part of the gulf; and should you round the cape at the distance of from one to three miles, the course will be about N.E.; or, if you should be about half-way between the cape and Point Herradura, the eastern side of the gulf, it will be a little more northerly.

Having sighted the Nigretas, named also the Boqueron Islands, which will show themselves on the port-bow, you will see a rocky point a little to the eastward of the Nigretas, having the appearance of a vessel, and hence called the Ship Rock, to which you must give a good berth, leaving it on the port hand. Haul then over to the starboard coast, so that in the event of it falling calm and an ebb tide, you might anchor in shallow water; whereas, if becalmed, with an ebb tide, when near the Ship Rock, or Nigretas, it would be difficult to find anchorage, at least in not less than 20 to 30 fathoms; and if unable to anchor, the ebb tide, which is very strong in this part of the gulf, would drive the vessel back again past Cape Blanco. Steer along the starboard coast, so as to pass the extreme points at a distance of from two to three miles, and you will soon perceive the custom-house of Punta Arenas, towards which you will shape your course, and as soon as the village is seen, bring the custom-house to bear N.N.W., or the middle of the village N. by W., when you will have from 13 to 8 fathoms, and will see in the distance the point named Punta Arenas. Further out there is a heavy breaking of the sea, occasioned by some sand-banks, which run out a great distance, and partly dry at low water. To the westward of the banks are the islands of San Lucas; to the eastward of which, between them and the banks, there is good anchorage.

Merchant-vessels prefer lying closer to the harbour, on account of their proximity to the landing-place and stores. The course indicated above will lead ships into this anchorage. The leading mark is the custom-house on with the flag-staff of the port. You will have about eight fathoms water, muddy bottom, at from a half to three cables' length from the shore.

The banks above alluded to have a tendency both to augment and change their position, and the safest course is to keep the custom-house a little open to the eastward of the flag-staff, keeping the lead constantly going; and should the water shoalen, to haul immediately to starboard. If desirous to come to anchor on heaving the ship to, at some two or three miles from the port, in order to obtain a pilot, it may safely be done, until one comes off and carries you to the place desired.

The custom-house is easily known by its white painted roof; but it should be carefully borne in mind that, from the rapid progress the

sea was making upon this spot, the said custom-house may by this time have been destroyed, and another rebuilt elsewhere." *

It has been recommended that ships from the southward should make Cape Blanco, for the purpose of obtaining a fresh departure for their intended port. Such is the course recommended by the writer of the foregoing directions, who considers that it is a better plan than to make a direct course for the volcano of Viego; as in winter the winds are light and variable, and attended with frequent calms, and it is frequently the case that the high lands are obscured by mists or haze, which renders the navigation difficult, even to those well acquainted with the coast.

From Cape Blanco the coast runs N.W. ¼ W., 50 miles, to Point Velas, so called from being frequently mistaken for a sail, off which are some rocks; and about eight miles before you come to which is a small place called Morro Hermoso. It is recommended to give the land a good berth, in order to avoid what dangers there may be; for it has not yet been closely examined. It is represented to be, in general, high land covered with trees, with occasionally some sandy plains and small deep bays. From Point Velas the coast runs seven miles to the northward, to Point Gorda, to the north-eastward of which is Port Culebra.

GULF OF PAPAGAYO is the bend of the coast in which are situated the ports of Culebra and Salinas.

PORT CULEBRA is an inlet running about four miles into the coast, in a north-easterly direction. At its entrance it is about a mile wide, with soundings of 10 to 20 fathoms, which depth decreases gradually towards the head of the bay, where there are nine to six fathoms. On the south side of the entrance are some islets, or rocks, at a short distance from the shore, called the South Viradores; and on the north side are also two similar rocks, called the North Viradores. Captain Sir E. Belcher has determined the north end of the bay to be in lat. 10° 36′ 55″ N., and long. 85° 33′ 30″ W., variation in 1838, 7° 5′ 54″ E. After mentioning various difficulties experienced in finding the port, he describes it in the following terms:—

"At daylight on Sunday, the 25th of March, 1838, we were close off the port, but not being able to detect the Viradores, we wore, and intended running further south; as Kellet had informed me that, in his search for me, he had been unable to find it.

* See page 18, in which Calderas is stated to be the chief port, from the information of Commander Sir E. Belcher, who says:—"Punta Arenas was formerly the port of this gulf in the state of Costa Rica; but interested parties, whose property lay near to Calderas, on the eastern side of the gulf, managed to have the port or custom-house officers, &c., shifted thither. It is very unhealthy, almost fatal to all new residents; and the highest authorities take care to excuse residence."

While in the act of wearing, a gleam of sunshine showed an island in-shore, which induced me to make another attempt, and on reaching to windward we opened the heads and discovered the Viradores; but even then could only ascertain from the mast-head that any recess of bay lay within. At noon we entered the heads, and at 3h. anchored in eight fathoms in this splendid *port*, justly deserving that appellation.

The port is certainly magnificent, and, from information derived from the natives, I learned that it is connected with Salinas, and thence on to Nicaragua, Granada, &c. If any railroad is contemplated in this quarter, it ought to enter at the Bay of Salinas, which would render these two ports important. When this portion of the country becomes settled, civilized, and more populous, I little doubt but Culebra will be better known, and probably the chief port of the state of Nicaragua.

Water, fit for consumption, was not found at the beach, but may be obtained a short distance up the creek, which a boat may enter at high water. If wells were dug, doubtless it would be found at the N.W. side, as the surrounding country is mountainous. Another symptom in favour of this is the thickly-wooded sides and summits, as well as bright green spots of vegetation throughout the bay.

Brasil wood is very abundant. Mahogany and cedar were observed near the beach, but, as people have been employed cutting the brasil, probably all the mahogany and cedar, easily attainable, has been taken."

From Port Culebra the coast runs to the N.N.W., about 20 miles, to Cape St. Helena, round to the northward of which are Tomas and Salinas Bays. On the south side of this remarkable cape is a cluster of islands, called the Murciellagos, or Bat Islands. Captain Sir E. Belcher makes the following remarks on these islands:—

"On rounding the point in view corresponding to Point Catalina of Bauza, we discovered a cluster of eight islands. These I determined to examine, as they did not appear on the chart. They almost formed two distinct harbours; the smaller islands forming a crescent by the south, one large island protecting the east, and another of similar size forming the line of separation. Passing into the bay, we anchored in the inner or eastern harbour; and, having fixed the positions, surveyed it, and completed water at a very convenient position, where we anchored in 32 fathoms, with a hawser fast to the shore.

We quitted for Salinas, after having satisfied ourselves that Culebra was not near us. The name of this remarkable cape, which we had mistaken for Catalina, is St. Helena, and the cluster of islands is termed Murciellagos, or Bat Islands.

The springs are numerous, and there are tolerable rivulets; but only that which we watered at (between the centre point and the main) is safe to approach, by reason of the constant surf. We found the gulf

squalls, even in this sheltered position, come down the gullies with great force, and impede our work as well as endanger our boats. In forty-eight hours, however, it was finished. The geological structure of the cape and islands is a schistose serpentine, containing balls of noble serpentine."

TOMAS AND SALINAS BAYS, to the northward of St. Helena Point, are separated from each other by a small headland, called Point Descarte. They are quite open to all winds blowing from the westward. In the south part of Tomas Bay, at about a mile from the shore, are some rocks above water, named the Vagares; and at the head of the bay is a small island, called Juanilla, inside of which are seven and eight fathoms. The north shore of the bay has also an islet lying off it, named Despensa. The water in this bay is very deep, there being 30 fathoms at two miles from its head; from whence it deepens gradually to eight and seven fathoms within Juanilla Island.

Salinas or Bolanos Bay is about the same size as Tomas Bay, nearly four miles; but has not such deep soundings, the depth averaging six to ten fathoms, sand and mud. In the south part of the bay are some rocks, above and under water, at a short distance from the shore; and in the centre of the bay is a small island, called Salinas, the position of which has been determined to be in lat. 11° 2′ 50″ N., and long. 85° 39′ 9″ W. The north side of the bay is high land, but the south side is low and flat.

The prevailing winds in this gulf, named Papagayos, blow with considerable violence out of the gulf, and frequently cause the loss of spars and rigging. They commence about the meridian of Leon, long. 86° 50′ W., and when you are coming from the westward, are first felt off Cape Desolada, about six miles to the eastward of Realejo, and suddenly give way to calms after passing to the westward. They decrease about sunset, and attain their greatest force about nine or ten in the morning.

Captain Sir E. Belcher says of this wind or breeze, that its limits may be considered to be included in a line drawn from Cape Desolada to Point Velas; and it is rather a curious phenomenon, that its strength seldom ranges so far as this chord, but seems to prefer a curve at a distance of 15 to 20 miles from the land.

Captain Marie says of the coast to the eastward of the gulf, that in this part of the coast, and as far as the entrance of the Gulf of Papagayo, the winds are very light, with frequent calms; the tides setting strong from the N.W. Custom recommends steering along the coast in the gulf, as by so doing it is thought that the squalls are less severe, the winds more steady, and the sea much smoother. He has frequently crossed this gulf, sometimes close in shore, and at other times been forced, by strong winds from N.N.E. to N.N.W., to keep in the offing. In the

summer time he has navigated in this locality both near to, and at a distance from the coast, and in both cases met with strong winds, accompanied with sudden and heavy squalls, which are almost immediately followed by calms; great care is therefore necessary. He has always taken the precaution to keep from one to three reefs in the topsails, taking care promptly to shorten sails when the squalls came on, and then keeping as close to the wind as possible, with a good full sail, so as easily to make Point Salade; and thus cross the gulf with this sort of weather in about 12 or 15 hours. The winds generally enable ships to make a N.W. course, but in order to keep in with the coast, it is desirable, as the squalls subside, to steer, if possible, a little to windward of that point.

PORT SAN JUAN.—From Salinas Bay the coast runs towards the north-west, about 15 miles, to a place named Port San Juan,* which was selected by Mr. Baily, who was employed by the government of Central America to make a survey of this part of the country, as the point where the railway or canal from the Lake of Nicaragua, projected at that time, 1838, should communicate with the Pacific. It is in lat. 11° 15′ 37″ N., and long. 85° 52′ 56″ W., and is but a small place, although sufficiently commodious within. High land surrounds it on every side, excepting towards the S.S.W. and W. by S. quarters, in which directions it is open to the ocean. At its head the beach is low and sandy, and on each side the land juts out towards the sea, forming promontories of 400 to 500 feet high. The port is about 1,100 yards in extent; and the entrance from the sea is clear, with a depth of water of nine, eight, seven, and six, fathoms, decreasing gradually to three fathoms at the distance of 300 yards from the beach. In every part there is good anchorage, generally on a muddy bottom; and the rise of tide is from 10 to 14 feet.

The prevailing winds on this part of the coast are North and N.E., which blow occasionally with considerable violence; and when such is the case, vessels may sometimes experience some difficulty in making the port. Fresh water can be obtained at a short distance from the beach. Fish is abundant, but nothing else, except firewood, is to be had; the neighbouring lands at present being in a state of nature, without inhabitants or habitations; nor is there either village or town nearer than that of Nicaragua, at a distance of seven or eight leagues. There are a few cattle about.

At the distance of less than a mile from the port of San Juan, there is another port named Nacascolo, which is of nearly the same size and figure; and, as the land between them is low and nearly level, they might be united by a cut, were it thought necessary. As these places are so

* Also called San Juan del Sur, and Concordia.

nearly adjacent, they could, probably, both be usefully occupied, one as an entrance to, the other as an exit from, the canal.

Captain Sir E. Belcher had great difficulty in finding Port San Juan, and remarks—"as we could not fetch Salinas, I beat up to a position where we observed a flag displayed, rockets fired, and a number of men and women in holiday garb collected; and, it being Sunday, we anchored for the day. The surf was too heavy to attempt landing, therefore we could neither fix our position satisfactorily, nor obtain information about San Juan, although I strongly suspected this to be the spot. On Monday we ran up to Salinas Bay, and then commenced the coast survey to Realejo, under very easy sail, anchoring for observations near noon as well as at night. Every nook was narrowly examined, but without success; therefore I am satisfied that Sunday's position, before noticed, was the port in question."

From Salinas Bay the coast runs towards the north-west, a distance of about 100 miles, to Cape Desolada, a term answering its description, as only one or two stunted shrubs are on its summit; it is in general pretty clear and bold-to, and has 10 to 12 fathoms a short distance off. About 10 miles to the westward of Cape Desolada is Cardon Island, at the entrance to the port of Realejo. It is said that at about seven miles before reaching the port there is a reef running off the land, having two rocks above water, the one eight and the other five feet high, which are distant from the beach rather more than three-quarters of a mile. In passing it, give the rocks above water a berth of two miles. The ground between the rocks and one and a half mile seaward of them, and probably more, is very uneven. In the year 1835, H.M.S. Conway struck on a part of this reef, at $\frac{5}{8}$ of a mile S.S.W. $\frac{1}{4}$ W. from the north-west, or highest of the rocks.*—*Nautical Mag.* 1836, *p.* 70.

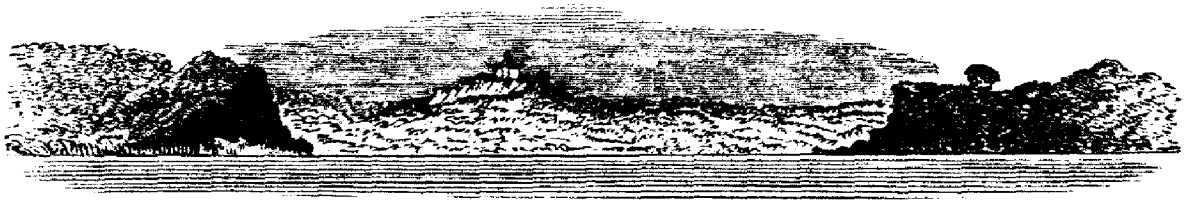
REALEJO.—The village of Realejo is about nine miles from the sea, and in 1837 had a population of about 1,000. Its prosperity has for some years past been declining, more from want of capital, and the little security afforded by a weak government, than from any want or field for speculation. The principal employment of the males is on the water, loading or unloading vessels. There is a custom-house, a collector, comptroller, and other officers necessary for the management of the port. Water and provisions can be obtained. The branch of the river on which the village is situated, the Donna Paula, takes a course towards Leon, and is navigable to within three leagues of that city. It has been

* It should be observed that, according to Captain Sir E. Belcher's chart of Realejo Harbour, there is a reef, named the Conway Reef, lying three-quarters of a mile from the beach, with Castanon Bluff, south side of the Barra Falsa Channel of the harbour, bearing N.W. $\frac{3}{4}$ W., nearly three miles. Probably it is the same reef.

suggested to carry a railway from Leon to the Lake of Managua, which might be effected; but neither the population or consideration of the returns at present warrant such a step, unless as the sole act of the government.

Off the mouth of the river is the island of Cardon, which divides the entrance into two channels, the Cardon Channel on the north, and the Barra Falsa on the south. It is about three-quarters of a mile long, and a cable's length broad, at the south end; thence widening a little towards its other extremity, and is surrounded, to a short distance off, by a sandy flat of one and two fathoms water. The island is of moderate height, appearing of a brownish red colour towards its north-west part, Cape Ponente, which has some trees on it. On each side of the entrance, the shore, for some distance, is low and woody.

The Barra Falsa Channel, the south channel into the river, lies between Cape Austro, the south end of Cardon Island, and Castanon Bluff, the western part of three islands running off the main, but which are connected together at low water by dry sand. The distance between the two capes is about a quarter of a mile, but the channel-way is not more than a cable's length wide, being confined by the shoals on either side. In approaching this channel, you should open the western point of Cardon Island to the southward of Castanon Head, as it will clear the Conway Reef in six and seven fathoms; and, in running in, bring the Vigia, a conspicuous building, about 4½ miles up the country, to bear about N.N.E., appearing between the two points, and it will lead in, in about five and four fathoms. Both flood and ebb press upon the Castanon Shoals, and without a knowledge of the tides, this channel will be unsafe for a large vessel, unless with a strong leading wind.



Cape Austro. The Vigia. Castanon Bluff.

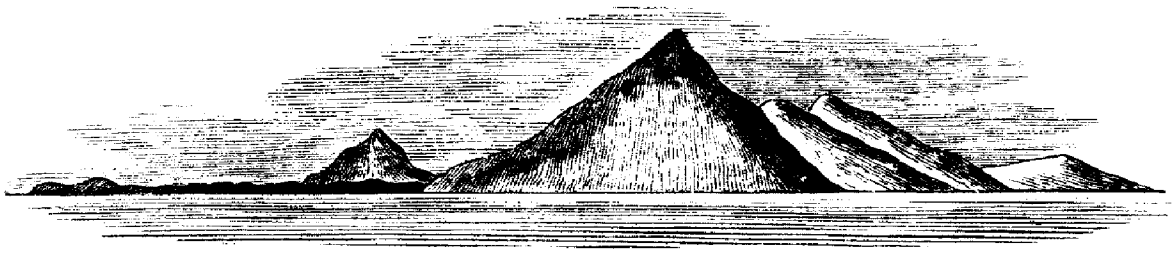
SOUTH CHANNEL OF PORT REALEJO.

The Cardon Channel is the safest for strangers. It lies close round the north end of Cardon Island, between it and the Sawyer Shoals, extending off the south-west end of Aserradores Island, which have not more than 3 to 15 feet on them. To sail in, run towards the entrance with the south end of Aserradores Island and Cardon Head touching each other; and when up with Cardon Head, haul close round it, as the current sets direct on the Sawyer Shoals. A heavy swell breaks on

Ponente Point. You may go close to Cardon Head, off which, at a short distance, are 11 fathoms.

If bound to this port from the southward, and having passed about 20 miles to the eastward of Cocos Island, you should steer so as to make the land to the eastward of the port, near Cape Desolada, during the period between November and May, as the winds prevail from the north-east, and blow, occasionally, with considerable violence out of the Gulf of Papagayo, causing a current to set along the shore to the N.W. From Cape Desolada you run along the coast in about 10 fathoms water.

A good mark to make Realejo is the mountains Viejo and Monotombo; the former of which is visible 60 miles, and bears about N.E. by E. from the anchorage. In our chart of the coast we have given a view of it.



VIEJO VOLCANO, bearing N. 70° E. 25 miles.

M. Marie recommends that, in the winter time, and wanting a pilot, you should anchor in eight or nine fathoms, muddy bottom, on the west side of Cardon Island, with the island bearing E.; and in the summer time, the north-west point of the island bearing S.E. ½ E.; in both cases, at about a mile off the island.

It is imprudent to attempt to run in without a pilot. When inside, the usual anchorage for merchant-vessels is eight or nine miles below the village, at a place named the Four Rivers. Here there is less annoyance from the musquitoes than if higher up. Good water can always be obtained by going to one of the small rivers a few miles above the anchorage. In winter this place is considered to be unhealthy, on account of the fevers, which are frequent and very dangerous.

The north end of Cardon Island was found, by Commander Sir E. Belcher, to be in lat. 12° 27′ 55″ N. and long. 87° 7′ 47″ W. The time of high water is 3h. 6m. on the days of full and change; and the rise at spring tides of 11 feet. Upon this port he makes the following remarks:—

"Cardon Island is of volcanic origin, and the beach contains so much iron, that the sand, which probably is washed up, caused the magnetic needle to vibrate 21° from zero. I do not believe, however, that the needle was much, if at all, affected on the summit of the island, where our

observations were conducted. Our position was on its new cliffy angle. The boats having examined and found the anchorage safe, the Sulphur was brought in and anchored within the Island of Aserradores, in perfectly still water, four fathoms, mud.

On the Island of Aserradores our tide-guage was established, being free from undulation, although directly open to seaward through Barra Falsa; and we were fortunate enough to find a good well of fresh water close to the beach.

Trusting to the accounts I had read of the magnificence of this port, I had fully intended placing the ship near the town. The visit of the Captain of the port soon undeceived me. He assured me that at low water not more than three feet would be found near the town, and so narrow, that there was barely room for the oars of my gig, and then only by careful steerage. Indeed, I found, that although the ship might be warped two miles higher up, she would there be entirely shut from any breeze, her yards probably locked in the trees, and swarming with musquitoes.

This port, if a settlement were established on the Islands of Aserradores, Cardon, or Castanon, would probably be more frequented; but the distance from the position where vessels usually anchor (within Cardon) to Realejo, is a sad drawback to vessels touching merely for supplies. Rum is also too cheap, and too great a temptation for the seamen. Supplies of poultry, fruit, bullocks, grain, &c., are, however, very reasonable, and of very superior quality; turkeys are said to attain an incredible weight; they still, however, justly maintain a very high reputation.

The present village of Realejo (for the name of town cannot be applied to such a collection of hovels) contains one main street, about 200 yards in length, with three or four cross openings, leading to the isolated cottages in the back lanes. With the exception of the houses occupied by the commandant, vice-consul, administrator of customs, and a few others, there is not a decent house in the place. The ruins of a well-constructed church attest its former respectability. The inhabitants generally have a very unhealthy appearance."

From Cardon Island the trend of the coast is about N.W. along Aserradores Island, which is low and well wooded, and has a sandy beach. A near approach to this coast is not recommended, as, if the wind should subside, the current and swell would soon drift you ashore. During winter, when the wind sometimes blows from S. to S.W. with rainy weather, there is also danger in remaining at anchor off this shore, as the sea runs very high.

At a short distance to the N.W. of Aserradores Island there is a small round island, covered with trees, and with a beach of a whitish colour,

called Manzana, between which and Aserradores there is a channel nearly dry at low water, at which time it appears to consist of a single bed *(plateau)* of rocks. It is dangerous to attempt this passage, even in a boat, unless in very fine weather and nearly high water. Between Manzana and the main there is another passage, but even more dangerous than that alluded to; for, although the sea breaks less, and consequently does not so readily discover to you the rocks and sandy shoals, there is actually much less water upon them than is found in the previously mentioned channel.

It has occasionally happened that vessels bound to Realejo, and unacquainted with the bearings necessary to make the entrance of that port, have mistaken Manzana for Cardon, and Aserradores for Castanon, and the passage mentioned for the entrance to Realejo; so that great caution is necessary when sailing along this coast not to be deceived in the appearance of the land. In fact, good charts and sailing directions are much wanted for this part of the coast.

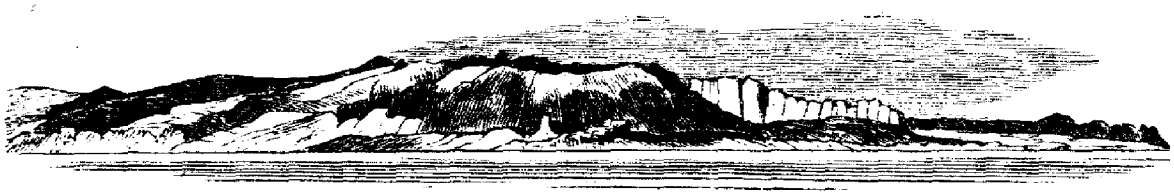
To the N.W. of Manzana are some rocks extending out some miles, and upon which the sea breaks violently. They extend along the coast as far as the parallel of the Mesa de Rodlan, a small mountain close to the beach, with a flat top. These reefs border the coast, are separated by channels, and have between them and the shore smooth water. From hence to Point Conseguina, at the entrance to the Gulf of Fonseca, the coast has a north-westerly direction.

GULF OF FONESCA, OR CONCHAGUA.—The Gulf of Fonseca is a large inlet or bay extending about 30 miles into the coast. The point on the eastern side, called Conseguina, is high, and has a reef extending off it nearly half a mile; from hence the coast runs six miles towards the N. by E., and is high and cliffy, having, about half-way, some rocks extending a short distance from the land. Hence the coast bends round to the eastward for about a mile, and then runs 5½ miles in a N. ½ E. direction to Moneypenny Point, which is low and swampy. On the eastern side of Moneypenny Point is a small river or lagoon.

From Moneypenny Point the coast takes a turn to the south-eastward, for 14 miles, to the mouth of the River Real, and is low all the way, but rises inland to high mountain land. The River Real is said to be navigable 60 miles from its mouth, and Sir E. Belcher was enabled to get his vessel, the Starling, up a distance of 30 miles, and could easily have gone further, had the wind permitted, but the prevailing strong winds rendered the toil of towing too heavy.*

* Captain Sir E. Belcher makes the following remarks on this stream; he says, "I am satisfied that the stream could have been followed many miles higher; and have not the slightest doubt that it is fed very near to the Lake of Managua. I saw the mountains beyond the lake on its eastern side, and no land higher than the inter-

About eight miles within Conseguina Point is the volcano of that name, notorious for its frequent emissions of dust, ashes, and water. Its summit is about 3,800 feet above the level of the sea, and can be seen at the distance of nearly 70 miles in clear weather. The verge of the crater is half a mile in diameter. The interior walls fall perpendicularly to a depth of about 200 feet, when the bottom of the crater becomes flattish, with a small transparent lake in the centre. The last grand eruption of this volcano occurred on the 20th of January, 1835, and was attended with the most disastrous effects.



CONSEGUINA VOLCANO.

From the River Real the coast bends round to the N.N.W., about 30 miles, to the head of the gulf, and has soundings of 1½ to 3½ fathoms, at four miles from the shore, with some dry patches at 6 miles, E. by N., from Moneypenny Point.

The western side of the gulf, Point Amapala or Candadillo, is of moderate height, and bordered by a reef of rocks and sand extending about a mile into the sea, and causing heavy breakers; thus enabling it to be easily avoided. Outside the point, at a short distance, are six to eight fathoms.

From Point Amapala the shore bends in to the north-westward to the outlet of a small river, and then turns to the north-eastward, nine miles, to Chicarene Point, round the north side of which is Port la Union, extending eight or nine miles inland. The upper and north shores of the port are low, and have extensive oyster beds running off them, by which the dimensions of the port are very much contracted. Off the entrance of the port are several islands. The channel-way to Conchagua, or San Carlos de la Union, is between these islands and Chicarene or Chiriguin Point, and is less than half a mile wide, with a depth of 12 to 14 fathoms in it.

vening trees occurred. This, therefore, would be the most advantageous line for a canal, which, by entire lake-navigation, might be connected with the interior of the states of San Salvador, Honduras, Nicaragua, and extended to the Atlantic. Thirty navigable miles, for vessels drawing 10 feet, we can vouch for; and the natives and residents assert 60 more; but steamers will be absolutely necessary to tow against the prevailing breezes."

Conchagua, or San Carlos de la Union, is but a small place, although the principal port of San Miguel, 40 miles to the westward, in the interior. The port is entirely land-locked, in fact, a complete basin, and has a depth of four to five fathoms on the south side, over against the town; but on the north side are extensive flats, which dry when the tide is down. The landing is at all times difficult, and at low water nearly impossible, and during strong northerly winds the communication is frequently cut off for days. It is not considered to be safe to lay-to close to the town; for, in summer, it blows hard from the northward, and if your anchor came home, you might be ashore before you could let go a second. The holding-ground is not considered to be very good.

At the head of the gulf are the Tiger and Conchagua Islands, of which the southernmost of the group is called Manguera. They are all more or less situated on a three-fathom flat.

On the eastern side of the gulf, and just within the entrance, is a dangerous reef of rocks, some above and some below the water, named the Farallones. They lie with Moneypenny Point bearing East, distant five and a half miles, and have eight to ten fathoms close-to all round.

From the Gulf of Fonseca the coast runs to the north-westward, about 50 miles, to the parallel of Vincente volcano, and is said to be dangerous all the way. In this space several rivers fall into the sea, the principal of which are the Rio Grande de San Miguel and the Lempa; having, at their entrance, numerous sand-banks, but imperfectly known. Outside these sand-banks there are 10 and 12 fathoms, sandy bottom. There are said to be very heavy rollers in this part, the sea breaking furiously even at the distance of six and seven miles from the land.

In reference to these shoals, opinions differ as to their position; some navigators stating that they have safely sailed along the coast at the distance of two or three miles; whilst others assert, that in sailing at the distance of nine miles from the land, they were close upon the southern edge of the reef. It is, therefore, most prudent not to keep too close in-shore, until San Vincente is brought to bear about N.N.E., when you may haul up in sight of the breakers of the coast, where there is no danger.

About half-way between the Gulf of Fonseca and San Vincente volcano, is the Port Triunfo de los Libres, or Giquilisco, which is but a small place, having at its entrance two or three small islands, and much obstructed by sand-banks, upon which the sea breaks heavily. Its position has been determined to be nearly as follows:—lat. 13° 22′ N., and long. 88° 12′ W.

PORT LIBERTAD.—Whilst in sight of San Vincente, you will see the volcano of San Salvador, the summit of which is flat, and not unlike a

tortoise, and appears from the eastward to end in a peak. From the meridian of San Miguel the coast is low, sandy, and covered with trees, but becomes rocky near Port Libertad. All this part of the coast to Point Remedios, in long. 89° 42′ 55″, is named *Costa del Balsamo*, from its yielding, in great profusion, the article termed Balm of Peru.

A good mark to make Libertad is the mountain San Salvador, bearing N. by E. or N. It is but a small village of about twelve huts, (1837) and a family of about six in each. There is also a government building, employed for the stowage of the tackle used in landing cargoes; and having at one end a cabin for the commandant, serving as parlour, bedroom, kitchen, &c. Captain Sir E. Belcher has made the following observations on the port:—

"One would naturally expect from the title, 'Port of Libertad,' something pretending to a bay, or a deep indentation; but a straight sandy beach between two slightly projecting ledges of rock, about one mile asunder, forms the *playa* of Libertad; it is law and interest only that have made it a port.

At times the bay is smooth, but the substratum at the beach being of large smooth boulders of compact basalt, the instant the surf rises, they are freed from their sandy covering, and a dangerous moving stony bottom left, on which our boat grounded. We were informed that it is generally violent for three or four days at full and change, which corresponded with our visits.

The rollers which set in on this beach curl and break at times in four or five fathoms, at least a quarter of a mile off. Those within, which are the most dangerous, are caused by the offset, or efflux.

The sand beach is composed chiefly of magnetic iron sand, the dried superstratum, about one inch in thickness, caking in flakes free from admixture.

The anchorage is uneasy, and, I should think, unsafe, and should be avoided near the full moon. Sudden rollers come in, which are apt to snap chain-cables, unless with a long range.

Poultry, bullocks, &c., are to be obtained, but, compared with those of San Salvador or Realejo, the prices are exorbitant. Bullocks can only be embarked in one of their bongos."

SONSONATE ROAD.—From Port Libertad the coast runs about 30 miles to the westward, to Point Remedios, round to the northward of which is Sonsonate or Acajutla Road, where ships can lie in nine to eleven fathoms, bottom of sand, mud, and gravel, partly sheltered from winds off the land, but exposed to all that blow from the southward and westward. Point Remedios is of moderate height, and can be seen at a considerable distance, and has a reef of rocks off it, some above and some under water, extending about three miles out to sea. This reef affords

great protection to the anchorage, as it breaks the force of the swell; it is steep-to on all sides, and must be carefully avoided. A good mark for Sonsonate Road is the volcano of Isalco, about 18 miles to the north-eastward, which cannot be mistaken as it almost constantly smokes. Here it is high water on the days of full and change at 2h. 25m. P.M., with a rise of tide of nine feet.

M. Marie says of this port:—"If you bring Isalco to bear N.E. ¼ N., and steer in that direction, you will make this port. The custom-house, magazines, and the huts of the village are situated on a height that overlooks the plain, but are not distinctly visible, being surrounded by trees; yet, at the distance of four miles, the harbour flag-staff and a shed with a tiled roofing on the sea-beach, can be distinctly seen. The port is also recognised by being situated at the termination of a range of rocks, and where the beach is sandy. The following are good marks for anchoring in summer, in eight fathoms, mud:—

Point Remedios	S.E.
The flag-staff on with the inner angle of the custom-house store.	
Mount Isalco	N.E. ¼ N.

and in winter, in 12 to 14 fathoms, mud:—

Mount Isalco	N.E. ¼ N.
Point Remedios	S.E. ¼ E.
The flag-staff in one with the west wall of the custom-house store.	

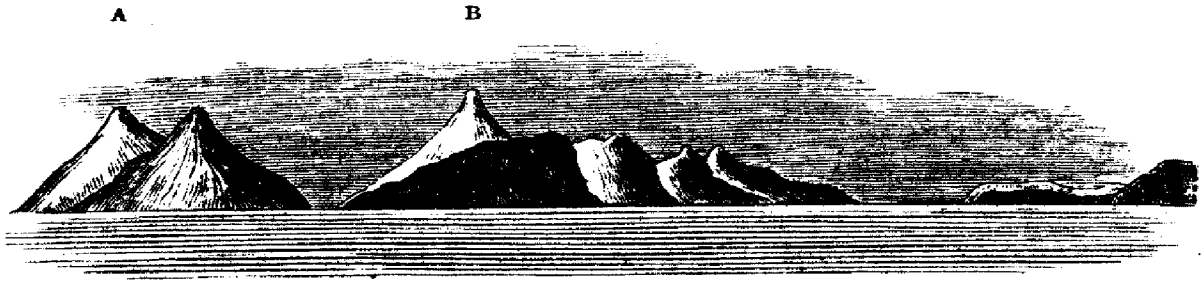
Landing in this place is difficult, and it is even imprudent to attempt to pass the breakers in a small boat. You ought to have a good whale boat; and, in order to prevent accidents, it should be manned by a competent crew; and not attempt a landing when the sea is rough.

Merchant-vessels load and discharge their cargoes by means of bongos, or large craft, in the shape of whale boats, which get on and off the beach in the following manner:—They let go a heavy kedge at about 150 fathoms from the beach, with a good warp attached to a well-secured tackle on shore, which ought to be kept well taut, and in a line perpendicular with the direction of the surf. To this a large buoy is attached, at about 20 fathoms from the anchor, for which you steer on leaving the ship. On reaching the buoy, take care to get hold of the warp, and lay it over the stem and stern of the boat; by means of which you will haul the boat or shallop close to the breakers, and watch a smooth, availing yourself of it to haul the boat quickly on the beach, where, if kept end on, you may load or discharge in safety.

There is a place at Acajutla, called Muelle, where landing, at high water, is comparatively easy. You keep you boat on her oars, until a smooth and favourable moment offers for landing. It is a good mile to the village, and is rather fatiguing in summer."

From Sonsonate Road the coast runs to the north-westward, about 55 miles, to Port Istapa, or Ystapa, which is an open roadstead similar to Sonsonate. In clear weather the mountains of Guatemala are visible at a considerable distance, and help much in making the land. When leaving Sonsonate, keep along the coast at a moderate distance, until you bring the volcano "Single-Peak" of Guatemala to bear N. by W. ½ W., in which direction Istapa bears from the anchorage. The anchorage is abreast the magazine, in eight to ten fathoms water in summer, but in 12 to 13 fathoms in winter. It is high water on the days of full and change at 2h., with a rise of tide of 10 feet.

The entrance of the river is about three miles westward from the anchorage; and, in consequence of the difficulty and danger met with in passing the bar, the landing of goods is effected on the open beach, near the lagoon, which forms the old entrance. It used to be customary to hoist a flag, coloured blue, white, and blue, horizontally, when a vessel made her appearance, and to fire a gun; perhaps the custom may be still observed. The position of the port is lat. 13° 56′ 30″ N., and long. 90° 37′ 30″ W. Variation of the compass 8° 40′ W. At 1½ mile from the coast the depth of water is 15 fathoms.



GUATEMALA VOLCANOES, Point A, distant 70 miles, and B, 30 miles.

From hence the coast trends round to the north-westward to the Gulf of Tehuantepec, and is but little known. There are many rivers which have their outlet to the Pacific in this quarter, and there may be a few secure harbours, but of these we have no description, except the following by Captain P. Masters, of Liverpool, which is taken from the *Nautical Magazine*, 1839, p. 805. It will be observed that Captain Masters is sailing from west to east.*

"On entering the Gulf of Tehuantepec, near the shore, we found the current setting to the W.S.W., 1½ mile per hour. As the wind was easterly and light, we made a stretch to the southward, and in lat. 15° N. and long. 95° 30′ W., I had the boat lowered and tried the current, and

* It is right to mention, that these observations do not agree with the charts, a proof of their incorrectness. The whole coast is now under examination.

found it setting S.S.E., one mile per hour. There had been a fresh breeze from the eastward the day previously. The following afternoon we were close in-shore, and found, as we approached the land, that the current had gradually altered, and was setting to the W.S.W. We came to an anchor the same evening in the Bay of Bamba, which is to the south-west of Morro de Zipegua, the current setting to the W.S.W., nearly two miles per hour. After a fresh S.W. or southerly sea breeze, the current close in-shore has run to the S.E., but this is not general, and does not last a long time.

Whilst we were getting to the eastward in the Gulf of Tehuantepec, we experienced a slight norther; as we stretched off-shore it hauled into the N.E.; a disagreeable short sea arose, the wind blowing in gusts, and the weather hazy.

Santa Cruz, port of Aguatulco, in lat. 15° 51′ N. and long. 96° 17′ W.,* is very difficult to make. It is situated in a small bay, about half a mile wide at its entrance, and runs in to the northward upwards of 1½ mile. At the bottom of the bay is a sandy beach, and on its eastern side are two huts which cannot be seen unless close in-shore. About three-quarters of a mile, E.S.E., from the eastern point of the bay is the Piedra Blanca, a reef of rocks extending east and west about a quarter of a mile. The western part of the reef is about 40 feet high, and for about one-third of its length it is of the same elevation, but the remaining two-thirds to the eastward is low, and in places level with the water. When abreast of it, and off shore a few miles, it appears to be a part of the coast. Although it is called Piedra Blanca, it is a dark irregularly-shaped reef of rocks.

The anchorage in Santa Cruz is said to be good. It is well sheltered from all winds except between East and S.E. by S.; but, as the strongest winds blow from the northward, except in the rainy season, it may be considered a very safe port. It is the only place that can be considered a harbour, to the eastward of Acapulco; and even in the rainy season, I was informed, a vessel might lay there in perfect security. The depth of water in the bay is from seven to nine fathoms, with a clear bottom.

About three miles E.N.E. from Santa Cruz, is the island Tangolatangola, separated from the main by a channel a quarter of a mile wide. This makes from the westward as a part of the main land; the outer part of it is quite bluff, or rather a cliff of a brownish stone, the strata of which are horizontal, and have the same geological appearance as the land on the main nearest it towards the N.E., and of the same height, namely, about 150 feet. Within the island, and round the western side, is the entrance

* In the Admiralty Chart is a plan of the Port of Guatulco, which we presume is the same, but its position is lat. 15° 44′ 25″ N. and long. 96° 8′ W., according to the observations of Commander Sir E. Belcher, R.N.

of the Bay of Tangolatangola; it runs in about N.E., 2 miles. At the bottom of the bay is a fine sandy beach. The anchorage is said to be very good in it, but not equal to Santa Cruz. Its entrance is nearly a mile across, and continues nearly the same to the bottom.

To the westward, half-a-mile from the head, which forms the western part of the bay or harbour of Santa Cruz, is a bluff point or head, under which is a good leading-mark for knowing the harbour. There is a cave in one of the rocks, level with the water, and close in-shore, and every swell that heaves in throws a quantity of water into it, and as the cave has a small aperture in the upper part of it, the water flies up resembling the spout of a large whale. It has often been taken for one by strangers, and deceived us by its appearance. In the night time, or foggy weather, when it is calm, or blowing a light breeze, the sound can be heard at some distance, like a whale blowing. This place is called the Bufadero.

When about five miles off the shore from the Bufadero, the western extreme point of land has a broken rocky appearance, and is not so high as the land adjoining. When about two leagues off-shore from the Bufadero, another cape, farther to the westward, can be seen. Its extreme point is rather low, but rises gradually inland to a moderate elevation.

To the westward of Santa Cruz are two bluff heads, which, when abreast of, might be taken for islands. The first is about three miles from the port; the other is two miles further to the westward, and has a white sandy beach on its western side. On the eastern side of the eastern head there is also a small sandy beach, from which to the Bufadero the coast is rocky. The land which crowns this part of the coast is covered with stunted trees and brushwood. About four or five leagues N. 8° 30′ W. is the Cerro Zadan, having a bell-shaped top, and a ridge on the north-east side connecting it with the higher range of the Cordilleras. The Cerro Zadan is elevated above the sea rather more than 6,000 feet. The mountains further inland, a few leagues, cannot be much short of 10,000 feet high, as they can be seen over the Cerro Zadan.

The Port of Aguatulco is so bad to make, that vessels have been upwards of a fortnight in searching for it; and it was by the greatest chance possible that we had not passed it, although we were not 1½ mile from the shore. The two huts, which were on the beach, can scarcely be distinguished from the trees near which they are built.

From Morro de Ystapa the coast runs about E.N.E. to Punta de Zipegua, in lat. 16° 1′ N. and long. 95° 28′ 30″ W.; variation of the compass 8¼° E. Between these points are several bluff headlands, which do not project far out from the general line of the coast, and afford no shelter. Punta de Zipegua forms the eastern part of what is called the Bay of Bamba, and is a very remarkable headland. From the west-

ward, it shows itself with a bold dark cliff to the sea, about 400 feet high. It projects out from the western line of coast nearly a mile, and forms a kind of double head. A short distance within the outer bluff is a peaked hill, with the appearance of a light-coloured sandstone, and quite bare of vegetation. Further inland, between one and two miles, the ground rises higher, in small hummocks, a few of which are quite bare, and others have a small quantity of stunted trees and bushes scattered over them.

The head, forming the western side of the Bay of Bamba, is not so high, nor does it rise so suddenly from the sea as Punta de Zipegua. It is also covered with bushes. The eastern side of Punta de Zipegua is covered with bushes and trees, the sand only showing through the soil in very few places. When abreast of it, and off the shore from two to eight miles, the current was running to windward W.S.W., from two and a half to three miles an hour. About N.E. from Punta de Zipegua, four or five miles, is a high reef of rocks called Piedra de Zipegua, or Machaguista, in the chart Island of Eschevan. Its greatest elevation is from 60 to 70 feet; and its length is about one-third of a mile in an E.S.E., and W.N.W. direction. It is said that there are no dangers near it but what can be seen. Between it and the main, from which it is about four miles distant, in a N.W. direction, is good anchorage; the best anchorage is close to the reef. The pearl oysters are plentiful near this reef; they are caught by the divers in the rainy season. The general line of coast, from Punta de Zipegua towards Tehuantepec, runs about N.E. by N., easterly.

As I had now passed to the northward and eastward of the position where, by my instructions, I was led to believe our cargo was, we hauled to the wind, with a fresh breeze from the southward, and made a tack or two to fetch the Bay of Bamba. At 4h. P.M. we came to anchor abreast the western part of the beach, in nine fathoms, sandy bottom, off-shore one and a half mile. As soon as we anchored, I went on shore to ascertain where the wood was cut for our cargo, and, with difficulty, got to speak with an Indian, who was greatly alarmed at seeing such a large canoe (as he called the brig), and thought we were come to plunder the coast. His companion ran off to the woods, and he appeared likely to follow; but, when I got within speaking distance, regained his confidence, and replied in answer to my enquiry—'What made them afraid? My companion, who is gone, is afraid; I am a valiant fellow!' He certainly appeared to have the valour of a goose; his heart was beating against his sides, as if they would burst. We had not been many minutes together when he wanted to go aboard, and engage himself as my servant, that he might see the world; but then, said he, 'I am in debt to my master, so I can't go.' It is a common practice with the landholders of Mexico to get their work-

men in debt, particularly if he is a good man; which secures their services equally, or probably more than if they were slaves, as they are compelled, if they have no cash, to work it out.

Shortly after I landed, the proprietor came down on horseback, and stated that he believed there was some Brazil wood at a place called Rosario, (in my instructions it was called St. Francis de Aguatulco), and that Rosario was several leagues nearer Aguatulco. He said that ours was the only vessel larger than a canoe, that had been on this part of the coast for a great number of years. No vessel had ever loaded hereabouts. The beach, or Playa de Bamba, is about five miles long, and must be very bad to land on, with a fresh sea breeze. There was more surf on it when we landed than was quite agreeable; and the boat was half-filled, although the wind was blowing along the coast. We remained at anchor until the morning, and got under weigh with the land breeze, keeping at about half-a-mile from the shore, excepting when abreast of the headlands. In the evening we came again to an anchor, in nine fathoms, sandy bottom, opposite a small sandy beach, one and a half mile from the shore; having seen nothing during the day like wood piled up, or anything in the shape of a signal. In the morning we again got under weigh, and stood to the westward; and at 10h. A.M. were off the Port of Aguatulco. I sent the boat on shore to enquire for the place where our cargo was lying; an Indian got into the boat, as they were shoving off, with the intention of seeing the vessel; from him I learned that we had passed it, and, as he knew the place, I kept him on board, and made all sail, with the wind S.W., for the place, and at 6h. P.M. came to an anchor in the Bay of Rosario. The consignees came on board before we were at anchor, and, by their talk, I expected to get loaded in a week; instead of which we lay there three weeks before the canoes arrived, or before they were prepared for shipping the wood off.

The Town of Aguatulco is eight leagues from the port, and this is the only port in the state of Oajaca, where goods can be imported. Its commerce can be easily imagined, when the person who is *administrador* of the customs, is also captain of the port, &c.; indeed he is the only individual, both in the marine and custom-house departments, with the exception of an old man, who lives at the port, and sends him information when there is any arrival. Mexican vessels can load on the coast, by having an order from any custom-house in the Republic, where they may have touched at; but foreign vessels are compelled to touch at Santa Crux to pass the custom-house visit.

From the Island Tangolatangola to the Bay of Rosario there are several small headlands, which do not project much beyond the general line of coast, with the exception of Morro de las Salinas de Rosario. Most of them have a steep cliff facing the sea, with fine sandy beaches

between them, at the back of which are scattered a few small trees and bushes; the land rising in very irregular-shaped hills towards the Cordilleras. Abreast of the beaches, between the heads, I found the anchorage quite clear; and when in nine to twelve fathoms water, the distance offshore is about a mile, with sandy bottom.

The west side of the Bay of Rosario is formed by the Morro de las Salinas de Rosario, and is in lat. 15° 50′ 25″ N. and long. 96° 2′ W. It projects about a mile beyond the line of coast. On its western side is a beach four or five miles in length to the next head. When abreast of Morro de las Salinas, it appears like an island with two large rocks abreast of its eastern and western part, but the whole is connected with the main. What appears to be the eastern rock, is a broken rocky head, about 160 feet high. The western is about half that elevation. Both these heads terminate with a broken cliff; the tops of them are bare and of a greyish colour, but the lower part is quite black, caused by the sea breaking against them. Between these heads is a small sandy bay, which is at the foot of the Morro, and rises gradually from the beach to the top of the hill, which is about 180 to 200 feet high, and presents a very barren appearance, having but a few straggling bushes on it. The beach of Rosario is 10 miles long, from Morro de las Salinas to Morro de la Laguna Grande, which is its eastern extremity. About half the distance between the Morros, is a rock on the beach, about 40 feet high, and nearly the same diameter at spring tides. The water flows round it.

During the time of our lying in the Bay of Rosario, which was from the 12th of February to the 1st of April, we had three smart northers, which came on at the full and change of the moon. At this time the surf runs very heavy on the beach. Our boat was capsized several times while we lay here, in landing and coming off. At times the sea broke very heavily in all parts of the bay, that is, on the beach. I was caught on shore, a few days after arriving here, during the first norther, which came on suddenly, with a parching hot wind. A cross confused sea hove in from the south and north-east. The wind must have blown strongly out in the gulf, from the same direction; and, though it blew heavily for three days, with the wind at times to the westward of North, the sea kept up until some time after the norther had ceased blowing. This is not generally the case, for a strong norther (and particularly if it veers round to N.N.W.,) beats the sea down; at which time the landing is attended with little or no risk, which was the case when we had the last two northers. I was informed (and, judging from appearances, I think correctly,) that very often when the wind is in N. or N.N.W., close in-shore, it is N.E. in the offing, which makes it impossible to land on the coast. I remarked, whilst lying here, at the full and change of the moon, and when no norther was blowing, that, although the surf ran so

high that no boat could land, the vessel lay without any motion. We were moored at less than 300 fathoms from the shore. The surf appeared not to be caused by a swell rolling in and agitating the sea at the surface, but to rise from below, and without any apparent cause, as we had light winds and fine weather the most of the time we lay here. On another occasion, I was caught on shore with a boat's crew for three days. In attempting to get off to the ship, the boat was capsized and stove. It was then, and had been for a week previous, nearly a calm. The heavy ground-swell invariably hove in from the S.S.W. We fortunately escaped from this beach without losing any of our people, which was more than I expected, having had three laid up at different times, who were saved from being drowned by a mere chance.

In addition to what has been said about this part of the coast, it can be known by the low land at the back of the beach of Rosario, which runs in from one to two and a half leagues before there is much rise in it, and is thickly covered with trees. From north to north-west of Morro de las Salinas, nearly two leagues from shore, the rising ground is formed by a number of small barren hillocks. From our anchorage, at the place where we loaded, the following bearings were taken, lying in 9½ fathoms, sandy bottom. There are two large patches of a whitish appearance, the farthest range of the Cordilleras; the eastern is the lowest, and bore N. 59½° W. The appearance cannot be seen, unless from a little to westward of Morro de las Salinas. This has every appearance of being a waterfall, and rises from the other patch in a N.W. direction, at about an angle of 45°. It issues from a small valley in the Cerro del Chonga. The highest point of this range has but a small elevation above it, and is covered with trees. The waterfall inclines towards the south, and can be seen for several hundred feet descending, before it is lost sight of amidst the forest below. Cerro de Zadan bore N. 89° W.; the extreme bluff of Morro de las Salinas, S. 36° W., three and a half miles; the eastern point well within the bearings, and Punta de la Laguna Grande, N. 71° E., six to seven miles; the rock on the beach, mentioned as being 40 feet high, N. 65° E.; and the galena or shed, under which the cargo was piled, N. 26° W., half-a-mile.

At the western part of the bay are four palm-trees, close to the beach. The distance from the Morro de las Salinas is about half-a-mile, and between these trees and the Morro is a larger cluster of palms. Between these two clusters is, at all times, the best place to land; as a boat can beach here with comparative safety; when, at every other part of the bay, the sea runs very heavy. At the neaps we found the place quite smooth, with the exception of a sea heaving in about every 10 or 15 minutes; but it causes no risk to a boat, provided she is kept end on.

At the south-western part of the beach, and where a small pathway leads to cross the Morro de las Salinas, close to the sea-side, in the cliff of a rock is a small spring of excellent water. We always found it clear and cool, even at noon; my consignee said we could fill the ship's stock of water from it with dispatch, but I soon found out that he knew nothing about it. The quantity that could be filled in a day did not exceed 30 gallons; and, after having landed all our water-casks, we had to re-ship them, through a great deal of surf, and land them at the galena, abreast of the ship. We filled our water at a well about a mile from the beach, but the supply was very limited, it being the only well that had water in it up to the day of our sailing. We did not complete our stock.

A captain of a ship should trust to no promises when he comes here, either with regard to supplies or anything else, no matter by whom made; and, as water and fuel are indispensable articles, the filling the one and cutting the other, should be commenced immediately on arrival, by some of the crew. It is useless to employ Indians to work for the ship (that is, on shore), as the greatest part of them will neither be led or driven. On board they answer better (that is, a few of them), to haul the wood about in the hold. I found the promises of Indians, and, as they call themselves, 'Gente decente y civilazado,' on a par.

Near the Morro de la Laguna is a large lake, from which the headland takes its name. A few miles farther, to the eastward, is the Morro de Santiago de Ystapa (in the chart it is called Morro de Ayuta), near which is the entrance of the small river Ayuta, the stream that runs by Huamilulu and Ystapa. There is a bar across the entrance. The canoes land on the beach in preference to going over it, as it is attended with danger."

ACAPULCO is considered to be the finest harbour in Central America; and, for its size, one of the most complete in the world. It affords sheltered and land-locked anchorage of 16 fathoms, and under, in a surface of one mile square; which, allowing for moorings, would, at half-a-cable range, or one cable asunder, accommodate 100 sail of vessels, even of the line. The bottom is sandy at its surface, but clayey beneath, and holds well.

All round the harbour, on every side, are high mountains, which, on the north and east sides, range from 2,000 to 2,700 feet in height, and on the west side from 300 to 500 feet. They afford considerable shelter to the harbour, and may be seen at a great distance off at sea.

On the eastern side of the entrance of the port, just round Point Diamond, off which a reef extends a short distance, the land bends inwards about one and a half mile, and forms a small and secure harbour, but open to all winds coming from the westward, called Port Marquis; in which are 13 to 19 fathoms, mud, sand, and rock. At the entrance of

the bay, on the north side, and at a short distance from the shore, is a small island or rock, and at the head of the bay is a rock, having from six to ten fathoms close to it; these can be easily avoided.

On the western side of the Harbour of Acapulco, and without the entrance, is an island about three-quarters of a mile long, called Griffin Island, having, off its eastern and western extremities, reefs extending to a short distance, and which, in parts, are above the water; in other respects the island is clear. About a quarter of a mile from the island, there is a small islet or rock, called Le Morro, above the water, and having outside it a depth of 20 fathoms. The passage between Griffin Island and the shore is about two cables' length wide, in its narrowest part, and has a depth of 16 to 20 fathoms. It is called the Little Channel; while the channel between the east and west points of the harbour is named the Great Channel.

The Town of Acapulco is on the west side of the port, and has long been in a state of decline, owing to the bad custom-house regulations, which cripple the energies of its merchants. Its market is but indifferently supplied; but fowls, and excellent fruit and vegetables, are readily obtained. Its position, from observations taken at the fort by Captain Beechey, is lat. 16° 50′ 32″ N. and long. 99° 50′ 44″ W.

In the north part of the bay are some rocks, called the San Lorenzo Rocks, at a short distance from the shore, having between them and the town the watering-place, where good water can always be obtained. About half-a-mile to the eastward of the San Lorenzo Rocks is another, called the Obispo, of a white colour, and about 60 feet high. Outside these rocks are seven to ten fathoms.

In approaching the harbour, there are some hills to the north-westward, named the Paps of Coyuca, which are considered to be good marks for it. Captain Sir E. Belcher, R.N., has observed:—"I cannot persuade myself that these Paps are useful for making the harbour, although in the offing they may be if not obscured.

Acapulco may be approached from the southward or westward, by keeping the western cone open of the land, which will lead up to the Boca Chica entrance, or until Acapulco port is so close under the lee, that no further marks are necessary. There is not any hidden danger in the entrance to Acapulco. Keep a moderate distance from either shore; five fathoms will be found alongside all the rocks, and 25 to 30 in mid-channel. Round Point Griffin sharply, rather than stand over to San Lorenzo, as the wind, generally westerly, heads on that shore. If working, tack when the rocks on the south point of Town Bay show in the gap.

The two best berths are off the rocks alluded to; that outside is preferable, but in either case let the outer rock bear W.S.W. or W.N.W.,

so that a hawser fast to the rock may keep your broadside to land or sea breezes, and prevent a foul anchor.

It would naturally be inferred that, as the harbour is surrounded on every side by high mountains, the breeze would scarcely be felt and the heat be intolerable. This is confined to the town limits; at our observatory, and at the port, San Carlos, we enjoyed a constant breeze.

In all harbours there may be objectionable berths, but in that of Acapulco, if care be taken to keep in the line of what I have designated the 'West Gap,' or neck of the peninsula, open of the south point of the town-bay, both land and sea breezes will be felt in their full strength, and free from causes which would heat them before entering the port, the neck being but a few feet above the sea-level.

Water of good quality was found at several points between the fort and Obispo Rock; but the two best streams are between the fort and San Lorenzo."

The following remarks from the French chart of the harbour, the proceeds of the survey made in 1838, by M. de Petit-Thouars, Commander of the 'La Venus,' will be of interest:—

"The currents are not felt in the road, but, without they run to the S.E. with a strength varying from a-half to two miles. This current is more rapid during the ebb.

In the fine season, that is to say, from December to May, the land and sea breezes are regular enough. They are feeble during the night, coming from N. to N.E. and E.; and from S.W. to W.S.W. and to N.W. in the day. In the other months of the year this coast is dangerous, and but little frequented.

The usual anchorage is to the south of the fort, and before the town, in 11 to 13 fathoms, muddy bottom; it is perfectly safe. In case of necessity, anchorage can also be obtained in the Great Channel.

When a ship is in sight at night, a light is shown near the signal-staff. The navigation is attended with so little danger, that there is no pilot."

From hence the coast trends a little inwards, about 80 miles, to the W. by N. ¼ N., to Point Tequepa, on the eastern side of which is the River Coyuquilla. We have no information of this part of the coast until we get to Morro Petatlan, 20 miles further to the north-westward, off which there are some rocks named the White Friars, from their supposed resemblance to a cross. They have been described by Lord Anson, in the following manner:—

"The hill of Petatlan may be at first mistaken for an island, although it is in reality a peninsula, joined to the continent by a low and narrow isthmus, covered with shrubs and small trees. The bay of Sihuatanejo extends from this hill a great distance to the westward, and has, at its

entrance, just off the hill of Petatlan, an assemblage of rocks, white with the dung of boobies and other tropical birds. Four of these rocks are high and large, and, together with several smaller ones, are, by the aid of a little imagination, made to resemble the form of a cross, and hence are called the White Friars."

SIHUATANEJO, OR CHEQUETAN, is about seven miles to the westward of Petatlan. It is a small but excellent harbour, of about a mile in extent, and open to all winds coming from the south-west. At its entrance are 10 fathoms, decreasing gradually towards the head of the bay, where there are two and a-half to one and a quarter fathoms. It has been lately surveyed by Captain Kellett, R.N., who places it in lat. 17° 38′ 3″ N., and long. 101° 30′ 52″ W. Lord Anson has described it in the following terms :—

"It is about 30 leagues to the westward of Acapulco, and may easily be found by keeping well in with the land, especially if sailing down the coast from Acapulco. There is a beach of sand extending 18 leagues from Acapulco to the westward, against which the sea breaks so violently that we found it impossible to land with our boats; but yet the ground is so clean, that, during the fair season, ships may anchor in great safety, at the distance of a mile or two from the shore. The land adjacent to this beach is generally low, full of villages, and planted with a great number of trees. On the tops of some small eminences there are several look-out towers, so that, altogether, the face of the country presents a very agreeable aspect; for the cultivated part, which is the part here described, extends some leagues back from the shore, where it seems to be bounded by a chain of mountains, which extends a considerble distance on either side of Acapulco.

The beach described above is the surest guide to those seeking Sihuatanejo; for five miles to the westward of the extremity of the beach there is a hummock, which at first makes like an island, and is in shape not much unlike the hill of Petatlan, though much smaller. Three miles to the westward of this hummock, is a white rock near the shore, which cannot easily be passed by unobserved. It is about two cables' length from the shore, and lies in a large bay about nine leagues over, the west point of which is the hill of Petatlan.

The harbour of Sihuatanejo is easily distinguished by a large rock, one and a-half mile, S. ½ W., from the middle of the entrance. I may add that this coast is no ways to be dreaded between the middle of October and the beginning of May, nor is there any danger from the winds. In the remaining part of the year, there are frequent and violent tornadoes, heavy rains, and severe gales, in all directions of the compass.

These are the marks by which the harbour may be known by those

who keep well in with the land; but there is no mark for those who keep at a considerable distance at sea, who must, consequently, make it by the latitude; for there are so many ranges of mountains rising one upon another inland, that no drawings of the appearance of the coast can be at all depended on, every little change of distance or position bringing new mountains into view, and producing an infinity of different prospects, which render all attempts at delineating the appearance of the land impossible.

The entrance of the harbour is but half-a-mile broad; the points which form it, and which are faced with rocks almost perpendicular, bearing from each other S.E. and N.W. The harbour is surrounded on every side, excepting to the westward, with high mountains covered with trees. The passage in is very safe, on either side of the rock that lies off the entrance, though we, both in going in and out, left it to the eastward. The ground without the harbour is gravel mixed with stones, but within is soft mud. It is necessary, when coming to an anchor, to make a good allowance for a great swell, which frequently causes a great send of the sea; as, likewise, for the ebbing and flowing of the tide, which we observed to be about five feet, and to set nearly east and west.

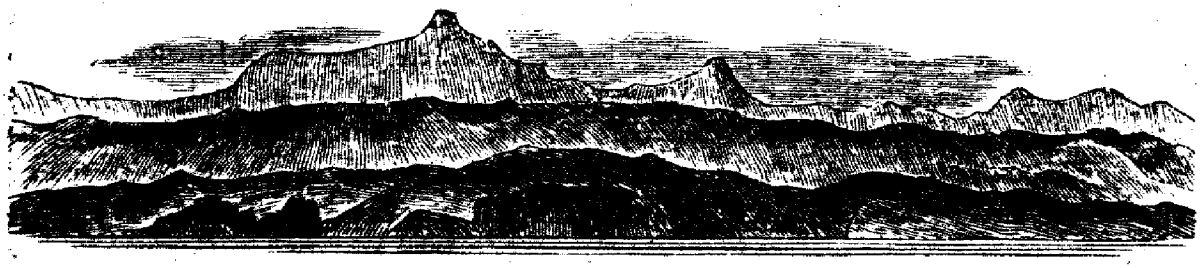
The watering-place is at the head of the bay. During our stay it had the appearance of a large standing lake, without any visible outlet into the sea, from which it is separated by the strand. The origin of this lake is a spring, which bubbles out of the ground nearly half-a-mile inland. We found the water a little brackish, but more considerably so towards the sea-side; for the nearer we advanced towards the spring-head, the softer and fresher it proved. This laid us under the necessity of filling our casks from the farthest part of the lake, and occasioned us some trouble; and would have proved still more difficult, had it not been for our particular management, which, on account of its convenience, deserves to be recommended to all watering at this place. Our method consisted in making use of canoes drawing but little water; for, on loading them with a number of small casks, they easily got up the lake to the spring-head, and the small casks being there filled, were in the same manner transported back to the beach, where were some of the hands to put them into casks of a larger size.

Though this lake, during our visit, appeared to have no outlet to the sea, yet there is reason to suppose that in the rainy reason it overflows the strand and communicates with the sea, for Dampier speaks of it as a large river. Indeed it is necessary that a vast body of water should be amassed before it can rise high enough to overflow the strand, since the neighbouring lands are so low that a great part of them must be covered with water before it can run out over the beach."

In lat. 18° 15′ N. and long. 103° 30′ W. is Point and River Tejupan, at the back of which the land rises to a great height, and forms two peaks called the Paps. From hence the coast runs to the north-westward nearly 80 miles to Manzanilla Bay, which is small but safe, and affords good anchorage, well protected against the southerly winds prevalent during the rainy season. In the summer-time it is rendered very unhealthy by a large lake of stagnant water in its immediate neighbourhood. This, together with myriads of musquitoes and sand-flies, renders it scarcely habitable. There are no houses, men and families living exposed under the trees.

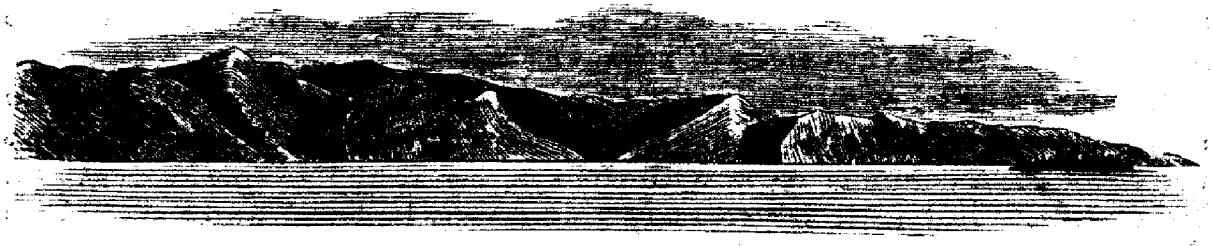
Manzanilla Port is the main sea communication with the city of Colima, 30 leagues inland, and which is said to contain about 30,000 inhabitants. It has been opened to foreign commerce for several years, but has not been able to make much progress.

Inland, at the back of Manzanilla, is a very lofty mountain, called the volcano of Colima, which is 12,003 feet high, and can be seen a great distance at sea. Its position, determined by Captain Beechey, R.N., is lat. 19° 24′ 42″ N. and long. 103° 33′ 1″ W. The following rough sketch of the volcano will give some idea of its form and appearance.



COLIMA VOLCANO, bearing N. 57° E., distant 35 leagues.

From Port Manzanilla the coast continues in the same direction, 40 miles, to Point Farallones, from whence it runs to the N.W. by N., 75 miles, to Cape Corrientes, in lat. about 20° 26′ N. and long. 105° 39′ 13″ W., which rises high in the interior.



CAPE CORRIENTES, bearing S. 31° E., 10 leagues.

From Cape Corrientes the coast runs N.E. by E. ½ E., a distance of

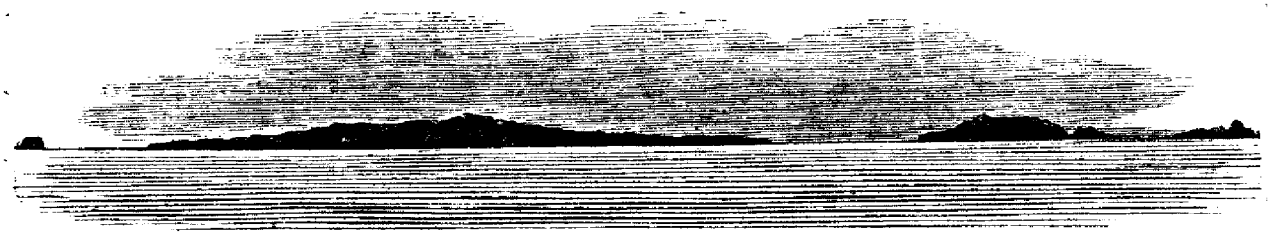
28 miles; thereafter it runs northerly a distance of eight miles; and next to the west, a distance of 16 miles, to Punta Mita. Between Cape Corrientes and Punta Mita, bearing about N. by E. ⅔ E. and S. by W. ⅔ W. from each other, is formed a deep bay, named Valle de Banderas Bay. Off Punta Mita there are numerous rocky heads, to the eastward of which, in the northern part of the bay, anchorage may be got, in from six to eight fathoms. In the eastern part of the bay is the mouth of the River Piginto; and in the western portion, at the distance of four miles, S.S.W., from Punta Mita, are two small islets, called the Marieta Islands, surrounded by numerous rocky heads; and to the westward of these, at the distance of six miles, is a small island, rocky on the western side. All this coast is but little known.

Care should be taken in the night-time to keep clear of a small cluster of low rocks, which lie 22 miles to the N.N.W. of Cape Corrientes. Of these Captain B. Hall says:—"We made them in lat. 20° 43′ N., and long. 105° 51′ 4″ W. Vancouver places them in lat. 20° 45′ N., long. 105° 46′ 55″ W.; an agreement sufficiently near." Vancouver describes them as follows:—"Much to our surprise, in the afternoon we approached a small black rugged rock, or, more properly speaking, a closely connected cluster of small rocks, which, though deserving of attention, from their situation, and the safety of the navigation between Cape Corrientes, St. Blas, and the Marias, yet they are not inserted in either of the Spanish charts, nor do they appear to have been noticed by any former visitor, with whose observations I have become acquainted. The space they occupy does not appear to exceed the dimensions of a large ship's hull, nor are they much higher. They are at a great distance from any land, and, so far as we could perceive in passing them, at the distance of about half-a-league, the water near them appeared to be deep in every direction. We could not gain soundings close round them with the hand-line, nor did this small rocky group seem to be supported by any bed of rock or shallow bank. The shores of the main land, to the eastward of them, at the distance of about eight leagues, appeared to be broken, and about ten miles within them are two small islets. These rocks, according to our observations, lie from the southernmost of the Marias, S. 36° E., at the distance of 12 or 13 leagues."

From Punta Mita the coast appears to run westerly, a distance of six miles, and thereafter 34 miles, N. ½ E., to the mouth of the Rio Custodios, in which latter space lies Taltemba Bay, containing numerous rocky heads in its northern part, and round the N.W. point to about the mouth of the River Chila, eleven miles distant from the mouth of the Rio Custodios. The land to the northward of this latter river runs out westerly, about a mile, to a point, from which to Santa Cruz Point, the southern point

of the roadstead of San Blas, the bearing and distance are NN.E. ½ E. seven miles.

LAS TRES MARIAS.—These islands lie before the port of San Blas, and are four in number, if the Isle San Juanito (low and tabling) is included, which is not more than six miles distant from the northernmost. There are many small rocks around them, whose heads just rise above the water. These islands lie between 21° 16′ and 21° 46′ N.



LAS TRES MARIAS,
The Western Point of the Northern Island, bearing N. 50° E., three leagues.

The northernmost is the largest of the group, and is thirteen miles long, and nine miles broad. It lies in a S.E. by E. and N.W. by W. direction; which is also nearly the line in which these islands lie from each other. It is but moderately elevated, yet, notwithstanding, it may be discerned at the distance of near 18 leagues. Its highest part is towards the south, from whence it gradually descends and terminates in a long low point at its north-west extremity. A small low detached islet, and a remarkable steep, white, cliffy rock, lie off this point of the island, whose shores are also composed, but particularly so on its south-west side, of steep, white, rocky cliffs. Its south-eastern extremity, which likewise descends gradually from the summit of the island, terminates also in a low projecting point, with some rocks lying off from it. On either side is a small bay; that on the eastern side is bounded by a beach, alternately composed of rocks and sand, and very probably good anchorage may be obtained in it, if the bottom should be good, as it is protected against the general prevailing winds. Between this island and Prince George's Island, the next to the southward, is a passage about six miles wide, with soundings from 20 to 40 fathoms, sandy bottom, and appears to be free from danger or interruption.

Prince George's Island is about 24 miles in circuit, and is bounded on its south-west side by detached rocks, lying at a small distance from its shores. The shores, in general, but more so on its northern and eastern sides, descend gradually from the centre of the island (whose summit is nearly as high as that of the northernmost island), and terminate at the water-side in a fine sandy beach. This island is more verdant than the other, as its vegetable productions extend from the more elevated parts

to the wash of the sea, and grow with some luxuriance, although its soil is principally of a sandy nature. The chief valuable production is lignum vitæ; besides which 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 tribe; the whole growing as close to the water-side as the wash of the surf would permit. A variety of fish, common to the tropical regions, abound about the shores.

The south-easternmost island is about nine miles round.

In navigating round these islands, some detached islets and rocks are visible about the shores, but all are sufficiently conspicuous to be avoided; and there is every reason to believe, from the regularity of the soundings, that secure anchorage may be obtained against the prevailing winds, at a commodious distance from the shore.

Of these islands, Captain Beechey says:—

"The Tres Marias, situated 1° 15′ west of San Blas, consist of three large islands, steep and rocky to the westward, and sloping to the eastward, with long sandy spits. Off the S.E. extremity of Prince George's Island (the centre of the group), we found that the soundings decreased rapidly from 75 fathoms to 17; and that, after that depth they were more regular. Two miles from the shore we found 10 and 12 fathoms, bad holding-ground. There is nothing to make it desirable for a vessel to anchor at these islands. Upon Prince George's Island there is said to be water of a bad description; but the landing is in general very hazardous.

There are passages between each of these islands. The northern channel requires no particular directions; that to the southward of Prince George's Island is the widest and best; but care must be taken of a reef lying one-third of a mile of its S.W. point, and of a shoal extending one and a half mile off its south-eastern extremity. I did not stand close to the south Maria, but could perceive that there were breakers extending full three-quarters of a mile off its S.E. extremity; and I was informed at San Blas, that some reefs also extended from two to four miles off its south-western point. There is an islet off the north-west part of this island, apparently bold on all sides: but I cannot say how closely it may be approached."

If the Tres Marias Islands be passed to the south-eastward, at the distance of eight or ten leagues, and a N.N.E. course steered, Piedro de Mer, off San Blas, will be readily got sight of. The Piedro de Mer is a white rock, about 130 feet high, and 140 yards in length, with 12 fathoms all round it; and bears from Mount San Juan, to the eastward of San Blas, N. 77° W., 30 miles. This rock is situated in lat. 21° 34′ 45″ N. and long. 105° 28′ 13″ W., and, from its height, forms an excellent land-mark.

Having made Piedro de Mer, pass closely to the southward of it, and, unless the weather is thick, you will see a similarly-shaped rock, named Piedro de Tierra, for which you should steer, taking care not to go to the northward of a line of bearing between the two, as there is a shoal which stretches to the southward from the main land. This course will be S. 79° E. true, and the distance between the two rocks is very nearly 10 miles.

SAN BLAS.—To bring up in the road of San Blas, round the Piedro de Tierra, at a cable's length distance, and anchor in five fathoms, with the low, rocky point of the harbour bearing N. ½ E., and the two Piedros in one. This road is very much exposed to winds from S.S.W. to N.N.W., and ships should always be prepared for sea, unless it be in the months in which the northerly winds are settled. Should the wind veer to the westward, and a gale from that quarter be apprehended, no time should be lost in slipping and endeavouring to get an offing, as a vessel at anchor is deeply embayed, and the holding-ground is very bad. In case of necessity, a vessel may cast to the westward, and stand between the Piedro de Tierra and the Fort Bluff, in order to make a tack to the westward of the rock; after which, it will not be necessary again to stand to the northward of a line connecting the two Piedros.

The road of San Blas should not be frequented between the months of May and December, as, during that period, the coast is visited by storms from the southward and westward, attended by heavy rains, and thunder and lightning. It is, besides, the sickly season, and the inhabitants having all migrated to Tepic, no business whatever is transacted at the port.

It is high water at San Blas at 9h. 41m., full and change; rise between six and seven feet, spring tide.

Captain Masters says:—"In the rainy season, when the wind blows strongly from the southward, a heavy swell sets in at San Blas; and, as there is nothing to protect the anchorage, it must be felt very severely; but I never heard of any damage having been done to the shipping in consequence.

There are some advantage in a vessel lying outside in the roads during the rainy season, for there the crews have purer air to breathe; and, probably, it might be more healthy than that of the port, besides being partially clear of mosquitoes, and other tormentors of the same cast, which are very numerous.

There are 13 feet 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 harbour a berth of 15 or 20 fathoms, you will avoid a large stone, which is awash at low water, and is about eight 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 a line with the other part of it inside, which runs to the N.N.E., it may be approached to within 10 or 15 fathoms, and by keeping well off from the low sandy point, which is on the starboard hand as you warp up the harbour, you will have the deepest water. But, as the sea sometimes in the rainy season (although but seldom) breaks over the breakwater which forms the harbour, it would be best to moor close under the high part of the land on which the old ruin of a fort stand, with the ship's head up the river, and a bower laid off to the eastward, and an anchor from the starboard quarter, making fast on the port side to the shore, either by taking an anchor out or making fast to the rocks. It would be next to impossible that any accident could happen to the ship."

The following notes, made on a passage to the port of San Blas, are by Lieut. Sherard Osborn, R.N. :—

"Supposing a vessel, bound to the western coast of Mexico, safely round Cape Horn, and running before the southerly gale which almost constantly blows along the shores of South America, she ought to shape a course so as to cross the equator in about 98° or 99° W. long., so that when she gets the N.E. trade she will be at least 6° or 7° to the eastward of her port,—San Blas or Mazatlan; and have at the same time a sufficient offing from the Galapagos Islands to avoid their currents and variable winds.

We crossed in 105° W. long., having been recommended to do so by some old merchants at Valparaiso, and were consequently, although a remarkably fast-sailing ship, a lamentably long time making the distance. Several days' log of the ship show as follow :—

March 24th	San Blas	672	miles distant
,, 25th	,,	646	,,
,, 26th	,,	657	,,

Our track led us to be exactly in the same longitude as our port, when we got the trade, and it hanging well to the northward, we were constantly increasing our distance, until in the latitude of San Blas, when an in shore tack, of course, shortened it. But, by the course I have recommended, the *first* of the N.E. trade will drive the vessel into the meridian of her port, and she will thus daily decrease her distance.

Care must be taken in standing in for the land not to go to leeward of San Blas, as there is a strong southerly current along the coast, especially off Cape Corrientes. If possible keep San Blas on an E.N.E. bearing. The Tres Marias Islands, off the port of San Blas, are convenient points for making; and here a master could leave his vessel in perfect safety to water, while he communicated with his consignees, or got his overland letters from his owners at home. There is a safe mid-

channel course between the middle and southern islands: we brought a saddle-shaped hill on the main, a little south of San Blas, one point open of the south island, and steered by compass N.E. by E.

The Two Piedro Brancos, that of de Mer and de Tierra, are excellent marks for the roadstead, which, by Beechey, is in lat. 21° 32′ 20″ N., long. 105° 15′ 15″ W. A good anchorage for vessels awaiting orders (for which purpose San Blas is now almost alone visited, except by English men-of-war, and Yankee clippers for smuggling purposes), will be found with Piedro Branco de Mer, N. 70° W.; de Tierra, N. 43° W.; and village in the Estero, N. 26° W.

Since the days of Hall and Beechey, the town of San Blas has very much changed. Its population of 20,000 have dwindled to 3,000 residents, and their unwholesome appearance, fully accounts for the decrease of residents; and nearly all its trade has been transferred to its rival—Mazatlan.

The large town of Tepic, in the interior, with a small factory, owned by an English merchant, causes a small demand for European luxuries, and a cargo or two of cotton; which petty trade is carried on during the six healthy months in the year. A great deal of smuggling is carried on from the neighbourhood of this port, the extensive bay, to the southward, affording great facilities to the men-of-war's boats in that employment.

The town is built on the landward slope of a steep hill, almost perpendicular to seaward, and its crest crowned by the ruins of a custom-house; but this being about three-quarters of a mile distant from the beach, a large assemblage of huts has been formed at the landing-place, in the Estero del Arsenal, for the convenience of supplying the shipping; the occupants being, for the most part, grog-venders, fishermen, and an agent to the harbour-master.

In the Estero del Arsenal, small craft, of less than 10 feet draught, will find convenient anchorage, means of heaving down, &c. The watering-place is, at least, three miles distant from the above anchorage; and to assist the boats in this heavy work, it would always be advisable to shift the vessel into such a position that they might make a fair wind off and on whilst the daily sea-breeze blows.

The watering-place is at the northern extremity of a large open bay, south of San Blas; the beach is shoal, and the casks have to be rolled three or four hundred yards through the jungle to a stream of water. This stream, during the spring tides, is liable to be found brackish; but even then we succeeded in obtaining supplies, by immersing the empty cask with the bung in such a position that only the fresh water (which, of course, would be on the surface), could enter.

By rigging triangles with spars in such a position that the boats

could go under them to load, we succeeded in embarking daily 32 tons of water.

Many useful and ornamental woods are to be procured on shore, for the mere trouble of cutting, especially lignum vitæ. Fresh beef we found good in quality. Game moderately plentiful; oysters good and plentiful; vegetables scarce and expensive. The climate may be summed up by the word execrable.

On the 1st of November, 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 musquitoes and sandflies. The sky 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 for 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 swamp; the haunts of alligators and aquatic birds. In September the action of the sun on water-soddened land, generates fever of the most violent nature, and it behoves those who arrive early in the dry season to be careful of exposure to the malaria."

General Remarks on the Coast.—Captain Basil Hall, R.N., makes the following observations on the winds and weather, and navigation of the south-west coast of Mexico:—

"On the south-west coast of Mexico, the fair season, or what is called the summer, though the latitude be north, is from December to May inclusive. During this interval alone it is advisable to navigate the coast; for, in the winter, from June to November inclusive, every part of it is liable to hard gales, tornadoes, or heavy squalls, to calms, to constant deluges of rain, and the most dangerous lightning; added to which, almost all parts of the coast are, at this time, so unhealthy as to be abandoned by the inhabitants. At the eastern end of this range of coast, about Panama, the winter sets in earlier than at San Blas, which lies at the western end. Rains and sickness are looked for early in March at Panama; but at San Blas rain seldom falls before the 15th of June; sometimes, however, it begins on the 1st of June, as we experienced. Of the intermediate coast I have no exact information,

except that December, January, and February are fine months everywhere; and that, with respect to the range between Acapulco and Panama, the months of March, April, and half of May, are also fine; at other times the coast navigation may be generally described as dangerous, and on every account to be avoided.

From December to May inclusive, the prevalent winds between Panama and Cape Blanco de Nicoya are N.W. and northerly. From thence to Realejo and Sonsonate, N.E. and easterly. At this season, off the Gulfs of Papagayo and Tehuantepec there blow hard gales, the first being generally N.E., and the latter N. These, if not too strong, as they sometimes are, greatly accelerate the passages to the westward; they last for several days together, with a clear sky overhead, and a dense red haze near the horizon. We experienced both in the Conway in February, 1822. The first, which was off Papagayo on the 12th, carried us 230 miles to the W.N.W.; but the gale we met in crossing the Gulf of Tehuantepec on the 24th, 25th, and 26th, was so hard that we could show no sail, and were drifted off to the S.S.W. more that 100 miles. A ship ought to be well prepared on these occasions, for the gale is not only severe, but the sea, which rises quickly, is uncommonly high and short, so as to strain a ship exceedingly.

From Acapulco to San Blas, what are called land and sea breezes blow; but, as far as my experience goes, during the whole of March, they scarcely deserve that name. They are described as blowing from N.W. and W. during the day, and from N.E. at night; whence it might be inferred, that a shift of wind, amounting to eight points, takes place between the day and night breezes. But, during the whole distance between Acapulco and San Blas, together with about 100 miles east of Acapulco, which we worked along, hank for hank, we never found, or very rarely, that a greater shift could be reckoned on than four points. With this, however, and the greatest diligence, a daily progress of from 30 to 50 miles may be made.

Such being the general state of the winds on this coast, it is necessary to attend to the following directions for making a passage from the eastward:—

On leaving Panama for Realejo or Sonsonate, come out direct to the north-westward of the Isla del Rey; keep from 20 to 30 leagues off the shore as far as Cape Blanco de Nicoya; and on this passage advantage must be taken of every shift of wind to get to the north-westward. From Cape Blanco hug the shore, in order to take advantage of the north-easterly winds which prevail close-in. If a *papagayo* (as the strong breeze out of that gulf is called) be met with, the passage to Sonsonate becomes very short.

From Sonsonate to Acapulco, keep at the distance of 20, or, at most,

30 leagues from the coast. We met with very strong currents running to the eastward at this part of the passage; but whether by keeping farther in, or farther out, we should have avoided them, I am unable to say. The above direction is that usually held to be the best by the old coasters.

If, when off the Gulf of Tehuantepec, any of the hard breezes, which go by that name, should come off, it is advisable, if sail can be carried, to ease the sheets off, and run well to the westward, without seeking to make northing; westing being, at all stages of that passage, by far the most difficult to accomplish. On approaching Acapulco, the shore should be got hold of, and the land and sea breezes turned to account.

This passage in summer is to be made by taking advantage of the difference in direction between the winds in the night and the winds in the day. During some months, the land winds, it is said, come more off the land than at others, and that the sea breezes blow more directly on shore; but in March we seldom found a greater difference than four points; and, to profit essentially by this small change, constant vigilance and activity are indispensable. The sea breeze sets in, with very little variation as to time, about noon, or a little before, and blows with more or less strength, till the evening. It was usually freshest at two o'clock; gradually fell after four; and died away as the sun went down. The land breeze was by no means so regular as to its periods or its force. Sometimes it came off in the first watch, but rarely before midnight, and often not till the morning, and was then generally light and uncertain. The principal point to be attended to in this navigatien is, to have the ship so placed at the setting in of the sea breeze, that she shall be able to make use of the whole of it on the port tack, before closing too much with the land. If this be accomplished, which a little experience of the periods renders easy, the ship will be near the shore just as the sea breeze has ended, and there she will remain in the best situation to profit by the land wind when it comes; for it not only comes off earlier to a ship near the coast, but is stronger, and may always be taken advantage of to carry the ship off to the sea breeze station before noon of the next day.

These are the best directions for navigating on this coast which I have been able to procure: they are drawn from various sources, and, whenever it was possible, modified by personal experience. I am chiefly indebted to Don Manuel Luzurragui, master attendant of Guayaquil, for the information they contain. In his opinion, were it required to make a passage from Panama to San Blas, without touching at any intermediate port, the best way would be to stretch well out, pass to the southward of Cocos Island, and then run with the southerly winds as far west as 96° before hauling up for San Blas, so as to make a fair wind

of the westerly breezes which belong to the coast. An experienced old pilot, however, whom I met at Panama, disapproved of this, and said, the best distance was 15 or 20 leagues all the way. In the winter months these passages are very unpleasant, and it is indispensable that the whole navigation be much further off shore, excepting only between Acapulco and San Blas, when a distance of 10 to 12 leagues will be sufficient.

The return passages from the west are always much easier. In the period called here the summer, from December to May, a distance of 30 to 50 leagues ensures a fair wind all the way. In winter, it is advisable to keep still further off, say 100 leagues, to avoid the calms, and the incessant rains, squalls, and lightnings, which everywhere prevail on the coast at this season. Don Manuel Luzurragui advises, during winter, that all ports on this coast should be made to the southward and eastward, as the currents in this time of the year set from that quarter.

If it were required to return direct from San Blas to Lima, a course must be shaped so as to pass between the Island of Cocos and the Galapagos, and to the south-eastward, till the land be made a little to the southward of the equator, between Cape Lorenzo and Cape St. Helena. From thence work along-shore as far as Point Aguja, in lat. 6° S., after which work due S., on the meridian of that point, as far 11½° S., and then stretch in-shore. If the outer passage were to be attempted from San Blas, it would be necessary to run to 25° or 30° S. across the trade, which would be a needless waste of distance and time.

Such general observations as the foregoing, on a navigation still imperfectly known, are perhaps better calculated to be useful to a stranger than detailed accounts of passages made at particular seasons. For, although the success of a passage will principally depend on the navigator's own vigilance in watching for exceptions to the common rules, and on his skill and activity in profiting by them, yet he must always be materially aided by a knowledge of the prevalent winds and weather. As many persons, however, attach a certain degree of value to actual observations made on coasts little frequented, although the period in which they may have been made be limited; I have given in the two following notices, a brief abstract of the Conway's passages from Panama to Acapulco, and from Acapulco to San Blas. The original notes from whence they are taken are too minute to interest any person not actually proceeding to that quarter of the world.

Panama to Acapulco.—5th of February to 7th of March, 1822 (30 *days*).—We sailed from Panama on the 4th of February, and anchored on that afternoon at the Island of Taboga, where we filled up our water.

Next evening, the 5th, we ran out of the bay with a fresh N.N.W. wind, and, at half-past two in the morning of the 6th, rounded Point Mala, and hauled to the westward. As the day advanced, the breeze slackened, and drew to the southward. In 24 hours, however, we had run 140 miles, and were entirely clear of the bight of Panama. It cost us nearly six days more before we came abreast of Cape Blanco de Nicoya; at first we had light winds from S.S.W., then a moderate breeze from N.N.W., which backed round to the eastward, and was followed by a calm: during each day we had the wind from almost every point of the compass, but light and uncertain. Between the 11th and 12th, we passed Cape Blanco de Nicoya, with a fresh breeze from S.S.E. and then S.S.W., which shifted suddenly to the northward, afterwards to the N.N.E., where it blew fresh for upwards of 24 hours, and enabled us to run more than 230 miles to the W.N.W. in one day. This breeze, which is known by the name of *papagayo*, failed us after passing the gulf of the same name, and we then came within the influence of adverse currents. On reaching the longitude of 92° W., on the 16th, we were set S. 16°. W., 77 miles; on the 17th, N. 16 miles; on the 18th, E. 51 miles; on the 19th, S. 78°. E., 63 miles; on the 20th, S. 62°. E., 45 miles; on the 21st, S. 87°. E., 17½ miles; all of which we experienced between 91° and 93° W., at the distance of 20 or 30 leagues from the shore; meanwhile we had N.N.E. and northerly winds, and calms.

After these currents slackened, we made westing as far as 93½°, by help of N.N.E. and easterly winds. On the 22nd, 23rd, and 24th, we were struggling against north-westerly winds off Guatemala, between 14° and 15½° north latitude. This brought us up to the top of the bay of Tehuantepec at sunset of the 24th; we then tacked and stood to the westward. The weather at this time looked threatening; the sky was clear overhead, but all round the horizon there hung a fiery and portentous haze, and the sun set in great splendour; presently the breeze freshened, and came to north by west, and before midnight it blew a hard gale of wind from north. This lasted, with little intermission, till six in the morning of the 26th, or about 30 hours. There was, during all the time, an uncommonly high short sea, which made the ship extremely uneasy. The barometer fell from 29·94 to 29·81, between noon and four o'clock, P.M., but rose again as the gale freshened; the sympiesometer fell twelve-hundredths. This gale drove us to the S.W. by S., about 140 miles. A fine fresh breeze succeeded from N.N.E., which carried us 120 miles towards Acapulco, and left us in longitude 97½° W. and latitude 15° N., on the 27th. This was the last fair wind we had on the coast, all the rest of our passage, as far as San Blas, being made by dead beating. The distance from Acapulco was now less than 180 miles, but it cost us eight days' hard work to reach it, principally

owing to a steady drain of lee-current running E. by S., at the following daily rates, viz., 13, 16, 27, 37, 25, 10, 9, 7, and 9 miles. The winds were, meanwhile, from N.W. to N.N.W., with an occasional spurt from S.E. and S., and several calms. We had not yet learned the most effectual method of taking advantage of the small variation between the day and night winds.

Acapulco to San Blas.—12th to 28th of March, 1822 (16 *days*).—This passage was considered good for the month of March, but in the latter days of December, and first of January, an English merchant made it in 10 days, having a fair wind off shore nearly all the day. A merchant brig, which passed Acapulco on the 6th of February, at the distance of 150 miles, was a fortnight in reaching Cape Corrientes, and nearly three weeks afterwards getting from thence to San Blas, a distance of only 70 miles. There is, however, reason to believe that the vessel was badly handled.

It would be useless to give any more detailed account of this passage than there will be seen in the preceding remarks. We generally got the sea breeze about noon, with which we laid up for a short time W.N.W., and then broke off to N.W., and so to the northward, towards the end of the breeze, as we approached the coast. We generally stood in within a couple of miles, and sometimes nearer, and sounded in from 15 to 25 fathoms. If the breeze continued after sunset, we made short tacks, in order to preserve our vicinity to the land, to be ready for the night wind. With this we generally lay off S.W., sometimes W.S.W. and W., but only for a short time. After passing latitude 18°, the coast trended more to the northward, and a much larger leg was made on the port tack, before we were obliged to go about. As we approached Cape Corrientes, in latitude 20°, the land winds became more northerly, and the sea breezes more westerly; so that, as the coast also trended off the northward, a more rapid advance was made.

On passing Cape Corrientes, the Tres Marias Islands came in sight; and, if they be passed to the south-eastward, at the distance of eight or ten leagues, and a N.N.E. course steered, Piedro Branco de Mer, off San Blas, will be readily got sight of. This is a round, bold, white rock, in lat. 21° 34¾′ N. and long. 105° 32⅙′ W., and being 130 feet high, forms an excellent land-mark. It lies exactly 11¾ of a mile nearly due west from the harbour of San Blas, which is pointed out by another white rock, bearing S. 83° E. from the former. Close round this last rock, called Piedro de Tierra, on the eastern side, lies the anchorage. The coast between Cape Corrientes and San Blas is full of deep and dangerous rocky bights. It is little known, and ought not to be approached. Care should also be taken, in the night-time, to keep clear of a small cluster of low rocks, which lie 22 miles to the N.N.W. of Cape Cor-

rientes. We made them in lat. 20° 43′ N. and long. 105° 51′ 4″ W. Vancouver places them in lat. 20° 45′ N., long. 105° 46′ 55″ W.; an agreement sufficiently near. Our difference of longitude was ascertained by chronometers next day from San Blas, where the longitude was afterwards determined by the occultation of a fixed star.

During our stay at San Blas, from the 28th of March to the 15th of June, we had light land-winds every night, and a moderately fresh breeze from west every day, with the thermometer always above 80°.

Towards the end of the period, the sky, which had been heretofore clear, became overcast; the weather lost its former serene character, becoming dark and unsettled; and, on the 1st of June, the periodical rains set in with great violence, accompanied by thunder and lightning, and fresh winds from due south. This was nearly a fortnight earlier than the average period. The heat and closeness of the weather increased greatly after the rains set in; but although our men were much exposed, no sickness ensued, excepting a few cases of highly inflammatory fever. The town was almost completely deserted when we came away; the inhabitants having, as usual, fled to Tepic and other inland towns, to avoid the discomfort and sickness which accompany the rains.

As soon as the rains subside, in the latter end of October, or beginning of November, the people return, although that is the period described as being most unhealthy, when the ground is still moist, and the heat of the sun not materially abated.

The coast from San Blas runs N.W. ⅓ N. a distance of about 120 miles. From San Blas to Mazatlan the coast is low (excepting near the entrance of Tecapan) and covered with trees, and is clear of all danger. About a mile from the shore, between Tecapan and Mazatlan, the soundings vary from 9 to 12 fathoms, fine sand. On the bar of Tecapan the water is very shallow, and in general breaks. The soundings increase gradually between San Blas and Mazatlan to 30 fathoms at 20 miles from the coast.

There is no danger whatever on the coast between Piedro de Mer and Mazatlan; the lead is a sure guide. The Island of Isabella in lat. 21° 51′ 15″ N. and long. 105° 52′ 3″ W., is high and steep, and has no danger at the distance of a quarter of a mile. It is a small island, about a mile in length, with two remarkable needle rocks lying near the shore to the eastward of it.

Beating up along the coast of Sonora, some low hills, of which two or three are shaped like cones, will be seen upon the sea-shore. The first of these is about nine leagues south of Mazatlan, and within view of the island of El Creston, which forms the port of Mazatlan. A current sets to the southward along this coast, at the rate of 18 or 20 miles a day.

MAZATLAN.—Mazatlan is a port very easily made. It is formed

by a cluster of islands, to the southward of which is a long line of beach, with low land thickly covered with trees, running several miles in before it reaches the foot of the mountains, and continues the same as far to the southward as the north side of the bar of Tecapan, where the land is high. Its position is lat. 23° 11′ 40″ N., and long. 106 22′ 24″ W.

The port of Mazatlan at its entrance, is formed by the island of El Creston on its western, and the island of Vienado on the southern side. From the sea the former has nearly a regular ascent, the length of the island lying from east to west, where it terminates in an abrupt precipice, and is covered with small trees. It has from 8 to 10 fathoms water to within a few fathoms of it. The island of El Vienado has a very similar appearance, and is about half the height of El Creston Island, being partially covered with trees. These islands can be seen several miles before the land, at the back of the town, makes its appearance. The outer rock is situated well outside the roadstead, and forms nearly an equilateral triangle with the islands of El Creston and Vienado; it is about eight feet high, and nearly the same breadth, and from seven to eight fathoms long from north to south; there are five fathoms water close to it.*

Within the port is a long sand, which extends out from the bottom of it, a great part of which is dry at low water, and is shoal for some distance to the south-east, extending nearly as far as the island El Vienado, with a boat channel between it and the island. The inner anchorage is to the westward of this sand. It is said that the bank is increasing, and that the port has filled very much within a few years past.

North of the island El Creston, and between it and the main land, is the Island of Gomer, which is low, and is separated from El Creston by a narrow boat-channel. From about the middle of Gomez a bar extends to the eastward across the port to the sand-bank already mentioned, on which there are said to be several patches of shoal water when the water was low, not having more than six feet on them. Inside the bar the water deepens, and close up to the town, there are said to be from two and a half to three fathoms, with a sandy bottom.

When the wind blows strong from the N.W., a short chop of a sea heaves in between the Island of Gomez and Point Calandare, although the distance they are apart is short, but by anchoring, as already mentioned, opposite Creston, most of it is avoided.

In the rainy season it is very unsafe to lay inside, as gales come on from the southward, which bring in a heavy sea. Vessels of all sizes

* It is right to mention that the above directions of Captain Masters do not correspond in many important particulars with the recent survey of Captain Beechey, R.N. The chart ought to be referred to as it will be found an invaluable assistance to those visiting the port.

anchor in this season in the outer roads between the islands and the outer roads from which they can be got under weigh, and stand clear of the coast.

To the northward of the present port of Mazatlan, about five miles, is the N.W. port of Mazatlan, a fine bay, well sheltered from N.W. winds by the Pajaros or Bird Islands. It was in the southern part of this bay that vessels formerly discharged their cargoes, but the present port being more secure, was established in its stead about thirty years since.

The river is said to extend about 30 miles from the port, and passes within a few miles of the town of Mazatlan, where the custom-house formerly was, but was removed to the present port a short time since, and as all business is transacted at the town of Ragosa (commonly called Mazatlan), the old town is fast falling to decay.

The watering-place for shipping is a small distance up a creek, on the east side of the river. Wood for fuel can be had in abundance.

Captain Beechey says:—

"The anchorage at Mazatlan, at the mouth of the Gulf of California, in the event of a gale from the south-westward, is more unsafe than that at San Blas, as it is necessary to anchor so close to the shore, that there is not room to cast and make a tack. Merchant-vessels moor here with the determination of riding out the weather, and for this purpose go well into the bay. Very few accidents, however, have occurred, either here or at San Blas, as it scarcely ever blows from the quarter to which these roads are open between May and December.

Having approached the coast about the latitude of 23° 11′ N., Creston and some other steep rocky islands will be seen. Creston is the highest of these, and may be further known by two small islands to the northward of it, having a white chalky appearance. Steer for Creston, and pass between it and a small rock to the southward, and when inside the bluff, luff up, and anchor immediately in about seven and a half fathoms, the small rock about S. 17° E., and the bluff W. by S. Both this bluff and the rock may be passed within a quarter of a cable's length; the rock has from 12 to 15 fathoms within 30 yards of it in every direction. It is, however, advisable to keep at a little distance from the bluff, to escape the eddy winds. After having passed it, be careful not to shoot much to the northward of the before-mentioned bearing (W. by S.), as the water shoals suddenly, or to reach so far to the eastward as to open the *west* tangent of the *peninsula* with the *eastern* point of a low rocky island S.W. of it, as that will be near a dangerous rock, nearly in the centre of the anchorage, with only 11 feet water on it at low spring-tides, and with deep water all round it. I moored a buoy upon it, but should this be washed away, its situation may be known by the eastern extreme of the before-

mentioned low rocky island, between which and Battery Peak, there a channel for small vessels, being in one with a *wedge-shaped protuberance* on the *western* hillock of the northern island (about three miles north of Creston), and the N. W. extremity of the high rocky island to the *eastward* of the anchorage being a little open with a rock off the mouth of the river in the N.E. The south tangent of this island will also be open a little (4°), with a dark *tabled hill* on the second range of mountains in the east. These directions will, I think, be quite intelligible on the spot.

The winds at Mazatlan generally blow fresh from the N.W. in the evening; the sea-breeze springs up about ten in the forenoon, and lasts until two o'clock in the morning.

It is high water at this place at 9h. 5 a.m., full and change, rise seven feet spring tide.

GUAYMAS.—From Mazatlan the coast runs to the north-westward to 27° 53′ 50″, the latitude of Port Guaymas, forming the eastern side of the Gulf of California, and is almost entirely unknown. The Port of Guaymas, in Lower California, was surveyed in 1840 by M. Fisquet, of the French Navy, a copy of which is on our chart of the coast. It is a small port about three miles in extent, and has numerous islands in it, affording good shelter to vessels drawing from 12 to 15 feet water. It is considered to be one of the best harbours in the gulf. The longitude is 110° 49′ 13″ W., and variation 12° 4′ E. The rise of tide is three and a half feet at ordinary tides, but is dependent upon the winds, which, when blowing strongly from the S.W., raise it to 10 and 11 feet.

This harbour was visited in 1826, by Lieut. Hardy, R.N., who says, "The harbour is, beyond all question, the best in the Mexican dominions; it is surrounded by land on all sides, and protected from the winds by high hills. It is not very extensive, nor is the water above five fathoms deep abreast of the pier; but there are deeper soundings further off. It would shelter a large number of vessels. The entrance is defended by the Island of Pajaros, on which, at the proper season of the year, is found a prodigious quantity of eggs, deposited by gulls, so that its surface becomes completely whitened by the vestiges which they leave behind them.

During the dry season, the hills which surround the harbour present a sterile appearance, truly unpleasing to the eye, and give but a bad idea of the prosperity of the town; while the size of the houses, the number of its inhabitants, or the want of cattle in its neighbourhood, do not tend to remove that impression.

The town is but a miserable place, that is, as far as regards the houses, which are built of mud, having flat roofs, covered with mould, so that, during a hard rain, the inmates may take a shower-bath without going

out of doors. The rafters are whole palm-trees; and there is a large kind of humble-bee which perforates them with the greatest ease, so that, by degrees, these *great bores*, which serve the insect for a nest, so weaken the rafters, that the lodger may sometimes find a grave without going to the churchyard, the roof falling for want of due support, which has since happened to the very house wherein we then resided."

The following notes made on a passage from San Blas to Mazatlan, are by Lieut. Sherard Osborn, R.N.:—"Leave San Blas with the first of the land breeze, and after passing Piedro de Mer, endeavour to steer such a course as to be enabled to make a good in-shore tack with the sea-breeze on the morrow, taking care not to stand closer to the shore than eight fathoms in a large vessel, or five fathoms in a smaller one; or, should the sea breeze be found to have much northing, stand well off, when a continued wind instead of the land and sea breezes will be obtained, and the strong southerly set in-shore be avoided. The *Collingwood* made the in-shore passage in April, 1846, and had light airs with frequent calms, being generally too far off shore at night to benefit by the land breeze; she consequently was five days going 120 miles, whilst the *Spy* did it in two and a half days by going well to seaward.

The *misnamed* port of Mazatlan is easily recognised by the two bluff headlands which form the entrance to the river, the northern and more conspicuous of the two, Creston, being an island, and affording a little shelter from the northerly breezes which prevail from January to May. To the westerly and southern breezes it is perfectly open, and has the only recommendation of being good holding-ground. The coasters run up the river off the new town of Mazatlan, which has risen to considerable importance within a very recent period, notwithstanding the advantages it labours under from the paucity of supplies, both animal and vegetable; and from water being both bad and scarce.

Mazatlan is now the outlet for the products of the valuable mining district of San Sebastian, and imports directly and indirectly large cargoes of English goods. The general healthiness of the climate, as compared with its more ancient neighbour San Blas, has materially tended to an increase of its population. The town, from being built on the crest of some heights, clear of mangrove and swamp, had an air of cleanliness and pure ventilation rare in Spanish America.

Vessels must invariably moor in the roadstead, open hawse to the W.S.W., and too close a berth to Creston Island is not advisable, as the squalls sweep over it with great strength. The *Collingwood* drove, though she had 50 fathoms on each cable.

Watering is attended with great risk at all times in this place, especially at full and change, the boats having to cross the heavy surf of the bar, formed between a long spit which runs down the centre of the river, and

a bank joining it from the south shore. Several boats and lives are annually lost here. In pulling in care should be taken to cross the surf pretty close to the middle ground; and when through the first rollers, to pull over to the south shore, and keep it on board up to the watering-place. In coming out, no casks ought to be allowed in the head sheets, every thing depending upon the buoyancy of the boat; inattention to this point, caused the loss of two lives, to my own knowledge.

The water is procured from a number of wells dug by seamen, on a low alluvial island, formed on a quicksand in the bed of the river; none of them are consequently more than ten feet deep. The water is by no means sweet, being merely sea water, which undergoes a partial purification in filtering through the soil.

Supplies of all sort come from the neighbourhood of San Blas; and as the bullocks are driven that long distance, and on arrival they are instantly killed, from the want of grass, the beef is necessarily lean and bad. Pork, fish, and oysters are however plentiful; vegetables are scarce. The river abounds in turtle of excellent quality; wood of various descriptions, principally hard, was plentiful, and at a short distance oak and cedar might be obtained.

Old Mazatlan, which lies about 20 miles up the river, was well known to ancient navigators, as far back as 1587. "Master Thomas Cavendish in the talle shippe *Desire*, 120 tons, refreshed his gallant company before cruising off Cape Lucas, for a Spanish galleon; and Don Sebastian Vizcaino, in an expedition to convert the Californians to the Catholic faith, recruited his squadron in the Bahia de Mazatlan."

THE COAST OF CALIFORNIA.

CALIFORNIA was formerly subject to Spain, and afterwards to Mexico; but in 1848, the northern part of it, called Alta California, was annexed, by treaty with Mexico, to the territories of the United States of North America. The country is naturally divided into two parts, the Old or Lower, and the New or Upper. Old California comprehends the long peninsula, between the Gulf and the Pacific Ocean, and extends about 700 miles in length, with a breadth varying from 30 to 100, comprising an area of about 38,000 square miles. A chain of rocky mountains, not exceeding 5,000 feet in height, runs through it from south to north; and the surface of the country consists of groups of bare rocks, broken by ravines and hills, interspersed with barren sandy tracts, forming altogether one of the most barren and unattractive regions within the temperate zone. The climate is excessively dry and hot, and violent hurricanes are frequent; timber is very scarce, and the greater part of the country is incapable of producing a single blade of corn. Some sheltered valleys only produce maize, and a variety of fruits, as dates, figs, &c., which are preserved and exported; wine is also made, and a kind of spirit is distilled from the must. Cattle are somewhat numerous; wolves, foxes, deer, goats, snakes, lizards, and scorpions, are among the wild animals. The pearl fishery in the gulf has been famed from its first discovery; at present, it produces annually pearls to the value of from 500 to 1000 dollars. Pearls, tortoise-shell, hides, dried beef, dried fruits, cheese, and soap, constitute all the exports, which are mostly sent to Mazatlan and San Blas in small coasting-vessels. The people are a feeble and indolent set of Indians, whom the Jesuits have partially converted to Christianity; but they are little advanced beyond the rudest stage of savage life, and depend for their subsistence on hunting and fishing, with the spontaneous produce of the soil.

Upper or New California extends from the Pacific Ocean to the Rocky mountains; but the only tract inhabited by European settlers is the narrow strip of land along the coast of the Pacific, which is bounded inward by the maritine range of hills, at the distance of about 40 miles from the sea. The surface of this region is very diversified, and consists of

hills and plains of considerable extent; along the coast there are several good harbours, of which San Francisco, in lat. 38°, is one of the largest and best on the west coast of America. The rainy season is in winter, from November till February. During the rest of the year there is no rain, but a few showers fall in some places. In summer the heat is very great. The country offers, nevertheless, a striking contrast to the peninsula. There is a profusion of forest trees on the western side of the mountains along the coast; and many fine fruits are easily cultivated, though few are indigenous. Among these is a species of vine, which produces grapes of considerable size, and so plentiful, that considerable quantities of brandy are distilled from them. Among the wild animals are reckoned the American lion and tiger, buffaloes, stags, roes, elks, bears, wolves, jackals, wild cattle, foxes, polecats, otters, beavers, hares, rabbits, &c. Birds of various kinds are exceedingly abundant. But the great and most important article of produce is black cattle, the multiplication of which has been really prodigious. In 70 years the number had increased from 23 to 210,000 branded cattle, and probably 100,000 unbranded; and it is found necessary to slaughter 60,000 annually to keep down the stock. Sheep have increased with nearly the same rapidity, but are at present of little importance to the trade of the country. Between the maritime chain and the rocky mountains is a dry or sandy plain or desert, 700 miles in length, by 100 in breadth at its south end, and 200 at the north, which is traversed by the Rivers Colorado and Gila, and forms the eastern limit of the inhabited, and indeed only habitable part of the country. The natives were a poor, filthy, pusillanimous set of Indians, in the most primitive state of barbarism, except those who have been converted nominally to Christianity, and who have been taught a few of the simpler arts and practices of civilized life. These resided in missions, where the men were employed in agriculture, or in the warehouses or workshops of the mission, while the women were occupied in spinning, grinding corn, and other domestic duties. They were in fact slaves to the monks who possessed the missions; and the greatest part of the land, and especially that to the south of Monterey, was in the hands of the missionaries. Since the annexation to the United States, a most extraordinary productive gold region has been discovered in the northern part of Upper California, commencing near the mouth of the Sacramento River, in 39° N. lat., about 100 miles N.E. of the Bay of San Francisco, and extending up the main valley northwards, and into several side valleys eastwards. Almost the whole population has taken to the "diggings," and the news of the discovery has attracted crowds of immigrants from both America and Europe.

The earliest accounts we have met with of the discovery of gold in California, are preserved in "Burney's Collection of Voyages in the

Pacific." It has been asserted that the discovery was made in the middle of the last century; and, Capt. Shelvocke is also stated to have first found it a century and a quarter ago. Burney has, however, preserved an account, which we quote here of the discovery of it, by the early Spaniards, in 1539, just 20 years after Cortez landed at Vera Cruz. That the existence of the rich district was known, is, therefore, evident, although its exact locality remained locked in secrecy, limited no doubt, but not to those who had contemplated the Mexican war, and its intended results. Burney has preserved the history of the journey of Friar Marcos de Niza, containing the account to which we allude.

"From Petatlan, Friar Marcos de Niza, with his followers, travelled along the coast, where people came to him from islands; and, he saw some that came from the land where the Marquis Cortez had been. At the end of a desert of four days journey, he found Indians who had not knowledge of the Christians, the desert obstructing communication between them and the countries to the south.

"These people," says the friar, "entertained me exceeding courteously, gave me great store of victuals, and sought to touch my garments, and called me *Hayota*, which, in their language, signified 'a man come from Heaven.'"—The principal motive of this undertaking, however, was not one of a pious or spiritual nature. It was to spy out the land, whether it was good or bad, and to bring of the fruit, that his countrymen might know if they should go up and possess it.

"These Indians," says the friar, "I advertised by my interpreter, according to my instructions, in the knowledge of our Lord God in Heaven, and of the Emperor. I sought information of other countries, and they told me that four or five days journey within the country, at the foot of the mountain, there was a large plain, wherein were many great towns, and people clad in cotton. I shewed to them metals which I carried with me, to learn by them what rich metals were in the land. They took the mineral of gold and told me that thereof were vessels among the people of that plain; that they had thin plates of gold, wherewith they scraped off their sweat; that the walls of their temples were covered therewith, and that they used gold in all their household vessels.

"I sent Estevanico another way, and commanded him to go directly northward, to see if he could learn of any notable thing which we sought to discover; and I agreed with him, that if he found knowledge of any people, and rich country, which were of great importance, he should go no further; but should return in person, or send me tokens: to wit, if it were a mean thing, he should send me a white cross, one handful long; if it were a great matter, he should send me a great cross, &c."

Estevanico, in his new route, very soon received information concerning

the seven cities, and that the nearest was *Cevola*, which was said to be distant thirty days' journey.* Towards *Cevola*, Estevanico directed his steps, sending messengers to the father; who, the fourth day after their separation, received from him "a great cross, as high as a man." At the sight of this token, and on hearing the reports of the messengers, Friar Marcos set forward, following the steps of his intelligencer. The friar relates that, in this journey, by a small deviation from a direct route, he came in sight of the sea coast, in 35° north, which he saw stretched from thence to the west. Giving him credit for speaking to the best of his knowledge, it cannot be supposed that he had other means of estimating his latitude than by guess, or that he saw any sea coast beyond the *Gulf of California.—Nautical Magazine*, Feb. 1849.

On the western side of the Gulf of California is the bay of La Paz, having the Espiritu Santu Islands at the entrance, which afford good protection from the swell of the sea. Here is the harbour of Pichilingue, in which small vessels only can winter, the water being shallow. In this harbour, it is said, there are some excellent pearl beds. There is a considerable quantity of land in its neighbourhood, which produces fruit and vegetables of an excellent quality. Both native and mine gold is brought from the Real of San Antonio, about four leagues to the W.N.W.; the metal, however, is not very abundant, nor is its quality very good. The inhabitants are chiefly the descendants of foreign seaman who have intermarried with the native women. For remarks on this bay, see the remarks by Lieut. Sherard Osborn, in the Appendix.

Between La Paz and the island Del Carmen is San Pedro and other islets, upon which garnets are said to be found.

To the northward of La Paz is the mission of Loretto, formerly a place of considerable trade, but now suffered to go to decay. It was once the capital of Lower California, and was founded in the year 1698, by Don Juan Caballero y Osis, who wrote a long account of it, and considered its locality as one of great importance. The anchorage is open to winds from North, N.W. and S.E., and when these prevail, the heavy sea renders it by no means safe for a vessel to attempt riding them out. Carmen Island affords shelter from the eastward, and the mainland from the westward. The following description of Loretto was written in 1826 by Lieut. Hardy, R.N.

"Loretto stands in a valley of about two or three thousand feet wide, surrounded by wild and sterile mountains, of which that called "La

* *Herrera* mentions the same distance. He writes the name *Cibola*, Dec. 6, l. 7. c. 7. *Ortelius*, in his chart, No. 5. *Americæ, Sive Novi Orbis*, places *Cevola* in 36° north latitude, and about 7° of longitude east, from the mouth of the river *Colorado*. *Theatrum Orbis Terrarum*. *Edit.* 1584.

Giganta" is the highest and least picturesque.* There are two gardens in the place in which the vine, peach, fig, quince, and date, are cultivated. A considerable quantity of wine is annually made, notwithstanding the fruit is common property to all the inhabitants. Peaches and pears are dried as well as figs; the dates are preserved; and these fruits are afterterwards exchanged for wheat and Indian corn, brought to the mission in small schooners from the port of Guaymas.

The situation of Loretto is in a valley of very limited extent, in which there is space only for the town and two gardens; and there being in consequence no possibility of raising either wheat or maize, the inhabitants are obliged to depend upon Sonora, almost for existence. Another circumstance renders the tenure upon which they exist very precarious. I remarked that the hills which surrounded the town are chiefly composed of primitive rock, granite, and hard sand-stone, all intermingled with scarcely any appearance of soil upon them. They are thus capable of absorbing but little moisture; and during the heavy rains, which happily do not occur more frequently than once in five or six years, the rush of water through every part of the town, as it comes down the ravine, is so great, that instances have been known of some of the houses having been actually carried away.

To prevent the recurrence of this danger, the former Franciscan friars, many years ago, erected a stone wall, to break the force of the water, and give it a new direction towards the sea. In successive years the rains washed this barrier away; and another was built, which by the returning floods was washed down also, and at present there is but a slight trace of its ever having existed. No attempts have been made to restore it; and on some future day it may be expected that the inhabitants will be seen floating down the gulf! Although the natives are perfectly sensible of their perilous situation, the love of their dwellings is so great as to extinguish all fear for the future, and all desire to change their residence.

The inhabitants of Loretto are of a dingy, opaque, olive-green, which shows that there is no friendly mixture in the blood of the Spaniard and the Indian; or it may be, that by degrees they are returning to the colour of the aborigines. They appear to be the same squalid, flabby, mixed race, which is observed in almost every part of the Mexican coasts. I did not see a good-looking person among them, always excepting the commandant and ci-devant deputy!"

At about 14 leagues to the southward of Loretto, between it and La Paz, is a small bay, named La Bahia Escondida, in which vessels of a moderate draught of water may anchor in perfect security.

* This mountain is estimated to be 4,560 feet high. It is of volcanic origin, as is all the rest of the chain which runs through the Californian peninsula.

The Placeres de Perla, or Pearl Beds, in the neighbourhood of Loretto, are the following:—the south-west point of the Isla del Carmen, Puerto Balandra, Puerto Escondido, Arroyo Hondo, La Isla Coronada, Tierra Firme, San Bruno, La Piedra Negada, and San Marcus. The four first are situated to the south, and the latter five to the northward of Loretto, at which place, says Lieut. Hardy, in 1826, the Virgin and the custom-house receive their proportion of the pearl fishery, which for the last 30 years has not exceeded, as I am informed, the value of 70 dollars annually.

From Loretto to Moleje Bay, a distance of about 100 miles, there are soundings near the land of 20 to 30 fathoms, and the coast offers several good anchorages. At three leagues to the northward of Loretto is the little Island of Coronados, under which there is shelter from the N.E. From hence, following the coast to the northward, there are several small bays marked on the charts.

MOLEJE BAY.—This bay is of considerable extent, and the water in it varies considerably in depth. There are numerous islands and small harbours in it, and it is said that there are many shoals scattered over its surface, and that in no part is there good holding-ground; yet, a small vessel may be lashed alongside some of the islets with perfect safety. In the bay, there is said to be an excellent pearl-bed, but its existence wants confirmation.

On the western coast of the bay of Moleje, there is a well of fresh water, remarkable for the water rising and falling with the tide, which is here about 18 inches. It was examined by Lieut. Hardy, in 1826, who ascertained that there was a communication between the mountain and the well, which is merely a hole of 12 inches (?) diameter, and of the same depth, situated close to high water mark. It is naturally formed, and is a great accommodation to travellers, being the only fresh water between the missions of Loretto and Moleje; so that it serves as a sort of half-way-house. Its rise and fall depend on the elevation of the sea, which, when it ebbs, allows the fresh water (which is of excellent quality) to filter through the porous sand-stone in which the well is formed.

A little to the north-westward of Moleje Bay, is the mission of Moleje, which can only be discerned from the sea by a small hill on the coast, named Sombrerito, from its resemblance to a hat. The entrance to the harbour is very shallow, and will only admit the entrance of very small vessels. The coast is whitened with surf, and the shallow water extends about two miles from the shore. Lieut. Hardy says that "being abreast of Sombrerito, with the wind easterly, we bore up, and stood directly for the coast, with our head about a quarter of a point to the southward of that hill, in order to avoid a reef of rocks that runs off from it for some distance. When within a hundred and fifty yards of the shore, Som-

brerito then bearing off us N.N.W., and being in-shore of the reef, we hauled up, and stood for the centre of the hill, till within 35 yards of it, when we dropped our anchor, and ran out warps to the shore on both sides of us, to prevent the vessel from either drifting or swinging, for which there is no room.

The water on the bar is so shallow, that we touched twice in going over it; but as it was composed of only soft sand, the vessel received no injury, although it blew fresh from the eastward, with a heavy swell on the shore. In the situation where we ultimately moored, there are three fathoms close by the hill, and it is well sheltered from wind and sea.

There is a small rivulet here, extending above the mission, which is at the distance of two leagues from the coast. From the sea, the hill of Sombrerito hides all appearance of the ravine; but from the shore, the date, olive, and peach-trees, as well as plantations of vines and of maize, present a cheerful show of verdure by no means common in Lower California. About the distance of a league from the mouth of the rivulet, the water is fresh, and I took advantage of it to re-fill our empty casks."

This mission of Santa Rosalia de Moleje was established in the year 1700 by the Marquis de Villa Puente, as it is supposed, and its distance from Loretto is about 45 leagues. It produces wine, spirits, and soap, which are exported chiefly from the capital; besides grapes, dates, figs, and olives, all of good quality. These form the principal branches of its commerce.

About six or eight leagues from Moleje, at some distance from the shore side, is the mission of La Madalena, established about the same period as the former; but by whom is not known. Its productions are the same as those of the Moleje; but the quality of the spirits which are made from the mezcal, growing wild about the mountains in its neighbourhood, is said to be the best of any made in Lower California. Its population is about equal to that of Loretto.

Nearly opposite the mission of Moleje is the Island of San Marcus, which is small, and is said to have a pearl-fishery in its vicinity. Between it and the mission is the small Islet of Santa Ines. Opposite San Marcus, at the distance of two leagues from the coast, is the mission of San Ignatio, established in the year 1725, which is a wretched place, and the inhabitants of which are stated by a recent writer to have the appearance of belonging more to the next world than to this. At about 12 or 14 leagues to the north-westward of this mission there is said to be an exhausted volcano, on one of the hills named Las Tres Virgines, which, however, still produces sulphur. These three hills extend as far as the Gulf of Moleje, where they end in a bluff point named after them.

The following, by Lieut. Hardy, will give an idea of the difficulty of sailing out of the harbour of the mission of Moleje :—" Not having been successful in my search for divers, I determined to proceed to sea. The wind was still dead upon the shore; and as it was not possible to attempt taking the vessel out through the channel, without her being inevitably driven on to the beach, I sent the boat ahead with a rope, and we succeeded in towing the Bruja through the midst of the rocks, which were perfectly distinguishable at intervals by the heave and fall of the waves, which enabled us to avoid them. Having got fairly outside of them, we clapped on sail, shaped our course along shore, and in two hours time went through the passage formed on the left by the low point of Santa Ines, and on the right by the island named after the same saint, carrying four and five fathoms' water. Having doubled the point, we came to anchor on the south-west side of the Island of San Marcus, round which I had been given to understand pearls had been formerly fished. We found, however, only a few unproductive shells. On this island there are numbers of wild goats, and I sent the captain and a part of the crew to hunt them."

On the Island of San Marcus there is abundance of talc, a soft marble, and pumice-stone of excellent quality. There are two kinds of the latter, white and yellow; but only the former is good. One of the hills is almost entirely composed of talc. At the northern extremity of the island there is good fresh water.

The coast of the main land, within Marcus Island, is iron-bound, and affords no shelter whatever. At about 40 miles from Moleje mission, is a small bay, named Thomson's Bay, in which you may occasionally anchor, but it is open to every wind except the south-east.

From Marcus Island the Gulf of California as far as its head, into which falls the Rio Colorado, is but little known, being seldom visited. A little to the northward of Thomson's Bay are some islands named Sal si Puedes (*Get back if you can*), in the vicinity of which the current runs strongly, sometimes to the south-eastward, and occasionally in the opposite direction. The larger island is about seven miles in circumference, and very mountainous. The hills are chiefly composed of a red stone, which has very much the appearance of cinnabar. Near these islands are some others, named Las Animas and San Lorenzo, by which a very dangerous passage is formed.

In about lat. 29° the long and narrow island of Del Angele de la Guardia, forms in conjunction with the coast a channel in which numbers of whales have been seen, and hence named the Canal de Ballenas. Opposite to the island, and nine leagues inland, is the mission of San Francisco de Borja.

RIO COLORADO.—This river falls into the northern extremity of

the Gulf of California, after a course of 640 miles; but its sources have not been explored. The depth at its mouth is not more than six feet, and the breadth scarcely exceeds 200 yards. Sixty miles from the sea it is joined by the Rio Gila, which rises from the Sierra Mongollon, in the Rocky Mountains, about 34° 20′ N. lat. The country through which these rivers flow is a sandy desert, destitute of good water, and subject to excessive heat.

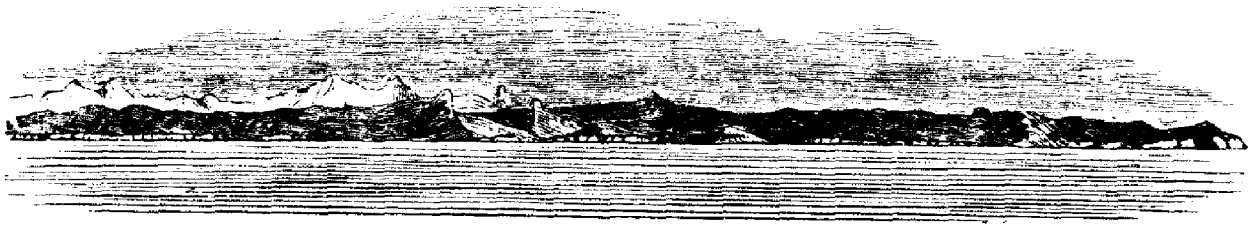
The coast on the western side of the entrance to the river, for a very considerable distance before reaching the river, appears to be composed of a loose sandy soil, easily raised by the wind. It has, in consequence, been named "Smoky Coast."

The three mouths of the Rio Colorado are formed by two islands, by the coast of Sonora to the eastward, and by the coast of California to the westward. The largest of the two islands has been named Montagu Island, in compliment to Admiral Sir George Montagu, G.C.B. On the western side of the river there are forests of the thorny shrub named Mesquite, an inferior species of the Quebrahacha; and on the banks there are a profusion of stems and large branches of the willow, poplar, and acacia, which have been brought down by floods, and are now permanently lodged in their present situations. On the eastern side of the river there are also the remains of these trees, but there is no other vegetation excepting a sort of dwarf reed. From the mast-head nothing on this side is distinguishable, besides the waters of the Rio Colorado and Rio Gila, but an interminable plain; and to the westward rises the Cordillera, which extends from Cape St. Lucas, the southern extremity of Lower California. To the northward and eastward there is a long row of lofty trees which probably grow on the banks of the Rio Gila. The point of land dividing the Rio Colorado from the Gila is named Arnold's Point, and the one on the opposite side of the same beach is named Newburgh's Point.

The Rio Colorado is of but little use to navigation, as although the tide rises 20 to 24 feet, the currents are so strong that it is always attended with danger to run in; the rate is said to be at times as much as 10 or 12 miles an hour, and occasionally much more. The bed of the river is filled with banks which are left dry at low water. When entering, the Californian coast must be kept on board to find the passage, which is narrow, and at low tide very shallow.

CURRENTS.—It may be remarked that in the Gulf of California, to the northward of Guaymas, during the prevalence of northerly winds, which continue from the latter end of October till the month of May, the currents set with the wind. The southerly winds commence in May, and are accompanied with southerly currents. To the northward of Guaymas there are regular tides.

CAPE ST. LUCAS, in lat. about 22° 52′ N., and long. 109° 53′ W., is of very moderate height, although a few leagues to the northward of it the land rises so high as to be seen at the distance of 20 leagues. When in this neighbourhood, it is recommended to keep the lead constantly going, because that the low shore is occasionally hidden by the haze which frequently prevails even when the weather is clear out at sea. At the distance of nine leagues from the shore, there is a depth of 70 fathoms.



CAPE ST. LUCAS, bearing S. 67°, E., four leagues.

From Cape St. Lucas the coast runs to the westward about eight miles to Cape Falso, so named from being frequently mistaken for the Cape.

Cape St. Lucas is mentioned in the following terms by Captain Colnett:—"Our cruising ground was between the latitudes 23° and 25°, and longitudes 112° and 113°, off a remarkable mountain near Cape St. Lazarus, to which I have given the same name. I make it to be in lat. 25° 15′, and long. 11° 20′. To the southward of it is very low land, till within a very few leagues of Cape St. Lucas, which is the south point of California, when the land rises to such an eminence, as to be seen at the distance of 20 leagues, but the cape itself is of very moderate height. Though the weather was fair and pleasant, it was so hazy while we were on this *low and dangerous* coast, as to require a continual employment of the lead. We frequently got soundings with 70 fathoms of line at the distance of nine leagues from the shore. I made the cape by the means of a number of observations of sun, moon, and stars, to be in lat. 22° 45′ N., and long. 110° W."

In the Bay of St. Lucas there is good anchorage, and shelter from westerly winds, but it is exposed to a dangerous and very heavy sea from the south-west. The soundings are very irregular, and the anchorage, by reason of its great depth in the centre, is completely on a lee shore. At the village a small quantity of provisions may be obtained.

Captain Sir E. Belcher has remarked "that they were nearly making a sad mistake, after shortening sail, by finding after they cast in 10, they had no bottom with 88 fathoms, just as they were about to let go the

anchor. This shows the necessity of keeping the lead on the bottom before letting go an anchor.

This bay was first called Aguada Segura by the Spaniards, and afterwards altered by Vizcaino to that of San Barnabe, it being the festival of that saint when this navigator entered it, in 1602. It is the same bay in which Cavendish landed his prisoners, 190 in number, when he anchored them with his prize, the Santa Ana, taken from the king of Spain, in 1587. Some Americans and Californians now reside there, who supply the whalers who annually resort there with water, wood, cattle, vegetables, and fruit. The country is mountainous and sterile about the Cape, and the supplies are brought from the valley of San Jose, about 20 miles to the northward, which is well cultivated. The water, which is procured from the wells, is sweet when drawn, and is very bright, but is impregnated with muriate of soda and nitre, which pervade the soil. It consequently soon putrifies on board.

It has been remarked in Captain Rogers's account of his voyage round the world, in 1710 :—" This port is about a league to the eastward of a round, sandy, bald headland, which some take to be Cape San Lucas, because it is the southernmost land. The entrance into the *bay* may be known by four high rocks, which appear like the *Needles* at the *Isle of Wight*, as you come from the westward. The two westernmost are in form of sugar-loaves, and the innermost of them has an arch, through which the sea makes its way. You must leave the outermost rock about a cable's length on your port head, and steer into the deepest part of the bay, being all bold, where you may anchor in from 10 to 25 fathoms depth. Here you may ride land-locked from all winds, save those between E. by N. and S.E. by S. Yet it would be but an ordinary road if the wind should come strong from the sea. The starboard side of the bay is the best anchoring-ground, where you may ride on a bank that has from 10 to 15 fathoms depth. The rest of this bay is very deep; and near the rocks on the port side going in there is no ground. This is not a good recruiting place."

MAGDALENA BAY, or rather GULF, is an extensive inland sea, affording shelter; and probably water can be obtained in the winter season, considered to be between May and October. It has lately been surveyed by Captain Sir E. Belcher, R.N., and by Captain Du Petit Thouars, in 1837.

The entrance is about 3¼ miles wide, with rocks lining the shore on both sides, so that it is recommended to keep as near the middle as possible, where will be found from 12 to 18 fathoms, rocky bottom, with shells. When within, there will be found a similar depth on a bottom of sand and shells. At the head of the bay there are numerous sandbanks which have not yet been examined. The back land is so very low

that it cannot be seen from the deck, when at the entrance. Captain Du Petit Thouars says:—"The high land of Cape St. Lazarus affords an excellent mark for making the land, as it can be seen at the distance of 10 or 12 leagues.

The entrance of the bay is three miles wide and very brief. It presents no difficulty, care only being taken not to go too near the south point, on account of a detached rock, on which the sea breaks, situated about half a mile from the point. In tacking, when within the bay, care ought to be taken to shun the Banc de la Venus, and you ought to hold yourself sufficiently far from the low land to the East and N.E.

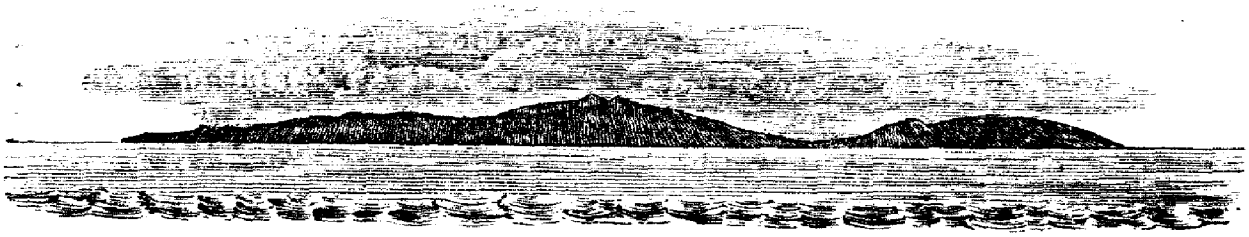
Anchorage can be obtained in the north-west part of the bay, or in the south part of it, according to the prevailing winds. The holding-ground is moderately good.

The bay offers no resources, as there are neither houses, woods, nor water.

Outside the bay, the current runs to the south, with a strength of about a third of a mile per hour.

The tides are regular, and occasion very strong currents at the entrance of the bay. It is high water, on the days of full and change of the moon, at 7h. 37m. Variation of the compass 8° 15′ E."

From the above mentioned survey (Captain Du Petit Thouars) it would appear that the north extremity of Cape St. Lazarus is in lat.



CAPE ST. LAZARUS, bearing about N.W. by N. distant, 182 miles.

21° 48′ 20″ N. and long. 112° 16′ 28″ W. It is very high land, and makes, from a distance, like an island, the country at the back, and to the northward and southward of it being very low.

Commander Sir E. Belcher surveyed this bay in 1839, and has made the following remarks upon it:—"I was fully prepared to have found, as the name imported, an extensive bay; but on entering the heads, which are about two miles asunder, no land could be discerned from the deck, from north-west to north-east or east; and even after entering, it was quite a problem in this new sea where to seek for anchorage, our depths at first, even near the shore, ranged from 17 to 30 fathoms. However, as the prevailing winds appeared to be westerly, I determined on beating to windward, in which it eventually proved I was correct. About 4 P.M.

we reached a very convenient berth in 10 fathoms, with a very sheltered position for our observatory. Preparations were immediately made for the examination of this extensive sea, or what I shall in future term the Gulf of Magdalena.

It is probable that this part of the coast formerly presented three detached islands; viz. St. Lazarus range, Magdalena range, and Margarita range, with one unnamed sand island, and numerous sand islets. It is not improbable that its estuaries meet those from La Paz, forming this portion of southern California, into an immense archipelago.

The first part of our expedition led us up the northern branch of what held out some prospect of a fresh water river, particularly as frequent marks of cattle were noticed. In the prosecution of this part of our survey we noticed that the St. Lazarus range is only connected by a very narrow belt of sand between the two bays, and that the summits of some sand-hills were covered, in a most extraordinary manner, by piles of fragile shells, which resembled those found recent in the gulf. At elevations of 50 and 60 feet, these minute and fragile shells were found *perfect;* but on the beaches, either seaward or within, not a shell was visible. This is the more extraordinary, as these sand wastes are constantly in motion, and drowning everything else, and yet these shells are always exposed! On digging beneath them to erect marks, no beds of shells occurred, nothing but plain sand. It was further remarkable that they appeared to be collected in families, principally arca, venus, cardium, and murex. When ostrea appeared, they were by themselves.

The cliffs throughout the gulf abound in organic remains, and I cannot but believe that the same cause has produced the above unaccountable phenomena, which I witnessed throughout a range of at least 30 miles.

Having explored the westernmost estuary, about 17 miles north of our observatory, until no end appeared to its intricacies, I resolved on attempting a second, which afforded a wider entrance, and offered deeper water. This was examined about four miles beyond the last, and it still offered ample scope for employment, the advance boat being at that moment in four fathoms, and distant heads in view; but considering that sufficient had been done to show that no hope offered of reaching fresh water, and the still unexplored state of the gulf would engross all our spare time, I determined on adhering to its main outlines, which eventually offered so many intricacies as almost to baffle our patience.

One circumstance connected with the examination of the second estuary afforded very strong proof that no fresh-water streams were in the vicinity. It was the fact of finding near our advanced position many large specimens of the Asteria Medusa, or Euryale, an Asteria seldom

found but in pure, and generally deep salt water. At least twenty were taken by the dredge.

By the 9th of November we had reached the eastern end of the first gulf, when the ship was moved into the second, the channel or strait connecting them being not more than a quarter of a mile wide. I had been very sanguine in my expectations that we should have discovered a safe channel out by the eastern end of the Island of Margarita; but until satisfied upon that point I took the Starling and boats to explore. I found that our boats, and, upon emergency, the Starling, might have passed out, but it was far too doubtful and intricate for the ship.

During the time the boats were thus engaged, I overlooked them from the summit of one of the highest peaks of Margarita, and plainly saw the outlines of the shoals, and difficulty of the navigation, even for boats. I had also a fine view of the southern unnamed island, which terminated in a crescent about ten miles to the S.E., with a passage very similar to that immediately beneath.

We had frequently seen indistinctly the outlines of very high mountains to the eastward, distant about 50 or 60 miles. But on this day I could detect abrupt breaks, which indicated water-courses between them, and could plainly follow out the yellow breaks of cliffs, as far as the eye could trace inland.

I have not the slightest doubt that these estuaries flow past them, and probably to the very base of the most distant mountains, even into the Gulf of California. As I am informed that there are no fresh streams in the district of La Paz, and that several esteros ran westerly from that neighbourhood, it is not improbable that they meet. Although the solution of this question may not be commercially important, it is one highly interesting in a commercial point of view.

After all the time expended, independent of severe labour, on this immense sheet of water, it will naturally be enquired, what advantages does the port offer? The reply is: at the present moment, shelter; and from several water-courses nearly dry at the time of our visit, it is evident that very powerful streams scour the valleys in the winter season, which in this region is reckoned between May and October.

Fuel can be easily obtained in the esteros (mangrove).

As a port for refit after any disaster, it is also very convenient; and for this purpose, either our northern or southern observatory bays may be selected. The latter would afford better shelter, but the former is certainly more convenient, and less liable to difficulty of navigation, the access to it being entirely free from shoals.

In war it would be a most eligible rendezvous, particularly if watching

the coasts of Mexico or California, as no one could prevent the formation of an establishment, without adequate naval force; and the nature of the country itself would not maintain an opposing party.

The Island of Margarita would afford an excellent site for a deposit for naval stores. Martello towers on the heads of entrance would completely command it, and, excepting on the inside, no force could be landed.

Water would doubtless flow into wells, of which we had proof in spots where the wild beasts had scraped holes; but from some (no doubt removeable) causes, it was intensely bitter. There is nothing in the geological constitution of the hills to render it so.

The ranges of hills composing the three suites of mountains, vary from 1500 to 2000 feet, and are composed principally of fragments of hornblende slate, serpentine, sandstone, and primitive limestone."

From the entrance of Magdalena Bay to Cape Corso, the north end of the narrow but elevated neck of land separating the bay from the ocean, the distance is about nine miles, and the coast then falls low, and bends inwards about four or five miles from the general direction of the land, and forms with Cape Lazarus the Bay of Santa Maria, which is entirely open to the westward.

SAN BARTHOLOMEW* is about three miles in extent, with soundings over the surface of eight fathoms, gradually decreasing to four and three at the head of the bay. The western point is called Kelp Point, and has some rocks off it: just round it to the northward is the landing-place. The eastern point of the bay, called Cape Tortola, has a reef of rocks, mostly above the water, extending from it nearly half-way across the bay, thus affording good shelter to vessels lying within it; its outermost rock is called the Sulphur Rock, and is 30 feet high.

The land round Port Bartholomew is high, and the soundings immediately outside it are deep, there being from 20 to 30 fathoms at two miles off. Capt. Sir E. Belcher, R.N., says that "the surrounding land is high and mountainous, composed, as far as we had opportunity of examining, of every rock occurring in trap formations, but reduced to fragments, not exceeding four or five pounds weight. Marine shells, similar to those found on the shores of the bay, were plentifully mixed up with this general debris, and in the layers between some clay beds, crystallized gypsum abounded.

The bay is formed by a high range of loose cliffs on the north, and fine gravelly bay on the east, and a coarse sandy tongue connects a high peninsula or island at high water in its centre, (forming a third southern bay). From this peninsula, rocks extend northerly, partly under water,

* Turtle Bay of the whalers.

jutting into the heart of the bay, and forming a safe land-locked position, having five fathoms within.

The place of observation on the northern head of the bay is situated in lat. 27° 40′ N., long. 114° 51′ 20″ W. Var. 10° 46′ E. (1839).

The anchorage we took up was in seven fathoms, sheltered from all but S.W. winds, but bad holding-ground."

CEDROS ISLAND is represented in the Spanish charts to be about 10 leagues long, and before an extensive bay, that of San Sebastian Vizcaino. The south-western point of this bay is named Morro Hermoso, and west from it there is a smaller island, called Natividad. Captain Vancouver has remarked:—"To these islands, as the day advanced, we drew somewhat nearer, but the land was still too far off to admit of our forming any correct judgment as to the productions of the country, or the shape of its shores. Those of the Island of Cedros wore an uneven broken appearance, though on a nearer approach they seemed to be all connected. The southern part, which is the highest, is occupied by the base of a very remarkable and lofty peaked mountain, which descends in a very peculiar rugged manner, and by projecting into the sea, forms the south-west end of the island into a low, craggy, rocky, point; this as we passed it at the distance of five or six leagues, seemed, like the other part of the island, to be destitute of trees, and nearly so of all other vegetable productions. Natividad appeared to be more moderately elevated. St. Benito Island is small, with some islets and rocks about it."

PLAYA MARIA BAY would appear from the survey of Captain Kellett, R.N., to be an open roadstead of six to nine fathoms. On its eastern side is a high mountain called the Nipple, 1132 feet high, from which Cedros Island bears between the angles of S. 49° 40′ W., and S. 38° W., *true*. The station for observations was on the western side of the bay, in lat. 28° 55′ 37″ N. and long. 114° 31′ 20″ W. Variation of the compass in 1847, 8° 44′ E.

SAN QUENTIN has been lately surveyed by Captain Sir E. Belcher, from whose plan it would appear that there is an extensive flat of 2½ and 1½ fathoms stretching across the entrance of the port, but leaving a narrow channel of 4 to 7 and 8 fathoms close to the western side. This sandy flat has several dry patches on it. Sir E. Belcher has remarked that "the sandy point on the left side of the entrance is situated in lat. 30° 21′ 53″ N., long. 115° 56′ 33″ W. Var. 12° 6′ E. (1839.)

The whole coast is dreary, being either sand-hills or volcanic mountains, five of which, very remarkably placed, caused one of the early navigators to term it the Bay of Five Hills. It is the Bay of the Virgins of former, and Port San Quentin of the later Spanish surveyors.

The island and paps of Las Virgines are situated to seaward, about two miles from what has been termed Observatory Peak, in our plan."

SAN DIEGO.—This is one of the most important harbours on the coast of California, south of San Francisco, as it affords perfect shelter from all winds, and has a considerable depth of water. That such a large volume of water should have so small an outlet is somewhat remarkable, as is also the very singular natural breakwater, Ballast Point.

The Port La Playa is situated on the western shore of the bay, about 1¾ mile from the entrance. The anchorage is in between 9 and 10 fathoms. There is a custom-house and revenue establishment, and also every convenience for the mail steamers which stop here. An excellent road leads from La Playa to Old San Diego, which is a small town of a few adobe houses, and unapproachable by water, even in boats.

New San Diego, now about two years old (1851), is situated on a plain at the base of the hills on the east side of the bay. It consists of a few American-built houses, and a large storehouse for the quartermaster's department. The United States military depôt is established there. A channel runs in a curve from La Playa to New San Diego, and vessels can carry from six to seven fathoms water. Both New San Diego and La Playa are dependent upon the river at Old San Diego for their water. Between the above-named channel and Old San Diego, are large flats, mostly covered with grass, and partly bare at low tide.

The most important subject, however, connected with the bay, is the effect of the debouchement of the San Diego River, bringing with it, when high (in the rainy season), great quantities of sand directly into the channel.

It is believed, and apparently with reason, that unless the course of the river be changed, the channel will be ultimately filled, which will have the effect of not only cutting off communication with New Town, but also of destroying the bay entirely as a harbour—for it appears that nothing keeps the bay open but the great amount of water flowing in and out at the narrow entrance; and, when the channel is closed, the greater part of the bay is cut off, leaving an insufficient amount to keep the entrance clear. A bar would doubtless form across the mouth, and the bay will gradually fill up.

That the river does bring sand into the bay is asserted by the deputy collector of this place, and others who have the means of knowing; and, farther, it is known that vessels at one time could anchor in False Bay, but the river flowing into it destroyed it, by filling it with sand; and it then turned its course into San Diego Bay.

If such be the facts, and there appears to be no reason to doubt them, the only remedy for the evil is to turn the river into False Bay again. This is an excellent harbour, and its loss would be severely felt.

The average rise of the tide is stated to be about six feet, but according

to the evidence of the pilots, it would appear to vary from nine feet, spring tides, to three and a half feet, during the greater part of the year.

A shoal has been reported to exist about two-thirds of the distance from the Playa to the end of Ballast Point, on which are only nine feet at low tide. The following directions for San Diego are by Lieut. Alden, U.S. Navy, and bear date Sept. 29th, 1851 :—

"Vessels in sight of the coast, and approaching San Diego from the north, will observe an opening in the hills, and the appearance of an inland bay. This is the 'False Port,' and must be avoided. Immediately north of 'False Port' commences a table land about 450 feet high, and extending southwardly six or seven miles. The extremity of this table land is called Point Loma, and forms the entrance to the harbour of San Diego.

Those bound from the southward will first sight the group of high rocky islets, called 'Los Coronados.' From thence to Point Loma, the course is N. ½ E., and the distance 15 nautical miles. On a clear day, 'Los Coronados' will serve as a land-mark and guide for vessels coming from any direction.

Steer right through the kelp, giving Point Loma a berth of one-half mile, and in a few minutes you will open Ballast Point, a low beach of shingle stones, forming a natural breakwater. Then round up gradually until you bring Ballast Point in range with the easternmost house on the Playa, *and be very careful not to open more of the village,* otherwise you will be too far to the East, and in danger of getting aground on Zuningo Shoal. The breakers show its position. During the summer, keep as close to the hills on the port side as your draft of water will allow, as you will then be able to lay on the wind right up to Ballast Point. You can carry four fathoms within a ship's length of the point. Keep on the above range, and when up with Ballast Point, steer direct for the Playa, and anchor as you please.

Inside of the breakwater, and about 250 yards true north of its extremity, is a shoal spot, with twelve feet at low tide. The shoals on the starboard hand are plain in sight, except at very high water.

Beyond the Playa, the shoals are easily distinguished. The channel, however, is buoyed. From the Playa to New Town, four miles distant, you can carry six fathoms of water. A mile or two beyond New Town, the bay becomes shoal."

Commander Sir E. Belcher remarks that "this port, *for shelter,* deserves all the commendation that previous navigators have bestowed on it, and, with good ground-tackle, a vessel may be perfectly land-locked. The holding-ground is stubborn, but in heavy southerly gales I am in-

formed that anchors 'come home,' owing to the immense volume of kelp driven into the harbour. It has been stated to me by an old sailor in this region, that he has seen the whole bank of fucus giganteus (which comprises a tongue of three miles in length by a quarter broad), forced by a southerly gale into this port. This, coming across the bows, either causes the cable to part, or brings the anchor home. No vessel, however, has suffered from this cause. The chief drawback is the want of fresh water, which, even at the presidio, three miles from the port, is very indifferent.

The seine afforded a plentiful supply of excellent fish, and we found good sport in killing rabbits, hares, &c.

The eastern spit of entrance was found to be in lat. 32° 41′ N., long. 117° 11′ W. The entrance is narrow, being only of a width suitable for one vessel at a time.

The trade consists entirely of hides and tallow; but not, as formerly, from the missions, for they have long been fleeced. It has now become a complete speculation. It is necessary that one of the parties should reside on the spot, probably marrying into some influential family (i.e. in hides and tallow,) to secure a constant supply for the vessels when they arrive. It is dangerous for them to quit their post, as some more enterprising character might offer higher prices and carry off their cargo."

Commander Wilkes, U.S.N., has made the following observations on Port San Diego:—"This port is of considerable extent, being, in fact, an arm of the sea. It is 10 miles long, and 4 miles wide, and, from being land-locked, is perfectly secure from all winds. The entrance is narrow and easily defended, and has a sufficient depth of water, 20 feet at lowest tide, for large vessels. The tide rises five feet. The tongue of kelp, three miles long by a quarter of a mile broad, off the entrance of the bay, must be avoided by large vessels, but small vessels may pass through it with a strong breeze; the bank has three fathoms water on it. During gales, this kelp is torn up and driven into the bay, where it becomes troublesome to vessels by the pressure it brings upon them, either causing them to drag their anchors or part their cables.

There are many drawbacks to this harbour; the want of water is one of them, the river which furnishes the mission with water disappearing in the dry season before reaching the bay, and the surrounding country may be called a barren waste of sand-hills. The town of San Diego, consisting of a few adobe houses, is situated on the north side of the bay, on a sand flat two miles wide. The mission establishment is seven miles from the town, up a valley to the north-east; and here, there is a good supply of water the year round. This river, in the rainy season, discharges a considerable quantity of water into the bay, bringing with it

much sand, which has already formed a bar across a part of False Bay, rendering it useless, and well grounded fears may be entertained that it will eventually destroy this harbour also: this occurrence, however, may be prevented at slight cost.

The whole country around San Diego is composed of volcanic sand and mud, mixed with scoria: the land is unfit for cultivation, and covered with cacti, one of the many evidences of the poorness of the soil; this leaves the Port of San Diego little to recommend it but the uniform climate, good anchorage, and security from all winds."

SAN JUAN is an open roadstead of 12 to 4½ fathoms. It has been mentioned in the following terms by Sir E. Belcher:—"On the evening of the 13th of October, 1839, we dropped anchor in the bay of San Juan. Owing to the surf running at the time, and my objects rendering me, without any assistant, a perfect slave to duty, I was compelled to stick to a half-tide rock, to effect the security of this position. The bay, or rather the outer rock, on which I observed, is situated in lat. 33° 26′ 56″ N. and long. 117° 40′ 50″ W. It has a high cliffy head to the north-west, but terminates in low sandy beaches to the southward. This bay was examined and surveyed. The anchorage is foul under five fathoms, is unprotected, and the landing bad.

The mission is situated in a fruitful-looking sheltered valley, said to abound in garden luxuries, country wines, and very pretty damsels, whence the favourite appellation Juanitas. I suppose, therefore, that they all assume this name. As many call here, apparently, to my view, at risk of anchor and cable, I was induced to ask the master of a vessel who called upon me, what brought him here. 'It is only visited for stock, fruit, or vegetables,' was his dry reply."

Captain John Hall has observed, that in coming into this bay from the north, care must be taken to give the bluff point a wide berth, as some dangerous rocks lie off it, about a mile or more distant.

Commander Wilkes, U.S.N., says, "This bay is 45 miles north of San Diego: at its head lies the fertile valley, in which is situated the town and mission of San Juan. The bay is entirely unprotected, and is a bad roadstead, the bottom being very foul inside of five fathoms, and the landing at times impossible, on account of the surf. It can be safely visited during the fine season, and provisions and water easily obtained, the latter from the mountain streams, which empty into the bay, and also enable the inhabitants to irrigate their lands, by which mode of cultivation they are made extremely productive. The shore here becomes quite bold, making the communication very inconvenient to the northward by land.

From San Juan, the coast trends W.N.W., 37 miles, to San Pedro, which is but an open bay, with scarcely any more claims to be called a

harbour than San Juan: it is equally exposed, except from the north-west winds; but from being near a part of the country which produced an abundance of what was formerly the staple of the country, hides, it was more frequently visited. The town of Nuestra Señora is 18 miles from the bay, up the valley.

The cliffs along this part of the coast are steep, and composed of clay and chert, throughout which are interspersed chalky lumps, which contain organic remains. Water is not to be obtained here, and the little that is required for the supply of a few inhabitants has to be brought from a distance in the interior.

SANTA BARBARA lies 35 miles, E. by S., from Point Conception. There is scarcely any protection, though somewhat sheltered from the north-west swell by the Island of Santa Cruz; vessels, however, anchor here, notwithstanding the south-east winds blow during the winter months with great violence. At these times it is necessary for vessels to put to sea, and this is usually done when indications of these storms are seen. There is anchorage within the line of kelp in five fathoms water, but it is only resorted to by navigators who are very desirous of discharging or getting on board their cargoes.

The town is within a few hundred yards of the beach, from which the valley rises in which the mission of Santa Barbara is situated. The mission, with its white-washed walls, forms an excellent land-mark for the anchorage, and all dangers may be avoided by keeping without the line of kelp, which is found to grow on this coast, in from 5 to 7 fathoms water.

Santa Barbara has been the residence of the best families in California: it is larger than Monterey, and contains nearly 1000 inhabitants; its position seems to be badly chosen, except as to climate, which combines all the good points of the other ports on the coast, being drier than those towards the north, and cooler than those of the south. The anchorage is bad holding-ground, being hard sand covered with sea-weed.

Excellent water, and in plenty, is obtained from the rocky hills four or five miles distant, which enables cultivation by irrigation to be carried on, and by this means all kinds of fruit and grains are brought to perfection, and some of the former made to produce throughout the year; flowers common to our gardens also bloom in the winter months. This fertile valley extends back 17 miles.

San Gabriel and the Pueblo de los Angelos, two of the principal towns, lie in this part of California, deemed the most agreeable climate in the country.

These towns have always been the centre of the Spanish population; but, under the recent changes, they will lose their importance, yet con-

tinue, no doubt, to be occupied as heretofore, exclusively by Californians and their descendants.

It has been remarked by Sir Edward Belcher:—"Off this part of the coast we experienced a very strong sensation, as if the ship was on fire, and after a very close investigation, attributed it to a scent from the shore, it being much more sensible on deck than below; and the land breeze confirming this, it occurred to me that it might arise from the naphtha on the surface. Vancouver notices the same smell.

At sunset, we were unable to discover the bay, and could barely distinguish a long, low, yellow line, spitting to the southward and terminating abruptly. This eventually proved to be the high yellow cliffs of the western head, at least fifty feet above the sea.

The customary guide, in approaching the coast, is the 'kelp line,' which generally floats over five to seven fathoms. So long as a vessel can keep on its verge, there is no danger. This is the general opinion of those who have navigated this coast during their lives, and our observation has tended to confirm it. I know, however, that less than *two fathoms* have been found *within* it, barely at its edge. It is the fucus giganteus, and sufficiently strong to impede the steerage, if it takes the rudder.

The mission at Santa Barbara is situated on an elevation of about 200 feet, gradually ascending in about three miles from the sea. The town is within a few hundred yards of the beach, on which the landing is at all times doubtful. The bay is protected from northerly and westerly winds, which prevail from November to March, and the swell is, in some measure, broken by the islands of Santa Cruz, Santa Rosa, and San Miguel, to the westward. In March, the south-westers blow with fury, which is contrary to the seasons southward of Cape San Lucas. Even during the fine weather months, vessels are always prepared to slip when the wind veers to S.E., from which point it blows with great violence, but soon expends itself.

We were fortunate in landing comfortably, and by four o'clock, nothing of interest detaining us, we moved on towards San Pedro.

Vessels occasionally anchor here within the five fathoms', or kelp line, but are always prepared to warp out. This is a kind of inner bar. The kelp doubtless prevents much surf, and renders it more convenient to vessels discharging; but during the heavy gales, the kelp is generally washed up.

The Canal of Santa Barbara is the strait between the Island of Santa Cruz and a chain of other islands and the main land. The mission of San Buenaventura, S.E. from Santa Barbara, about 20 miles, is on the main, about two miles from the shore.

A short distance to the southward of Buenaventura, the coast spits out in a low sandy point, off which the water shallows suddenly to seven fathoms. There is no danger if the lead is kept going.

The Bay of San Pedro, which is situated in lat. 33° 43′ N., and long. 118° 14′ W., is open to the south-west, but tolerably sheltered from the north-west. Inside of the small island in the bay is a very snug creek, but only accessible to small craft, by reason of a rocky bar, having only, at low water springs, five feet.

The only house near the bay is supplied with water from some miles inward; and I am informed, that at times the inhabitants are in great distress. It is only maintained for the convenience of trading with the vessels which touch here for the purchase of hides and tallow.

The cliffs of the western sides of the bay which form the beach line, are very steep, about fifty feet perpendicular, descending from one elevated range, about five hundred feet above the sea. They are composed of a loose mud, mixed with lumps of a chalky substance, enclosing organic remains, sometimes running into chert or chalcedony."

Captain John Hall has remarked of Santa Barbara that "this bay is only sheltered from the N.W. winds, being exposed to the south and S.W. The anchorage is not very good, being hard sand, and overgrown with sea-weed. We had such a quantity of this on our anchor when we hove it up, that it entirely impeded the ship's progress until we got it clear. We found no tide or currents, but there appeared to be a rise and fall, in-shore, of about two feet. All kinds of provisions are cheap here, as also fruits, viz: grapes, pears, apples, and plums, in the season."

Captain Vancouver has remarked of Santa Barbara, "To sail into the bay requires but few directions, as it is open, and without any kind of interruption whatever; the soundings on approaching it are regular, from 15 to 3 fathoms; the former, from half a league to two miles, the latter within a cable and a half of the shore. Weeds were seen growing about the roadstead in many places; but, so far as we examined, which was only in the vicinity of our anchorage, they did not appear to indicate shallower water, or a bottom of a different nature. The shores of the roadstead are for the most part low, and terminate in sandy beaches, to which, however, its western point is rather an exception, being a steep cliff, moderately elevated; to which point I gave the name of Point Felipe, after the commandant of Santa Barbara."

Of the islands in the offing, the only one that has been examined is the westernmost, St. Nicholas, which appears to be about seven miles long and three broad. It is high in the middle, and has breakers ex-

tending off the eastern and western ends. At the distance of two and a half miles to the northward of it are 40 fathoms water. The western end of the island is in lat. 33° 22′ N. and long. 119° 42′ 3″ W., according to the observations of Captain Kellett, R.N., 1847. At the distance of seven and a half miles, W.N.W., from St. Nicholas Island, is a rock, called John Begg Rock, which is 30 or 40 feet above the water. Midway between the rock and the island are 40 to 45 fathoms, coral.

The southernmost of the islands is the Coronados, to the south-westward of the port of St. Diego, in lat. 32° 24′ 55″ N. and long. 117° 15′ W. They appear from the survey of Captain Kellett, to be four in number, and to have from 12 to 15 fathoms immediately to the eastward of them.

They have been described by Vancouver in the following manner:—"The Coronados consist of two islets and three rocks, situated in a south direction, four or five leagues from Point Loma, occupying the space of five miles, and lying N. 35° W. and S. 35° E. from each other. The southernmost, which, in point of magnitude, is equal to all the rest collectively taken, is about a mile broad and two miles long, and is a good mark to point out the port of St. Diego, which, however, is otherwise sufficiently conspicuous, not easily to be mistaken."

Of the Island St. Juan, to the northward of the Coronados, in lat. 32° 56′ N., and marked on the chart of the coast, it appears that there is some doubt of its existence, an American vessel being reported to have lately sailed over it. It has been thought better to retain it on the chart, as our knowledge of the coast is very imperfect.*

POINT CONCEPTION is about 110 miles, W.N.W., from Point San Pedro, and is remarkable by its differing very much in form from the headlands to the northward. It appears to stretch out from an extensive tract of low land, and to terminate like a wedge, with its large end falling perpendicularly into the sea, which breaks against it with great violence. Off the point the current sets to the north in the early spring months. There is generally hereabout a strong smell, resembling asphaltum, which, as it is mentioned by Vancouver, is probably of a

* This island is laid down on the authority of Vancouver, who says:—"At the distance of about eight leagues, somewhere about N. 55° W. and N. 60° W. from Point Loma, by a very uncertain estimation, is situated an island called St. John's; between which and the coast we passed without seeing it, nor did we observe it whilst we remained at anchor, excepting on one very clear evening, when it was seen from the Presidio, at a time when I was unprovided with a compass, or any other means of ascertaining its direction, and was therefore only able to guess at its situation. It appeared to be low and flat, is but seldom seen from the Presidio of St. Diego, and was undiscovered until seen by Martinez, a few years before, in one of his excursions along this coast."

permanent nature. As this part of the coast is frequently enveloped in fog, this smell may be a good notification of the vicinity of the land.

The land from Point Conception trends to the northward, and it is a singular circumstance that the climate seems to undergo as great a change as the direction of the coast. To the northward of the cape, fogs and mists prevail during the early part of the day for three-fourths of the year.

From Point Conception the coast runs N. 51° W., 10 miles, to Point Arguello, a steep rocky point rising abruptly in rugged, craggy cliffs, near which are two or three detached rocks, lying close to the shore. From hence it runs N. 4° W., 19 miles, to another high, steep, rocky, cliff, called Point Sal, which projects from the low shore, similar to Point Arguello. The intermediate land has the same appearance as that to the northward, the whole is destitute of trees, and nearly so of all vegetable productions, excepting near a stream about six miles from Point Arguello, which has the largest flow of water of any river to the southward of the Columbia River, but the breakers across its entrance will render it of but little use to navigation.

From Point Sal to Point Esteros, the distance is about 38 miles, the coast bending inwards, and forming two bays, those of St. Luis Obispo and Esteros. Vancouver has observed :—" At the north point of this bay, Esteros, the woodland country ceases to exist,* and the shores acquire a quick ascent, with a very uneven surface, particularly in the neighbourhood of the bay. Some detached rocks are about its southern point, which lies about 13 miles from the northern, and is formed by steep cliffs, falling perpendicularly into the ocean. From the line of the two outer points, the shores of the bay fell back about five miles, and appeared to be much exposed; and unless the conical rock is connected with the shores, they did not seem to form any projecting point, but were composed of a sandy beach, that stretched from a margin of low land, extending from the rugged mountains that form the more interior country, from whence four small streams were seen from the mast-head to flow into the bay.

This bay was the first indent in the shore to the southward of Carmelo Bay, and, according to the Spanish charts, is called Los Esteros. To the southward of it, the whole exterior country had a sterile, dreary, unpleasant aspect. The south point of Esteros forms the north-west extreme of a conspicuous promontory, which takes a rounding direction, about eight miles, when the coast retires again to the eastward, and forms the northern side of an extensive open bay. This promontory is called

* It should be observed that Vancouver was sailing to the southward, along the coast.

the Mountain del Buchon, and is said to have off it an island, at the distance of about eight leagues, although we saw nothing of it, probably in consequence of a thick haze, sometimes approaching to a fog, which totally prevented our seeing any object further than from two to four leagues in any direction, insomuch that we stood into the bay to the southward of the Mountain del Buchon, without knowing it to be such, until the south point discovered itself through the haze, at the distance of about three leagues.

This not being named on the charts, I have called it Point Sal, after our friend the commandant at San Francisco. As the day was fast declining, we hauled our wind to preserve our situation during the night, with so strong a gale from the north-west as obliged us to close-reef our top-sails. In the morning, the weather being more moderate and the atmosphere more clear, we steered for Point Sal, and had a good opportunity of seeing the northern shores of the bay, which, like those of Esteros, seemed compact, without any projecting points that would afford shelter or security for shipping.

The interior country consisted of lofty barren mountains, in double and treble ridges, at some distance from the shore. The intermediate land descended gradually from their base, interspersed with eminences and vallies, and terminated on the coast in sandy beaches, or low white cliffs."

From Point Esteros the distance to Carmel Point, the south side of Carmel Bay, is about 80 miles. In lat. 35° 42′ N. there is a low projecting point, off which are two or three rugged detached rocks. To the eastward of this point, the mountains fall back from the water-side, and the intermediate country appears to be a plain, or to rise with a very gentle ascent, for the space of about four leagues along the coast. This land appeared to Vancouver to be tolerably well wooded, even close to the shore, and, by the assistance of his glass, some of the trees appeared to be very large, with spreading branches; and being for the greater part distributed in detached clumps, produced a very pleasing effect. Hence, the country is mountainous, even close to the shore, the mountains being called Na Sa de Sta. Lucia.

Commander Wilkes, U.S.N., has made the following remarks on this coast:—"San Luis Obispo is 40 miles to the north of Point Conception: immediately in the rear are the Santa Lucia hills, a part of the coast range, extending as far north as Punto Pinos, the southern part of the Bay of Monterey. The plains and neighbouring mountains are well covered with large timber, and here the olive and other fruits of this region grow in perfection; on the hills the California cedar (pale colorado) is found of large size. A small stream, the Rio San Felipe, empties into the sea at this point.

On the opposite or eastern slope of the ridge is the valley of Salinas, through which the Rio Buenaventura flows. The hills are rendered much more fertile by their exposure to the fogs and mists of the coast, which supply them plentifully with moisture, and this is seen running in many rills down the hill-sides.

The valley of Salinas is 50 miles in length, and has an average width of six or seven miles; the valley descends to the north-west, and at its lower end is contracted by the hills through which the river passes, a low and well-wooded bottom being formed on each side; the whole of it is well drained, and admirably adapted for stock farms; it may be called an open country, covered with grass; the tops of the hills are covered with oaks, pines, and cedars.

The river having passed through a narrow range of hills, the valley again opens, and now receives the name of La Soledad, which is 20 miles wide, and extends to the bay of Monterey. The land on either side rises into undulating hills, and from these into mountains, some 2000 feet high. The valley of La Soledad is considered very fertile, the plains affording large areas of arable land, while the hills are covered with grass and groves of oak, and the mountains with trees of higher growth."

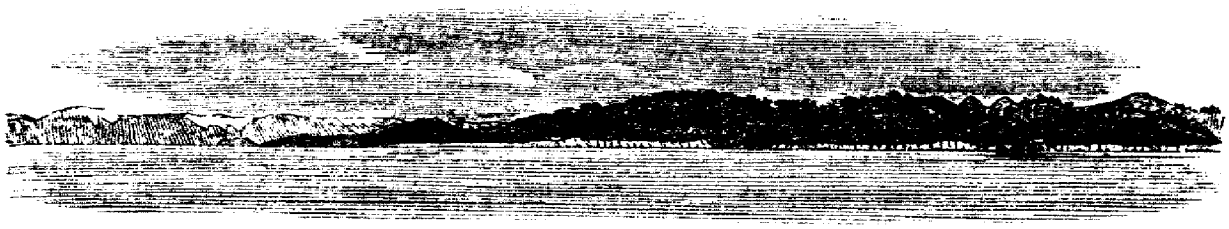
CARMEL BAY is about six miles to the southward of Point Pinos, the west side of Monterey Bay. Its north side, Fisherman's Point, has some rocks off it, and there are also some rocks off the south point of the bay, at about a quarter of a mile from the shore. Vancouver has remarked that "Carmel Bay is a small, open, and exposed situation, containing some detached rocks, and as it has a rocky bottom, it is a very improper place to anchor in. Into this bay flows the River Carmel, passing the mission of St. Carlos, which is said to abound in a variety of excellent fish.

From the north point of Carmel Bay, the coast takes a S. by E. direction, about four leagues, to a small, high, rocky, clump of land, lying about half a mile from the shore, which is nearly barren; indeed, the trees from Point Pinos extend a little way only to the southward of Carmel Bay, where the mountains rise rather abruptly from the sea, and the naked shores, excepting one or two sandy beaches, are entirely composed of steep rocky cliffs. To the southward of the detached lump of land, the coast is nearly straight and compact; the mountains form one uninterrupted, though rather uneven, ridge, with chasms and gullies on their sides; the whole, to all appearance, utterly destitute of vegetation."

MONTEREY BAY.—From Fisherman's Point, the north point of Carmel Bay, the coast trends round to the northward, about five miles, to Point Pinos, the west side of Monterey Bay. The projecting points

have rocks off them to a short distance, rendering precaution necessary when running along the coast.

Monterey Bay is situated between Point Pinos and Point Anno Nuevo, which bear from each other about N. 72° W. and S. 72° E., distant 22 miles, and is formed by the coast falling back, nearly four leagues, from the line of the two points. The only part of it that is eligible for anchoring is near its southern portion, about a league south-eastward from Point Pinos, where the shores form a sort of cove, which affords clear good riding, and tolerable shelter for a few vessels. In order to be protected from the sea, it is necessary to lie at no great distance from the south-west shore, where, either at night or in the morning, the prevailing wind from the land will permit vessels to leave the bay, which otherwise would be a tedious task, by the opposition of the winds along the coast, whose general direction is between the N.W. and N.N.W. To these points of the compass this anchorage is wholly exposed, but as the swell of the sea is broken by the land of Point Pinos, and as these winds, which prevail only in the day-time, seldom blow stronger than a moderate gale, the anchorage is rendered tolerably safe and convenient; and notwithstanding these north-westerly winds are



POINT PINOS bearing N. 33° E., distant four miles.

common throughout the greater part of the year, there is seldom an instance of their being so violent as to affect the safety of vessels tolerably well found in anchors and cables. The soundings are regular, from 30 to 4 fathoms, with a bottom consisting of a mixture of sand and mud; and the shores are sufficiently steep for all the purposes of navigation, without shoals or other impediments. Near Point Anno Nuevo are some small rocks, at a short distance from the coast; the shores of Point Pinos are also rocky, and have some detached rocks lying at a small distance from them, but which do not extend so far off as to be dangerous. The rocky shores of Point Pinos terminate just to the southward of the anchoring-place, and are succeeded by a fine sandy beach, said to extend all round the bay. About four leagues from Point Pinos is a small stream, called the River Monterey, but, like Carmel River, it is nothing more than a very shallow brook of fresh water, although dignified by the name of a river. Near Point Anno Nuevo is another small stream.

The anchorage under Point Pinos is the only situation in the bay

where vessels can ride with any degree of safety or convenience. Near it is the town, situated on low flat ground, but having in its vicinity many delightful situations, and a soil fertile enough to repay the labour of the cultivation. The climate of Monterey and the immediate neighbourhood is considered to be very healthy. Since coming into the possession of the Americans, the town has been much visited, as supplies can be obtained in plenty.

It has been remarked by Captain Beechey, R.N., that "the anchorage of Monterey is about two miles south-east of Point Pinos, in the south angle of the great bay extending between Point Anno Nuevo and Point Pinos. It is necessary to lie close to the shore, both on account of the depth of water, and in order to receive the protection of Point Pinos, without which vessels could not remain in the bay. It presents to the eye a very exposed anchorage, but no accidents have ever occurred to any vessel properly found in cables and anchors, in which respect it very much resembles the bay of Valparaiso, nearly in the same parallel in the southern hemisphere.

The village and presidio of Monterey are situated upon a plain between the anchorage and a range of hills covered with woods of pine and oak. At the distance of a league to the southward of the presidio lies the mission of San Carlos, situated in a valley near the River Carmel; a small stream emptying itself into a deep rocky bay. The shores of this bay, and indeed of the whole of the coast near Point Pinos, are armed with rocks of granite, upon which the sea breaks furiously; and, as there is no anchorage near them on account of the great depth of water, it is dangerous to approach the coast in light or variable winds. Fortunately some immense beds of sea-weed* lie off the coast, and are so impenetrable, that they are said to have saved several vessels which were driven into them by the swell, during calm and foggy weather.

Directions.—Ships should not enter this bay in light winds in any other part than that used as an anchorage, as there is generally a heavy swell from the westward, and deep water close to the shore.

It is impossible to mistake Point Pinos, if the weather be at all clear, as its aspect is very different to that of any part of the bay to the northward. It is a long, sloping, rocky, projection, surmounted by pine-trees, from which its takes its name; whereas the coast line of the bay is all sandy beach. There is no danger in approaching Point Pinos, except that which may ensue from a heavy swell almost always setting upon the point, and from light winds near the shore, as the water is too deep for anchorage. With a breeze from the southward, Point Pinos should be passed as closely as possible; a quarter of a mile will not be

* Fucus Pyriformis.

too near; and that shore should be hugged in order to fetch the anchorage. In case of having to make a tack, take care of a shoal at the S.E. angle of the bay, which may be known by a great quantity of sea-weed upon it: there is no other danger. This shoal has 3½ and 4 fathoms upon its outer edge, and 7 fathoms near it. With a fair wind steer boldly towards the sandy beach at the head of the bay, and anchor about one-sixth of a mile off shore in 9 fathoms, the fort upon the hill near the beach bearing W.S.W., and moor with the best bower to the E.N.E.

This anchorage, although apparently unsafe, is said to be very secure, and that the only danger is from violent gusts of wind from the S.E. The north-westerly winds, though they prevail upon the coast, and send a heavy swell into the bay, do not blow home upon the shore; and when they are at all fresh they occasion a strong off-set in the bay. This I believe is also the case at Callao and at Valparaiso to which, as before mentioned, this anchorage bears a great resemblance.

There is no good water to be had at Monterey, and ships in want of that necessary supply must either proceed to San Francisco, or procure a permit from the governor, and obtain it at Santa Cruz, or some of the missions to the southward.

By the mean of many observations on the tides at this place, it is

High water (full and change) at	9 h. 42 m.
Rise is about	6 ft. 0 in. at spring tide,
And	1 ft. 2 in. at the neaps.

There is very little current at the anchorage."

Captain Hall observes:—"As a harbour, Monterey is extremely inferior to San Francisco; however, it is quite protected from the South and S.W. winds; and, by anchoring well under the point, a vessel may also be protected from the N.W., although the N.W. winds send in a very heavy swell. Fish here, also, is plentiful, as are likewise provisions generally, including *good bread*."

On the plan of the harbour, from the survey of M. de Tessan, are the following remarks, drawn up by M. du Petit Thouars:—"In making the bay, it will be known by a depression in the coast, while the land rises to an elevation of more than 3000 feet at the northern and southern extremities. When in the latitude of Pt. Pinos (36° 39′ N.), and near the shore, great white spots are seen to the westward of the point, which render it sufficiently marked. To anchor, with a fair wind, you run in to within two or three cables' length of the rocks seen from this low point, and follow at the same distance the western coast of the bay,

until Point Pinos is shut in by Point Venus. You are then in 15 or 16 fathoms water, on a bottom of sand and a little mud, with good holding-ground: that is the anchorage for large vessels.

Small vessels run in nearer to the bottom of the bay, and anchor very nearly in a range with the battery, in 9 or 10 fathoms water, on a bottom of muddy sand, having Pt. Anno Nuevo (the northern extremity of the bay) shut in by Pt. Venus. On account of the calms, which frequently oblige vessels to anchor, it is necessary to follow the western shore of the bay, neither too far off nor too near. During adverse winds, vessels may safely beat about in the bay of Monterey, as the two coasts are safe, the only danger being in the bottom of the bay, in the south-east anchorage. This is a bank of rock, on which are from 4 to 10 fathoms of water; but it is betrayed by the leaves of the fucus giganteus (kelp) which float on the surface. Fogs are very frequent, and sometimes render it difficult to make the land; and it often happens that it is foggy in the offing but clear near the coast. During the *rainy season* (from November to March), the wind blows from S.E. to S.W.: S.E. is the wind of bad weather.

During the *dry season* (March to November), the winds blow generally from N.W. to North. N.W. is the wind for good weather. The N. wind causes a heavy swell in the bay, but it is frequently less severe than in the offing. There is no sensible current in the bay. Without, the currents are not strong, and appear to run in the North near the coast, and in the South more in the offing.

The tides are regular. High water, full and change, 9h. 52m.; rise 3 feet. Variation, 14° 30′ E."

The remarks of Commander Wilkes, U.S.N., may also prove interesting; they are as follow:—"The roadstead of Monterey is at the south end of the bay, and is considered a safe anchorage, though but partially protected from the westerly winds by Point Pinos. The points of the coast which form the bay, and the land a short distance back, are all elevated; but the beach is sandy, and has a continual surf beating upon it, which may be heard for some distance. There are no hidden dangers in the bay; those that exist are visible, or have kelp growing on them, which points out their position, and lie near the shore. The bottom at the anchorage is sand and stones, but in places, rocky; to the north the water deepens, and the soundings are yellowish mud, mixed with sand. The tides are regular, but not felt at the usual anchorage, the current flowing inside and around the bay.

The ordinary winds at this place are from the S.W. and W.S.W. in the morning; towards ten o'clock it veres to the W. and W.N.W., from which quarter it freshens till three or four o'clock, afterwards decreasing, and finally becomes calm, which lasts until midnight, when light airs

come off from the land, continuing until daylight. In November there are frequent short gales from the S.E., which blow from off the high land, rushing down in violent squalls. The most dangerous gales are from the north and west, on which side the bay is completely open; the sea sets in very heavy, and is more to be apprehended than the wind. Fogs generally prevail in the morning to seaward; these, however, do not extend into the bay, and when the wind from the N.W. sets in, they are generally dissipated."

To these remarks on Monterey Bay, may be added the following, by La Perouse, which, although written as long back as 1786, may still be valuable:—"In Monterey Bay the sea rolls to the foot of the sandy downs which border the coast, and produces a noise, which we heard when more than a league distant. The lands to the north and south of this bay are elevated, and covered with trees. Vessels intending to stop here must follow the southern shore, and when they have doubled Point Pinos, which projects to the north, the presidency appears in view, and they come to an anchor in 10 fathoms of water, within and rather near to the Point, which shelters them from the winds of the sea. The Spanish vessels which make a long stay at Monterey usually approach as near the shore as the distance only of one or two cables' lengths, and moor in six fathoms of water, by making fast to an anchor, which they bury in the sand on the beach. They have then nothing to fear from the south winds, which are sometimes strong, but not at all dangerous, as they blow from the coast. We had soundings in every part of the bay, and anchored at the distance of four leagues from the shore, in 60 fathoms, soft mud; but as the sea is heavy, it is not possible to remain in this situation longer than a few hours, while waiting for day, or the clearing up of the fog. It is impossible to describe either the number of whales with which we were surrounded, or their familiarity. They blowed every half minute within half a pistol-shot from our figures, and occasioned a most annoying stench. We were unacquainted with this property in the whale; but the inhabitants informed us that the water thrown out by them is impregnated with this offensive smell, which is perceived to a considerable distance; and to the fishermen of Greenland or of Nantucket, this would probably have been no new phenomenon.

Almost incessant fogs envelope the coasts of Monterey Bay, which renders the approach somewhat difficult. But for this circumstance there would scarcely be a safer shore. No concealed rock extends further than a cable's length; and if the fog be too thick, it is easy to anchor and wait for its clearing up, when the Spanish settlement is seen in the angle formed by the southern and eastern shores.

The sea was covered with pelicans. It appears that these birds never fly to a greater distance than 5 or 6 leagues from the land, and

navigators who meet with them during a fog, may be certain of being no further distant from it. We saw them for the first time in Monterey Bay, and I have since been informed that they are common over the whole coast of California. The Spaniards call them *alkatræ*."

SAN FRANCISCO.—From Point Anno Nuevo, the north point of Monterey Bay, the coast runs to the N.N.W. about 53 miles, and is for the whole distance uninviting in appearance. Along the coast are the San Bruno Hills, which gradually decrease in altitude, and become sandy and barren, without any appearance of cultivation. On the north side of the bay is Table Hill, 2569 feet high, from whence the coast trends W.N.W. to Punta de los Reyes.

Since coming into the possession of the Americans, this harbour has become of great importance, on account of the great quantities of gold that are found up the country, and now a great trade is carried on with the Sandwich Islands and China. The principal town in the bay is San Francisco, situated at Yerba Buena Cove, on the south side of the entrance, which, although but recently built, boasts of several churches, an exchange, a theatre, and some hotels of the largest size. Some of the houses are built of stone, although many are only of wood and sun-burnt clay; but these are rapidly giving place to more substantial structures. The streets are said to be well laid out, but there is no drainage; the hasty erection of the town precluding such an arrangement. The population is represented to amount to over 60,000.

In the north-east part of the Bay of San Pablo, is the city of Benicia, situated on the north side of the Straits of Karquines, leading to the Sacramento River. It is a rising place, and said to possess greater commercial advantages than San Francisco, as vessels of the largest size can lie close to the shore. Sacramento City is a considerable distance to the north-east of Benicia; it is situated on the Sacramento River at the junction of the American Fork, and on the first discovery of the gold collected a large population. The houses were erected on piles, but at the time of the floods in 1849, were almost entirely washed away, and we believe have not been rebuilt.

The River Sacramento and country adjoining, have been described in the following terms by Commander Sir E. Belcher:—"Throughout the whole extent, from Elk station to the Sacramento mouth, the country is one immense flat, bounded in the distance N.W. by Sierras Diavolo, W. Sierras Bolbones, and E.N.E. to E.S.E. by the Sierras Nievadas, from whence no doubt this river springs, and rises in proportion to the rains and thaws. Our case lay between banks, varying from 20 to 30 feet above the river-level, apparently, from its strata, of differently composed clay and loose earth, produced by some great alluvial deposit. Sand did occur at times, but not a rock or pebble varied the sameness of the banks.

These were, for the most part, belted with willow, ash, oak, or plane, (platanus occidentalis,) which latter, of immense size, overhung the stream, without apparently a sufficient hold in the soil to support them, so much had the force of the stream denuded their roots.

Within, and at the verge of the banks, oaks of immense size were plentiful. These appeared to form a band on each side, about 300 yards in depth, and within (on the immense park-like extent, which we generally explored when landing for positions) they were to be seen disposed in clumps, which served to relieve the eye, wandering over what might otherwise be described as one level plain or sea of grass. Several of these oaks were examined, and some of the smaller felled. The two most remarkable measured respectively 27 feet and 19 feet in circumference, at 3 feet above ground. The latter rose perpendicularly at a (computed) height of 60 feet before expanding its branches, and was truly a noble sight.

All the trees and roots on the banks afford unequivocal proofs of the power of the flood-streams, the mud-line on a tree we measured exhibiting a rise of 10 feet above the present level, and that of recent date.

At the period of our examination, the river was probably at its lowest, and much less than I had anticipated in regard to strength, being at times almost still water; and yet up to our present position, the *Sulphur* might have been warped or towed by a steamer. During the rainy season, which commences about the middle of November, and terminates about the end of February, the river is said to overflow its banks, when its impetuosity is such that navigation (for the craft of this country I suppose) is then impossible. The annual rains do not, however, of necessity inundate these low lands, but in severe seasons, after heavy falls of snow, they produce an immense sea, leaving only the few scattered eminences, which art or nature have produced, as so many islets or spots of refuge.

Upon these spots, the tribes who inhabit these low lands, are frequently compelled to seek shelter, principally, however, on those artificially constructed—as all were which we examined. They consist merely of a rounded pile, raised about 15 feet at the apex above the surrounding level; the space from which the earth is removed, forming a ditch to carry off the superfluous water.

Our pilot termed them Rancherias, (as they also do any place to which the natives resort,) and assured us that each was the separate property of a distinct tribe. None exceed one hundred yards in diameter, and confined within such a compass, it is fearful to contemplate the ravages, which disease must make in an inclement season, or the misery which the survivors must endure, thus pent up with the dead and dying.

Lately, fever and ague carried off whole tribes; and the spots they had thus so carefully reared, were but their own tombs! On one of these I had fixed a station, and on digging to insert the spot (?), the parts of a skeleton, with hair perfect, mixed with ashes, were turned up. It is, therefore, probable that they burn their dead, to destroy the animal matter, and prevent contagion. This Rancheria was assigned by our pilot (an Indian) to the Onēē-shăn-á-tēē tribe; but as he appeared to name every tribe below Point Victoria (where they are wallocks) by the same appellation, I am induced to attach little importance to his nomenclature, as I have been since informed that they keep to the left bank.

At a position nearer Point Victoria, where no mound was apparent, many entire skeletons were scattered about, above ground; which probably may have resulted from the mortality before alluded to (a few years since) having cut them off before they could reach their Rancheria. My first impression was, that some great battle had been fought, and that their dead had been left. But this is not customary, and they would not have been left so complete by birds or beasts of prey. As these skeletons appeared less disturbed, it is probable that at these seasons of inundation, birds and beasts retire to the mountains or wooded elevations."

On approaching the coast in the neighbourhood of San Francisco, the country has by no means an inviting aspect. To the north, it rises in a lofty range, whose highest point is known as the Table Hill, and forms an iron-bound coast from Punta de los Reyes to the mouth of the harbour.

To the south, there is an extended sandy beach, behind which rise the sand-hills of San Bruno, to a moderate height. There are no symptoms of cultivation, nor is the land on either side fit for it; for in the former direction it is mountainous, in the latter sandy, and in both barren. The entrance to the harbour is striking: bold and rocky shores confine the rush of the tide, which, a recent writer observes, bore us on and through a narrow passage into a large estuary; in this, several islands and rocks lie scattered around: some of the islands are clothed with vegetation to their very tops; others are barren and covered with guano, having an immense number of sea-fowls hovering over, around, and alighting upon them. The distant shores of the bay extend north and south, far beyond the visible horizon, exhibiting one of the most spacious, and at the same time, safest ports in the world. To the east rises a lofty inland range, known by the name of La Sierra.

Commander Wilkes mentions:—"At the time of our visit, the country in the interior of the bay altogether presented rather a singular appearance,

owing, as I afterwards observed, to the withered vegetation and the ripened wild oats of the country. Instead of a lively green hue, it had generally a tint of a light straw-colour, showing an extreme want of moisture. The drought had continued for eleven months; the cattle were dying in the fields; and the first view of California was not calculated to make a favourable impression either of its beauty or fertility."

The bar of San Francisco Bay, as it has been termed, lies about four miles outside the entrance. The least depth of water is 4½ fathoms, but it is at times very dangerous on account of the heavy breakers. It can be avoided by keeping the southern shore aboard, where deeper water is found. At the time of new and full moon, a swell sets in upon this coast, and causes heavy and remarkable breakers. These were experienced by Commander Wilkes, in 1841, who says:—"While standing out from San Francisco, the wind died away, and we were obliged to anchor in 7 fathoms; but a few hours after this a heavy swell arose, apparently without cause, and in a short time we were riding in the midst of breakers, many of which broke over and swept our decks, rendering our situation very precarious for several hours. Vessels, at these times, should avoid leaving the bay of San Francisco without a sufficient breeze to carry them to sea or beyond the influence of the breakers. If becalmed, vessels may anchor in 12 fathoms water with perfect safety."

The entrance to the bay is very striking, bold, and rocky; a mile wide and three miles in length, with deep water and no obstructions. It then expands into an extensive bay, in which lie several islands; that of San Angelo is the largest and highest, and covered with vegetation to its very top. The next in size are Yerba Buena and Alcantras. The smaller ones are covered with guano, over which an immense number of sea-fowl are seen hovering. The shores of the bay extend north and south beyond the visible horizon; to the east is the coast range, and beyond rise the lofty Californian mountains, brilliant with all the beautiful tints that the atmosphere in this climate gives.

The Bay of San Francisco is 36 miles in length by an average of 6 in width; a large portion of its southern, eastern, and northern shores are bordered by extensive and wide mud-flats, preventing the landing, at low water, of even a boat; so much so that the eastern shore may be said to be inaccessible for a distance of 30 miles; and this impediment prevents it from ever becoming useful, except by the construction of extensive artificial works. On the north it is bounded by the Straits of San Pablo, which divide it from the bay of that name.

The Bay of San Pablo is nearly circular, about ten miles in diameter, the larger segment of which is a mud-flat, with but a few feet of water over it; this renders its shore on the western side quite inaccessible. On

the east side is the channel, with a sufficient depth of water for large vessels, leading to the Straits of Karquines, at the mouth of the Sacramento River.

On the western side of the Bay of San Francisco, from the Straits of San Pablo, for a distance of 15 miles, the country is broken and mountainous, and the shores rocky and indented by small bays, which are useless.

These obstructions reduce this extensive bay very much in size, and it becomes still more so when the safety and convenience of vessels is taken into consideration; indeed, with the deep water, cross tides, and exposed situations, there are but two safe anchorages, viz:—Yerba Buena and Sausalito.

Yerba Buena lies on the south of the entrance, between the island and town of the same name, and is but of small extent, with mud-flats, bare at low water, to the channel; it is also very much exposed to the prevailing winds, which blow at times with great violence. It is the usual, but by no means the best anchorage, and has but a scanty supply of water, not sufficient for the population of the town, or the vessels that frequent it; this, added to the rocky point on which the town is situated, will prevent it from ever becoming the seat of trade.

Sausalito or Whaler's Harbour is on the north side of the entrance, under Table Hill, which protects vessels from the prevailing westerly winds. This anchorage is the principal resort of whalers. Here they can obtain wood and water, and refit. The water in the summer is obtained from small springs. The extent of land around this bay is limited to a few acres, the hills rising precipitately, and the high spurs cutting off communication with the country adjoining it.

From Yerba Buena the distance to the mouth of the bay of San Pablo is 10 miles, the course N. by W., passing to the right of San Angelos Island, and to the left of Molate. The points San Pedro and San Pablo, which form the mouth of the bay, are two miles asunder.

The channel to the Strait of Karquines is on the east side of the bay of San Pablo. It has not less than 4½ fathoms water, and is a mile wide.

The Strait of Karquines, through which the river Sacramento discharges its waters, runs nearly east and west for the distance of 8 miles, and at its narrowest point is half a mile wide, with very deep water from 12 to 17 fathoms. The banks on both sides are high, and composed of sandstone. The Napa Creek empties into the strait from the north, about a mile from the bay of San Pablo. It affords fresh water.

Passing through Karquines Strait, the Bay of Sooson is entered. It extends eleven miles to the north-east, and is two miles wide. Sooson Creek flows into it on the west, and on the east it receives the waters

of the Sacramento and its tributaries. Sooson Bay is not deep, and the greater part of it to the north-east has only sufficient water to float boats.

The channels through the delta of the Sacramento are narrow, and pass into each other, forming islands. These cover an area of 25 square miles, which is entirely overgrown with Tula (*Scirpus lacustris*). The true channel of the river lies through the south branch, its direction being due east. It has sufficient water for vessels not drawing over 12 feet. Eleven miles from Sooson Bay, the course of the river changes to the north for two miles. At this point the left hand channel must be taken, as it is the one leading to the Sacramento proper, the right one leading to Marsh's Landing and the San Joachin. In proceeding up the Sacramento, the river gradually changes its course to the north, with several considerable bends; and at the low stage of water is navigable as far as New Helvetia (Captain Suter's), at the mouth of the American Fork, a distance of 50 miles above where its deltas discharge into Sooson Bay, and, by the water communication, eighty miles from Yerba Buena. Three and a half miles above the American Fork, sand-banks are encountered. These intercept the navigation during the dry season, and are met with as far as the mouth of the Feather River, across which there is a bar and ford, but it is partly quicksand. Above the Feather River, the Sacramento changes its character, becoming very tortuous. During the annual freshlets, these rivers would afford good opportunities for the transportation of timber from the upper country, where it is found of large dimensions, and in great abundance.

The branch leading to the mouth of the San Joachin is 10 miles long, and is navigable for vessels to that place. The San Joachin can only be ascended in boats, and with these but a few miles in the dry season; in the season of the rains, the country for several miles around its mouth is overflowed, and when not under water, is a large marsh.

Captain Wilkes says:—"The Bay of San Francisco is well adapted for a naval depôt, or a place for whalers to recruit at. There is no place where a natural site for a town can be found throughout the whole bay; and it appears extremely difficult to select one where the locality would permit of extensive artificial improvements."

The following directions are by Captain Beechey, R.N., a copy of whose survey of the harbour is on our chart of the coast, and to which we would refer the reader:—

"The harbour of San Francisco, for the perfect security it affords to vessels of any burthen, and the supplies of fresh beef and vegetables, wood, and fresh water, may vie with any port on the north-west coast of America. It is not, however, without its disadvantages, of which the difficulty of landing at low water, and the remoteness of the water-

ing-place from the only anchorage which I could recommend, are the greatest.

Ships bound to San Francisco from the northward and westward, should endeavour to make Punta de los Reyes, a bold and conspicuous headland, without any danger lying off it sufficiently far to endanger the ship. In clear weather, when running for the land before the latitude is known, or the Punta can be distinguished, its situation may be known by a Table-Hill terminating the range that passes at the back of Bodega. This hill in one with the Punta de los Reyes bears E. (*mag.*) If ships are not too far off, they will see, at the same time, San Bruno, two hills to the southward of San Francisco, having the appearance of islands; and from the mast-head, if the weather be very clear, the South Farallon will, in all probability, be seen. Punta de los Reyes, when viewed from the W. or S.W., has also the appearance of an island, being connected by low land to the two hills eastward. It is of moderate height, and, as it stands at the angle formed by the coast-line, cannot be mistaken. Soundings may be had off this coast, in depths varying with the latitude. In the parallel of the Farallones they extend a greater distance from the main land, in consequence of these islands lying beyond the general outline of the coast.

The Farallones are two clusters of rocks, which, in consequence of the shoals about them, are extremely dangerous to vessels approaching San Francisco in foggy weather. The southern cluster, of which in clear weather one of the islands may be seen from the mast-head eight or nine leagues, is the largest and highest, and lies exactly S. 3° E. true, 18 miles from Punta de los Reyes. The small cluster of rocks lies to the N.W., and still further in that direction there are breakers; but I do not know how far they extend from the rocks above water. In a thick foggy night, we struck soundings in 25 fathoms, stiff clay, near them; and on standing off, carried regular soundings to 32 fathoms, after which they deepened rapidly.*

Coming from the southward, or when inside the Farallones, the position of the entrance to San Francisco may be known by the land receding considerably between the table-hill already mentioned, and San Bruno

* According to Vancouver there is also a cluster of rocks, scarcely above the surface of the water, at the distance of 12½ miles S. 36° W. from Punta de los Reyes. There may also be sunken rocks to the south-eastward of the Farallones, as the following paragraph appeared in the *New York Gazette*, in August, 1850:—"The brigantine *Kalama* struck upon a sunken rock on the 10th of April, off the harbour of San Francisco, not laid down in any chart At the time, the south-east Farallon bore N.W., distant about 12 miles. Hove about, sounded, and cruised about for two hours, but could find no soundings. The *Kalama* drew 12 feet water at the time of leaving San Francisco."

Hill, which, at a distance, appears to terminate the ridge extending from Santa Cruz to the northward. The land to the northward or southward of these two hills has nothing remarkable about it to a stranger; it is, generally speaking, sufficiently high to be seen 13 to 15 leagues, and inland is covered with wood.

About 8¼ miles from the fort, at the entrance of San Francisco, there is a bar of sand extending in a S. by E. direction across the mouth of the harbour. The soundings, on approaching it, gradually decrease to 4¼ and 6 fathoms low water, spring tide, depending upon the situation of the ship; and as regularly increase on the opposite side to no bottom with the hand-leads. In crossing the bar, it is well to give the northern shore a good berth, and bring the small white island, Alcatrasses, in one with the fort or south bluff, if it can be conveniently done, as they may then ensure six fathoms; but if ships get to the northward, so as to bring the south bluff in one with the Island of Yerba Buena, they will find but 4¼; which is little enough with the heavy sea that sometimes rolls over the bar; besides, the sea will sometimes break heavily in that depth, and endanger small vessels: to the northward of this bearing the water is more shallow. Approaching the entrance, the Island of Alcatrasses may be opened with the fort; and the best directions are to keep mid-channel, or on the *weather side*. On the south shore the dangers are above water; and it is only necessary to avoid being set into the bay, between the fort and Point Lobos. If necessary, ships may pass inside, or to the southward of the *One Mile Rock;* but it is advisable to avoid doing so, if possible. On approaching it, guard against the tide, which sets strong from the outer point toward it, and in a line for the fort. Off Punta Boneta there is a dangerous reef, on which the sea breaks very heavy: it lies S.W. from the point, and no ship should approach it nearer than to bring the fort in one with Yerba Buena Island.

In the entrance it is particularly necessary to attend to the sails, in consequence of the eddy tides and the flaws of wind that come off the land. The boats should also be ready for lowering down on the instant, as the entrance is very narrow, and the tides, running strong and in eddies, are apt to sweep a ship over upon one side or the other, and the water is in general too deep for anchorage; besides, the wind may fail when most required. The strongest tides and the deepest water lie over on the north shore. Should a ship be swept into the sandy bay west of the fort, she will find good anchorage on a sandy bottom in 10 and 15 fathoms out of the tide; or in the event of meeting the ebb at the entrance, she might haul in, and there await the change. There is no danger off the fort at a greater distance than 100 yards.

As soon as a ship passes the fort, she enters a large sheet of water in which are several islands, two rocks above water, and one under,

exceedingly dangerous to shipping, of which I shall speak hereafter. One branch of the harbour extends in a S.E. by S. direction, exactly 30 miles, between two ridges of hills, one of which extends along the coast towards the Bay of Monterey, and the other from San Pablo, close at the back of San José to San Juan Baptista, where it unites with the former. This arm terminates in several little winding creeks, leading up to the missions of Santa Clara and San José. The other great branch takes a northerly direction; passes the Puntas San Pablo and San Pedro, opens out into a spacious basin, ten miles in width, and then converging to a second strait, again expands, and is connected with three rivers, one of which is said to take its rise in the rocky mountains near the source of the Columbia.

As a general rule in San Francisco, the deepest water will be found where the tide is the strongest; and out of the current there is always a difficulty in landing at low water. All the bays, except such as are swept by the tide, have a muddy flat extending nearly from point to point, great part of which is dry at low water, and occasions the before-mentioned difficulty of landing; and the north-eastern shore, from Punta San Pablo to the Rio Calaveros, beyond San José, is so flat that light boats only can approach it at high water. In low tides it dries some hundred yards off shore, and has only one fathom water at an average distance of 1½ mile. The northern side of the great basin beyond San Pablo is of the same nature.

After passing the fort a ship may work up for the anchorage without apprehension, attending to the lead and the tides. The only hidden danger is a rock, with one fathom on it at low water, spring tides, which lies between Alcatrasses and Yerba Buena Islands. It has seven fathoms alongside it: the lead, therefore, gives no warning. The marks when on it are, the north end of Yerba Buena Island in one with two trees (nearly the last of the straggling ones) south of Palos Colorados, a wood of pines situated on the top of the hill, over San Antonio, too conspicuous to be overlooked; the left hand or S.E. corner of the Presidio just open with the first cape to the westward of it; Sausalito Point open ¼ point with the north end of Alcatrasses; and the Island of Molate in one with Punta de San Pedro. When to the eastward of Alcatrasses, and working to the S.E., or, indeed, to the westward, it is better not to stand towards this rock nearer than to bring the table-peak in one with the north end of Alcatrasses Island, or to shut in Sausalito Point with the south extreme of it. The position of the rock may generally be known by a ripple; but this is not always the case.

There are no other directions necessary in working for Yerba Buena Cove, which I recommend as an anchorage to all vessels intending to remain at San Francisco.

In the navigation of the harbour much advantage may be derived from a knowledge of the tides. It must be remembered that there are two separate extensive branches of water lying nearly at right angles with each other. The ebbs from these unite in the centre of the bay, and occasion ripplings and eddies, and other irregularities of the stream, sometimes dangerous to boats. The anchorage at Yerba Buena Cove is free from these annoyances, and the passage up to it is nearly so after passing the Presidio. The ebb begins to make first from the Santa Clara arm, and runs down the south shore a full hour before the flood has done about Yerba Buena and Angel Island; and the flood, in its return, makes also first along the same shore, forcing the ebb over the Yerba Buena side, where it unites with the ebb from the north arm.

The flood first strikes over the Lime Rock,* and passing the Island of Alcatrasses, where it diverges, one part goes quietly to Santa Clara, the other sweeping over the sunken rock, and round the east end of Angel Island, unites with a rapid stream through the narrow channel formed by Angel Island and the main, and both rush to the northward through the Estrecho de San Pablo to restore the equilibrium of the basin beyond, the small rocks of Pedro Blanco and the Alcatrasses Island lying in the strength of the stream.

The mean of 80 observations gave the time of high water (full and change) at Yerba Buena anchorage	10h. 52m.		
The tide at the springs rises . .	7ft. 10 in.	sometimes 8ft. 3 in.	
Neap	1ft. 10 in.		
Average rate of ebb at spring tide	2k. 0f.	at neap	1k. 0f.
Flood	1k. 0f.	,,	0k. 6f.
Duration of Flood	5h. 25m.		
At Sausalito the mean of 17 observations gave the time of high water, on the days of full and change, as	9h. 51m.		
Rise (full and change)	6ft. 0in.		
Neap	2ft. 6in.		
Duration of Flood	4h. 43m.		

On quitting San Francisco, the direction of the wind in the offing should be considered. If it blow from the S.W. there would be some difficulty in getting out of the bay to the southward of Punta de los Reyes. The residents assert that an easterly wind in the harbour does not extend far beyond the entrance, and that a ship would, in consequence, be becalmed on the bar and perhaps exposed to a heavy swell, or she might be swept back again, and be obliged to anchor in an exposed

* See the plan in the Chart.

situation. Northerly winds appear to be most generally approved, as they are more steady and of longer duration than any others: they may, indeed, be said to be the trade-wind on the coast. With them it is advisable to keep the north shore on board, as the strength of the ebb takes that side, and as on the opposite shore, near the One Mile Rock, the tide sets rather upon the land. In case of necessity, a ship can anchor to the eastward of the One Mile Rock; but to the S.W. of the rock the ground is very uneven. The wind generally fails in the entrance or takes a direction in or out. From the fairway steer S.W. ½ W., and you will carry seven fathoms over the bar, half ebb, spring tide. This I judge to be a good course in and out with a fair wind. I would avoid, by every endeavour, the chance of falling into the sandy bay to the southward of Lobos Point, and also closing with the shore to the N.W. of the Punta Boneta."

Captain Belcher has said:—"About 10h. we got sight of the land and ran in, the breeze freshening, as it generally does on entering the heads. This is a very common occurrence at this port, requiring small sail to beat out, and suddenly losing the tide and breeze together. It is, therefore, advisable to keep the fairway marks open until reaching the bar, before hauling to the southward, by which more wind will be procured and unpleasant swells escaped.

Considering myself a fair pilot for this port, I would say to those approaching it, after decreasing the depth from 30 to 15 fathoms, mud, if the wind be light it is advisable, or preferable, to anchor and wait for daylight, or fog clearing off, but be prepared to weigh and stand off should the wind freshen; but do not go beyond 30 fathoms. The breeze always dispels the fog. Do not desert a safe harbour when an hour or two will show the road in.

The fort in one with Yerba Buena Island leads over the bar in four fathoms, and no ship should cross farther north on account of the rolling swell; but the best course is to keep Las Alcatrasses touching the fort."

To this may be added the remarks of Captain John Hall:—

"In entering this port, which is one of the best and most interesting, from its security and magnitude, in the world, great attention must be paid to the tides, which, during the full and change of the moon, run very rapid, and, I should think, in mid-channel at the rate of six miles per hour. A vessel going in would do well to keep in the middle of the stream, as on both sides there are very strong eddies, in which you are apt to lose the command of the helm, and consequently are obliged to anchor. After getting within the heads, keep *Fort Blanco* about a point on the starboard bow. Passing the fort, the anchorage is situated in a small bay, immediately abreast of the *presidio*, where a vessel will find

good holding-ground in five fathoms, about a cable's length from the beach. Provisions are cheap. The harbour also abounds with fish, which can be procured with a net in great quantities."

The entrance of the bay has also been surveyed by M. de Tessan, of the French navy, from whose chart we copy the following:—"The currents of ebb and flood, being very strong in the channel (6 knots), occasion, behind the points, very strong rollers, in which it is dangerous for a vessel to be placed. In consequence the channel is very narrow, half a mile, and small vessels only can attempt to tack in it.

To enter the channel, it will be necessary to wait until the flood. You can remain under sail when you anchor, should the breeze be slight, until the ebb-tide."

The following remarks on entering the harbour of San Francisco will be found useful to masters of ships bound to that place. They are derived chiefly from Mr. Richardson, Captain of the port, and also an experienced pilot for that harbour:—

"Ships coming in from the south Farallones should run in on a N.E. by E. ½ E. course, and bring Point Lobos on the same bearing, in order to cross the bar in 6½ fathoms, and to keep as nearly mid-channel as possible, there being a bank of four fathoms on the south shore, outside, which has generally a heavy swell on it. There is a similar bank also on the north shore, extending at least five miles out.

Between these two banks there is anchorage in 10, 12, and 15 fathoms, as you draw in. After getting inside, and having passed the fort, you can anchor any where in as far as the Alcatrasses, there being no hidden danger.

In going for Sausalito, with a light wind and ebb tide, it will be very advisable to steer directly for Angel Island, as the tide sets strong against Sausalito Bay, and tends to heave the ship into deep water.

A ship leaving Sausalito, should avoid being set into Lime Rock Bay, by standing over towards the fort point, and from the fort point stand across to the northern shore to keep out of the eddy current in the S.E. bay, outside the fort.

The ebb makes on each shore at least two hours before it sets out in the stream, and, therefore, a ship should not leave the anchorage until the tide had fallen a foot, by the shore. These remarks apply chiefly to vessels leaving with a foul wind.

If the wind be fair, and of sufficient strength to render the ship perfectly under command, she can then start at the last of the flood.

The ebb tide makes from Yerba Buena Bay across towards Lime Rock, thence into Mile Rock Bay (so that ships going out have not unfrequently been set between Mile Rock and the main), and from that bay it runs to the N.W. round Point Lobos.

Outside the fort-point the ebb sets to the N.W. round Point Boneta, and the flood runs to the S.E.

If the Farallones are not made, and the position of the harbour not very certain, some difficulty may be experienced in discovering the entrance, particularly from the northward. It may, however, be known by a long sandy stripe of land just to the southward of the entrance, which has much the appearance of a hay field; and also not far from this shore is a remarkable rock, having an arch in it.

To the northward of the entrance are three or four rocks close in-shore, very white on their tops, and at nearly equal distances from each other."

The bay is now being re-surveyed by order of the United States Government, and the following buoys have been moored, under the superintendence of Commander Cadwallader Ringgold, U.S.N.

Tonquin Point Shoal, making out from North Bay, has been surveyed, and a black spar-buoy moored on the N.W. end, in 15 feet at low water. Vessels coming in from sea, are directed to pass the buoy on the starboard bow, at the distance of two cables length.

Blossom Rock.—This rock has a large black buoy, terminating in a cone of three feet, moored upon it, in 15 feet water. The point of the rock lies 20 feet north-eastward from the buoy, and has only six feet upon it at low water. The tide sweeps over and across this dangerous rock with irregularity and great velocity. It must, therefore, be approached with great caution, particularly with light winds.

Southampton Middle Grounds.—This extensive shoal, extending north and south, lies to the eastward of Angel Island, and has on its south extremity a black spar-buoy in 15 feet, at low water. On its centre there is a red spar buoy, and on its north extremity there is also a black and white spar-buoy, both of which are in a similar depth. The soundings on the west side of this shoal, decrease abruptly from five fathoms blue mud to hard sand, in three fathoms.

Invincible Rock is a dangerous shoal near the Straits of San Pablo, and situated about 400 yards to the southward of the Two Brothers. It is marked by a black spar-buoy in 15 feet, at low water.

Kincom Point Rocks.—A ledge of rocks lying off this point, with a channel inside, has a black spar buoy moored upon it, in six feet at low water.

Pilots are also stated to have been appointed, Dec. 30th, 1850.

On the 1st of November, 1851, the following notice was issued:—"On and after this day, a lantern will be hoisted at dark, at the outer Telegraph Station, showing a blue and yellow light seaward, at an elevation of 3000 feet (?) above tide water. The position of this station is

such, that on the centre bar, in six fathoms water, it bears E.N.E. ½ E., Alcatras and Fort Head being in one."

POINT DE LOS REYES.—From the entrance to San Francisco the coast trends to the N. 62° W., a distance of nearly 30 miles, to Point de los Reyes. For a distance of about 12 miles, it consists of abrupt cliffs, with very unequal surfaces, and has a most dreary and barren aspect; it then falls lower, and forms a low, sandy, projecting point. A few scattered trees grow on the more elevated land, and some patches of dwarf shrubs in the vallies; but the rest of the country consists of barren rocks, or with a very slight covering of vegetation. Off the low projecting point some breakers extend nearly two miles to the E.S.E. To the westward of this low projecting point, the coast bends a little inwards, and forms with Point de los Reyes an open bay, named, by Vancouver, Port Sir Francis Drake; because he supposed it to be the place in which that navigator had anchored. The eastern side of the bay is composed of white cliffs, as is also the coast between it and Point de los Reyes, though the latter is lower. In consequence of the exposed state of the anchorage, being open to the S. and S.E. quarters, it is unsafe to anchor here when the wind blows from those directions. It is said that you may occasionally anchor here in May to October.

Vancouver remarked in November, 1792:—"According to the Spaniards, this is the bay in which Sir Francis Drake anchored; but however safe he might then have found it, in this season of the year it promised us little shelter or security. The wind blowing fresh out of the bay from N.N.W. I did not think it proper to lose the opportunity of proceeding with all dispatch to San Francisco; where there was little doubt of our obtaining a supply of those refreshments which were now much wanted by the whole crew." Captain Beechey has also expressed an unfavourable opinion of this anchorage:—" We passed Point de los Reyes, and awaited the return of day off some white cliffs, which, from being situated so near the parallel of lat. 38° N., are, in all probability, those which induced Sir Francis Drake to bestow upon this country the name of New Albion. They appear on the eastern side of a bay *too exposed* to authorise the conjecture of Vancouver, that it was the same in which Sir Francis refitted his vessel."

Point de los Reyes, in lat. 38° 1′ 30″ N. and long. 123° 2′ 30″ W., is a high, bold, and very prominent headland, visible, in clear weather, 50 miles off. It is one of the most conspicuous promontories on the coast, south of Cape Classet, at Fuca Strait, and cannot easily be mistaken, as when seen from the north or south, at the distance of five or six leagues, it appears insular, owing to its projecting into the sea, and the land behind it being less high than usual near the coast; but the interior

country preserves a more lofty appearance, although these mountains extend in a direction further from the shore than those along the coast to the northward of the point. The point stretches like a peninsula into the ocean, where its highest part terminates in steep cliffs, moderately elevated, and nearly perpendicular to the sea, which beats against them with great violence. Southward of the point the shore is composed of low white cliffs, and forms Sir Francis Drake's Bay.

THE FARALLONES are a group of detached islets, or rather rocks off the entrance to San Francisco. They lie in a N.W. and S.E. direction, and form two groups, the north-western and south-eastern; the distance from the extremes of which is about 12 miles. They are apparently of volcanic origin, as most of the rocks have evidently been once in a state of fusion. It is said that there is no fresh water on them, and that they are much resorted to by sea fowl. The south-eastern island is considered a good mark for San Francisco, and it is probable, that after the lapse of a few years, a lighthouse may be erected on it.

In the whole group of the Farallones, there are seven which appear above the water. The south-east islet is the largest of the group, and is distant from the fort, at the entrance of San Francisco, 28 miles in a S. 68° W. (true) direction. This islet is about 150 or 200 feet high, and on the south-east side, there is anchorage in 11 fathoms water, hard (probably rocky) bottom, which is tolerably sheltered from the north-west wind and sea.

It is said, that the larger of the Farallones has the form of a saddle, when viewed in certain directions, in consequence of each extremity rising into a hill. In order to distinguish between the north-west and south-east groups of these islets, it is only necessary to observe, that the former group shows three rocks of nearly the same size, lying nearly east and west of each other, nearly a mile apart, and sending off a reef to the eastward, about a mile in extent.

About one-third the distance from the south-east Farallones to San Francisco, there are 41 fathoms, sand and mud; from whence the soundings gradually diminish until up with the bar, off the entrance to the harbour. The bottom in the vicinity of the Farallones, appears to be of a very tenacious quality, as Captain Beechey says, "we stood to the southward from Point de los Reyes, during the night, and about three o'clock in the morning, unexpectedly struck soundings upon a clayey bank, in 35 fathoms, very near the Farallones, a dangerous cluster of rocks, which, until better known, ought to be avoided. The ship was put about immediately; but the next cast was 25 fathoms, in so stiff a clay, that the line was broken. The weather was very misty, and a long swell rolled towards the reefs, which, had there been less wind, would have obliged us to anchor; but we increased our distance from them,

and deepened the water. This cluster of rocks is properly divided into two parts, of which, the south-eastern is the largest and the highest, and may be seen 9 or 10 leagues in clear weather. The most dangerous part is apparently towards the north west."

BODEGA BAY is about 40 miles north of San Francisco, and is a small and inconvenient port, inaccessible, except by vessels of a light draught of water. The anchorage outside, is rocky and dangerous. Off Cape Bodega, there is a small rocky islet, having a reef extending off it, about three quarters of a mile to the south-eastward, close to which are 6 and 9 fathoms. It is high water on the days of full and change, at 11h. 30 m., with a rise of tide of 7 feet.

This port has lately been surveyed by Commander Sir E. Belcher, R.N., who says of it:—"Bodega is an extensive bay, almost joining (by a creek) the port of Sir Francis Drake, at its southern end, which is very shallow. On the northern side of the bay, at a small creek or estuary (nearly dry at low water springs) stand two Russian buildings; one a store-house, the floor of which was filled with grain and a few marine stores, and the other, the residence of those left in charge, amounting perhaps to three men, their wives, and children.

The anchorage is within a rocky islet, with a reef and bank extending about three-quarters of a mile, which is covered thickly by fucus giganteus. The bottom is coarse sand, with some patches of clay, but bad holding-ground. Here, however, it is customary for the Russians (who have excellent ground tackle) to ride out the south-west gales, inasmuch as the heavy swell which immediately tumbles in, or generally preceeds, prevents any moderate sailing vessel from making any head, and the sea-room is but scant. I am informed that the Russians have experienced several losses here, but no lives.

At the houses there is excellent water carefully conducted by spouts, for the convenience of hose, which allow of filling without removing the casks; and although we found the runs small, yet being steady and continuous, they afforded employment for two boats. I am satisfied, also, that it is as good, and more expeditiously obtained than at Sausalito, San Francisco, where it is necessary to fill from wells, and injure the boats embarking it."

This port has also been visited by Captain John Hall, who says:—"To sail into this port, when the winds are from the N.W., (and these are the prevailing winds throughout nearly the whole year, with the exception of the winter months), a vessel coming from the northward, should pass between the point and the rock, as a dangerous shoal lies immediately off the south end of the rock. We anchored with the rock bearing W. by S., distant three-fourths of a mile. The bottom is good holding-ground all throughout, being a mixture of clay and sand. In port, a

vessel is sheltered from all winds but the South and S.W. The watering-place is situated in the small bay where the Russian storehouse stands, and the water is good and easy of access."

In November, 1792, the Port of Bodega was visited by Vancouver, who thus writes :—" Our attention was directed to the appearance of a port to the eastward, for which we immediately steered. By sun-set, we were close in with the shore, which extended from N.W. by W. to S.S.E. ½ E., so that we were considerably embayed. We were now off the northern point of an inner bay that seemed divided into two or three arms, the soundings had been regular from 40 to 28 fathoms, the bottom a bed of coral rock, sand, and shells. Being anxious not to leave any opening on the coast unexamined, and as the evening was serene and pleasant, I was induced to anchor, though on a rocky bottom, off this point for the night, which bore by compass from us N.E. by E., two miles distant, that my design might early in the morning be carried into execution. Our situation here was by no means pleasant; during the night two deep sea lines were cut through by the rocks, and at four in the morning the buoy was seen drifting past ship, and was proved to have been severed in the same way. Lest the cable should share the same fate, no time was lost in weighing the anchor; fortunately, however, the cable had not received any injury. A light breeze from the land permitted us to stand across the bay, which we soon discovered to be Port Bodega; its north point is formed of low, steep, cliffs, and when seen from the south, has the appearance of an island, but is firmly connected with the main land. To the east the land retires and forms a small inlet, apparently favourable to anchorage; it has a flat rock, on which the water broke, in its entrance, and has not any other visible danger excepting that of being much exposed to the South and S.E. winds. Not being able to sail into the bay, we stood towards its south point, which lies from the north point S. 30° E., at the distance of seven miles. Within these limits appeared three small openings in the coast, one already noticed to the eastward of the north point, the other two immediately within the south point; across these a connected chain of breakers seemed to extend, with three high white rocks, which nearly blockaded the passage. Although very solicitous of gaining more intelligence, this was all the information I was able to procure of this place, which required to be minutely surveyed by our boats before the vessel should enter; the state of the weather was ill-calculated for such service; it was very dark and gloomy, and the depression of the mercury in the barometer indicated an approaching storm. Our soundings, when under 35 fathoms, were on a rocky bottom."

About 30 miles to the northward of the Port of Bodega, is the Russian settlement of Ross, which, it is said, is now abandoned. It is situated

on land elevated about 100 feet above the sea, the outline of which is cliffy, with alternate rocky and gravelly margin, rendering landing, excepting in very fine weather, nearly impracticable. The anchorage off is bad, by reason of beds of rock above and below water, and the constant liability to fogs, rendering it unsafe to break ground, unless with a fair wind. The hills above it, which command the presidio, are sparingly clothed with fir-trees. The main government establishment, or fort, as such enclosures are termed in these countries, consists of a large square, fenced in with strong planks of 15 feet in height, and furnished with block-houses or watch-towers at two angles; one commanding the sea, and the other the land sides, or covering the east, south, and west faces.

From Port Bodega to Cape Mendocino, the coast consists of high, bold cliffs, with but few indentations; and what dangers there are, lie close to the shore. The kelp will always indicate foul ground, and it is recommended to avoid it. After running along the coast a distance of 40 miles, you will reach Punta Barra de Arena, in about lat. 38° 50′, which is described by Vancouver, as "a conspicuous mark on the coast, the shores to the north of it taking a N. 10° W. direction. Its northern side is composed of black rugged rocks, on which the sea breaks with great violence; to the south of it the coast trends S. 35° E. Its southern side is composed of low, sandy, or clayey cliffs, remarkably white, though interspersed with streaks of a dull green colour. The country above it rises with a gentle ascent, and is chequered with copses of forest trees and clear ground, which gives it the appearance of being in a high state of cultivation. The land, further south, is high, steep to the sea, and presented a rude and barren aspect. As we approached the shore advancing to the southward, the country became nearly destitute of wood and verdure, at least that part of it in the vicinity of the sea shore, which was nearly straight and compact. The more interior hills, rising behind those forming the coast, were tolerably well wooded."

From Punta Barra de Arena, the coast runs to the N. by W., a distance of about 55 miles to a slight projection, named Punta Delgada, immediately to the eastward of which, the coast falls back about two leagues. This part of the coast appeared to Vancouver on his first visit to be very much broken, but a subsequent examination proved it to be compact, the deception having been occasioned by the distance from which it was viewed, and by the irregularity of the surface, which rises abruptly in low sandy cliffs from a connected beach which uniformly composes the sea shore. The interior country appears to be nearly an uninterrupted forest, but towards the sea side, presents a pleasing variety of open spaces. In sailing along the coast from Point Delgada, southward, to Punta Barra de Arena, at the distance of four or five miles, the shore

will appear compact with two or three small rocky islets near it. As you proceed, a distant view will be obtained of the inland country, which is composed of very lofty rugged mountains, extending in a ridge nearly parallel to the direction of the coast. These are in general destitute of wood, and the more elevated parts are covered with perpetual snow.

CAPE MENDOCINO.—From Point Delgada to Cape Mendocino the distance is about 40 miles. Cape Mendocino is in latitude 40° 27′ N., and is formed by two high promontories, about 10 miles apart; the southernmost, which is the highest, is situated in latitude 40° 23′ N. Off the cape are some rocky islets and sunken rocks, at near a league from the shore. The southernmost of these from the northernmost promontory lies S. 61° W., about a league distant; and within it are two rocky islets, in shape much resembling hay-cocks. The northernmost of them lies N. 3° W. distant five or six miles, and is nearly of the same shape and size as the other, to which it is apparently connected by a ledge of rocks, whose outermost part lies from the above promontory, N. 38° W., about two leagues distant, having a smaller islet, about midway between them. On some parts of this ledge, the sea constantly breaks with great violence; on others, at intervals only. The broken water appeared to Vancouver from the mast-head to extend along the coast as far north as could be discerned, which, however, was at no great distance, owing to the weather being thick and hazy. The whole of this cape, though by no means a very projecting headland, is very remarkable, from being the highest on the sea-shore of this part of the coast. The mountains at its back are considerably elevated, and form altogether a high steep mass which does not break into perpendicular cliffs, but is composed of various hills that rise abruptly and are divided by many deep chasms. In some of these, as well as on some of the ridges of the hills, are a few dwarf trees. The general surface is covered with vegetation of a dull green colour, interspersed in some places with perpendicular strata of red earth or clay. South of the cape, the coast is nearly straight, forming only a trifling bend. Its elevation is regular, it may be considered as high land, and is apparently steep-to, as Vancouver sounded without gaining bottom with 120 fathoms of line, at distances of from two to five leagues from the shore.

A sunken rock, on which the sea breaks occasionally, has lately been discovered by Lieut. Knox, U.S. Navy, at about eight miles N.W. by W. from the rocks off Cape Mendocino. Vessels passing the cape should give it a berth of about nine miles, although a vessel may pass inside the reef; but the ground is foul.

To the northward of Cape Mendocino, the country is not so high beyond the rocky islets, where it is of a moderate height. With the

south promontory of Cape Mendocino, bearing S. 60° E., distant 11 miles, it is stated, that there is no bottom with a line 120 fathoms long.

Vancouver says, "From Cape Mendocino, the coast takes a direction N. 13° E. After passing the above islets, the shores become straight and compact, not affording the smallest shelter; and, although rising gradually from the water's edge to a moderate height only, yet the distant interior country was composed of hills of great elevation; before which, were presented a great variety of hills and dales, agreeably interspersed with wood-land and clear spots. The coast we passed this afternoon seemed to be generally defended by a sandy beach; but the evening brought us to a country of a very different description, whose shores were composed of rocky precipices, with numberless small rocks and rocky islets, extending about a mile into the sea; the most projecting part, which is situated in lat. 41° 8′, obtained the name of Rocky Point, (Trinidad Head, of the recent surveyors). When abreast of Rocky Point, the colour of the sea suddenly changes from the oceanic hue, to a very light river-coloured water, extending as far a-head as could be discerned. A detached rocky islet, about half a mile in circuit, lies from Rocky Point N. 11° W., distant 13 miles, and about half a league from the shore. A passage may be obtained in 35 to 50 fathoms water, black sandy bottom, within this rocky islet."

At about 15 miles north of Cape Mendocino, is the entrance of the Eel River, a small stream, having nine feet water on the bar. The entrance is represented to be very narrow, and the swell so high, generally, as to render it difficult and dangerous for sailing vessels, although steamers might enter and depart without difficulty.

HUMBOLDT BAY.—The entrance of this bay is about 25 miles to the northward of Cape Mendocino. It is about half a mile wide between the breakers, but when within, it widens considerably, the whole extent of the bay being 16 miles long, and from four to five miles wide. The entrance between the breakers is nearly straight, and its direction is *rather* along the coast; it is about a mile long, and is said to have a depth of 18 to 21 feet at low water on the bar. This bay is perfectly accessible, except in very heavy weather, when the sea breaks entirely across the entrance. The surveyor, Lieut. Alden, U.S. Navy, at the period of the examination, had no trouble in getting in, and was able to beat out against a very light breeze, with little or no tide in his favour. He thus describes it (1851):—"This body of water partakes more of the character of a lagoon, than an ordinary bay. It is 16 miles long, and from one to five broad. It is broadest at either extremity, where it is but a great grassy flat, washed with about one foot of water, (when the tide is out) and broken here and there by navigable sluices. The

entrance is practicable, except in very bad weather, when the sea breaks entirely across it. There are 21 feet on the bar at low water, and the ordinary strength of the tide does not exceed two knots. Under unfavourable circumstances, at low water, and with a very light breeze blowing directly in the channel, the schooner went to sea without difficulty. The two sea walls, or narrow necks of land, which so nearly shut out the sea, are covered with sand-hills, ranging from 10 to 40 and 50 feet in height. On the North Spit, I have marked the place where, I think, the lighthouse should be located. It is the nearest point to the entrance, and is therefore less liable to be obscured by fog; and with a beacon father back, the two would form the best range to pass between the north and south breakers—not that it should be attempted at night, unless under the most favourable circumstances. The country is hilly, almost mountainous, in the vincinity of Humboldt. The fir and the red wood predominate in the forests, and I am informed that the land possesses every requisite for farming purposes. The cattle luxuriate the year round, in green grass, and the tallest grass I ever saw. The temperature is very equable; they have a slight frost in the fall, and the winter only differs from the summer by being more pleasant. Elk and deer are found in abundance, and many varieties of wild fowl frequent the bay. There are no less than four villages or settlements on the bay. Humboldt, at the entrance, has 13 houses; Eureka as many; Bucksport is just taking a start, and its location is thought to be superior to all the others, from the fact, that it has better water, and more room for commercial purposes. Union Town is the largest, having about one hundred houses. It is located in the North end of the bay. Its proximity to the mine is only the advantage it has over the others, while the difficulty of transporting supplies from the depôt at Eureka seems to be almost an insurmountable objection to its ever becoming a place of much importance. Everything has to be carried in small boats up a very narrow sluice, and that only at high water, while the nearest point of water communication is a mile from the town. A road can be cut from either of the other towns to communicate with the one from Union to the mines, with but little expense or trouble."

TRINIDAD BAY.—This bay it 42 miles to the northward of Cape Mendocino, and lies immediately under Trinidad Head, or Rocky Point of Vancouver. On the west side of this point are some rocky islets, named the Turtles. This bay is not very extensive, but it is a very convenient and safe anchorage during six months of the year, and will be found by vessels that have suffered from the strong head winds, (northerly) that prevail along this coast, a comfortable harbour of refuge.

It is said, that in the vicinity of Trinidad Bay there are some valuable mines, so that, after the lapse of a few years, it is likely to become a

place of importance. There are about 100 houses in the village (1851), and the land in the vicinity, for agricultural purposes, is so rich that it cannot be surpassed. The gigantic red-wood abounds here in all its magnificence, always affording to the hardy settler the readiest and most lasting material for neat and appropriate buildings. The fibre of this wood is so straight, and so easily separated, that it is split, with comparatively little trouble, into all the different forms required for an unpretending dwelling in a new country.

Trinidad Bay was visited on the 2nd of May, 1793, by Vancouver, who thus writes :—" About 6 o'clock in the evening, we anchored in eight fathoms water, dark sandy bottom, in Porto de la Trinidad. Our station here was in a small open bay or cove, very much exposed, and bounded by detached rocks, lying at a little distance from the shore. When moored, the bearings from the ship were, a high, steep, rounding, rocky headland, projecting a small distance from the general line of the shore into the ocean, forming, by that means, the bay. This was the northernmost land in sight, and bore by compass N. 75° W., distant about three-quarters of a mile ; a high, round, barren rock, made white by the dung of sea fowl, between which, and the above headland, we had entered the bay, S. 50° W. at the like distance ; the high distant land of Cape Mendocino, the southernmost land in sight, South ; a rugged rocky point forming the South-east point of the bay, S. 62° E. distant one mile and a half ; and the nearest shore, North-east, about half a mile from us.

The next morning, I went on shore with a guard of marines, and a working party, in search of wood and water ; these were found conveniently situated, a little to the southward of a small Indian village. The landing was tolerably good, being within several rocks, which lie a little way from the shore, and greatly protect the beach from the violence of the surf caused by the north-west swell that breaks with great force on all parts of this coast.

How far the place is deserving the denomination of a port, I shall not take upon me exactly to determine ; but in the language of mariners, it can in no respect be considered as a safe retreat for ships ; not even the station occupied by the Spaniards, which I conceived to be close up in the N.N.W. part of the bay, between the main and a detached rock lying from the headland, which forms the north-west point of the bay, N. 72° E., about half a mile distant. There, two or three vessels moored head and stern, may lie in six and seven fathoms water, sandy bottom. The point above-mentioned will then bear by compass S.W. ; and the rocks lying off the south-east point of the bay, S. 50° E. Between these points of the compass it is still exposed to the whole fury and violence of those winds which, on our return to the southward, the preceding

autumn, blew incessantly in storms; and when we approached the shores, were always observed to take the direction of the particular part of the coast we were near. Under these circumstances, even that anchorage, though the most sheltered one the place affords, will be found to be greatly exposed to the violence of these southern blasts, which not only prevail during the most part of the winter seasons, but continued to blow very hard in the course of the preceding summer. Should a vessel part cables, or be driven from this anchorage, she must instantly be thrown on the rocks lying close under her stern, where little else than inevitable destruction is to be expected. The points of Trinidad Bay lie from each other S. 52° E., and N. 52° W., about two miles asunder. From this line of direction, the rocks that line the shore are nowhere more than half a mile distant. The round barren rocky islet lies from the north-west point of the bay, S. by W., distant three quarters of a mile; this is steep-to, and has eight or nine fathoms water all round it, and admits of a clear channel from nine to six fathoms deep, close to the above point; from thence to Rocky Point, the shores of the coast are bounded by innumerable rocky islets, and several sunken rocks lying a little without those that appear above water; but I know of no danger but what is sufficiently conspicuous. The soundings of the bay are regular, from nine to five fathoms, the bottom clear and sandy; but as our anchors were weighed with great ease, and came up quite clean, we had reason to consider it to be not very good holding-ground."

This place was also visited by Commander Wilkes, who discovered a small sunken rock between two islets. Plenty of good water may be procured in the bay, but during strong westerly winds the anchorage is unprotected.

At about 30 miles to the northward of Trinidad Head, is the entrance to the Klamath, or Smith's River, on the bar of which there are about 17 feet at mean low water. The land on the north side of the river is high and abrupt, but on the south side, a narrow neck of dry sand projects, with a perpendicular rock on the extreme point. The current sweeps out of the river with great velocity, causing heavy breakers on the bar, which, at most times, prevent vessels from entering. The soundings outside the entrance are regular, and there are three sunken rocks about a mile distant from the sandy point. The channel into the river is so narrow, and the current so strong, that it is deemed unsafe for sailing vessels to attempt to run in.

In the interior, along this portion of coast, there is a range of very high mountains running in a direction parallel to the shore, the summits of which can be seen in clear weather, above the hills which form this iron-bound coast. One of these mountains, named Mount Shaste, is covered with perpetual snow, and appears as though composed of large blocks of

rock; its conical shape indicates its volcanic character, although no crater is visible. The position of this mountain is about lat. 41° 20′ N., and long. 121° 45′ W. The party under Captain Wilkes had a fine opportunity of observing this mountain, when travelling overland in 1841. "It presented a magnificent sight, rising as it does to a lofty height, its steep sides emerging from the mists which envelope its base, and seem to throw it off to an immense distance; its cleft summit gave proof of its former active state as a volcano. The snow lies in patches on the sides and part of the peak of this mountain; but there is a great difference in the position of its snow-line from that of Mount Wood, or St. Helen's. Its height is said to be 14,390 feet, but Lieutenant Emmons thinks it not so high."

PORT ST. GEORGE.—In sailing along the coast to the northward of Trinidad Bay, towards Port St. George, it will be observed to be composed of steep rocky precipices, broken by deep gullies, which, at a distance, would lead one to suppose that there were harbours or breaks in the land. The country is mountainous, and does not present so pleasing an aspect as that to the southward of Trinidad Bay. In lat. 41° 47′ N., you will reach Point St. George, which is composed of a cluster of remarkable rocky hummocks, having low land behind them, which gives them the appearance of an island, when seen from a distance. Off the point there are a number of rocky islets and breakers.

Point St. George forms a bay on each side; the northern of which is named Pelican Bay, and the southern, St. George's Bay. Pelican Bay is very spacious and secure during north-westerly gales; but there are several rocks close to the shore which must be avoided. Near these rocks a stream discharges itself, from whence water can be procured by boats. In St. George's Bay there is good anchorage during north-west gales, under shelter of the rocky islets; but no fresh water can be procured here.

Vancouver visited Port St. George in April, 1792, and thus writes:—"Off Point St. George, there extends a very dangerous cluster of rocks, named the Dragon Rocks. The outermost of these lies from Point St. George, N. 52° W., three leagues distant. The rocks above water are four in number, with many smaller ones, and numerous breakers stretching from the outermost. Point St. George forms a bay on each side; that into which we stood from the north side is perfectly open to the N.W., yet apparently sheltered from the W.S.W., and southwardly winds by the Dragon Rocks; the soundings we found regularly from 35 to 45 fathoms, black sand and muddy bottom; when at the former depth, Point St. George bore by compass S. 33° E., 10 miles; the northernmost of the Dragon Rocks S. 7° W. four miles; and the north point of the bay, which I named St. George's Bay, N. 24° W., six or seven miles distant.

The surf broke with great violence all round the bay; and although we were again in *whitish* water, there was not any opening on this side of the point: the shores of the northernmost part of the bay, like the coast of the bay on the south side of Point St. George, rise very abruptly from the sea, forming numberless gullies and chasms, which were covered with a dull brownish herbage, and produced little or no wood. North of the bay, the shores were again bounded with numberless small rocks and rocky islets, similar to those already mentioned; but the low land of Point St. George terminates in a sandy beach, from whence the coast takes a direction N. 15° W."

From Point St. George, the coast to the northward is composed of high steep precipices and deep chasms, falling very abruptly into the sea. The inland mountains are very lofty, and appear to be tolerably well covered with trees, apparently pines, although there are some spreading trees of considerable magnitude. Some of the mountains are barren. Along the coast are a number of rocky islets. In lat. 42° N. is the boundary between Oregon and California.

THE COAST OF OREGON.

By a convention with Spain in 1817, the southern boundary of Oregon was fixed at the latitude of 42° N., and until 1847, the whole territory so far south as the Spanish frontier, was claimed by both Great Britain and the United States, and the subjects of both proceeded to colonize it; but in that year negociations were concluded between the two powers, by which the mutual boundary was fixed at the 49° of latitude. The whole territory extends from 42° to 54° 40′ N. latitude, and contains about 480,000 square miles, of which, about 7-12ths belong to the United States. Nearly the whole region is drained by the river Columbia, with its tributaries, which takes its name from the ship of Captain Gray, of Boston, who was the first to ascend the stream, in 1792. The name Oregon, as applied to both the river and the country, has arisen solely from the statement of the traveller Carver, that, when on the Upper Mississippi, he heard of a great river in the interior, flowing westward, and which he called the Oregon or Oregan, or River of the West. The principal establishments of the whites are the Hudson's Bay Company's posts and settlements, and the Missionary Stations of the American Board of Foreign Missions; the country generally being still in possession of the native tribes. Population not known.

Fort Vancouver, the Company's principal depôt for Columbia district, stands on the northern bank of the river, 100 miles from its mouth, in the midst of beautiful and fertile prairies. The fort is merely a stockade inclosing the Company's buildings, and outside are about 50 huts, occupied by the mechanics and labourers, with their Indian wives and slaves. There are several other forts of the same kind scattered over the country. A Company's ship arrives every year in the Columbia, in spring, with goods for the Indian trade, and returns in the autumn, after having made a trip to the Sandwich Islands with furs. A Company's ship, brig, schooner, sloop, and steam-boat, remain on the coast to traffic and bring in the furs; and every spring, numerous parties leave Fort Vancouver in boats loaded with goods for the Indian trade, at the different inland posts. The whole number of persons connected with the establishment is

about 800, who are mostly Canadians, half-breeds, and Indians. The Mission Board has two stations, and employs several missionaries and teachers.

RIVER TOUTONNIS, OR ROGUE'S RIVER.—This is the first river met with after passing the boundary line of Oregon and California, when sailing northward. It has a very narrow entrance, with a low shingle beach on each side, by which it may be recognised; but in consequence of the narrowness of the channel, it is scarcely available for shipping, there being hardly room to turn. The passage of this river is between high mountainous land; and in consequence of the deep inclination of its bed, the stream is very rapid. There are from 10 to 12 feet water on the bar, which deepens to four or five fathoms within the distance of a quarter of a mile inside; the flats then begin. The overfalls extend several miles. The tide rises about six feet. It is said that wood and water can be procured in any quantity. This river is named by Wilkes, the Klamet or Tootootutna River.

At about 18 miles north of the Klamath River, is a small open cove, named Ewing Harbour, in which safe anchorage may be obtained during the summer months. It is said that there is no surf in the landing cove.

CAPE ORFORD, OR BLANCO is at the extremity of a low projecting tract of land, and forms a very conspicuous point, which bears the same appearance, whether approached from the north or the south. It is covered with wood as low down as the surf will permit it to grow. The space between the woods and the wash of the sea appears to be composed of black craggy rocks, which can be seen at the distance of seven or eight leagues. Off the cape, there is a group of rocky islets, four in number, surrounded with dangerous sunken rocks, on which the sea breaks with considerable force. The outermost of these bears from the cape S. 38° W., distant four miles, and has outside it, at a short distance, 45 fathoms, black sandy bottom.

From Cape Orford, the coast runs to the northward, and until about a league from the cape is lined with rocky islets, which are succeeded by an almost straight sandy beach, with land behind rising gradually to a moderate height; but the interior is considerably elevated, and much diversified both by its eminences and productions, being generally well wooded, though frequently there are clear spots, which give the country an appearance of being well cultivated.

CAPE GREGORY, OR ARAGO, about 30 miles to the northward of Cape Orford, is very conspicuous, especially when viewed from the northward, being formed by a round hill on high perpendicular cliffs, some of which are white, and rise to a considerable height above the level of the sea: above these cliffs the land is pretty well wooded. About a

league northward of the pitch of the cape, the rocky cliffs composing it terminate, and a compact white sandy beach commences, which extends along the coast eight leagues, without forming any visible projecting point or headland.

Vancouver, after observing the impropriety of the term "blanco" being applied to Cape Orford, the cape being of a dark colour, goes on to say "the land seen to the south of Cape Gregory, by Captain Cook, and by him considered as answering nearly to the situation of Cape Blanco, must have been some of the inland mountains, which to the south of Cape Gregory rise to a great height; whilst the land near the sea shore, particularly in the neighbourhood of Cape Orford, was much too low to have been seen at the distance which Captain Cook was at that time from it; and it is fair to presume that the excessive bad weather led Captain Cook and his officers to consider the extremely white sand on the sea shore and on the hills to be snow. With us it put on the same appearance, excepting where it was interrupted by the clumps of trees, and until it was entirely lost in the forest. There could be no doubt of its being mistaken in winter for snow, but as the general temperature, since our arrival on the coast, had been at 59° and 60°, the error of such conclusion was sufficiently apparent."

Between Capes Orford and Gregory, is a small river named Coquille, which is not available for any thing larger than small boats and canoes.

Immediately round Cape Gregory, on the north side, is the Kowes River, which has not yet been closely examined, but it is highly probable, judging from appearances at the entrance, that it will be found available and very useful for steamers.

At about 20 miles to the northward of Cape Gregory, is the Umpqua River, on the bar of which are about 14 feet, deepening inside to 3 fathoms. Heavy rollers break across the entrance. Lieut. M'Arthur has expressed an opinion that this river is practicable for steamers, but dangerous to sailing vessels, unless under very favourable circumstances. Commander Wilkes describes the entrance of Umpqua River as being between two sand spits, the northern of which is a mile and a half long, and on the southern spit is a small rock. There are 2 fathoms water on the bar, which lies outside the spits; between them, 6 and 7, and inside, 11 fathoms. The river, for the distance of 10 miles, admits vessels not drawing more than 12 feet.

Between the Umpqua and Columbia Rivers there are several small streams; but which have not sufficient water for large ships. The names of these streams are Alseya, Nekas, Yaquinna, and Killamook. From most of these fresh water can be obtained by boats.

CAPE PERPETUA, in lat. 44° 12′ N., and the first projecting

point northward of Cape Gregory, is a high rocky bluff, nearly perpendicular to the sea, which occasionally breaks against it with great violence. Hence the coast runs to the northward to Cape Foulweather, in lat. 44° 49′ N., which has a very singular appearance, appearing with a high round bluff point that projects abruptly into the sea; to the northward there is a remarkable table hill, and to the southward there is a lower round bluff. From Cape Foulweather the coast takes a direction a little to the eastward of North, and is nearly a straight and compact shore, considerably elevated, and in general steep to the sea. The face of the country is much diversified, being in some places covered with herbage, and in others with barren rocks and sand; but in no place is there very much wood.

CAPE LOOKOUT, in lat. 45° 52′, is a small projecting point, having off it four rocks, one of which is perforated. Hence the cost takes a direction about N. 8° W., and is pleasingly diversified with hills near the sea-shore; in it there are some shallow sandy bays, with a few detached rocks lying about a mile from the land. The more inland country is considerably elevated; the mountains stretch towards the sea, and at a distance appear to form many projecting points and inlets; but the sandy beach along the shore renders it a compact coast, now and then interrupted by perpendicular rocky cliffs, on which the surf violently breaks. This mountainous inland country extends about 10 leagues to the northward of Cape Lookout, when it suddenly descends to a moderate height.

COLUMBIA RIVER.—The Columbia River and its valley is by far the most important and interesting part of Oregon, not only on account of the variety of soil, productions, and climate, but also from its being the great and only line of communication between the sea coast and the interior. The river is estimated to be 750 miles long, and is navigable from its entrance, a distance of about 100 miles, as far as the cascades, by vessels drawing over 12 feet of water. Although it possesess at all times a good depth of water, yet it is difficult and dangerous to enter, so much so that it can be said to possess but few advantages as a port; it therefore is not of such value to the district as the length of its course and the magnitude of its waters would lead us to expect. It also has the disadvantage of a shifting bar, so that it is impossible for large vessels to enter without a pilot.

It has been said that the Columbia is navigable for vessels drawing 12 feet of water, as far as the cascades. These are falls extending a distance of about 2 miles, and the descent of the river in this space is upwards of 40 feet, so that it is rendered impassable even for boats, and a portage of 2½ miles has to be made. The width of the river is here reduced to 450 yards, which causes the whole body of the water to rush through with great velocity, and produces high waves and whirlpools.

At about 40 miles within the entrance of the river, on the north shore, is one of its tributaries, named the Cowlitz, which is about 35 miles in length. It is not navigable during the greater part of the year; but in the freshes discharges a large quantity of water into the Columbia, and so extensive are these floods, that it has been known at times to overflow its high prairie. About its head waters is some of the finest land to the north of the Columbia, on which a considerable settlement has already been made by the Hudson's Bay Company, named the Cowlitz Farm.

At about 65 miles within the entrance of the Columbia, on the south bank, is the entrance of the Willamette River and Valley. This valley extends as far south as the Elk range of hills, where the river takes its rise, the upper portion of which is termed Mackenzie's Fork. Mackenzie's Fork has its source in the Cascade Mountains; and after flowing 30 miles west joins the main stream. The principal settlements of the country have been made in this valley, on account of its good soil and easy cultivation. It is divided into an upper and lower prairie; the first is adapted for pasturage and the raising of stock; the latter arable and productive land on which all kinds of grain yield abundant crops. The southern end of the valley rises gradually into undulating hills, destitute of trees, except a few oaks, which are found at the banks of the streams. The soil is a red decomposed basalt. The Willamette River flows nearly north, in the middle of the river, and has several small streams which empty into it. Fifteen miles below the valley the river falls about 25 feet, and at this place is 350 yards wide. These falls are 33 miles from its junction with the Columbia; and the river is navigable to the Klackamus, 3 miles farther down. The banks below the falls are high and basaltic, to within four miles of its mouth, where they become low, and subject to be overflown. Its width varies, from there being many islands in it, which are covered with beautiful groves of ash. The freshets in this river take place in February and March, and by the sudden rise at times do great damage. At the falls is the principal settlement in the territory; it has received the name of Oregon *city*. Its location is very contracted, and ill adapted for trade. The principal advantage of its site is its suitableness for the establishment of mills, and its being one of the best salmon fisheries in the country.

Cape Disappointment, on the north side of the entrance to the river, is high and cliffy, and has several lofty spruce and pine trees on its summit. Within the cape the land bends inwards, and forms a bay, named Baker's Bay, in which vessels generally anchor when awaiting an opportunity for departing from the river. In this bay there are soundings of 20 to 8 feet; but it is entirely open to the S.E. Baker's Bay

terminates to the eastward at Chinook Point, which is 5 miles to the eastward of Cape Disappointment. Commander Wilkes has remarked on the occasion of his visit, in 1841 :—"I determined to go to Baker's Bay, where we could obtain water; for that of the Columbia is not fresh as low down as this point. We found the tide exceedingly strong, and having some apprehensions that the boats might lose their way, I thought it better for us to make for the Chinook shore, and follow it until we reached the cape. It may seem strange that this precaution should be taken; but it is necessary at all times, even in clear weather; for the tide is frequently so strong that it cannot be stemmed by oars; and too much caution cannot be observed in passing across the bay. As little frequented as it is, many accidents have occurred to boats and canoes, by their being swept by the tide into the breakers on the bar, where all hands have perished. The Indians are very cautious, and it is only at certain times of the tide that they will attempt to make the passage. We reached Baker's Bay in two hours, and formed our encampment; and here we determined to remain until the weather should become clear, and allow us to proceed with our duties."

Point Adams, on the south side of the river, is distant from Cape Disappointment nearly 5 miles. It is low and sandy, and has, at its extremity, an Indian village, named Clatsop, which merely consists of a few rough lodges, constructed of boards, or rather hewn planks, of large size; the interior resembled a miserably constructed ship's cabin, with bunks, &c., the only light being admitted from above, near the ridge and gable end. Around the whole is a palisade, made of thick planks and joists, about 15 feet in length, set with one end in the ground, to protect the inhabitants from attack. The Indians are an idle and dissolute set, spending their time in gambling and fighting.

The land near the entrance of the river is well marked, and cannot be easily mistaken. On the summit of the two capes are several lofty spruce and pine trees, which the officers of the Hudson's Bay Company have caused to be trimmed of branches nearly to their tops; these serve as conspicuous marks.

From each point of the entrance of the river a sand-spit runs off nearly 4 miles; that from Point Adams projecting to seaward of the other, being nearly at right angles to it; the distance between them is nearly one mile. These sand-spits have been formed by the deposits of the sands brought down by the river, or washed by the abrasion of the sea from their respective capes. The bar lies outside, and on it there is said to be no particular danger unless the sea is heavy, when breakers form on it, and a vessel would be subjected to risk in passing. The sea on both spits is generally heavy, although at times there are little or no

breakers. On the spits the depth is generally 1 to 3 fathoms, and there are also some patches awash; but this of course is dependent on the changes which are continually taking place. On the bar the depth is generally 3½ to 4½ fathoms. It seems that the south end of the north spit is the point of the greatest danger, as most of the wrecks have occurred there.

Commander Wilkes says of the breakers on the bar:—"Mere description can give but little idea of the terrors of the bar of the Columbia: all who have seen it have spoken of the wildness of the ocean, and the incessant roar of the waters, representing it as one of the most fearful sights that can possibly meet the eye of the sailor. 'The difficulty of its channel, the distance of the leading sailing marks, their uncertainty to one unacquainted with them, the want of knowledge of the strength and direction of the currents, with the necessity of approaching close to unseen dangers, the transition from clear to turbid waters, all cause doubt and mistrust."

Within the entrance of the river, between Cape Disappointment and Point Adams is an extensive middle ground, which is dangerous on account of the little water on it. In one part it dries, forming a sandy islet. The depth of water on, as well as shape of this bank, depend very much on the freshets from the river. There are also extensive flats in the middle of the river, before the village of Astoria.

Astoria. From Point Adams to the entrance of Young's River, on the south side of the Columbia, the distance is about 6 miles. This is a small stream flowing through meadows. Astoria is two or three miles to the eastward of Young's River. It is very beautifully situated, and was at one time the principal place of trade in this district; but since the establishment of the Hudson's Bay Company's settlement at Fort Vancouver, it has gradually declined, until that it is now little more than a collection of a few log-houses and huts. The site of Astoria is ill adapted for commerce, the navigable channel of the river being narrow, and only able to accommodate a few vessels. The river, although 3½ miles wide here, has its bed occupied by extensive sands, over which there is but little water; these militate very much against Astoria ever becoming again a place of much importance.

Fort Vancouver, the Hudson's Bay Company's principal depôt for Columbia district, stands on the northern bank of the river, 100 miles from its mouth, in the midst of beautiful and fertile prairies. It was visited in 1841, by Commander Wilkes, who thus writes:—"The situation of Vancouver is favourable for agricultural purposes, and it may be said to be the head of navigation for sea-going vessels. A vessel of 14 feet draft of water, may reach it in the lowest state of the river. The Columbia at this point makes a considerable angle, and is divided by two islands, which extend upwards about 3 miles,

to where the upper branch of the Willamette joins it. The shores of these islands are covered with trees, consisting of ash, poplars, pines, and oaks, while the centre is generally prairie, and lower than the banks: they are principally composed of sand. During the rise of the river, in May and June, the islands are covered with water which filters through the banks that are not overflowed. This influx renders them unfit for grain crops, as the coldness of the water invariably destroys every cultivated plant it touches.

The Company's Establishment at Vancouver is upon an extensive scale, and is worthy of the vast interest of which it is the centre. The residents mess at several tables; one for the chief factor and his clerks; one for their wives (it being against the regulations of the Company for their officers and wives to take their meals together); another for the missionaries; and another for the sick, and the Catholic missionaries. All is arranged in the best order, and I should think with great economy. Everything may be had within the fort: they have an excellent apothecary's shop, a bakery, blacksmiths' and coopers' shops, trade-offices for buying, others for selling, others again, for keeping accounts and transacting business; shops for retail, where English manufactured articles may be purchased at as low a price, if not cheaper, than in the United States, consisting of cotton and woollen goods, ready-made clothing, ship-chandlery, earthen and iron ware, and fancy articles; in short everything, and of every kind and description, including all sorts of groceries.

Vancouver is the head-quarters of the North-west or Columbian department, which also includes New Caledonia; all the returns of furs are received here, and hither all accounts are transmitted for settlement. These operations occasion a large mass of business to be transacted at this establishment.

Vancouver is a large manufacturing, agricultural, and commercial depôt, and there are few if any idlers, except the sick. Everybody seems to be in a hurry, whilst there appears to be no obvious reason for it. Canadian French is generally spoken to the servants: even those who come out from England after a while adopt it, and it is not a little amusing to hear the words they use, and the manner in which they pronounce them.

The routine of a day at Vancouver is, perhaps, the same throughout the year. At early dawn the bell is rung for the working parties, who soon after go to work: the sound of the hammers, click of the anvils, the rumbling of the carts, with tinkling of bells, render it difficult to sleep after this hour. The bell rings again at eight, for breakfast; at nine they resume their work, which continues till one; then an hour is allowed for dinner, after which they work till six, when the labours of

the day close. At five o'clock on Saturday afternoon the work is stopped, when the servants receive their weekly rations.

The mode in which their trade is carried on will give some idea of the system pursued by the Company. All the imported goods are divided into three classes, viz. :—articles of gratuity, those of trade, and those intended to pay for small services, labour, and provisions. The first consists of knives and tobacco; the second, of blankets, guns, cloth, powder, and shot; the third, of shirts, handkerchiefs, ribands, beads, &c. These articles are bartered at seemingly great profits, and many persons imagine that large gain must be the result from the Indian trade; but this is seldom the case. The Indians and settlers understand well the worth of each article, and are not inclined to give for it more than its real value, besides getting a present or "potlatch" to boot. The Company are obliged to make advances to all their trappers, if they wish to be sure of their services; and from such a reckless set there is little certainty of getting returns, even if the trapper has it in his power. In fact, he will not return with his season's acquisitions, unless he is constrained to pursue the same course of life for another year, when he requires a new advance. In order to avoid losses by the departure of their men, the parties, some thirty or forty in number, are placed under an officer, who has charge of the whole. These are allowed to take their wives and even families with them, and places where they are to trap during the season, on some favourable ground, are assigned to them. These parties leave Vancouver in October, and return by May or June. They usually trap on shares, and the portion they are to receive is defined by an agreement; the conditions of which depend very much upon their skill.

I witnessed the Columbia at its greatest and least heights, and no idea can be formed of it, unless seen at both these epochs. The flood is a very grand sight from the banks of the river at Vancouver, as it passes swiftly by, bearing along the gigantic forest trees, whose immense trunks appear as mere chips. They frequently lodge for a time, in which case others are speedily caught by them, which, obstructing the flow of the water, form rapids, until by a sudden rush the whole is borne off to the ocean, and in time lodged by the currents on some remote and savage island, to supply the natives with canoes. I also witnessed the undermining of large trees on the banks, and occasional strips of soil: thus does the river yearly make inroads on its banks, and changes in its channels.

From the circumstance of this annual inundation of the river prairies, they will always be unfit for husbandry, yet they are admirably adapted for grazing, except during the periods of high water. There is no precaution that can prevent the inroad of the water. At Vancouver, they

were at the expense of throwing up a long embankment of earth, but without the desired effect. It has been found that the crop of grain suffers in proportion to the quantity of the stalk immersed: unless the wheat is completely covered, a partial harvest may be expected.

The temperature of the waters of the Columbia, during the months of May and June, was 42°, while in September it had increased to 68°.

The waters of the Columbia have no fertilizing qualities, which is remarkable when the extent of its course is considered: on the contrary, it is said, from experience, to deteriorate and exhaust the soil. It is, when taken up, quite clear, although it has a turbid look as it flows by. Quantities of fine sand, are, however, borne along, and being deposited in the eddies, rapidly form banks, which alter the channel in places to a great degree."

DIRECTIONS. The following are the instructions given by Commander Wilkes for running into the river; but *they must not be followed*, as, since the survey by the Exploring Expedition in 1841, great changes have taken place, both in the depth of the water on the bar, and in the shape of the banks at the entrance of the river. A new survey has since been made (in 1850), by which it appears that a South Channel has opened; and directions in accordance with that survey, by Lieut. McArthur, are appended. We add the instructions of Commander Wilkes, because they supply useful information on the tides and winds:—

"The principal dangers in the entrance of the Columbia are the cross tides, their velocity, and the influence of an under-current, together with the heavy swell. These become greater from the distance of the leading marks for the channel, and their indistinctness when the weather will permit entrance. It is necessary to use them, in consequence of the compass bearings being of little or no use.*

There is little doubt that the spits are undergoing constant change, and are both increasing. This is corroborated by those who have had the most experience. In the memory of many, Cape Disappointment has been worn away some hundred feet by the sea and the strong currents that run by it. The *middle sands*, which lie within the two spits,

* Commander Wilkes, after alluding to the loss of his consort, the *Peacock*, on the bar of the Columbia, says:—"The cross-tides change every half hour, and are at times so rapid, that it is impossible to steer a ship by her compass, or maintain her position; and no sailing directions can possibly embrace the various effects produced upon them by a vessel. A singular fact in illustration of this remark is, that the safest time to cross the bar is when both the tide and wind are adverse; and this is the only port, within my knowledge, where this is the case.

During the summer, haze and fog occur almost every day, in the afternoon."

and occupy a great extent of the bay, are subject to still greater changes. In the course of two months, a large portion of what was dry sand was washed away. The sea usually breaks on the western edge of these sands. Two vessels have been wrecked here within the last year; the barque *Vancouver*, one of the Hudson's Bay Company's vessels, and the whale ship *Maine*, both totally lost.

After passing the spits, the *old* channel leads to Baker's Bay, the usual anchorage for vessels awaiting an opportunity for departure. This bay is by no means well sheltered during the stormy months, being exposed to the south-east. Good water and wood can be procured. The *New*, or *Clatsop* Channel leads directly to Point Adams. Changes in both the channels are said to have taken place since the surveys made by the Exploring Expedition of the U.S. The alteration in the former is caused by the accumulation of sand about the wreck of the *Peacock;* that in the latter by the greater deposit of sands, from the failure of the common spring freshets. I am led to believe that neither is of the extent reported, and I feel satisfied that the Clatsop Channel will be kept open by the action of the current of the river, and ought to improve in depth. Before any degree of reliance can be placed on these reports, an accurate survey of the river ought to be made, which will serve to show the changes that have occurred since that made by the Exploring Expedition; and a comparison of the two surveys will point out the causes that may be at work to effect it, and the probable remedies that may be used to prevent the change, or retard its progress.

It is safest to enter the river on the ebb-tide, with the usual north-west wind, which sets in about 10 or 11 o'clock, A.M., during the summer months. The entrance should never be attempted with a flood-tide and north-west wind, unless the Clatsop Channel is followed, and the sea is smooth.

After making Cape Disappointment, which is easily distinguishable by the dark hummocks and tall pines, trimmed up, with the exception of their tops, you may lead in for it on a north-east bearing, if to the southward; if to the northward, you may run in until you have that bearing on. A hummock, or saddle-hill, to the northward, on with the outer part of the cape-land, will give you notice that you are on the bar, in four and a half or five fathoms water: in ordinary weather, the outer line of the north spit is readily perceived by the rollers breaking; the inner line is always perceptible. When Young's Point is open with dead trees on Point Adams, you will be to the northward of the end of the north spit, and may run down along it, until those two points are on range; then haul in for Point Ellice, or the green patch on Chinook hill, if intending to take the channel by the cape. When *Leading-in Cliff* is well open with the inner point of the cape, haul up for the latter, and steer in; you

will then have doubled close round the north breaker, in seven fathoms water; and it is better to keep the north spit aboard if the wind is not so scant as to oblige you to beat up for Cape Disappointment: on opening Green Point, you must go about; it is not safer to go nearer the middle sand. On ordinary occasions, there will be scarcely ever a necessity to tack; the ebb-tide on your lee bow will keep you sufficiently to windward.

The cape will be required to be passed close aboard, in order to avoid the *sand-spit* making off from the *middle sands* towards the cape: the two outer bluffs of the cape, in range, will strike it. After you have passed this range, you may steer into Baker's Bay, and, having passed an opening in the wood on the cape, you may anchor in from seven to ten fathoms. In passing the cape, care must be taken not to be becalmed by it; if this should happen, the only resource is to down anchor at once, and wait a favourable tide. The current will be found very strong. It sometimes runs from five to six knots an hour—a perfect mill-race—and no boat can make way against it when at its strength.

If desirous to proceed up to Astoria, and one of the native pilots is not to be had, the only caution necessary, in proceeding up, is to keep the small islet in the cove of the cape open, until you have the *dead trees* nearly S.S.E. (*mag.*), and then steer over them, as it will be probably young flood. It is necessary to keep the starboard or sand island side of the channel, and if near high water, this island, in running up, must be kept open on the starboard bow; otherwise the approach to it would be too near for safety. On reaching the Clatsop Channel, steer up for Young's Point, keeping in five or six fathoms water. The sand shoals on either side are very bold. When abreast of Astoria, moor with an ebb and flood anchor, with open hawse to the northward and westward.

If the intention be to take the Clatsop Channel, the same directions are to be observed in passing the north spit. When the Leading-in cliff is open, instead of hauling up for the cape, steer direct for the Clatsop village, on Point Adams, which will take you into fair channel-way; the breakers on each side will be visible: keep in the middle, and steer up for Young's Point, following the directions as before given.

In coming out, the state of the bar may be distinctly seen from the top of the cape, but due allowance must be made for the distance. The surf beating on the cape is a good guide; if there is much of it, the swell will be very heavy and sharp between the north and south spits, if it does not actually break: the best time is with a north-west wind, and about half ebb, you will then have tide enough to carry you to sea.

I look upon it as always dangerous to drop anchor in the channel

between the cape and the end of the north spit; if it is done, it should only be in case of absolute necessity, and not a moment is to be lost when possible to proceed out or in. If the ship gets off with only the loss of an anchor, she may consider herself fortunate. The sea breeze or north-west and westerly winds blow at times very fresh; a sure indication of them is a thick hazy bank in the west, to seaward.

In entering the river, the following cautions should be attended to:—

1. The entrance should never be attempted when the passage between the north and south spits is not well defined by breakers; it is equally dangerous, whether it be concealed by the sea's breaking all the way across, or so smooth as not to show any break.

2. The wind generally fails, or falls light, in the passage between the north and south spits, if it blows but a moderate breeze; and leaves a vessel at the mercy of a strong tide and heavy swell.

3. The best time to enter and depart, is after ebb, and before quarter flood; the tide then runs direct through the channels, and is confined to them. With the prevailing westerly winds, for those intending to take the north channel, the best time to enter is after half-ebb, though the wind may be scant; yet the ebb-tide, acting on the lee bow, will enable the vessel to keep to windward, and avoid the spits on the middle sands."

The recent examination of the entrance of the Columbia, in June, 1850, shows that great alterations have taken place since the survey of Commander Wilkes. A new South Channel has been opened, through which it appears that vessels drawing 17 feet can be taken over the bar, at a quarter flood, or three quarters ebb, without the least risk of touching, and vessels drawing 20 feet can pass at high water. This is after due allowance has been made for the "drop" which a vessel makes when in the swell of the bar, which is, however, much less in the South than in the old North Channel, when the wind is in the usual north-western quarter. But how long the channel may continue in this state is uncertain, the sands being liable to alter after heavy gales.

In the winter or spring seasons, when the wind is in the south or south-west quarter, there is a lively breaker on the south bar, at which time it will be smoothest on the north bar, and this southerly wind being fair for the North Channel, there is no occasion to take the south bar in *southerly winds, going in;* yet, with a moderate draught in a *sailing* vessel, the South Channel is ever safest in coming out, although the wind may be "dead in" to the bar; the bar being so short and quickly passed that it is not necessary to tack in shoal water.*

* Lieutenant Bartlett, U.S. Navy, says:—"My experience at the mouth of the Columbia convinces me that the South Channel is the practicable commercial channel of the river, for certainty and safety, with the additional advantage of accomplishing

Within the entrance of the river, the changes have been equally as great as outside. Sand Island is nearly a mile to the westward of its position in 1841; and the North Channel seems to be gradually filling up, whilst the new South Channel is becoming both larger and deeper. This change will go on until some violent storm throws up the sand again, and, upon subsiding, leaves the waters of the river to find a new channel. After crossing the bar, there is a good, unobstructed channel for ships, as far up as Astoria, beyond which, Tongue Point Bar presents a serious obstacle to vessels drawing 16 or even 15 feet. The channel over this bar is very crooked and shallow, so that vessels seldom pass it without delay. Once beyond Tongue Point Bar, vessels can easily go up the river as far as Fort Vancouver, and as far as Portland, on the Willamette River.

The harbour of Astoria is perfectly safe and capacious, and has good holding ground. Abundance of wood and water can easily be procured.

On Sand Island, a beacon was constructed in June, 1850, having on it a white flag, 80 feet above the island, and 85 feet above high water mark. Around the base of the flagstaff is a block-house, 35 feet high, and 15 feet square, which can be plainly seen 12 miles off in clear weather. These are excellent objects when making the river.

Pilots have been appointed for the river, and it is probable that by this time the channel is buoyed. Should a pilot not be obtained, you may run into the river by the following directions, which were written by Lieut. McArthur, U.S. Navy, in November, 1850:—

"It is best at all times and under all circumstances to have a pilot; but, should it be necessary to enter the river without one, the directions are as follows:—

North Channel.—Bring Sand Island in range with Point Ellice, and stand in towards Sand Island, passing the south end of the north breaker; when Cape Disappointment and Leading-in Cliff are in range, haul up towards the cape, keeping Leading-in Cliff in range, until nearly abreast the cape. Give the cape a small berth, and continue on towards Baker's Bay until the *second island* in the bay can be seen; then keep off, and with the second island and cape in range astern it will pass clear of the north part of the Middle Sands. As soon as the soundings shoal on this course, keep off towards Sand Island, and passing close by the east end of the island, get the beacon on the island in range with a

the passage to or from the river without waiting for a particular wind. Ships frequently pass the bar inward in 15 minutes after receiving their pilot, and outward in 30 minutes after getting their anchors. A disabled ship that can be sailed so as to have good steerage way, can pass over the south bar in safety, when it would be impossible to get her in by the North Channel."

tree on Cape Disappointment, (which is trimmed up like an umbrella), and with that range astern, stand on up the bay, until the custom-house is on with Young's Point, when haul to the east, and keep the last range on till nearly up with Young's Point. Pass along the shore, running by the *lead* until up to Astoria.

SOUTH CHANNEL.—To enter the South Channel, bring the beacon on Sand Island to bear N. 40° E., (*true*), and Point Adams on the peak, which can be seen east of Point Ellice, and called "Jim Crow," (upon which there is a notable tree) nearly in range, the vessel will be then on the bar in the South Channel, in the best water. Steer for the beacon, taking care not to sag to the *eastward;* rather keep close to the breakers on the Sand Island shore. Pass close to Sand Island, and fall into the range of the beacon with the trimmed tree on Cape Disappointment, and proceed as already directed.

The best time for entering is on the first or last of the *ebb tide.* The last of the ebb tide is preferable in either channel."

SHOALWATER BAY, &c.—The coast of Oregon between the Columbia River and Fuca Strait is rocky, much broken, and affords no harbours, except for very small vessels. It must, therefore, be considered as extremely dangerous, and particularly on account of its outlying rocks. The soundings however, will serve as a sure indication by which danger may be avoided, and safety can always be insured by not approaching the land into less than 70 fathoms. The bottom is regular, and increases almost gradually, until the depth of 90 fathoms is reached; but a short distance beyond that depth, and at about 15 miles from the land, the bank suddenly falls off, and no bottom is obtained with a line 200 or 250 fathoms long.

Shoalwater Bay, on the north side of Cape Disappointment, is merely a deep indentation in the coast, which, from its exposure to the N.W., can be of little use for the protection of vessels. It is surrounded by a low sand beach.

In about lat. 46° 40′ is Cape Shoalwater, and the shore, for about 15 miles to the southward of this, appears to be fringed with a dangerous reef. When sailing along this coast in April, 1792, Vancouver writes:—"The country now before us presented a most luxuriant landscape, and was probably not a little heightened in beauty by the weather that prevailed. The more interior parts were somewhat elevated, and agreeably diversified with hills, from which it gradually descended to the shore, and terminated in a sandy beach. The whole had the appearance of a continued forest, extending as far north as the eye could reach, which made me very solicitous to find a port in the vicinity of a country presenting so delightful a prospect of fertility; our attention was therefore earnestly directed to this object, but the sandy beach, bounded by breakers

extending three or four miles into the sea, seemed to be completely inaccessible, until about four in the afternoon, when the appearance of a tolerably good bay presented itself. For this we steered, in the hope of finding a division in the reef, through which, should admittance be gained, there was great reason to expect a well sheltered anchorage; but on approaching within two or three miles of the breakers, we found them produced by a compact reef, extending from a low projecting point of land along the shores to the southward, until they joined the beach to the north of Cape Disappointment. This projecting point is somewhat more elevated than the rest of the coast. Not a little disappointed, we resumed our route along the shores of this pleasant country. The projecting point, at six, bore by compass N. 10° E.; the centre of the bay, and the nearest part of the reef in a line, N. 69° E.; distant from the former about seven, and from the latter, about three miles. Immediately within the point, the interior country is more elevated than to the north or south of it; rising in gradual ascent to land of a moderate height. In respect of latitude, this point answered nearly to Mr. Mears's Cape Shoalwater; but, from his description of the adjacent country, it should rather appear to be his Low Point; and the bay we endeavoured to enter to the south of it, Shoalwater Bay; as in it there appeared two openings, the one taking a northerly, and the other an eastwardly direction. Mr. Mears likewise states:—"That, with their glasses, they traced the line of the coast to the south of Cape Shoalwater, which presented no opening that promised like a harbour;" those to the south of both these points flattered our expectations, until the breakers, extending across each of them, gave us reason to consider them inaccessible, and unworthy any loss of time whilst accompanied by so favourable a breeze. At sunset we again shortened sail, and as usual, hauled our wind to preserve our station until the morning. Our soundings were from 24 to 43 fathoms, dark brown sandy bottom. It was calm for a few hours during the evening and night, with a heavy fall of rain. The next morning, at four o'clock, with a light breeze at E.S.E., we again steered in for the land, and found that we had been materially affected by a northern current."

GRAY'S HARBOUR.—This harbour is 40 miles to the northward of the Columbia, and is situated at the entrance of the Chickeeles River. The points to the north and south are composed of low sand hills, and from both of these project sand-spits somewhat similar to those of the Columbia River. On the northern side is Eld's Island, with several hillocks, which appear as one from seaward. The channel is narrow, though deep, and is two miles in length. This harbour is easy to enter, the wind being usually fair, and it is only necessary to keep clear of the breakers on either side: but the same cause makes it very difficult to

depart from. The bay is capacious, but the extensive mud and sand banks confine the anchorages and channels to very small space. The land about it is low, with the exception of Brackenridge Bluff on the north, and Stearn's on the south. These are both covered with pines, the latter bearing S. 85° E., and on with the south side of Eld's Island, will lead into and through the channel.

Mr. Whidbey, in his report on this harbour, in 1792, stated that he thought it probable that the bar was a shifting one, there being a very apparent difference in the channel on their arrival and at their departure, when it appeared to have become much wider but less deep. A dry sand bank on the north side of the channel, near which they anchored the first evening, was then entirely washed away by the violence of the sea, which incessantly broke upon the shoals and bar. The surrounding shores of the harbour are low, and apparently swampy, with salt marshes; the soil is a thin mixture of red and white sand over a bed of stones and pebbles. At a short distance from the water side, the country is covered with wood, principally pines of a stunted growth.

Wood and water are at too great a distance to be easily procured, particularly the latter, which is found in small springs only, running through the sands near Point Hanson, the south side of the channel, at the distance of a mile from the landing place, over a very heavy sand.

This harbour was surveyed in 1841, by Commander Wilkes, who says:—"The tract of land bordering on the Chickeeles, below the mouth of the Sachap, and around Gray's Harbour, is of a poor description for cultivation. The spruce forest extends down to the water's edge, except in a few places around the harbour, where there are patches of salt marsh, which produce coarse grasses and cat's tail *(typha)*. The salt creeks into which the tides flow are generally very tortuous; and the meadows are occasionally overflowed at spring-tides. The only piece of land that appeared suitable for cultivation was immediately within the South Head, but this is of small extent. The coast, as far south as Cape Shoalwater, is no more than a smooth sandy beach, which rises in a gentle acclivity to a line of low sand hills.

Gray's Harbour seems to offer but few facilities for commercial purposes. The entrance is narrow, the width being from one-half to two-thirds of a mile, with dangerous breakers on both sides. The depth of water is from five to seven fathoms. The space, after entering, is extensive, but the greater part of it is filled up with mud-flats, which are bare at low water, and confine the harbour suitable for the anchorage of vessels to very small limits. The River Chickeeles, before entering the harbour, increases in width to several hundred feet, and is navigable for vessels drawing 12 feet of water, eight miles above its mouth. The harbour is only suitable for vessels of from 100 to 200 tons; and there are places

where such vessels may find security between the mud-shoals, some distance within the capes.

The tides here are irregular, and influenced by the winds and weather. The time of high water at full and change was found to be 11h. 30m.

Fogs prevail very frequently during the summer season. Our party remained at this place for 23 days, three-fourths of which time it blew a strong gale from either the south-west or north-west, accompanied with a dense fog that rendered it impossible to see further than half a mile.

The Indians in this part of the country are not numerous, and although some little difficulty was experienced with them on several occasions, yet upon the whole, they were found to be friendly. They live principally upon salmon, which, during the season, is taken in large quantities.

The coast between Gray's Harbour and Cape Shoalwater is bordered by sand-hills, behind which, from the Indians' account, there are lakes and streams of fresh water, in which plenty of beaver are found."

CAPE GRENVILLE.—At about 24 miles to the northward of Gray's Harbour, is a projection of the coast, named Cape Grenville, off which are three small rocky islets; one of them being perforated like that off Cape Lookout.

From Cape Grenville, the coast begins to rise regularly in height, and the inland country, behind the low land bordering on the sea shore, acquires a considerable degree of elevation. The shores, in passing, will be observed to differ in some respects from those to the southward. They are composed of low cliffs rising perpendicularly from a beach of sand or small stones, with many detached rocks of various remarkable forms lying at the distance of about a mile off. The soundings are regular of from 16 to 19 fathoms, soft sandy bottom.

In lat. 47° 37′ is an island, named Destruction Island, situated at a short distance from the land, which is by far the largest island on this coast. It is about a league in circuit, low, and nearly flat on the top, and presents a very barren aspect, as there are only one or two dwarf trees at each end. From its northern end some breakers extend a short distance.

Along this part of the coast there appears to be a current setting to the northward, at an uniform rate of nearly half a league per hour, as Vancouver remarks, that after passing Cape Orford he was carried further to the northward by 10 or 12 miles per day than he expected. He also observes, that in the vicinity of Destruction Island, the current or tide set him rapidly in-shore, so that he was obliged to anchor in a depth of 21 fathoms, on a bottom of soft sand and mud. This in-shore set of the

current was also experienced by Commander Wilkes, when he visited this part, in 1841.

The coast from Destruction Island continues to increase in height as you proceed to the northward. Off it there are many rocky islets and sunken rocks, extending in some places a league from the shore. Soon after passing the outermost of these rocks you will plainly distinguish Cape Classet, the south point of the entrance of Fuca Strait.

At about 18 miles to the southward of Cape Classet is Cape Flattery, off which are some rocks, named the Flattery Rocks, lying at a distance of four or five miles from the land. They are from 50 to 100 feet high, black, and pillar shaped.

Vancouver remarks, that soon after passing Destruction Island, "the most remarkable mountain on the coast now presented itself. Its summit, covered with eternal snow, was divided into a very elegant double fork, and rose conspicuously from a base of lofty mountains clothed in the same manner, which descended gradually to hills of a moderate height, and terminated in low cliffs falling perpendicularly on a sandy beach; off which were scattered many rocks and rocky islets of various forms and sizes. This was generally considered, though it was not confirmed by its latitude, to be the Mount Olympus of Mr. Mears; it being the only conspicuous mountain we had observed on the part of the coast we had visited."

CAPE CLASSET.—Cape Classet is a bold, projecting, and conspicuous promontory, thickly wooded. It is of moderate height, and in an easterly direction bears some resemblance to an island. At a short distance from the foot of the cape is a pinnacle-rock, of considerable height, named De Fuca's Pillar, which stands on the beach. Most of the rocks bordering this coast have this columnar shape; but this is said to be so conspicuous that it is singular that it escaped Vancouver's observation. His words are:—"We did not observe the Pinnacle Rock, as represented by Mr. Mears and Mr. Dalrymple, in order to identify these straits as those of De Fuca, or any other rock more conspicuous than thousands along the coast, varying in form and size; some conical, others with flat sides, flat tops, and almost every other shape that can be figured by the imagination."

Immediately off Cape Classet is a group of rocky islets, named Tatooche Islets, the largest of which is of an oblong shape, lying nearly in a N.W. and S.E. direction, about half a league in circuit, with a verdant and fertile appearance, but without trees; near this are some small white barren rocks, some sunken ones, and the islets generally present curious and romantic shapes. Vancouver remarks, that "on the east side of the larger island is a cove which nearly divides the island into two parts; the upper part of the cliff in the centre of the cove had the appearance of

having been separated by art for the protection or conveniency of the village there situated; and has a communication from cliff to cliff above the houses of the village by a bridge or causeway, over which the inhabitants of the village were seen passing and re-passing. On the beach were seen several canoes, and some of them would most probably have visited us, had we thought proper to shorten sail. This promontory (Cape Classet), though not generally elevated, rises very abruptly from the sea in steep barren cliffs; above these it seems well wooded."

It has been proposed to erect a lighthouse on the largest of the Tatooche Islands, which, to vessels bound from seaward, would be of great service, as it would enable them to enter the strait at all times, while at present, ships are frequently compelled to remain at sea till daylight. When once inside the strait, vessels are comparatively secure.

At about a mile to the N.N.W. of the Tatooche Islands is a dangerous rock, named the Duncan Rock, separated from the islands by a clear and navigable channel, in which are 30 to 40 fathoms water. It is just above the surface of the water (8 to 10 feet) at low spring tides, and over it the sea breaks with considerable violence. At three-quarters flood it is generally wholly covered. It was examined in 1847 by Capt. Kellet, and placed by him in lat. 48° 24′ 12″ N., and long. 124° 45′ 45″ W.

At one quarter of a mile N.N.W. from the Duncan Rock, is a dangerous patch of three fathoms, over which the sea breaks with great strength. Close to it all round is deep water, of 60 to 100 fathoms.*

It may be here remarked that Fuca Strait, as well as the coasts of Oregon and California, as far south as San Francisco, are subject to dense fogs during the months from October to April.

* Mr. G. J. Gibbon, R.N., when alluding to the supposed existence of this 3-fathom patch, says:—"From the whirling and broken water extending from the Duncan Rock, in a N.W. direction, fully half a mile, I am led to suspect the existence of a dangerous reef of rocks, and as the tide here trends to the southward of West, and runs at the rate of 3 to 5 miles an hour, influenced by the state of the weather, the force and direction of the wind, I should recommend all strangers bound into or out of the strait, to keep to the northward of the stream of it, until at least 4 or 5 miles east or west of its meridian; nor do I consider it advisable ever to pass between it (the Duncan Rock) and Classet Islands (Tatooche Islands) unless bound into or out of Neeah Bay, and then only with a good commanding breeze."

FUCA STRAIT AND PUGET SOUND.

THE Strait of Juan De Fuca, or, as it is now more generally termed, Fuca Strait, is the channel separating the south coast of Vancouver Island from Oregon. It is extensive, being 95 miles in length, with an average width of 11 miles; and may be safely navigated throughout, there being no dangers, except the Duncan Rock and 3-fathom patch, already mentioned, as situated near Cape Classet. The shores of the strait are bold; so bold, that in some places no bottom can be obtained, even within a boat's-length of the shore, with 60 fathoms of line. Anchorage is to be obtained in but few places; yet the north shore, in the eastern part of the strait, contains a few good harbours, which will be described in their proper place. The winds blow for the greater part of the year from the westward, and at times strongly.

Puget Sound, Hood's Canal, Admiralty Inlet, and the Archipelago of Haro, are at the eastern extremity of Fuca Strait, and cover an area of about 2000 miles. The whole is unsurpassed by any estuary in the world; and throughout, there are many fine harbours and anchorages entirely free from dangers. The country by which these waters are surrounded is remarkably salubrious, and offers every advantage for the accommodation of a vast commercial and military marine, with conveniencies for docks, and a great many sites for towns and cities. It is well adapted for agriculture, and capable of providing everything required. Water is in great abundance.

In the following description of Fuca Strait, we have availed ourselves of the remarks of Commander James Wood, R.N., contained in the Nautical Magazine for 1851, and of the observations of Commander Wilkes, U.S. Navy.

On the *southern shore* of Fuca Strait, there are generally soundings and anchorage sufficient to enable vessels to wait a tide all the way to Dungeness; also several bays which may be used for the same purpose, when beating either up or down. These are Neeah Bay close to Cape Classet, Callam Bay, Freshwater Bay, Port Angelos, and Dungeness Bay. From Dungeness Point to Wilson Point the coast line is more irregular,

and indented by two harbours, one of which has a very narrow entrance, but a considerable area of deep water inside; the other is Vancouver's Port Discovery, an extensive and secure harbour, having off its entrance a small island, named Protection Island. In most of these bays and harbours water of good quality may be obtained in sufficient quantities; indeed, throughout the strait this important article is easily procured.

Between Wilson Point and Partridge Point, on the opposite side, is the entrance to Admiralty Inlet, the channel leading to Puget Sound.

The *northern shore* of Fuca Strait, Vancouver's Island, is rocky, and composed of conglomerate and a reddish granite. On this side of the strait there is less shelter, the coast line being more rocky, less indented by bays, with the deep water in general running closer up to it, than on the southern side. The prevailing winds, also are from the southward of West, making it a lee shore; and the trend of the coast from Cape Classet being nearly south, leaves it open to the long and heavy south-west swell of the Pacific. This is experienced as far up as Sooke Bay, where the opposite shore affords protection, and from whence the coast begins to be more broken by bays and harbours.

On both sides of the strait the topographical features are nearly similar. The hills mostly rising from low sandstone cliffs at the water's edge, broken by numerous valleys, the sides of which are covered with dense forests of fir, oak, cedars, &c. On the southern side, they are terminated by the snowy peaks of the Mount Olympus range, where the hardy pines may still be seen forcing their way. Those on the northern side, though quite as precipitous, are not so high, showing no trace of snow in the summer months. After passing the Race Rocks, or Islets, where the strait opens into a great basin, the eastern horizon in clear weather is bounded by a snowy range of fantastic peaks, far above which, towers the immense white cone of Mount Baker.

Vancouver visited Fuca Strait in April 1792, and observes:—"The shores on each side of the strait are of a moderate height; and the delightful serenity of the weather permitted our seeing this inlet to great advantage. The shores on the south side are composed of low sandy cliffs, falling perpendicularly on beaches of sand or stones. From the top of these cliffy eminences, the land appeared to take a further gentle moderate ascent, and was entirely covered with trees, chiefly of the pine tribe, until the forest reached a range of high craggy mountains, which seemed to rise from the woodland country in a very abrupt manner, with a few scattered trees on their sterile sides, and their summits covered with snow. The northern shore did not appear quite so high; it rose more gradually from the sea side to the tops of the mountains, which had the appearance of a compact range, infinitely more uniform, and much less covered with snow than those on the southern side."

It may be here remarked that all the rocky shoals and dangers in these latitudes are well marked by kelp; indeed the kelp line, to a stranger, is in every instance the danger line, and should be avoided, for though it will sometimes show in a depth of even 40 fathoms, it is always indicative of the presence of rocks, and should not be ventured into unless well known.

CAPE CLASSET has already been mentioned. It is formed by a conical hill having several peaks covered with a forest of pines, &c. The sea face is very much broken into dark, rugged cliffs, probably of slate, with numerous high off-lying rocks, the principal of which are Tatooche Islets. It is said that when viewed on an E. by S. bearing, distant 12 miles, the cape appears like an island, high in the centre, with a gradual rounding slope from N.W. to S.E. Between the Tatooche Islets and the shore, there is a passage from rock to rock of two-fifths of a mile wide; but as it is so narrow, and has some sunken rocks in it, with a heavy swell at most times rolling through, it is needless to say it is unavailable. On the larger of the islets are some lodges belonging to the Indians of the Callam tribe.

From Cape Classet, the extreme point of which is fringed with low rocks, covered with kelp, the coast trends due East, three and a quarter miles, to Koikla Point, the western extreme of Neeah Bay. It continues to be faced by the bank of kelp-covered rocks, through which, in one part, there is a passage into a small bay, named Coe de Cabbet, where there is a village of the Classet Indians.

NEEAH BAY.—From Koikla Point, the land takes a sudden bend to the south-eastward, and, with Wyadda Island, forms Neeah Bay. From Koikla Point to Mee-na Point is S. 64° E., two miles. Wyadda Island, which lies N. 69° W., a quarter of a mile from the latter, contracts this width very much, but forms the principal shelter of the bay. It is a narrow island of slate rock, about a cable's-length across, and half a mile long, in the direction N. 30° W. and S. 30° E. From Koikla Point to its north-west extreme is S. 86° E., 1·4′; off this point a ledge of rocks extends in the same direction as the island, a cable's length from the cliff. The south-west, or inner face of the island, is fenced by a rocky bank which extends two cables' length from the shore, whilst the kelp and foul ground are found nearly as far again.

From Koikla Point, the shore of the main trends S. 23° E., one mile, when the cliffs give place to a fine sandy beach forming the bay; this portion of the shore is also faced by a low rocky flat, covered with kelp, continuing as far as the middle of the sandy beach. Close to the end of the cliffs is an Indian village, and the remains of the old abandoned Spanish settlement, which was formed here long ago. Near to it is a stream of good water, very convenient for the supply of shipping, as the kelp breaks the

swell which at all times rolls into the bay, and the beach is steep enough to allow the boats to lie close-to, except at the low water of spring tides. From this stream the beach makes a sweep to Mee-na Point, forming the bight of the bay, the land at the back being low and covered with forest. Mee-na Point has a village of the same name close to it. These villages are mostly deserted during the summer season, when the Indians are out fishing, or roving along the banks of the strait, in search of berries and the cammas-root, which forms the principal portion of their summer food.

From what has been said respecting the extent of the kelp, both from the main and the back of Wyadda, it will be seen that the space left clear for anchorage is not great; the best berth is with Koikla Point N. 51° W.; Wyadda Island, N.W. point, N. 39° E.; S.E. point N. 77° E. There is also anchorage in the channel between the island and the main, but it is very narrow and difficult to leave without a leading wind. There are three and a half to four fathoms in the best berths. It is high water, full and change, at 3 o'clock, the stream setting through the bay with the turn of the tide, but with little strength. When leaving the bay with light winds, care must be taken to allow for the set outside, as, at the entrance, the flood sets towards the rocky ledge off Wyadda Island, and the ebb, amongst the foul ground which lines the coast to the westward.

This bay does not by any means offer a secure anchorage, as the heavy swell which often prevails outside is much felt. It is also exposed to north-west winds, which bring in a heavy sea, and are much dreaded by the natives.

In 1841, this bay was visited by Commander Wilkes, who says:—"Neeah Harbour is but a small indentation in the coast, which is partly sheltered on the north east by Wyadda Island. It is the position where the Spaniards attempted to establish themselves in 1672, and which they called Port Nunez Goma. The remains of an old fort are still to be perceived, and some bricks were found that were supposed to have belonged to it. Water is to be obtained here in some quantity, and a small vessel would have no difficulty in getting enough. It offers a tolerably safe anchorage, though somewhat exposed to the north-west gales; yet by anchoring well in, which a small vessel may do, protection even from these gales might be had.

The ship, on anchoring, was surrounded by many canoes of the Classet Indians, who inhabit the country around Cape Classet. They were well disposed to trade, and were greatly surprised that so large a ship should want no furs, which were of several kinds: the sea-otter was that most prized, and held at very exorbitant prices, more than they could be bought for in the United States.

The Classet tribe of Indians is one of the most numerous on the coast that I had an opportunity of seeing, and seems the most intelligent.

These Indians wore small pieces of an iridescent muscle-shell, attached to the cartilage of their nose, which was, in some, of the size of a ten cents piece, and triangular in shape. It is generally kept in motion by their breathing. They had seldom any clothing, excepting a blanket; but a few, who have contrived to make friends with the visitors, have obtained some old clothes: while others seem to be in the pay of the Hudson's Bay Company. The principal articles of trade are tobacco, powder ('paulalee'), and leaden balls. These are preferred to most other merchandise, although more can be obtained for spirits than for any other article. This shows very conclusively, to my mind, the sort of trade that was carried on, when the Boston ships entered into rivalry with the North-west Company, for the purchase of furs.

It was reported to me, late in the afternoon, that a ball had been fired at some of the sailors engaged in surveying; but it did not do any damage, striking the beach some little distance from them. I did not think it worth while to make any enquiry or disturbance about this matter, and only mention the fact, to caution those who may hereafter visit this port, that it is necessary to be upon their guard.

At 2h. P.M., we got under way, with the *Porpoise* in company, and succeeded in making an offing before the fog enveloped us. These fogs are one of the greatest annoyances to vessels arriving on this coast; for in fine weather they are experienced almost daily, coming up with the sea breeze, they continue throughout the night, and until the sun has sufficient power the next day to dissipate them."

From Mee-na Point to Kydaka Point, the bearing is S. 61° E., 10¼ miles; the coast is mostly low cliff, covered with trees, and fringed with kelp-covered rocks. At two and a quarter miles west of Kydaka Point, these cliffs disappear, the above point forming the eastern horn of a bay, and having a ledge of rocks lying off it. This bay is open to the westward.

At one and a half mile to the eastward of Mee-na Point is the Klaholoh or Seal Rock, a singular white rock, 150 feet high, composed of sandstone. This rock shut in with the south-east end of Wyadda Island, clears the rocks off Koikla Point. At six and a half miles in the same direction, there is a remarkable white patch on the cliffs, caused by a ship having bared the sandstone. The soundings off this portion are regular, from five fathoms at the edge of the kelp out to 40 fathoms, one and a half mile off.

From Kydaka to Sekou Point, the bearing is S. 61° E., three miles; the coast is composed of broken cliff, with the deep soundings nearer to the shore.

CALLAM BAY.—Sekou Point forms the western extreme of Callam Bay, and bears from Slip Point N. 86° W., two miles, which

gives the bay a depth of three-fourths of a mile. It is too open to the north-west to afford good shelter, except from easterly winds, but it may be used as a stopping place for a tide. The soundings vary from 6 to 14 fathoms. A small river falls into the bay, and there are lodges both at its eastern and western sides; that at the eastern is called Hygèdith.

From Slip Point, off which a ledge of rocks extends, the coast trends S. 66° E., six and a half miles, it being one high rugged cliff, with the exception of a gorge, which connects a small bay at its eastern end with the bay beyond. It is faced by the usual rocks and kelp, the deep water approaching the rocks very close, not less than 40 to 50 fathoms being found a quarter of a mile from the cliffs.

From Pillar Point, which is so named from being formed by a high detached rock, the shore takes a sudden bend to the southward, forming a bay, the hills receding, and leaving a passage for a good sized river, the Canel, which disembogues itself in this bight, and has nearly filled up with sand banks its best sheltered or western portion. An Indian village, called Ketsoth, may be seen on the eastern side of the mouth of the stream, the inhabitants of which do not bear the best of characters, and have a most repulsive appearance. The distance from Pillar to Low Point is S. 74° E., 11¼ miles, the coast between being principally formed of broken wooded cliffs with small sandy bays between, into which numerous little streams run from the hills, which here rise at once from the beach. The soundings are not so deep off this portion, 33 to 38 fathoms being found two and a quarter miles from the shore, which is very flat and shallow, the kelp line extending in some places three-quarters of a mile out, amongst which, numerous patches of rocks show themselves at low water.

Low Point is a shingle spit, thrown out by the small River Lyre, and forms its mouth.

From Low Point to Tongue Point the bearing is N. 86° E., 4·9 miles. This part of the coast is even more broken, and the cliffs higher than those last described. It is divided into two portions by a very rugged broken point, 0·4 of a mile off which, is a sunken rock, on which the sea breaks at low water. This point is three and three-quarter miles from Low Point. To the westward of it the soundings are convenient for anchorage, but there is little or no shelter, and the coast is lined with rocks. To the eastward, is Crescent Bay, the western horn of which it forms.

CRESCENT BAY.—The entrance to Crescent Bay is contracted to a quarter of a mile off its western point, and has a rocky ledge extending a third of a mile off the eastern or Tongue Point. It is small, and of no depth; the soundings varying from three to six fathoms, and it affords shelter to none but very small craft or boats.

Tongue Point is formed by a spur of a conical hill which is a very prominent object when working either up or down the strait; if kept on with the north-west end of Wyadda Island, it will lead to the northward, clear of Duntze Rock and all the dangers to the westward of Neeah Bay. It is called Striped Peak, from a white stripe on its eastern face, where a land-slip has left the soil clear of trees. From this point to Observatory Point the bearing is S. 74° E., three miles. The coast is a rugged cliff, fringed with rocks, close to which the deep water approaches.

From Observatory Point to Angelos Point the bearing is East, three and a quarter miles, the coast between them forming a bay, one mile deep, called Freshwater Bay; this is clear, and tolerably well sheltered, having anchorage in from five to ten fathoms all over it. Good water may be had in the western bight. Off Observatory Point there is a small island, and some rocks. From the point the coast runs in nearly South, two-thirds of a mile, then S. 78° E., two and a quarter miles, when it makes a sudden bend to the north-eastward, and extends out one and a quarter mile to the point. The western half of the coast is cliff, with a sand and shingle beach; the eastern half is low, with a shingle beach.

Point Angelos has a beach of shingle and sand; it is a low and gradually rounding point, formed by the River Elwha, which at the time of the examination had two mouths, but as it runs for some distance close to the beach, it is likely that both the position and number of these entrances depend very much upon the melting of the snow, and from other sources of supply in the Angelos Valley, from whence this river flows. From Angelos Point, the hills recede, and leave a level space between them and the coast; from thence they rise suddenly to a great height, their summits capped with snow, even in summer, forming some of the highest peaks of the Mount Olympus range. The most conspicuous break is a deep and narrow valley abreast this point, called Angelos Valley, from whence, as before remarked, the River Elwha flows in a good sized stream, having sufficient water to admit our boats. The whole of this country is covered with fine wood, and abounds in deer and other game, but it is difficult to penetrate, from the underwood and fallen trees. There are several Indian lodges on and near the coast.

From Angelos Point to the commencement of Ediz Hook, the bearing is S. 72° E., 3·8 miles, the coast forming a slight curve or bay, the shores of which are alternately cliff and low ground. These cliffs are for the most part bare of trees, and form a good mark for pointing out the position of Port Angelos. The beach is mostly shingle. The soundings off this part extend some distance out, 30 fathoms being found nearly three miles off the bight of the bay. The tide runs

strongly here, and abreast the commencement of the Hook are several ripplings and overfalls, which are caused by the sudden fall of the lead from 9 to 30 fathoms; for here the bank terminates abruptly, and the deep water approaches close to the back of the shingle spit forming Port Angelos.

PORT ANGELOS.—Port Angelos is one of those singularly formed harbours and roadsteads which, under various modifications of size and shape, abound in the strait. It is formed by the long, narrow, and slightly curved shingle spit, called Ediz Hook, which extends N. 84° E., 2⅔ miles from the cliffs which form its base. It is only a few yards broad at high water for the greater part of its length, but, like all the rest, its outer extreme is broader, and has a rounded form. The curve is convex from the shore. At its base, or the apex of the inner water, there is a small, shallow lake, which communicates with the harbour by a narrow channel.

It may be remarked here that in every instance these spits are thrown out in the direction of the flood tide (stream), and it is probable that this is a rule which obtains in every part of the world, for wherever a shingle spit is thrown out, it generally takes the direction of the flood stream, let the prevailing winds be what they may. This circumstance may be a useful hint, in the construction of works for preventing the growth of shingle spits.

One of the most singular features of the spit just described is, that though so narrow, it has deep water close-to on both sides, 25 to 28 fathoms less than a hundred yards from the high water mark on the inside, whilst from 30 to 40 fathoms may be had at the same distance from the outside. From the commencement of the spit the cliffs recede, and leave a level space of no great width between them and the shore of the harbour. The rest of the coast of this port is composed of cliff and these flat spots alternately; the latter, where not overgrown with trees, are covered with wild oats and a strong grass. Several small streams fall into the bay, at any of which vessels may water, but all in the western or upper part of it are subject to the inconvenience of having a long flat in front of them at low water. The largest and best stream is a little to the eastward of the entrance of the harbour, and is therefore exposed to the swell, but in smooth water it may be used with advantage.

From the end of the spit to the main the breadth of the entrance is one and a half mile; but some rocky patches, having less than four fathoms on them, extend a quarter of a mile from the main, and reduce the available distance to little more than a mile; its depth is two and a quarter miles, and it affords anchorage in any depth from 5 to 20 fathoms all over it. It is defended from all winds but from E. to E.N.E., and even these may be avoided, by anchoring near the spit, whilst their force

and the sea they bring are much broken by Dungeness Point. There are three separate Indian lodges within the harbour, one at the upper or western end, another about the middle, the other a little to the eastward of the entrance. Captain Wood found these people civil, harmless, and disposed to barter their salmon, &c., which are obtained outside of the spit, where they seem to be plentiful.

When entering the harbour, care should be taken to allow for the strong tide which sweeps past the spit-head. This point, however, is steep, from 10 to 20 fathoms being found close to it. After clearing it, a vessel should haul at once up the harbour, to avoid the before-mentioned rocky patch, and anchor as convenient, observing that the water deepens from four fathoms close to the kelp off the main shore, to 25 or 28 fathoms close to the spit. The time of high water is 3h. 50m. P.M., full and change, with a rise of tide of eight feet.

From Ediz Hook to Dungeness Point the bearing is N. 78° E., twelve and a quarter miles, being a chord of a large but not a deep bay. From the lodges abreast the entrance to Green Point the bearing is N. 85° E., four and three quarters miles; this coast is composed of high sandstone cliffs, mostly bare. With reference to the before-mentioned mark for recognising the position of Port Angelos, it will be seen that the cliffs on both sides are bare of trees, and composed of the same white sandstone; whilst those within the harbour are nearly covered with trees, and thus form a dark break or interval in the white line of cliff, which is easily distinguished from seaward. Two miles from the lodges there is a break in the cliff, where the small river or brook before-mentioned finds its way to the beach, with another Indian lodge close to it. The beach is mostly shingle and sand, but at low water the flat portion as well as all the salient points are found to consist of boulder stones; this is particularly the case at Green Point, where another small stream runs out, and a break in the cliff affords access to the country by means of a narrow valley. From Green Point to the bight or turn of the bay, which is marked by another break in the cliff, the bearing is N. 86° E., two and a half miles; this part of the coast makes a sweep or bend, and is formed of the same high and inaccessible sandstone cliffs, as before described, and it may be remarked here that they preserve this character all the way to the turn of the Dungeness cliffs, having but one break in them.

At high water spring tides, the sea washes the foot of them, but as the water recedes, a road is formed by the fine sandy beach, which both the Indians and wild animals prefer to forcing their way through the thick forest above them. At one and a half mile, N. 78° E., from Green Point, and half a mile from the beach, lies a sunken rock, having only 11 feet on it at low water, but six to ten fathoms all round; it is well marked by kelp, and only lies in the way of vessels working up under the lee of

Dungeness. From the before-mentioned bight or break in the cliff, the coast runs N. 46° E., for four and a half miles; of this only two miles are cliff, for they then make a sudden bend to east, for two and a quarter miles, forming the base of the long, curved, Dungeness spit, which commences at the spot where they turn, and where they become less steep, and are clothed with trees. From the termination of the above straight line, the spit sweeps round, and runs N. 72° E., one and a half mile, to the point. The whole of this spit is composed of shingle and sand, and is very narrow, except at the northern apex of the interior lake, where the junction of the inner and outer coast lines forms a broader and higher belt. With this exception, when the tides are high and a strong westerly wind is blowing, the sea washes over the whole of it, covering its summit with abundance of drift wood, amongst which are some very large trees.

Within the line connecting the two points Ediz Hook and Dungeness, the soundings are regular, from 18 to 25 fathoms into five to three fathoms, at a quarter of a mile from the beach. Outside the line the soundings increase very gradually to 80 or 90 fathoms, but abreast the turn in the spit the deep water approaches very close, and continues to do so up to the shoal that runs out off the end of it, as much as 50 fathoms being found less than one-third of a mile from the beach.

In easterly winds, anchorage may be had in this bay, but it is too much exposed to westerly and north-westerly winds to be recommended.

From the extreme end of Dungeness Point, a shoal extends N. 41° E., one mile, having only two fathoms over it at low water spring tides. It is narrow, but very steep, the lead falling at once from five or six fathoms into 20 to 50 fathoms. In hauling round the point, either going in or coming out, care should be taken to give this a clear berth, as the tide sets over it with considerable strength, causing a strong over-fall, and in bad weather a very nasty sea.

DUNGENESS BAY is formed by the spit just described, and encloses a large space available for anchorage, where shelter may be found from any winds, from North round by the west to S.E., in from five to ten fathoms, even with the wind at south-east. The land round Port Discovery and Protection Island is so near that very little sea could be felt till it got to East. The bottom is stiff mud, forming very tenacious holding-ground, and but little tide is felt. There is very good water to be had in a cove at the bottom of the bay close to the entrance of the lagoon. At low water, however, the flat which fills up this bight and extends some distance out would be a great hindrance to a watering-party. When going either up or down the strait, this is a more convenient place to wait for tide or daylight than Port Discovery, or the anchorage under Protection Island, being more easy both of access and egress, and having less depth of water.

The outside of the spit has been described; the inside is precisely similar, except that of the beach, which shoals off very gradually, leaving a mud flat, narrow towards the point, but gradually widening as it sweeps into the bight of the bay, where it extends three-quarters of a mile off the shore, and is mostly dry at low water springs, leaving, however, a very narrow channel into the lagoon. From the spot where the lagoon commences, the beach lies S. 22° W., for rather more than a mile, when it is terminated by its entrance. The spit is of the same character as that outside, but narrower and not so high. The entrance to the lake is small and choked with shoals, but at high water a small vessel may enter, and find sufficient depth within to float her at low water. The Hudson's Bay Company's schooner *Cadboro* did this, and both traded and watered; but it could only be done at spring tides, and is not to be recommended. The southern side of the entrance is formed by two points or spits, the inner one of which runs out from the east end of the cliff before-mentioned, and overlaps the North Spit. The outer point is the end of a spit of shingle which forms the commencement of the beach that runs to the eastward and makes the coast line in that direction.

It has been recommended to build a lighthouse on Dungeness Point, and Lieutenant McArthur, U.S. Navy, says: — "I have carefully examined the roadstead of New Dungeness, and find it to be safe and capacious. The holding-ground is excellent, and it is well protected from all winds except those from the N.E.; a quarter from which it seldom or never blows so hard as to endanger shipping. The ingress and egress are remarkably convenient. A point, two and a quarter miles in length, extends from the main land, and completely shelters the anchorage from the strong and prevalent north-west winds. This point is quite low and narrow, and not discernible at night. On the extremity of this point I would recommend a lighthouse of the first power to be built; the shaft to be not less that 80 feet in height. Thus situated, it would guard navigators against the spit, as well as point out the anchorage. The entrance is entirely clear; but, as the profile of the bottom is so precipitous, I would advise navigators to come to an anchor in not less than 10 or 13 fathoms water."

Commander Wilkes observes that a vessel may approach Dungeness Point to within a quarter of a mile, and after rounding it, safe and secure anchorage may be obtained, in from 10 to 15 fathoms water, in a roadstead sufficiently capacious to accommodate a very large fleet. Abundance of wood, water, and fine fish may be obtained.

The following is by Mr. G. J. Gibbon, R.N., of H. M. sloop *Modeste*, in 1844:—

"I would recommend all strangers when bound into Fuca Strait, after they have made both capes, to get into a mid-channel course,

steering about E. ½ S., until the centre of Classet Island bears anything to the westward of S.S.W., then an E ½ N. course will take you up off Rocky Point (which is the most south-eastward projection of Vancouver Island, and has off it many rocks above water; the largest of them is about the size of the hull of a ship of about 200 tons, and is the southern most of the whole group), and sufficiently to the northward to clear the shelving ground off False and New Dungeness. Should you be bound for Port Victoria, and from the direction of the wind have to borrow on the north shore, be sure to give these rocks a berth of at least half a mile, for the tide runs here very strong and irregular. From the outer or southern rock, the mouth of Victoria bears N.N.E. ¼ E., about 11½ miles distant. It has a dangerous rock lying off it, covered with only 11 feet of water, and bears from the south-eastern point of the harbour about south, 500 fathoms. I know of no good anchorage without the harbour, the land being steep-to, and bottom rocky. H.M. sloop *Modeste*, in September, 1844, anchored in 35 fathoms water, about a mile S. ½ E. from the mouth of the harbour, and N.N.E. ½ E. from Rocky Point.

Being abreast of Rocky Point, and bound for New Dungeness, steer S.E. ½ E. to S.E. by E., depending on the direction of the wind and the set of the tide, and having reached within sight of the Ness (being the eastern end of a remarkable belt of pine trees which extends the whole length of the southern side of Dungeness Bay), bear a little to the southward of S.S.E., which will clear you of a long shelving spit of sand, extending about three-quarters of a mile to the northward from the extreme point of Dungeness Spit, over which the tide runs strongly, and produces a dangerous race for boats. Run on that bearing until within the bay, and when you have brought the extreme point of Dungeness Spit to bear from N. by W. to N. ½ W., you may then haul up for the head of the bay, and anchor in any depth, from seven to four fathoms, good tough holding-ground.

The best position for a small vessel to anchor in is, about a quarter of a mile from the north side of the bay, with the extreme point of the sandy spit bearing from N.N.E. to N.E. in from five to four fathoms water.

There is excellent water to be had from a small river in the south-west part of the bay, where you can enter your boats at half-tide, and fill the casks in the boat. Potatoes, salmon, and a great variety of fish are brought by Indians to barter for clothes. Whale and salmon oils are also offered in small quantities.

The natives are not unlike those at Cape Classet; the men have a wild and savage aspect, are of the middle stature, somewhat robust, and their complexion tawny; while their only covering is a small plaited grass-fringed apron round their loins. The women present a soft and mild appearance, and are not of an uninteresting complexion; they have a pleasing manner of articulating words of their language, and were it not for the deformity of

the upper part of their heads, which are flattened when infants, they would be symmetrically formed. They are blessed with a bewitching risibility of expression, which is seldom displayed with more becoming modesty by an enlightened race. Their dress is simply a fringed belt, made from the fibres of the inner part of bark of the white cedar, worn round the loins.

The climate, I think, is in no way insalubrious, at any season of the year. The distant country is exceedingly mountainous, many of the highest peaks, Mount Baker especially, being capped with perpetual snow; whilst there are many extensive plains, clad with exuberant pasture, where numerous herds of elk and deer are found. The dense forests of pine, cedar, oak, yew, maple, poplar, ash, willow, alder, elder, and hazel, are the abiding places of the bear, panther, wolf, fox, racoon, lynx, and squirrel; whilst the lakes abound with wild-fowl, swans, geese, ducks, seals, &c., and, in season, the swamps and marshes afford cover for snipe and plover.

It is in the lakes of the high land where the sagacious beaver builds its huge dam with such adroitness and skill, so that its instinct would seem to surpass the genius of man himself."

BUDD'S HARBOUR.—At about 6 miles to the southward of Dungeness Point is Budd's Harbour, the entrance to which is by a narrow channel of two and a half fathoms water, but which may be easily deepened should it be necessary. It is a fine and very capacious harbour, being four miles long, and one and a half mile wide, and perfectly secure at all times for repairs. When inside there is a depth of from 10 to 15 fathoms, shoaling gradually as you approach the head of the harbour.

PORT DISCOVERY.—The entrance to this port is about seven miles to the south-eastward of Dungeness Point. It is a harbour easy of access, and affords good protection; but the depth of water and the high precipitous banks will almost preclude its being made the seat of a settlement. The anchorage is close to the shore in 27 fathoms water. The extent of the harbour is about seven and a half miles, with an average width of one and a half mile, and its points, which terminate in low sandy projections, interlock each other. At the head of the harbour is a small stream which has its rise at some distance in the country: there is also a small stream on the western shore, five miles from the entrance, the outfall of which is through one of the low spits of sand constituting most of the projecting points of the inlet.

Vancouver remarks that "these projecting points usually acquire a form somewhat circular, though irregular; and, in general, are nearly steep-to, extending from the cliffy woodland country, from 100 to 600 yards towards the water's edge, and are composed of a loose sandy soil. The surface of some was almost entirely occupied by a lagoon of salt water, or brackish swamp; others were perfectly dry; no one of them

produced any trees; but were mostly covered with a coarse spiry grass, interspersed with strawberries, two or three species of clover, samphire, and a great variety of other small plants, some of which bore very beautiful flowers. On a few of the points were some shrubs that seemed to thrive excessively, such as roses, a species of sweet-briar, gooseberries, raspberries, currants, and other small bushes, which, in their respective seasons, produce most probably the several fruits common to this and the opposite side of America. These all appeared to grow very luxuriantly; and, from the quantity of blossoms with which they were loaded, there was great reason to believe them very productive.

We had little trouble in clearing a sufficient space for our encampment, which was very commodiously situated, close to the north side of the stream or brook. In my excursion up the harbour, I found that it extended about four miles from the ship, and then terminated in a muddy flat across its head, about a quarter of a mile from the shore. The water, which was seven fathoms deep close to the flat, gradually deepened to 10, 20, and 30 fathoms, good holding-ground. On this bank were found some small indifferent oysters. The shores beyond it are low and thickly wooded, and through them there appeared to run a very considerable stream of water, with several smaller ones, emptying themselves into the harbour. The back country had the appearance of a swampy fen for a considerable distance. We landed not far from the largest rivulet, where we found a deserted village, capable of containing about 100 inhabitants."

If Port Discovery lies under any disadvantage it is its great depth of water; but the bottom is excellent holding-ground, and free from rocks. Towards the upper part of the harbour it decreases in depth, and there is perhaps not a more eligible spot for riding than off the first low sandy point on the western shore, about four and a half miles from the entrance; here Vancouver anchored, and obtained supplies of wood and water. The country in the neighbourhood of the port is of a moderate height, although bounded on the west side by mountains covered with snow, to which the land from the water's edge rises, in a pleasing diversity, by hills of gradual ascent. The snow on these hills probably dissolves as the summer advances, for pine trees are produced on their very summits. On the sea shore the land generally terminates in low sandy cliffs; though in some spaces of considerable extent it runs nearly level from high water mark. There are few places where the variety and beauty of the flowers are so great as they are here; the general character of the soil around this harbour is a thin, black, vegetable mould, with a substratum of sand and gravel. The vigour and luxuriance of its productions prove it to be a rich fertile mould, which might possibly be considerably improved by the addition of the calcareous matter contained in the marrow-stone that presents itself in many places. The trees grow so closely, that in some

places the woods are almost impenetrable. The timber consists principally of pine, fir, and spruce. Of the latter there are two species, one of which resembles the hemlock-spruce of the United States: it has a very tall growth, and puts out but few, and those but small lateral branches. Some maple-trees grow in the open ground and on the banks, but they are too small to be of any service to the settler.

The Indians in the vicinity of Port Discovery are of the Callam tribe. They occupy a few miserable lodges on one of the points, and are a most filthy race, so much so, that the appearance of their lodges is absolutely disgusting.

Before the entrance of Port Discovery, is a small island, named Protection Island, which is about one mile in extent, and has a reef of rocks extending off the east and west ends. It is separated from the points of Port Discovery by a channel, one and a quarter mile wide, in which there is a depth of water of from 50 to 60 fathoms. Had this island been located by the most able engineer, it could not have been placed more happily for the protection of the port, not only from the N.W. winds, to the violence of which it would otherwise be greatly exposed, but against all attempts of an enemy, when properly fortified; hence it has been well named Protection Island.

Port Discovery was visited in 1841, by Commander Wilkes, who remarks:—" After passing Protection Island, an extensive bay opened, on whose shores we saw the long poles mentioned by Vancouver, and represented in his book. The use of these he was unable to discover, but the Indians informed us that they were for the purpose of suspending nets for taking the wild-fowl that frequent these shores in great numbers. On these poles the nets are set up at night, at which time the geese search these grounds for food: fires are then lighted, which alarm the birds, and cause them to fly against the nets, by which they are thrown upon the ground, where, before they have time to recover themselves, they are caught and killed.

The description of Vancouver is so exactly applicable to the present state of this port, that it was difficult to believe that almost half a century had elapsed since it was written. The beautiful woods and lawns of Protection Island, in particular, exist unchanged. The lawns still produce the same beautiful flowers and shrubs, and though closely surrounded by dense woods, do not seem to have been encroached upon by their luxuriant growth, although there is no apparent reason why it should not, long ere this, have overrun them.

The name of Port Discovery was given by Vancouver. Protection Island covers it completely to the north, and would render it easily defensive against the most formidable attack. The only objection to it as a harbour is the great depth of the water, which in the middle is

nowhere less than 40 or 50 fathoms, and is often as much as 16 fathoms close to the shore.

There is no permanent settlement of Indians at Port Discovery, and during our stay we had visitors from the various neighbouring tribes. The two sexes of all who visited us were dressed almost alike, and can hardly be distinguished in external appearance from each other: both wear their hair long, and both are equally dirty. All the adults have their heads much flattened, which appears to be performed, as it is among the more southern tribes, by compressing the frontal and occipital bones by several thicknesses of bark, until they become set, and the head takes a permanent shape. Their children seem to give them but little trouble; in their infancy they are tied to a piece of bark, which is hung to a tree or pole, where it is kept in motion by a string fastened to the toe of the mother. These Indians appear to have but few of the comforts, and barely the necessaries of life. They live principally on fish, shell-fish, the cammas-root, and potatoes. They have muskets and bows and arrows; the bows are short and small, but possess great strength, and are made of yew: their arrows are pointed with iron or bone."

At six and a half miles to the eastward of Protection Island is Point Wilson, the western side of the entrance to Admiralty Inlet.

PORT SAN JUAN.—The first bay on the north side of Fuca Strait, when entering from the westward, is Port San Juan, which is nearly opposite Cape Classet, and is a fine deep harbour, but open to the south-west, and exposed to the full effect of both wind and swell. It is about three and three-quarter miles in breadth in a N.N.W. direction, and one and a half mile broad, and has soundings over it of 8 to 10 fathoms, decreasing to four and three at the head of the bay. Its western side has some rocks, awash, lying off it some little distance; and there are also some ledges, named the Hammond and Observatory Rocks, off the eastern side of the bay; but you may avoid all these rocks by keeping as much as possible in mid-channel. The River Gordon falls into the head of the bay on the north side, and on the south side is Cooper's Inlet; both these are shallow, but supply fresh water. The Observatory Rocks, on the east side of the entrance, are in lat. 48° 31′ 30″ N., and long. 124° 28′ 15″ W., according to the observations of Captain Kellett, R.N., in 1847. Variation 21° E.

From Port San Juan the coast runs in nearly an unbroken line, 22½ miles, in an East direction, to Sherringham Point, and is high with deep soundings a short distance off. At seven miles from Port San Juan is the River Sombrio, close to which is a reef of rocks, and 10 miles farther is the River Jordan; both these rivers are small streams. At four miles from Sherringham Point is Point Otter, three and a half miles beyond which is Sooke Inlet.

SOOKE INLET.—This is a narrow channel, three and a half miles long, leading into a wide basin two miles in extent, which is perfectly landlocked, and has a depth of 10 to 15 fathoms. Sooke Inlet is difficult to navigate, on account of its winding direction. On its northern side the water is shallow, and sends off several spits of shingle, one of which joins Whiffin Island, so that the entrance is limited to a few yards in width. The depth is from three to nine fathoms, and the safest course appears to be to keep along the eastern side; but it is not recommended to attempt this inlet without a pilot.

On the eastern side of Sooke Inlet, and just off the coast, is Secretary Island, a small, but bold rocky islet, separated from the shore by soundings of 15 to 16 fathoms; it lies in lat. 48° 19′ 30″ N., and long. 123° 42′ 40″ W., and has from 80 to 90 fathoms at one and a half mile to the southward of it. At nearly three miles to the eastward of Secretary Island is Beechey Head, the western side of the entrance to Becher Bay. This bay is about one and a half mile in extent, but, although possessing a depth of water of from 9 to 15 fathoms, it is too exposed to the southward to be of much use. In it are Frazer and Wolfe Islands, but as there are several rocks scattered about, it must not be attempted without a pilot. Beechey Head is estimated to be in lat. 48° 18′ 30″ N., and long. 123° 39′ 27″ W.

From Smyth Head, the eastern point of Becher Bay, the distance to Cape Church is about one mile in a W.S.W. direction; near Smyth Head are the Bedford Islands, and off Cape Church are Church and several other islets. From hence the distance to Cape Christopher, the most southern point of Vancouver Island, is about one mile in an E.N.E. direction, and the coast then turns to the northward, one and a half mile to Cape Calver, the southern point of Pedder Bay.

Between Capes Christopher and Calver is Bentinck Island with several islets and rocks about it, and at one mile to the south-westward of this island are the Race Islets or Rocks, which are steep-to, having deep water in their immediate vicinity.

PEDDER BAY.—From Bentinck Island the coast takes an abrupt turn to the northward, forming several bays and harbours; the hills, also, recede here from the coast line, leaving a more level country. The first is a long narrow inlet called Pedder Bay, the northern point of which forms a cove, well sheltered from all but south-easterly winds, having good anchorage, and being convenient for awaiting the turn of the tide off the Race Rocks. The north-east side of the bay is William Head, separating it from Parry Head, the north limit of which is Albert Head, three and a quarter miles farther to the northward.

ROYAL BAY.—This is an extensive bay to the northward of Albert Head, in which there is good and safe anchorage. At the bottom, or

north-east corner of the bay, is the entrance to Esquimalt Harbour, a safe and excellent port. From Sailor Point, forming the eastern extreme of Royal Bay, the coast trends to the eastward again, also forming the western point of the entrance into Port Victoria, a narrow, intricate, as well as shallow harbour; but which, though so small, the Hudson's Bay Company have selected as the site of their establishment, from the superior nature of the adjacent soil. Amongst its other disadvantages, there lies off the entrance a dangerous patch of rocks, called Brotchy Ledge, with two feet water over it.

ESQUIMALT HARBOUR.—The entrance to this harbour, as before-stated, lies at the north-east corner of Royal Bay, and is about one-quarter of a mile wide, passing between Duntze Head on the east, and Fishguard Island, off Rodd Point, on the west. A depth of from eight to nine fathoms will be found in the entrance, but gradually a lesser depth as you proceed inwards. On the eastern side of the harbour lies Village Bay, having a depth of from five to six fathoms, in the eastern portion of which are some rocks, named the Village Rocks. Esquimalt Harbour runs inland about two miles, in a north-westerly direction from the entrance, but it is contracted by the Inskip Islands, at three-quarters of a mile due West, from which is a rock in mid-channel having only 10 feet water on it.

For about one hundred yards off Fishguard Island the water is shoal, and to the southward of Duntze Head, which is bold-to, are some islets, named the Brothers, off which are the Scrogg Rocks, some sunken rocks which extend 150 yards, the outermost being S. by E., one-third of a mile, from Duntze Head.

VICTORIA HARBOUR.—In this harbour is the most important settlement of the Hudson's Bay Company in Vancouver's Island. It was established in 1842, and it is probable that the establishment at Fort Vancouver on the Columbia River may, after a few years, be removed to it. The country in the immediate vicinity of the harbour is highly fertile, and said to be well adapted to either tillage or pasture. It is well wooded, and produces abundance of grass and clover. Water, also, is very abundant.

The entrance to Port Victoria is rendered somewhat difficult by a bar which stretches across, but when inside, the depth increases to two and a half and three fathoms. It is said that buoys have been placed on all the shoal patches, but it is not advisable for strangers to attempt to run in without a pilot. The settlement is about three-quarters of a mile within the entrance, where are a fort and the requisite buildings for trading.

There is a dangerous shoal, named Brotchy Ledge, lying about a mile to the south-eastward of the entrance of the harbour, at half a mile from

the eastern shore. On one spot there are only two or three feet water, and as immediately around it are 14 to 20 fathoms, with eight fathoms between it and the eastern shore, it is highly dangerous. Two beacons have lately been established on the shore side, for the purpose of marking its situation; one of these is on a small hill, hence named Mount Beacon. If these beacons are brought in one, they will lead over the ledge.

It is said that since 1846 considerable additions have been made to the buildings at Victoria, and the stockade now includes all the goods stores, and extends 450 feet by 330. The dairy also has been much improved, and a breed of cattle introduced. Butter in considerable quantities is salted for exportation, as well as salmon; large quantities of which, as well as grain, are sent to the Sandwich Islands and Russian settlements to the northward. A good substantial wooden bridge has been thrown across the narrows above Victoria, and a road cut to a saw mill, now in the course of erection on a small stream that runs into the head of Esquimalt Harbour.

From Point Victoria, the coast to the eastward is low, and indented as far as Point Gonzales, off which are two small islands, named Trial Islands. From this point it trends northwards, forming a deep but rocky and shallow bay, called for this reason Shoal Bay, which is closed up by two low rocky islets, named Discovery and Chatham Islands, and by a bed of rocks named the Chain Rocks. The northern horn of this bay is named Cadboro Point, and behind it is a hill named Mount Tolme. From hence the coast of Vancouver Island runs to the north-westward, forming the western shore of Haro or Arro Strait.

SAILING DIRECTIONS.—When running in for Fuca Strait, two precautions must be observed. The first is that Cape Flattery does not, as is generally supposed, form the southern point of the entrance, but is a projection of no particular elevation, in lat. 48° 0·6′ N., and long. 124° 47′ W., or 17 miles to the southward of Cape Classet, which is the true southern extreme, and is situated in lat. 48° 23′ N. and long. 124° 44′ W.

The other is, to allow sufficiently for the usual southerly set, so as to keep in the parallel of 48° 28′, when the Strait will be well open, then make for the centre of it, as should the wind fall light, (as it mostly does at sun-set in fine weather,) before Neeah Bay can be reached, the vessel will probably be set by the ebb tide towards Duncan Rock, and its off-lying danger, Duntze Rock. These are to be provided against by all possible means, as this tide sets directly over towards them, the former being nearly covered at high water, and the latter having but two and a half or three fathoms over it, and occasionally a heavy sea breaking on it. There is also very deep water close to them; whilst farther to the north-

west, towards the Vancouver side, the kedge may be let go in from 40 to 60 fathoms.

Vessels from Neeah Bay, bound up the strait to Victoria, should shape a course to make the Race Islets or Rocks, bearing S. 84° E., 43 miles from the north point of Wyadda Island, and when one mile north of this point, an E. by S. course will lead one and a half mile to the southward of them. Having run that distance, they should then haul up for Royal Bay, as, unless about to enter Victoria or Esquimalt Harbour, this is the best anchorage.

As the winds are mostly from the westward, it is generally necessary to beat down; in which case vessels leaving Victoria or Royal Bay should start so as to be off the Race Rocks at the first of the ebb, but failing in this there is good anchorage and shelter in the cove at the south-west end of Parry Bay, where they may await the turn of the tide. By being off these rocks at the first of the ebb, the anchorages either in Sooke, Pillar, or Callam Bay, may be reached before the flood makes. When leaving either of these anchorages, it is advisable to keep on the southern shore, during the rest of the beat to Neeah Bay, which may generally be reached in one tide more.

When leaving Neeah Bay with an ebb tide, to beat out of the strait, care must be taken, as before remarked, to avoid being set towards the dangers off Tatooche Island.

It may be as well to remark here, that the current or tide stream within the strait seems to be affected by various causes, and is consequently subject to great irregularities. At springs there is generally a strong and tolerably regular set of the tidal stream, six hours each way, beginning on the shore rather sooner than in the offing, but at neaps the tides are not so regular, for, when beating down, Commander Wood passed through even three different streams, within as many miles of the land.

Between the points at the entrance, the current is affected by the coast stream which sets across them, the flood going to the northward, the ebb to the southward.

Between Point Angelos and the Race Rocks, the tide runs about three knots, especially off the latter, and must be allowed for when hauling round them for Victoria. Beyond this the tides are not so strong, but move rather slower through the great basin before mentioned, but even here, off all the points, such as Trial Islands, Point Wilson, Dungeness, &c., it runs very strong at springs, from two and a half to three knots.

Throughout the western portion of the strait, the stream follows the general direction of the coast, except, as before remarked, at the entrance, where both flood and ebb are more or less influenced by the coast stream.

Abreast of the Race Rocks the stream divides, the northern portion setting direct for Trial Islands, and so up the Haro Strait; the middle portion making a direct course for the entrance of the Rosario Strait; whilst the southern stream sets past Dungeness Point for Point Wilson, and so up Admiralty Inlet. Off each of these straits, or inlets, the main stream of ebb is more or less affected by the body of water poured into it, till, off the Race Rocks, they all unite and run parallel with the coast to the ocean.

It is high water, full and change, at Neeah Bay, at 3h. P.M.; at Port Angelos, at 3h. 50m. P.M., rise 8 feet; and at Victoria, 4h. P.M., rise 10 feet.

Admiralty Inlet, Puget Sound, and Haro Strait.

Admiralty Inlet is the inlet leading to Puget Sound. On the eastern side of the inlet, as well as at the head of Fuca Strait, and the waters within the Gulf of Haro, as far as Point Roberts, in lat. 49° N., there are many fine harbours and bays formed by the islands and projecting headlands. Some of these are more extensive than others, but they will all in time become places of resort for vessels. Situated on the east side, they are more accessible for trade than those on the peninsulas on the west side; and from having a larger area of country lying around them, susceptible of improvement, they must become more thickly and densely populated.

The archipelago, between Haro Strait and Ringgold's Channel, offers many fine anchorages. The islands composing it afford large quantities of sandstone and granite for building purposes, which, from its nearness to water transportation, may be easily taken to any locality within these waters. The Gulf of Georgia and Johnson Straits are not well adapted for navigation, in consequence of the rapidity of the tides, and the many sunken rocks at the northern outlet. The harbours within them, both on the main land and Vancouver's Island, are useless, on account of the great depth of water and the perpendicular banks.

The Narrows, which connect Admiralty Inlet with Puget Sound, are a mile in width and four and a half miles long; the tide here runs with great velocity, carrying a ship through with great rapidity, and at times not without danger. The banks rise nearly perpendicular, and are composed of sandstone; a great variety of shrubs grow along their base. This narrow pass seems as if intended by nature to afford every means for the defence of Puget Sound, and will no doubt be made use of when the country becomes more peopled. Point Defiance, on the east, commands all the approaches to it.

Puget Sound may be described as a collection of inlets, covering an

area of 15 square miles, the only entrance to which is through the Narrows, which, if strongly fortified, would bid defiance to any attack, and guard its entrance against any force.

The inlets, in the order in which they come from the entrance, have received the names of Carr's, Case's, Hammersley's, Totten's, Eld's, Budd's, and Henderson's; they are united by passages which form several islands and peninsulas. All these inlets are safe, commodious, and capacious harbours, well supplied with water, and the land around them is fertile. On many of the islands and peninsulas are to be found slate and sandstone, which, though soft and friable in some places where it has been exposed on the surface, will be found suitable for building purposes.

Nothing can exceed the beauty of these waters, and their safety. Not a shoal exists within the Strait of Fuca, Admiralty Inlet, Puget Sound, or Hood's Canal, that can in any way interrupt their navigation by a seventy-four gun ship.

The shores of all the inlets and bays are remarkably bold, so much more so, that in many places a ship's side would strike the shore before the keel would touch the ground. Some few of them have creeks running into them with water sufficient to turn mills. These creeks all have extensive mud-flats at their mouths, with fertile prairies at their heads and along their banks. The spring tides rise 18 feet, those of the neap 12 feet, affording every facility for the construction of dry-docks, &c.

The country on all these salt-water inlets is thought to be remarkably healthy; the winter is represented to be mild, and but of short duration, and the channels and harbours are never obstructed by ice.

ADMIRALTY INLET.—At the entrance of Admiralty Inlet, on the western side, is Port Townsend, a fine sheet of water, three and a quarter miles in length, by one and three-quarters in width. Near the head of the bay, on the western side, is an extensive table-land, free from wood, which would afford a good site for a town. The eastern side of the bay is formed by two islands, so that when within you lie nearly land-locked. This bay is free from dangers, there being all over it a depth of 10 to 15 fathoms, and it is well protected from the quarters whence stormy winds blow. It has anchorage of a convenient depth, and abundance of fresh water may be obtained. At the extreme west end of the bay there is a lodge of Indians (1841), and here the soil is a light sandy loam, apparently very productive, as it was covered with wild flowers, and strawberry plants in blossom. From this part of the bay Mount Baker is distinctly seen to the north-eastward, and forms a fine sight when its conical peak is illuminated by the setting sun.

Vancouver visited Port Townsend in 1792, and remarks:—"It proved to be a very safe and more capacious harbour than Port Discovery, and ren-

dered more pleasant by the high land being at a greater distance from the water side. Its soundings also give it a further advantage, being very regular from side to side, from 10 to 20 fathoms depth of water, good holding-ground; but with respect to fresh water, so far as we could determine by our transitory visits, it was very deficient."

The north-east point of Port Townsend is a high steep cliff formed of indurated clay, much resembling fuller's earth, and hence, named by Vancouver, Marrow-stone Point; it is the northern point of the outermost island on the east side of the bay. East of this cliff, the shore is extended, about a quarter of a mile, by one of the sandy projecting points so peculiar to Fuca Strait. The country on the eastern shore of the bay, as far as the eastern snowy range, presents a very luxuriant appearance; at its northern extremity is Mount Baker, and Mount Rainier also is clearly visible, bearing about N. 42° E.

At the southern extremity of the islands forming the eastern side of Port Townsend, is a small bay named Oak Cove, or Port Lawrence, in which there is a depth of 8 to 15 fathoms. It is situated just at the junction of Admiralty Inlet and Hood's Canal, and is separated from the head of Port Townsend only by a narrow strip of land. This is considered to be a very convenient anchorage.

Departing from Oak Cove, and following the western side of Admiralty Inlet, after sailing about five miles, you will reach Foulweather Bluff, a high perpendicular point, forming the western side of Hood's Canal, and separating it from the Inlet. This in some positions has the appearance of an island.

Soon after passing Foulweather Bluff you will reach a small cove, named Pilots' Cove; and soon after, another, named Apple-tree Cove, from the numbers of that tree which were in blossom around its shores at the time of the survey. This latter cove is about 10 miles from Foulweather Bluff, and, although but of small extent, it answers for a temporary anchorage; in it there are soundings of 3 to 10 fathoms.

About two miles south of Apple-tree Cove is Port Madison, a fine harbour, having a depth of 15 to 30 fathoms. It is about two miles in extent, and affords every possible convenience for shipping. Between this harbour and Port Orchard is a large island, named Bainbridge Island, which is separated from the shore by a narrow but deep channel, wide and deep enough to allow ships to pass to Port Orchard.

It has been remarked by Commander Wilkes that "the scenery of this portion of Admiralty Inlet resembles strongly parts of the Hudson River, particularly those about Poughkeepsie and above that place. The distant highlands, though much more lofty, reminded us of the Kaatskills. There were but few lodges of Indians seen on our way up; and the whole line of shore had the appearance of never having been disturbed by man.

PORT ORCHARD.—At about seven miles to the southward of Port Madison is Restoration Point, the south-eastern point of Bainbridge Island, and the northern point of the entrance to Port Orchard. Here Vancouver found that the tides were materially affected by the direction and force of the wind, not only in respect to their rise and fall, but as to the time of high water. The former seldom exceeded seven or eight feet, and the latter generally took place about 4h. 10m. after the moon had passed the meridian.

Port Orchard is one of the most extensive and beautiful of the many fine harbours in these inland waters, and is perfectly protected from the winds. It consists of two inner and an outer harbour. The former, although the entrance is by a strait not more than 200 yards wide, is from a half to one and a half mile in width, and extends for a distance of six miles. The water is deep enough for the largest class of vessels, with a bold shore, and good anchorage.

The only danger in Port Orchard is a reef of rocks nearly in the middle of the entrance from Admiralty Inlet. This port is very extensive, and surrounded by a large growth of trees, with here and there a small prairie covered by a verdant greensward, and with its honeysuckles and roses, when in bloom, resembling a well kept lawn. The soil is superior to that of most places around the sound, and is capable of yielding almost any kind of production. The woods are alive with squirrels, while tracks along the shore, and through the forest, show that the larger class of animals also are in the habit of frequenting them.

Commander Wilkes says :—" Port Orchard was found to communicate, on the north, with Port Madison, which we had surveyed on our way up the sound. Lieutenant Maury, with the boats, surveyed this passage, and found that it had a depth of four and a half fathoms at low tide. Near this passage is a place where the Roman Catholic Missionaries have established a station for teaching the surrounding tribes. A large cross is erected, and a building 172 feet long by 72 wide, which was found to contain many rude images. Many of the natives are capable of saying their prayers and telling their beads, and some were met with who could sing some Catholic hymns in their own language."

Vancouver writes on May 24th, 1792 :—" We found the entrance of the opening situated in the western corner of the cove, formed by two interlocking points about a quarter of a mile from each other ; these formed a channel about half a mile long, free from rocks or shoals, in which there was not less than five fathoms water. From the west end of this narrow channel the inlet is divided into two branches, one extending to the S.W. about five or six miles, the other to the north about the same distance, constituting a most complete and excellent port, to all appearance perfectly free from danger, with regular soundings, from four fathoms near the shores

to nine and 10 fathoms in the middle, good holding-ground. It occupied us the whole day to row round it, in doing which we met a few straggling Indians, whose condition seemed excessively wretched and miserable. The country which surrounds this harbour varies in its elevation; in some places the shores are low level land, in others of a moderate height, falling in steep low cliffs on the sandy beach which in most places binds the shores. It produces some small rivulets of water, is thickly wooded with trees, mostly of the pine tribe, and with some variety of shrubs. This harbour, after the gentleman who discovered it, obtained the name of Port Orchard. The best passage into it is found by steering from the village point for the south point of the cove, which is easily distinguished, lying from the former S. 62° W., at the distance of about two and a half miles, then hauling to the N.W. into the cove, keeping on the port or S.W. shore, and passing between it and the rocks in the cove; in this channel the depth of water is from 9 to 15 fathoms, gradually decreasing to five fathoms in the entrance into the port. There is also another passage round to the north of these rocks, in which there are seven fathoms water; this is narrow, and by no means so commodious to navigate as the southern channel."

Immediately opposite the southern entrance of Port Orchard there is a small island; and beyond this are two islands, named Vashon Islands, which occupy a space of about ten miles, and have soundings of two to nine fathoms between them. On either side of these islands is deep water of 40 to 60 fathoms; but the best passage is considered to be the western one.

At the bottom of Admiralty Inlet, in the East Channel, there is a small bay, named Commencement Bay, which affords good temporary anchorage, and a supply of wood and water. A rivulet empties into it, named by the Indians, Puyallup, at the entrance to which there is a delta, but none of the branches into which it is divided are large enough for a boat. The Indians in the vicinity are described as being very filthy.

PUGET SOUND.—At two miles from the south end of Vashon Island is the entrance to the Narrows, a narrow channel four and a half miles long, connecting Admiralty Inlet with Puget Sound. The banks on either side are very lofty, and have deep water close-to.

Puget Sound is very extensive, and contains many islets and inlets. Its shores are very fertile, and, enjoying a fine climate, it is likely in future years to be of considerable importance. Throughout its extent there is deep water, and but few if any dangers besides what show.

Puget Sound was visited in 1841 by Commander Wilkes, who thus describes the narrows, when entering the sound:—"We had great difficulty in getting beyond the reach of the eddy winds occasioned by the high banks. The scenery about this pass becomes very fine; on all sides

are high projecting bluffs of sandstone, rising almost perpendicularly from the water, with a great variety of shrubs along their base. The tide which runs through the Narrows with great velocity, causes many eddies and whirlpools, through which a ship is carried with extraordinary rapidity, while the danger seems to be imminent. The *Porpoise* succeeded in entering the Narrows first, and in a few minutes was lost sight of; the *Vincennes* entered, and seemed at first to be hurrying to destruction, with her sails quite aback. We were carried onward wholly by the force of the tide, and had backed and filled only once before we found ourselves in as spacious a sound as the one we had just left. This narrow pass seems as if intended by its natural facilities to afford every means for its perfect defence."

NISQUALLY.—This is the station of the Puget Sound Company, a company formed for the purpose of turning to advantage the agricultural capabilities of the southern part of Puget Sound. Although not ostensibly connected with the Hudson's Bay Company, yet it is in reality a branch of it, the shares being held by its officers, and the servants of the latter Company being employed in its service. The capital is about £500,000, divided into shares of £100 each; the operations of this Company are consequently extensive. They began by making large importations of stock from California, and some of the best breeds of cattle from England, and have now the supplying of all the forts and stations of the Hudson's Bay Company on the west side of the American continent; the Russian ports are also supplied by it with grain, butter, and cheese, in considerable quantities.

The country in the vicinity of Nisqually presents an inviting aspect, and, with the exception of some bluffs, is undulating, and covered with trees of the pine, white-oak, and arbutus kind. The soil of this forest-land is a thin brown stratum of sandy vegetable earth, with a sub-soil of clay and gravel; the latter having the appearance of being water-worn. These are succeeded by the tract of prairie-lands in the immediate vicinity of the station, which are valuable as pasture-lands for flocks of sheep and dairy-cows. These prairies have a very extensive range in a south-east direction, and are connected with the valley of the Cowlitz, on the south, towards the Cascade Mountains; over them in various parts are strips of forests. Within this district are numerous ponds or lakes, surrounded by rich meadow-land, which latter furnishes luxuriant crops of nourishing herbage. No part of Oregon is better adapted for dairy purposes than this; and wheat, rye, barley, oats, &c., come to perfection.

Nisqually is about nine miles from the Narrows. The anchorage off it is very contracted, in consequence of the rapid shelving of the bank, which soon drops off into deep water, so that only a few vessels can be accom-

modated. The shore rises abruptly to a height of about 200 feet, and on the top of the ascent is an extended plain, covered with pine, oak, and ash trees, scattered here and there, so as to give the plain a park-like appearance. The hill side is mounted by a well-constructed road of easy ascent. From the summit of the road the view is beautiful over the sound and its many islands, with Mount Olympus covered with snow for back-ground. Fort Nisqually, with its outbuildings and enclosure, stands back about half a mile from the edge of the table-land. It is constructed of pickets, enclosing a space of about 200 feet square, with a bastion at each corner. Within this enclosure are the agent's stores, and about half a dozen houses, built of logs and roofed with bark. Its locality is considered to be badly chosen, on account of the difficulty of obtaining water, which has to be brought a distance of nearly a mile.

In the garden at Nisqually, on the 12th of May, 1841, peas were a foot high; strawberries and gooseberries in full bloom, and some of the former nearly ripe, with salad that had gone to seed, three feet high and very thrifty.

The hill at Nisqually is an insuperable objection to the place ever becoming a deposit for merchandize, as it would very much increase the labour and expense of transportation. Water, however, can be obtained for vessels with great ease, from a small stream that flows in abreast of the anchorage. The harbour is also exposed to the south-west winds.

Better sites than Nisqually, for the location of a town, are to be found in this neighbourhood. There is one, in particular, just within Kitron Island, about two and a half miles north of Nisqually anchorage, where the shore has a considerable indentation, and, although the water is deep, vessels would be partially protected from the S.W., S.E., and N.W. winds, which blow with great violence, and also from any sea. Water can be obtained with as much facility, and the hill is not so precipitous.

Commander Wilkes says:—" The spring tides were found to be 18 feet, those of the neaps 12 feet. High water, on the days of full and change, at 6h. 10m. P.M. During the whole of our stay there was found to be a great discrepancy between the day and night tides, the latter not rising as high as the former by two feet.

The country in the vicinity is thought to be remarkably healthy, and on all these salt-water inlets, the winter is represented to be mild, and but of short duration. The mean temperature, six feet under ground, during our stay at the observatory, from the 20th of May till the 14th of July, was found to be 58·5°. I was not fully satisfied that this record gave correct results for the mean temperature of the climate, although frosts do not penetrate the ground; for, by the same manner of trying it, and under almost the same circumstances, at Astoria, we obtained only 54°, although the place is a degree to the south of Nisqually. At Nis-

qually the greatest range of temperature was found to be 55°, the lowest, 37°; and the mean, during the same period, 63·87°: the barometer standing at 29·970 in.

The Indians round Nisqually are few in number, and the whole tribe does not amount to 200, including men, women, and children. They belong to the tribes who flatten their heads, and are represented as vicious, and exceedingly lazy, sleeping all day, and sitting up all night to gamble. So strong is the latter propensity among all these tribes, that it is said, that after parting with all their moveable property, they will go so far as to stake their wives and children, and lastly even themselves for years of slavery.

CASE INLET.—In the western part of Puget Sound are a number of inlets, the principal and largest of which is Case Inlet. It has a northwesterly direction, and runs to within two miles of Hood's Canal, a communication with which might easily be made. Between the nearest points of junction is a large pond, named Kellim or Kellmsu Lake. In Case Inlet are several large islands.

MOUNT RAINIER, &c.—From Puget Sound the high lands in the interior are distinctly visible; of these, the elevation of Mount Rainier has been determined to be 12,330 feet. The white summits of Mounts St. Helen's and Hood are very conspicuous, and resemble each other closely, appearing from some points of view as perfect cones. Mount Rainier is at all times a very striking object from the prairies about Nisqually, rising, as it does, almost imperceptibly from the plain, with a gradual slope, until the snow-line is reached, when the ascent becomes more precipitous. Since 1845 the craters on the tops of Mounts Rainier and St. Helen's have been in a state of activity. It is said that these mountains have never yet been ascended.

HOOD'S CANAL.—The entrance to Hood's Canal is on the western side of Foulweather Bluff, the point of land separating it from Admiralty Inlet, and lies in latitute about 47° 56′ N. The canal extends for a distance of nearly 40 miles, in a S.S.W. direction, and then turns to the N.E. for 10 miles, approaching Case Inlet in Puget Sound, as before stated. The average width of the canal is two miles, and in it are the good harbours of Ports Ludlow, Gamble, Suquamish, Scabock, and Daboq, of all which surveys have been made.

The banks of Hood's Canal, as far as Tskutska or Hazel Point, do not exceed 100 feet in height, and are formed of stratified clay, with a light gravelly soil above it, thickly covered with a species of pine. This is the character of the eastern shore for its whole extent; but the west and north shores above this point become more bold and rocky, with a deeper and richer soil, formed by the alluvial deposits from the Mount Olympus range.

Throughout the whole extent of Hood's Canal there is deep water of 40 to 50 and 60 fathoms, gradually decreasing in depth towards its extremity. It is in general too deep for anchoring; yet there are a few good harbours. The first harbour is on the western side, opposite Foulweather Bluff, and is named Port Ludlow; it is about one and a half mile in extent, and may afford occasional shelter. At three and a half miles farther up the inlet, on the same side, is what Vancouver at first supposed to be a high round island, but he afterwards found it attached to the main by a low neck which was partly sandy, but principally occupied by a salt-water swamp. Port Gamble lies on the opposite side of the canal, and has a narrow entrance between the kelp, which runs in two and a quarter miles, in a southerly direction. The canal hereabout runs S.W. ½ S., 14 miles, and is generally about one and a half mile wide; and in a south-westerly direction from the above island is situated Suquamish Harbour, off which lies a dry sand-bank. So scarce is the water in this part of the country, that no streams can be found, with the exception of a few falling into the small harbour formed by the before-mentioned island or peninsula. Commander Wilkes found that Hood's Canal did not terminate where Vancouver ended his survey, but ran for about 10 miles in a north and easterly direction, and approached within two and a half miles of Puget Sound, the land in the intermediate space being hilly and rough. Black Creek is a large inlet lying at the south extreme of Hood's Canal, which the Indians use in communicating with the Chickeeles and Columbia Rivers. Before reaching the southern end of the Canal, the rocky shore of the west side, near Mount Olympus, gradually slopes into low land, with a thickly-wooded and good soil. At the extreme end of the canal there is also a wide creek, which has an extensive mud-flat at its mouth. This is the case with all the rivers that empty into these waters.

In the small harbours in Hood's Canal there is plenty of water, and in some of the streams there is sufficient power to turn mills. Along the banks of the canal there is not a very great extent of country adapted for cultivation. The climate is very similar to that at Nisqually.

The shores in the southern part of the first reach of Hood's Canal exhibit by no means the same luxuriant appearance that prevails to the northward, being nearly destitute of open verdant spots, and alternately composed of sandy or rocky cliffs, falling abruptly into the sea, or terminating on a beach; whilst in some places the even land extends from the water side, and with little or no elevation. The low projecting points cause the coast to be somewhat indented with small bays, where, near the shore, are soundings of 5 to 12 fathoms. Vancouver observes that although the canal is only two miles wide, yet he could obtain no bottom

with a line 110 fathoms long. In Commander Wilkes's chart, the depth appears nowhere to exceed 62 fathoms, so that Vancouver's inability to reach the ground may perhaps be ascribed to the effects of a strong current.

In lat. 47° 41′ N. is Hazel Point, so named from the number of hazel-trees growing on it, which divides the canal into two branches, one taking a direction nearly true North, and the other running to the S.W. That running to the northward has an extent of about nine miles, and contains Dahap and Colseed Inlets; while the southern inlet is the main body of the canal. Just opposite Hazel Point is Hahamish Harbour, which is formed on the west side by Seabeck Island; and due North from Seabeck Island, on the west side of the canal, is Sylopish Rock, situated close to the shore.

Vancouver observes in sailing up Hood's Canal:—"To the westward and north-westward lay a range of snowy mountains, which gradually descended in a southern direction, whilst the summit of the eastern range now and then appearing seemed to give bounds to this low country on that side. Between the S.E. and S.W. a country of a very moderate height seemed to extend as far as the eye could reach; and, from its eminences and vallies, there was reason to believe that this inlet continued to meander a very considerable distance, which made me much regret that we were not provided for a longer excursion. Yet, having proceeded thus far, I resolved to continue our researches, though at the expense of a little hunger, until the inlet should either terminate, or so extensively open, as to render it expedient that the vessels should be brought up; which would be a very tedious and disagreeable operation, in consequence of the narrowness of the channel, and the great depth of the water. Soundings in some places only could be gained close to the shore; and in the middle no bottom had anywhere been found with 100 fathoms of line, although the shores were in general low, and not half a league asunder."

WHIDBEY ISLAND.—This is a long crooked shaped island, lying at the entrance of Admiralty Inlet, and forming for a considerable extent its eastern shore. It is about 33 miles long, and so irregular is its outline, that in some places it is not more than a mile broad. The soil of the island is represented to be good, and the timber to be excellent, and it is said that there are also several open plains ready for the plough. On the island there are many small villages, and the inhabitants, which are of the Sachet tribe, are more numerous than in other parts of Fuca Strait or Puget Sound.

The channel between Whidbey Island and the main is named Possession Sound. In it there are several places of excellent anchorage, of which the principal are Ports Gardner and Susan, and Penn Cove. The

water throughout is in general deep, although not so much so as Admiralty Inlet.

The western point of Whidbey Island, Partridge Point, is in lat. 48° 13′ N. and long. 122° 45′ W. It forms the eastern point of entrance to Admiralty Inlet, and is a high white sandy cliff, having a verdant lawn on either side of it. Vancouver says:—"When passing at the distance of about a mile from this point, we very suddenly came on a small space of 10 fathoms water, but immediately increased our depth to 20 and 30 fathoms. After advancing a few miles along the eastern shore of the gulf, we found no effect either from the ebb or flood tide, and the wind being light and variable from the northward, at three o'clock in the afternoon we were obliged to anchor in 20 fathoms water, sandy bottom."

On the west side of Whidbey Island, immediately opposite Port Townsend in Admiralty Inlet, is an open bay, named Admiralty Bay, in which are soundings of 20 to 8 fathoms. It is about two miles in extent, and will occasionally afford shelter from northerly winds.

Bonilla Island.—This is a small low sandy island, lying nearly seven miles to the north-westward of Partridge Point. At its western end is a low cliff, above which are some dwarf trees. Some rocks lie on its western side, at nearly three-quarters of a mile from the shore; and the eastern side of the island is formed by a very narrow low spit of land, nearly level with the water. From this island the remarkable high snow-capped mountains, Mount Baker and Mount Rainier bear, the former N. 63° E., and the latter S. 27° E. To the southward of these are visible two other very lofty round snowy mountains, lying apparently in the same north and south direction, or nearly so. They appear to be covered with perpetual snow as low down as can be seen, and seem as if they rose from an extensive plain of low country.

Fidalgo Island.—This is an island about six miles in extent, separated from the northern end of Whidbey Island by a narrow and dangerous passage, named Deception Passage. In nearly the centre of the island is a lofty hill, named Mount Erie; and on the western side of the island are two smaller islands and rocks, named Burrows and Allan Islands. Fidalgo Island is nearly connected to the main by low marshy land. Deception Passage communicates with Possession Sound, and is a narrow intricate channel, which, for a considerable distance, is not 40 yards in width, and abounds with rocks above and beneath the surface of the water. These impediments, in addition to the great rapidity and irregularity of the tide, render the passage navigable only for boats or vessels of very small burden.

The country about Fidalgo Island presents a very different aspect to that further southward. The shores are composed of steep rugged rocks,

whose surface varies considerably in respect to height, and exhibits little more than the barren rock, which in some places produces a little herbage of a dull colour, with a few dwarf trees.

POSSESSION SOUND.—This is the extensive sound between Whidbey Island and the main, and its principal and indeed only navigable entrance for ships is from Admiralty Inlet, between the south end of the island and the main shore, in lat 47° 54′ N. On the eastern shore, near the entrance, is the outlet of the Sinahormis River; off which is a small high island, lying in the middle of the sound, which has 12 to 20 fathoms close-to all round it. The shores of the sound are in general regular, and of but moderate elevation, and Vancouver observes:—"We found the shores of the inlet to be straight, compact, and about two miles apart. In several places we attempted to land near the upper end, but found ourselves as often repulsed by a flat sandy shoal, which extended directly across. The land there seemed of a swampy nature, was thinly wooded, and through it was the appearance of a shallow rivulet falling into the sea; farther back it was more elevated, and the surrounding country being covered with timber, made us conclude that it was fertile."

At about nine miles within the entrance of Possession Sound is Allan Point, the southern extremity of Camano Island. This island is nearly 14 miles long, and its upper part is joined to the shore by a tract of swampy land, through which a small stream flows; behind this the country is more elevated, and covered with timber. On the east side of Camano Island is Port Susan, which extends 11 miles to the north-westward, and has deep water soundings all over it, excepting at its head, where is the swampy land just noticed, which is fronted by a quantity of kelp.

On the eastern side of the entrance of this port is a small bay, into which flow two excellent streams, but so nearly on a level with the sea, that Vancouver could procure water only at low tide, or at some distance up the brook, which latter was easily effected, as the boats could go up as far as where the fresh water fell from the elevated land.

Port Gardner is on the west side of Camano Island, and is merely a reach of Possession Sound; in it there is deep water of 30 fathoms, and good shelter from all winds. In the western part of the port there is a deep bay, extending into Whidbey Island about five miles, the shores of which appear to be clean, excepting some rocks off the eastern shore, at the entrance. From Port Gardner the trend of the sound is towards the N.W., about eight miles, to Penn Cove.

Penn Cove is an inlet on the east side of Whidbey Island. It is a very excellent and commodious harbour, and has regular soundings of

10 to 20 fathoms, good holding-ground. The extent of the cove is about five miles, and when within there is shelter from all winds. The head of the cove is not more than a mile from Partridge Point, the western extremity of the island, so that the island is here nearly divided. On each point of the harbour Vancouver found, in 1792, a deserted village.

From Penn Cove, Possession Sound runs to the northward about eight miles, and has a very contracted channel, although deep enough for vessels. From the eastern shore an extensive flat runs out, nearly over to Whidbey Island, and narrows the channel to the width of about three-quarters of a mile; on this flat there are several islets and rocks. In the northern part of the Sound is the entrance to Deception Passage; and between Fidalgo Island and the main is a narrow tortuous channel over the marshes, leading into Bellingham Bay, which is fit only for boats.

Vancouver says of Penn Cove, in 1792:—"The surrounding country, for several miles, in most points of view, presented a delightful prospect, consisting chiefly of various meadows, elegantly adorned with clumps of trees; amongst which the oak bore a very considerable proportion, in size from four to six feet in circumference. In these beautiful pastures, bordering on an expansive sheet of water, the deer were seen playing about in great numbers. Nature had here provided the well-stocked park, and wanted only the assistance of art to constitute that assemblage of surface which is so much sought in other countries, and only to be acquired by an immoderate expense in manual labour. The soil principally consisted of a rich black vegetable mould, lying on a sandy or clayey substratum; the grass, of an excellent quality, grew to the height of three feet, and the ferns, which, in the sandy soils, occupied the clear spots, were nearly twice as high. The country in the vicinity of this branch of the sea is, according to Mr. Whidbey's representation, the finest we had yet met with, notwithstanding the very pleasing appearance of many others; its natural productions were luxuriant in the highest degree, and it was, by no means ill supplied with streams of fresh water. The number of its inhabitants he estimated at about six hundred, which I suppose would exceed the total of all the natives we had before seen; the other parts of the sound did not appear by any means so populous, as we had been visited by one small canoe only, in which were five of the natives, who civilly furnished us with some small fish. The character and appearance of their several tribes here seen did not seem to differ in any material respect from each other, or from those with which we had already met.

In a bay just to the westward of the north point of the entrance to Possession Sound, there is a *shoal* at a short distance from the shore.

It shows itself *above* water, and is easily discovered by the soundings gradually decreasing to 10, 7, and 5 fathoms, so that it cannot be considered as any material impediment to the navigation of the bay.

HARO AND ROSARIO STRAITS.—Between the east end of Vancouver's Island and the main, there is an extensive group of islands, the larger of which is named San Juan and Lopez Islands. They have not yet been closely examined, and we have but little information respecting them, but they are known to contain some well sheltered anchorages. The easternmost island, named Lopez Island, is nearly 20 miles in extent, and off its south-east point, which is low and rocky, is a dangerous sunken rock, visible only at low water; there is also a dangerous cluster of small rocks about two miles further to the northward, some of which are always above the water.

The strait separating Vancouver's Island from San Juan and Lopez Islands is named Haro Strait. It is about six miles wide, and has deep water in it. Near its northern extremity are a number of small islands. Rosario Strait is between Lopez Island and the shore; it has also deep water in it, and scattered over its surface are a number of islands. These straits form the communication between Fuca Strait and the Gulf of Georgia, which is an extensive sound separating Vancouver's Island from the main.

At about eight miles within the south entrance of Rosario Strait is Cypress Island, an island four miles in extent, so named by Vancouver on account of the number of cypress-trees growing on it. On the west side of the island is Strawberry Bay, a bay of small extent, and not very deep; but in which there is good anchorage on a sandy bottom. When at anchor in 16 fathoms, fine sand, the south point of the bay bears S. 40° E.; a small islet forming nearly the north point of the bay, and round which there is a good clear passage, West; and the bottom of the bay, East, distant three-quarters of a mile. This situation, though very commodious in respect to the shore, is greatly exposed to the wind and sea in a S.S.E. direction.

Strawberry Bay was so named by Mr. Broughton, from the quantity of strawberries growing there. The anchorage is good and secure, although somewhat exposed; yet, in fair weather, wood and water may easily be procured. Cypress Island is principally composed of high rocky mountains, and steep perpendicular cliffs, which, in the centre of Strawberry Bay, fall a little back, and the space between the foot of the mountains and the sea-side is occupied by low marshy land, through which are several small runs of most excellent water, that find their way into the bay by oozing through the beach. The rise and fall of the tide are inconsiderable, though the stream when Vancouver visited the bay was rapid,

the ebb coming from the eastward. It is high water at 2h. 37m. after the moon passes the meridian.

On the east side of Cypress Island are some islands, the principal of which are Sinclair and Guemes Islands; these face Bellingham and Padilla Bays on the main land.

BELLINGHAM and PADILLA BAYS.—These bays are situated within Cypress and Guemes Islands, and are separated from each other by a narrow straggling point, named William Point. There is a communication between Possession Sound and Padilla Bay, but it is too shallow and tortuous for anything but boats. Throughout Bellingham Bay there is good and secure anchorage, in a depth of eight to four fathoms. Opposite to its north point of entrance the shores are high and rocky, with some detached rocks lying off it; hereabout is a stream of excellent water. To the north and south of these high and rocky shores, the shores are less elevated, especially to the northward, where some verdant lawns are seen. The bay extends as far north as lat. 48° 40′, but the land behind it is inconvenient to communicate with, on account of an extensive flat which runs a considerable distance off, particularly in the southern part of the bay.

To the northward of Bellingham Bay is Gaston Bay, which extends as far north as 48° 47′ N., and is formed to the westward by a long straggling peninsula, named Point Francis. It is about five miles in extent, and joins Bellingham Bay. Of its capabilities and advantages we have no information.

BIRCH BAY.—At about 10 miles to the northward of Point Francis is a small bay, named, in consequence of the abundance of black birch found growing there, Birch Bay. The south-east part of this bay is formed by nearly perpendicular rocky cliffs, from whence the higher woodland country retires a considerable distance to the north-eastward, leaving an extensive space of low land between it and the sea, separated from the high ground by a rivulet of fresh water, which discharges itself at the bottom, or north extremity of the bay. On the low land very luxuriant grass is produced, with wild roses, gooseberries, and other bushes in abundance. Here Vancouver anchored in June 1792, and, by the mean result of eleven meridional altitudes of the sun, determined the latitude to be 48° 53¼′ N., and the variation of the compass, by nineteen sets of azimuths, to be 19° 30′ E. The tides were found to be very inconsiderable, but were not particularly noticed.

Vancouver remarks, when sailing to the northward from Strawberry Bay:—" We directed our course to the N.W., along what appeared to be a continuation of the continental shore, formed by low sandy cliffs, rising from a beach of sand and stones. The country, moderately elevated,

stretched a considerable distance from the N.W. round to the south-eastward, before it ascended to join the range of rugged snowy mountains. This connected barrier, from the base of Mount Baker, still continued very lofty, and appeared to extend in a direction leading to the westward of north. The soundings along the shore were regular, from 12 to 25 and 30 fathoms as we approached or increased our distance from the land, which seldom exceeded two miles: the opposite side of the gulf to the south-westward, composed of numerous islands, was at the distance of about two leagues. In the evening we steered for a bay that presented itself, where, about six o'clock, we anchored in six fathoms water, sandy bottom, at half a mile from the shore."

The coast to the northward of Birch Bay forms two open bays, of which the southernmost and smallest has two rocks, lying off its south point, and extends in a circular form to the eastward, with a shoal of sand projecting some distance from its shores; this bay affords good anchorage in from 7 to 10 fathoms water. The other bay is much larger, and extends to the northward. The shoals attached to the shores of each, and particularly to those of the latter bay, prevent a nearer access to their heads than four or five miles.

Point Roberts, the western extremity of the previously mentioned bays, is a low narrow peninsula, the highest part of which, to the south-eastward, is formed by high white sand-cliffs falling perpendicularly into the sea; from whence a shoal extends to the distance of half a mile round it, joining those of the larger bay. The south-west extremity of the peninsula, at not more than a mile in an east and west direction from the former extremity, is a low projecting sandy point, with 10 to 7 fathoms water within a few yards of it.

From Point Roberts the Gulf of Georgia runs to the north-westward, and separates Vancouver Island from the main land. It is but little visited, there being no trade or traffic to occasion vessels to frequent this part, consequently it is not necessary for us to enlarge upon it farther. Suffice it to say, that as you advance northward the shores rise to what may be considered elevated land, and that the forests are composed of a less variety of trees, and that their growth is less luxuriant. The trees most commonly seen are pines of different sorts, the arbor vitæ, the oriental arbutus, and, probably, some species of cypress. On the islands a few dwarf oaks are met with, and in the vicinity of Birch Bay, the Weymouth pine, Canadian elder, and black birch are plentiful.

VANCOUVER ISLAND.

VANCOUVER, named also Nootka or Quadra Island, is a large island close on the coast of North America, to the north of the Columbia River, and crossed by the 50° N. latitude. It is separated from the main land by Queen Charlotte's Sound, the Gulf of Georgia, and the Strait of Fuca. It is about 250 miles long, and 70 broad, at its widest part, and contains 30,000 square miles; is rocky and elevated, but no part of it attains to any great height.

The winter in Vancouver Island is generally very stormy, with heavy rain in the months of November and December, the south-east wind then prevailing. There is some frost and snow about the low land in the beginning of January, which is seldom of long duration, and never interrupts agricultural operations. Early in February, vegetation begins to advance, and about the commencement of March, everything assumes the beautiful hue of spring. April and May bring in alternate warm showers of rain and sunshine, and the heat becomes extremely oppressive in the months of June and July. In August and the beginning of September, vegetation dries up, from the drought of summer, and is then easily ignited, which is generally done by the natives when passing along the coast in their canoes. The weather being then very foggy, still, and close, the atmosphere becomes so much darkened by the fog and smoke combined, that the sun occasionally appears to us of a deep red colour, even at noonday. In the month of October the rainy season sets in; the soil being then moist, and the weather not very cold, the grass grows vigorously. The pasturage for the cattle is then better than during the two preceding months.

The fur-bearing animals generally hunted on the island are beaver, both black and grizzly, raccoon, minks, land-otter, &c., and the sea-otter is hunted about Nitinat and Scott's Islands. The elk and deer are said to be abundant in the interior of the island. The fish generally taken by the natives in the vicinity are as follows, viz.:—halibut, flounders, skate,

rock cod, sardine, salmon, trout, and several varieties of the herring species.

From the month of September to the month of April following is a very favourable time to obtain supplies of vegetables at this place and Nisqually. A ship of war of 500 men could always depend upon receiving supplies of flour, beef, and pork, at this place and Nisqually; and, during the time specified in the preceding remark, upon receiving supplies of potatoes and other vegetables.

Of the interior of Vancouver Island but little is known, no exploring party having as yet penetrated very far into the country. Along the shores there are many excellent harbours, particularly on the western coast, where the shore line is much indented. In the northern part of the island it is said that coal is very abundant, and also of good quality, so that it is probable that it may ultimately become of considerable importance. Along the northern shores salmon is represented to be very plentiful.

The principal settlements on Vancouver Island are Victoria Harbour in the south, and Beaver Harbour in the north part of the island; of these Victoria Harbour is the principal. They are both in the possession of the Hudson's Bay Company, whose charter for the colonisation of this part of the American continent bears date January 13th, 1849.

The following, from recent despatches from the island, will be interesting:—" The climate is found to be agreeable, and, even in the northern part, considerably milder than that of England. For settlers, the facilities, both as regards the raising of produce and the erection of works and dwellings, appear to be greater than had been anticipated. Game is everywhere abundant, and is calculated to prove an important item in economising domestic expenditure, while, in addition to wild fowl on the waters, there are many valuable fisheries, besides a great frequency of oyster-beds. Deer are often met, and there are also some black bears, which, however, are considered harmless. One of the most remarkable peculiarities of the island is the great number of inlets, or arms of the sea, which, being deep and narrow, and penetrating a considerable distance inland, furnish in many instances, from the great rush of water in and out, an important and permanent motive power. The natural features of the country are described as being very beautiful, owing to its lakes, hills, woodlands, and occasional patches of prairie. The oak is abundant, frequently growing in glades, with park-like regularity. There is also a cypress which grows to a large size, and is particularly valuable for building purposes. The pines are of three sorts, and are found 160 feet in height, and from 12 to 16 feet in circumference. One description is extremely plentiful, and possesses superior qualities for ship-building purposes. Varieties of maple and other trees are likewise common, and the valuable hemp known as the *urtica canabina* grows wild and luxuriantly in the woods. Artifi-

cial grasses, it is believed, might be cultivated with great advantage, and seeds of every description have been sent out. The soil generally is a dark vegetable mould, averaging 18 inches in depth, and unusually fertile. Contrary to what is seen in England, the best lands are mostly those where pine-trees grow. The flora of the island is much the same as that of Great Britain. With regard to its mineral resources, the principal rocks are stated to be all of an excellent kind for building materials, both as respects appearance and durability. It is also considered that the geological features of the districts thus far surveyed are all such as strongly to favour the anticipation that gold may be found throughout an extensive range. There is an abundance of feltspar and quartz, specimens of which have been transmitted to London for examination. Ironstone is likewise found in several places, but its value has not yet been determined. The quantity of iron is sufficient to affect the compass considerably, and captains of vessels who have visited the island are of opinion that this disturbance is unusually great along its shores. The native Indians behave well, and a small party of settlers penetrating into the interior with a canoe met a number of them, by whom they were warmly welcomed. They described a large lake which no white man had ever yet seen, but which the explorers now visited, and found to be about 20 or 30 miles in length, and from two to three miles in breadth."

The southern shore of Vancouver Island having been described in the account of Fuca Strait, it now only remains for us to add the little information we possess of the western shore.

NITINAT SOUND.—The entrance to this sound lies 10 miles to the N.W. of Bonilla Point, the northern point of Fuca Strait. It is an inlet of about 12 miles in extent, filled with islands, and supposed in many parts to contain good anchorage; but of its capabilities we have no information. The north-western point is named Terron Point, and its south-eastern, Carrasco Point; under the former is a channel, named on the charts Cayuela Entrance. This sound also bears the name of Berkeley Sound.

The land between Nitinat and Clayoquot Sounds, in the vicinity of the coast, may be considered as rather low, forming alternately rocky cliffs and sandy beaches, with many detached rocks lying at a little distance from the shore, which land, when viewed from a distance, bears the appearance of being well wooded. The surface of this low country is very uneven, and at a short distance from the sea meets a compact body of rugged dreary mountains, whose summits are covered with snow, which, says Vancover, extended on many, though not on all of them, a considerable way down, and impressed us with no great opinion of their fertility.

CLAYOQUOT SOUND.—This sound lies in lat. 49° 10′ N., and is very extensive. Over its surface are many large islands, particularly one named Flores, which is nearly 15 miles long; and in the eastern part of the

sound is an extensive arm of the sea running into the land in a northerly direction about 25 miles, which is named Brazo de Tofino. Of the advantages of this sound we have no information, but in its southern part, a little within the entrance, there is said to be a moderately good harbour, named Port Cox.

Cape Estevan, in lat. 49° 25′ N. is the southern point of entrance to Nootka Sound. Off it a great many sunken rocks extend some distance. In sailing to the southward from this, Vancouver had soundings of 90 and 40 fathoms at the distance of 8 to 10 miles from the land.

NOOTKA SOUND is an extensive inlet, formed, on the western side, by the large island of Nootka, which is 12 miles in extent, and separated from the shore by a narrow channel, named Tasis Canal. Through this canal it is probable that ships may pass, and so, leaving Nootka Sound, gain access to the ocean by Esperanza Inlet. This sound was formerly of considerable importance, but of late years has much declined.

The only account we have of Nootka Sound is that of Captain Cook, who visited it in 1778. "On my arrival in this inlet, I had honoured it with the name of King George's Sound; but I afterwards found that it is called Nootka by the natives. The entrance is situated in the east corner of Hope Bay, in the latitude of 49° 33′ N., and in the longitude of 126° 36′ E. The east coast of that bay, all the way from Breaker's Point to the entrance of the sound, is covered with a chain of sunken rocks, that seemed to extend some distance from the shore; and, near the sound are some islands and rocks above water.

We entered this sound between two rocky points that lie E.S.E. and W.N.W. from each other, distant between three and four miles. Within these points the sound widens considerably, and extends into the northward four leagues at least, exclusive of the several branches towards its bottom, the termination of which we had not an opportunity to ascertain. But, from the circumstance of finding that the water freshened when our boats crossed their entrance, it is probable that they had almost reached its utmost limits. And this probability is increased by the hills that bounded it towards the land being covered with thick snow, when those towards the sea, or where we lay, had not a speck remaining on them, though in general they were much higher. In the middle of the sound are a number of islands of various sizes. . . . . The depth of water in the middle of the sound, and even close home to some parts of the shore, is from 47 to 90 fathoms, and perhaps more. The harbours and anchoring-places within its circuit are numerous; but we had no time to survey them. The cove in which our ships lay is on the east side of the sound, and on the east side of the largest of the islands. It is covered from the sea, but has little else to recommend it, being exposed to the S.E. winds, which we

found to blow with great violence; and the devastation they make sometimes was apparent in many places.

The land bordering upon the sea-coast is of middling height and level, but within the sound, it rises almost everywhere into steep hills, which agree in their general formation, ending in round or blunted tops, with some sharp, though not very prominent ridges on their sides. Some of these hills may be reckoned high, while others of them are of very moderate height; but even the highest are entirely covered to their tops with the thick woods, as well as every flat part toward the sea. There are sometimes spots upon the sides of some of the hills which are bare; but they are few in comparison of the whole, though they sufficiently point out the general rocky disposition of the hills. Properly speaking, they have no soil upon them, except a kind of compost, produced from rotten mosses and trees, of the depth of two feet or more. Their formations are therefore to be considered as nothing more than stupendous rocks of a whitish or gray cast when they have been exposed to the weather; but, being broken, they appeared to be of a bluish-gray colour, like that universal sort which was found at Kerguelen's Land. The rocky shores are a continued mass of this; and the little coves in the sound have beaches composed of fragments of it, with a few other pebbles. All these coves are furnished with a great quantity of fallen wood lying on them, which is carried in by the tide, and with rills of fresh-water sufficient for the use of a ship, which seem to be supplied entirely from the rains and fogs that hover about the tops of the hills; for few springs can be expected in so rocky a country, and the fresh water found farther up the sound most probably arose from the melting of the snow, there being no reason to suspect that any large river falls into the sound, either from strangers coming down it, or from any other circumstance. The water of these rills is perfectly clear, and dissolves soap easily. The weather during our stay (March 29th to April 26th, 1778) corresponded pretty nearly with that which we had experienced off the coast. That is, when the wind was anywhere between North and West the weather was fine and clear; but, if to the southward of West, hazy with rain. The climate, as far as we had any experience of it, is infinitely milder than that on the east coast of America under the same parallel of latitude. The mercury in the thermometer never, even in the night, fell lower than 42°; and very often in the day it rose to 60°."

Friendly Cove.—This small cove lies on the north-western side of Nootka Sound, just within the entrance, and is situated at the southern extremity of Nootka Island. It is not more than three cables' length in extent, and the depth shoals gradually from six to two and a half fathoms. When inside, anchorage in six fathoms is afforded under shelter of the

islands on the south side of the bay, which protect the cove from all quarters but the east.

This place was visited in 1837 by Sir E. Belcher, who places the principal island at the entrance in lat. 49° 34′ 59″ N., and long. 126° 35′ W. He has observed :—" We anchored in Friendly Cove, Nootka Sound, the very interesting point of Cook and Vancouver's operations. At first I doubted my senses, that so small a space could have occupied so much type, and until I had examined it myself in my boat, did not think that it could afford shelter to two vessels. However, by placing one anchor outside, one well in, and the stream cable to the rocks, the *Sulphur* became well secure, with the *Starling* within us. The greatest distance between any two points does not exceed a quarter of a mile, and mostly rocky."

At about four or five miles to the northward of Friendly Cove is an anchoring place, named Mowenna or Marvinas Bay, which is in considerable repute. Although further from the sea than Friendly Cove, it yet possesses over it several advantages in point of security and accommodation. The land in its vicinity continues to be low to a greater distance than about Friendly Cove, and seems to be composed of less rocky materials. The extent of this harbour is but small, but being well protected against all winds, and its distance from the ocean preventing it being much affected by the swell, several vessels might ride here in perfect security; and as it has a fair navigable channel out of it in a southerly direction, vessels can sail from this harbour whenever the land wind prevails to push them clear of the sound, with infinitely more ease than from Friendly Cove; out of which they are first obliged to warp a considerable distance, and to anchor not only in an inconvenient depth of water, but on an uneven rocky bottom, in addition to which, in the event of the wind suddenly setting strongly in from the sea, their situation becomes by no means pleasant. The departure from Friendly Cove, although not difficult in the summer season, yet is said to be subject in winter to great inconvenience, and indeed danger, from the heavy sea that rolls in stormy weather into the sound, especially during the S.E. gales, against which, from its vicinity to the ocean, it is not sufficiently protected. As a military establishment, however, Friendly Cove is greatly to be preferred to Mowenna, as nothing can pass or repass into the sound unobserved from it.

At about four miles to the E.N.E of Friendly Cove is the entrance to an extensive inlet of Nootka Sound, named Zuciarte Arm, which is formed on the north side by a large island. Immediately within the entrance of this inlet, on the north side, is Resolution Cove, a small place in which Cook anchored in 1778, and refitted his vessel. Its advantages are unknown, but as he stayed here some time, it must have been found

a suitable place. The time of high water on the days of full and change is 12h. 20m., with a rise of tide of about 8ft. 9in. in the day time, and in the night time of two feet more.

Proceeding northwards from Nootka Sound, a shoal is marked on the charts as existing two and a half miles from the land, with Mocuina Point, the northern point of the sound, bearing East, distant nine miles. At 15 miles north-west of the entrance of the sound is Ferrer Cove; and beyond this about five miles is Esperanza Inlet, the inlet separating Nootka Island from the main, which has an island, named Catala, at its mouth, besides several rocks.

WOODY POINT.—From Esperanza Inlet the coast trends round to the north-westward to Woody Point, in lat. 50° 6′ N., and long. 127° 52′ W., and is but little known. Vancouver, when sailing down the coast from Woody Point to Nootka, intended examining it, but was prevented by adverse winds. It appeared from a distance of three or four miles to contain several openings, apparently coves or harbours. Innumerable rocky islets and rocks lined the shores, which, on advancing, became low, but the country behind rose into hills of considerable height, divided by many valleys; beyond these it rose to mountains so elevated that at that season of the year, August, 1792, many patches of snow were still undissolved.

Woody Point is an extensive projecting promontory, and of considerable height. About half a league westward of it is a small rocky islet, and another larger one lies N. 28° W., about a league from the north part of the point.

Immediately to the northward of Woody Point is an extensive inlet, named Port Brookes, in which are some islets and rocks. From hence to Cape Scott, the coast, when viewed from a distance of three or four leagues, appears to be much broken, and to form many inlets, coves, and harbours. Under Cape Scott is an extensive inlet, named Josef Bay, which probably affords good anchorage. It appears to consist properly of two bays, but has not yet undergone an examination. Off its north point of entrance are two small islets.

CAPE SCOTT, the north-west point of Vancouver Island, is in lat. 50° 47′ N., and long. 128° 27′ W. It is a low hummock, joined to the main land by a narrow isthmus, and off it about three and a half miles are some islands, the channel between being clear. There are also a few breakers at a small distance from the cape, in a direction of S. 27° E., about seven miles. In the vicinity of the cape the land is composed of hills of moderate height, although to the south-eastward it soon becomes very mountainous.

The islands off Cape Scott consist of a group of three small and almost barren islets, with many rocks and breakers about them. West

from the westernmost of them, a ledge of rocks extends about two miles, and south of it is another, about a league distant. The westernmost islands and rocks are named Scott's Islets, the middle, Lanz Islets, and the islet nearest Cape Scott, Cox Island. The outermost of the group, the Scott's Islets, are in lat. 50° 52′ N., and long. 129° 5′ W.

Vancouver says of the soundings in this part:—"We saw Scott's Islets bearing S. 22° E., about seven leagues distant. The wind during the day was light and variable, though attended with fair weather; in the evening it seemed fixed at S.S.W.; when, not being able to pass to windward of Scott's Islets, our course was directed to the north of them, towards Cape Scott, having soundings and a soft bottom at the depth of 80 and 90 fathoms, until about nine in the evening, when the water suddenly shoaled from 60 to 17 fathoms, and the bottom became rocky. On this we instantly stood back to the westward, lest we should approach some danger, but we did not perceive either breakers or shoals, although the night was still and clear. These soundings were from the westernmost of Scott's Islets, N. 18° E., about five leagues; from this circumstance, and from the distant rocks and shoals we saw extending from the shores of Calvert's Island, it is highly necessary that the space between Calvert's and Scott's Islands should be navigated with great caution."

In the northern part of Vancouver Island, within Queen Charlotte Sound, is Beaver Harbour, in the vicinity of which, coal of an excellent quality has recently been discovered. It is represented to afford moderately good anchorage, but further than this we have no information. Since the discovery of the coal, many ships have touched at it.

ISLANDS AND ROCKS

OFF THE COASTS OF

CENTRAL AMERICA AND CALIFORNIA.

COCOS ISLAND.—This is an island about four miles in extent, the northern part of which, Chatham Bay, lies in lat. 5° 32′ 57″ N., and long. 86″ 58′ 22″ W., according to the determination of Sir Edward Belcher in 1838. It is of considerable height, particularly the western part, and when viewed from a distance of six or seven leagues, on a bearing of N. 73° E. to N. 81° E., its south-west extremity appears to rise abruptly from the sea, in steep rugged cliffs, to a considerable height, and then in a more moderate ascent to its most elevated part, which is a hill of no great size, from whence it descends more uniformly to its northern extremity, which appears like a detached islet. When viewed from the northward, opposite the bays, the shores appear to be composed of broken, perpendicular, rocky precipices, beyond which the surface rises unevenly to the summit of the island, the whole covered with a thicket of small trees near the shore, but on the more elevated land in the interior, with large spreading trees. This island can be seen more than 20 leagues off; but of its interior little is known, except that it is rocky and mountainous, and probably contains a large lake or sheet of water, such having been seen by some of the party under Sir E. Belcher. Its shores have only partially been examined, and principally at the northern part of the island, where there are two bays containing moderately good anchorage. Off the coasts are several detached islets and rocks, which extend some distance, and particularly from the S.W. part of the island, where they run off fully two miles, and would be dangerous, if it were not that they are sufficiently high to be seen

and avoided. The lower parts of these detached islets consist of a belt of white barren rock to the water's edge, and their tops are generally covered with trees. The coasts of the island are generally steep perpendicular cliffs, against which the sea breaks with so much violence as to preclude an attempt to land in any part except in the bays on its northern side. In many parts of these cliffs are falls of excellent water, a supply of which, it is said, can easily be procured, as well as cocoanuts, and plenty of wood for fuel.*

Captain Colnett, who visited the island in 1793, says:—"The western side of the island is the highest, and presents itself in the form of a round hill. The eastern side appears to be much broken, the land sloping in most parts abruptly to the sea, but in others presenting bold and perpendicular cliffs. The island does not appear to possess a spot where trees can grow that is not covered with them, or some kind of bushy plant, which, when blended with the barrenness of intervening rocks, produces a picturesque effect; while the streams pouring down from their various fountains to the sea greatly heighten the beauty of the scene. It is Otaheite on a small scale, but without the advantage of its climate, or the hospitality of its inhabitants."

Vancouver appears not to have had so favourable an impression of the island, as Captain Colnett. "This island cannot be considered as having a pleasant appearance in any one point of view, for although its inland surface is much diversified by hills and valleys, yet the only low land of any extent that we were certain it possesses is in the bottoms of the two bays, each of which forms the extremity of one of these valleys, bounded by craggy precipices, from the foot of which extends a narrow strip of low flat land that terminates in a beach at the water side, resembling more the dreary prospect exhibited at the heads of the several branches of sea we had so recently explored on the coast of North West America, than anything else I could compare them to. Every other part of the shore seemed to be composed of steep, broken precipices of rock, of which substance the interior of the island was apparently composed, as the naked cliffs were frequently seen protruding their barren sides through the thicket, which otherwise covered the surface of the island. This thicket, so far as we were able to ascertain, was chiefly composed of a great variety of trees of a moderate size, with an impenetrable underwood of the vine or supplejack kind, which opposed any excursion into the country; some attempts were, I believe, made to penetrate there by the water course, but this, from rocky

* This is according to Vancouver; but recent visitors to the island have stated that all the trees have been cut down.

precipices and other obstructions, was found to be equally impracticable; our knowledge of its productions must consequently be confined to our observations on the small margin between the woods and the sea shore, the only part that was accessible to us."

The primary advantage of Cocos Island is the abundant supply of water which it affords. This abounds in every part, and is to be easily procured at the stations to which vessels can resort. From its purity and limpid appearance, and from its being destitute of any colour or unpleasant taste, either from dead leaves or other decayed matter, Vancouver was led to infer, although heavy rains had fallen during his stay in January, 1795, that the larger streams of water have a more remote and permanent source than accidental showers. The soil in the immediate vicinity of the streams falling into the bays is of a poor, loose, sandy nature; but at a little distance behind the beach, and in the fissures of the rocks, there is a rich black mould, apparently of great fertility, and this is probably the case in other parts of the island. All the vegetable productions of the island grow luxuriantly. On the rocky cliffs near the sea, where the uneven surface will permit anything to grow, there is a coarse kind of grass, which affords an excellent retreat for the sea-fowl, and also a particular kind of tree, something like the cloth plant of the South Sea Islands, but much larger. Some of these trees grow to the height of 30 feet, and have a brightish coloured bark, free from branches to the top, where the leaves fall over, giving the trees the appearance of umbrellas. Besides these trees there are others in the interior, occasionally of a considerable size.

CHATHAM BAY.—The north-easternmost anchorage of the island is named Chatham Bay, from the armed tender accompanying Vancouver. It is not very large, and off its east and west points are two islets, the western and larger named Nuez, and the eastern Conic Islet; these afford protection from the sea, especially the western islet. The width of the bay from point to point of the islets is about a mile, in a direction of S. 52° E., and N. 52° W.; and from this line of direction its extent to the bottom of the bay is also about a mile. The soundings are regular, of from 12 to 50 fathoms, and vessels may ride very snugly within less than half a mile of the beach, in about 20 fathoms water, but in a less depth the bottom does not appear to be so free from rocks. Here Vancouver anchored, in January, 1794, in 33 fathoms, on a sandy and gravelly bottom, apparently good holding-ground and free from rocks. The east point of the bay, which is a small conical islet lying close to the north-east extremity of the island, bore S. 51° E., half a mile; the west point of the bay S. 75° W.; a steep rocky islet lying off it, from S. 87° W. to N. 66° W.; and the watering place at the mouth of a very fine

stream, emptying itself over a sandy beach S. 13° W., about three-quarters of a mile. Within this the *Chatham* also anchored, in 26 fathoms, similar bottom.

Sir Edward Belcher says, that in Chatham Bay a vessel may anchor in six fathoms, within a quarter of a mile of the beach, but the best anchorage is in 12 fathoms. There a constant draught will be experienced between the openings of the islets, and a vessel can generally enjoy the refreshing sea-breezes, and fetch out at once, clear of the dangers, which are but few.

From the depth of 20 fathoms, the soundings outside of Chatham Bay soon deepen to 40 and 50 fathoms, the latter at only one and a quarter mile from the shore. Both this and Wafer Bay afford good protection from the winds prevailing during the early months of the year; and from the abundance of the vegetation growing close to high water mark, it would seem that neither of them are subject to violent storms, or heavy seas.

Wafer Bay,—At about a mile to the westward of Chatham Bay is Wafer Bay, which is more extensive and exposed than it, and its soundings are neither so regular, nor is the bottom so good. Into this bay a large stream of fresh water flows, and the sea breaks heavily. Captain Colnett appears to have preferred this bay to Chatham Bay; he says:—"It may be easily known by a small rugged barren rock, about the size of a large boat, bearing west of the body of the bay about five or six miles. It lies east and west, and its greatest depth is not two miles, nor is it one in breadth; but I would not venture into it in a vessel of more than 200 tons. Its anchorage is in from 7 to 50 fathoms, and is nearly sheltered from all winds. This bay is also preferable to that at the North point, because the shore of the first is steep; while that of the latter consists of a beautiful valley and sandy beach, where cocoa trees appear in greater numbers than I have seen in any other place. There is also a rivulet of water 18 or 20 feet in breadth, which is supplied from a basin one mile inland, in which our crew, to avoid the sharks, went and bathed. Although this bay is so small, it is very convenient, and as secure as the anchoring places generally are which are not entirely sheltered. Its principal inconvenience arises from the constant rains; as out of the four days we were beating off it, it rained during three of them, and sometimes with heavy storms of lightning and thunder. Those on shore experienced an equal amount of wet weather; and so thick was the rain, that, for eight hours together, we were not able to see twice the length of the ship; but this may not be the case at all seasons."

Of Wafer Bay it may be said that one of its principal inconveniences is the heavy rollers, particularly at low water, at which time the flat

extends out a considerable distance. It is also more subject to calms than Chatham Bay, and consequently not so easy of ingress and egress; and being exposed to westerly winds, watering at all times is difficult, and at low tide quite impracticable.

The climate was considered by Vancouver to be temperate and salubrious. The thermometer, in January, 1795, was usually between 78° and 80°, yet the heat was not so oppressive as was experienced further to the northward, and no inconvenience was experienced from the heavy rains.

The rise and fall of the tides by the shore are very considerable and regular, twice in the 24 hours, without any apparent stream, and are not influenced by the currents. The night tides appear to be the highest, and probably rise 10 feet perpendicularly; but at the time of the observations, the surf was too high to permit a very correct measurement. The time of high water is about 2h. 10m. after the moon passes the meridian.

Cocos Island appears to be well provided with sea-fowls; pigs, also, were left there by Captain Colnett, which appear to have increased and multiplied considerably. Fish are abundant, but difficult to catch; eels are large and numerous, as also are the turtles, but they appear shy of coming to the land. It is said that there are a large number of rats of the white and brown kinds on the island, also land crabs of a prodigious size, and that goats are in the interior, but keep to the heights.

MALPELO ISLAND.—The correct position of this island has not yet been ascertained, but lat. 4° N. and long. 81° 32′ W., will not be far from it. Captain Colnett places it in lat. 4° 20′ N., and long. 80° 45′ W. It is a high, barren, and perpendicular rock, visible about 20 leagues. A small quantity of green moss, and a few dwarf bushes grow in its cracks or gullies, and are the only signs of vegetation it possesses. It is surrounded with islets, and the whole may extend about 9 or 10 miles in a north and south direction. The centre of the island bears a resemblance from several points of view to the crown of a head; and its being barren accounts naturally enough for the name Malpelo, which the Spaniards have bestowed on it, and which signifies *bald head.*

In the vicinity of this island the currents are strong, and have much the appearance of breakers; the set appears probably to be to the N.E. by E., at the rate of two and a half miles an hour.

GALLEGO ISLAND, &c.—Between longitudes 104° and 106° W., and latitudes 2° and 6° N, there are said to be two islands, bearing the names of Gallego and Duncan, but their existence requires confirmation; as also does one named Passion Island, reported to be in lat. 16° 54′ N.,

and long. 109° W. A writer in the Nautical Magazine for 1848, states the correct position of the latter to be lat. 17° 11′ N., and long. 106° 21′ W., and that it appears from aloft to be high, and peaked in several places.

CLIPPERTON ROCK.—This rock is in lat. 10° 17′ N., and long. 109° 10′ W., and may be seen four or five leagues off. When seen from a distance of 10 or 12 miles, it is not unlike a sail, but as you approach it, it has more the appearance of an immense castle. The colour is very dark, in fact nearly black. This most dangerous rock and shoal is but little known, and thought by many not to exist, it becomes, therefore, the more important to avoid it, and give it as wide a berth as possible. Its vicinity is generally indicated by the presence of numerous sea-birds—the white gannet, wide awake, and booby, which are often found as much as 50 or 60 miles from the rock.

The above position of Clipperton Rock is from the determination of Sir Edward Belcher, but it has recently been stated that its more correct position is lat. 10° 13′ 24″ N., and long. 109° 7′ 30″ W. The *island* is between seven and eight miles long, and is almost an even height from one end to the other, being only six or eight feet above the sea-level. The *rock* in its highest point is about 150 or 170 feet; and the width of the island is about 1700 or 1800 yards. The island is composed of the whitest sand, and the only appearance of vegetation is one continous fine brown line, supposed to be of grass or rushes. The rock is conical, unequal, and jagged, and at the northern end has a circular hole right through, about 50 feet from the top. The sea breaks over the whole extent of the island to windward, and at the north-east and south-west ends, at different distances from the sand-bank. It has been observed that, "as the calms are sudden in these latitudes, and the winds variable (Clipperton being on the edge of the south-east trade-wind), if a ship is anxious to sight the rock, she should pass to the eastward of it, as the western side is evidently the windward side; if it becomes calm when they are in the neighbourhood, there is less danger when they are to leeward, the swell will throw them off.

Clipperton is the most naked, solitary danger that imagination can picture, situated as it is in the midst of the ocean, 600 miles from Acapulco, and 500 miles from Socorro and Gallego. The sand bank seems ill able to support the weight of the huge rock, and the rock itself appears to be sinking from its treacherous foundation. The sight of this tremendous and distressing danger, and the reflection it calls up of the awful calamities it has been the cause of, reminds one of the sublime truth of M. de Lamartine's remark, when he was surveying some of the ruins of the Hill of Baalbec, that 'Silence is the only language of man, when what he feels outstrips the ordinary measure of his impressions.'

There is an association with the ruins in the midst of a desert, and this solitary rock standing in the midst of the pathless ocean."

In May, 1839, Clipperton Rock was visited by Sir Edward Belcher, and after mentioning that from a distance of about 15 miles, it presented the appearance of a brig close hauled, owing to the sun's rays playing on its nearest face, he proceeds to say:—"The name, Clipperton Rock, certainly misled us, and had we made the point at night, with a fair wind, would, almost *inevitably*, have severely damaged or destroyed both vessels. I certainly should have steered to pass it to the northward; merely assuming it to be a solitary rock.

Nothing in this name would lead a seaman to imagine a high rock, placed on the southern edge of a coral lagoon island, three miles long north and south, by the same east and west.

Its description should stand thus:—A very dangerous low lagoon island, destitute of trees, with a high rock on its southern edge, which may be mistaken for a sail.

This rock can be seen 15 miles. In thick weather the low coral belt, which appears like sand, will not be distinguished until close to it. The breakers on the eastern side of it do not afford sufficient warning for a vessel to trim or change course. On the northern part of the belt, the land is a little raised, and appears to be clad with something like grass.

There are two entrances, which at high water may be safe; but at the moment we passed, the surf was too heavy, and the reflux showed the rocks bare. The dangers from the rock, northerly, extend two miles easterly, and the same north-westerly. On the beach several large trees were observed, and an object which was thought to be part of a vessel, near the western opening.

In the centre of the lagoon, as viewed from the mast-head, there is one large hole of blue water, and a second belt is connected with rock, attaching it to the eastern side of the island. This literally constitutes two islands, formed by its two openings; both are on the *weather* side of the island.

No living trees were seen, but the whole island was covered with gannett, boobies, frigate pelicans, and several kinds of tern, which had also been noticed in great numbers during the previous week, at least 500 miles to the eastward. From this, an easterly current may be inferred, as these birds generally keep in its stream or tail course.*

No bottom was obtained by the *Sulphur*, with 100 fathoms of line, but

* It does not therefore follow, as a matter of course, as noticed by some writers, that the appearance of birds denotes land to windward; they are more likely guided by tide.

the *Starling* had soundings with less than 100, on the northern side of the island.

Sharks, porpoises, and turtle were observed together. The former annoyed us much by biting at our patent logs, for which one was taken, and made an example of. They were very large, and literally swarmed. In all probability, they were attracted by a shoal of file (balistes) and other small fish which had been feeding off our copper since quitting the Island of Cocos."

REVILLAGIGEDO ISLANDS.—This is a group of islands in lat. 18° 43′ N., the largest of which, Socorro, is stated to be nearly 30 miles in extent. They are evidently of volcanic origin, and are said to supply neither wood nor water. The name Rivella Gigeda, or Revillagigedo as the islands are more generally called, was given by Colnett in 1793, in compliment to the Viceroy of Mexico, from whom he had received much kindness and civility.

SOCORRO.—This island is lofty, making in several peaks, the highest of which is probably 2000 feet above the sea level. Its northern and western shores have, as yet, only partially been examined, the principal anchoring-places being on the south-eastern coast, which is represented to have a dreary and forbidding aspect. The general direction of the island is W.N.W. and E.S.E., and its average breadth is about three leagues. It may be said to consist of one mountain, which can be seen at the distance of about 20 leagues in clear weather, falling in a gradual descent on the south side. It is in a great measure covered with brush-wood, intermixed with the low prickly pear-trees, and occasionally shaded with other trees of a larger growth. Some few patches of the soil are black and barren, as if fire had lately issued near it; and the top of the high land has the appearance, from a distance, of being an extinct volcano: the surface is of a whitish colour, like that of pumice-stone. Although Socorro has not recently given evidence of volcanic action, yet there is little doubt that the whole of this group of islets originated from that source.

Off the north and west coasts of Socorro there are some detached rocks; and some rocks extend also off the south shore, which is a high bold coast. On this side of the island are two bays, Cornwallis * and Braithwaite Bays, in which there is moderately good anchorage, under shelter of the land. Captain Colnett says:—"The seasons of the year being considered, I think the safest anchorage, from June to December, is between the south and south-west points, opposite to two white coral

* In this bay there are soundings of 30 to 20 fathoms, sandy bottom. Colnett anchored here in 1793, in 25 fathoms, at about two miles from the shore, with the extremes of the island bearing from W.N.W. to E.S.E.; and two small sandy beaches N. by E. to N.N.E.

beaches, which are the first two in succession from the south point of the island towards the west. It is the place where we first anchored, and remarkable from the pinnacle rocks which lay close off the west point of the bay. I prefer this place 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 end of December to the beginning of June, I prefer the south-east bay, being better anchorage and nearer to the cove, which was the only good landing-place we discovered, and is easily 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 extremely difficult, if not impossible, to land, except in very fine weather."

Braithwaite Bay is an open roadstead, exposed to the eastward and southward; in it the soundings are 17 to 10 fathoms, sand and coral. Its position is lat. 18° 43′ 14″ N. and long. 110° 54′ 15″ W., according to Sir Edward Belcher, who observes:—"The landing is rocky, with shores of lava *coulé*, and nothing like a beach. Neither wood nor water was visible, although from the constant clouds which hang over the high peaks, there must be a supply in some other point. Lieut. Wood was despatched to examine the westward bay for wood or water. His report (not having landed) was, 'that goats were observed, the bay spacious, but no indications of wood or water visible.' It is probable that the goats find water.

I found it difficult to penetrate into the interior of the island, even for a few hundred feet, owing to the prevalence of the *cactus opuntia;* all who attempted to do so suffered for their curiosity. One of my boat's crew made himself ill by eating a large bean which grew abundantly; but as I partook of them cooked without injury, I suspect him to have indulged too freely." Some of Captain Colnett's people also suffered severely from the same cause.

St. Benedicto Island.—This island is to the north-eastward of Socorro, in lat. 19° 20′ N. and long. 110° 45′ W., and when viewed from the southward, has a barren appearance, with little or no vegetation. It is about six miles long, in a N.E. and S.E. direction, and two or three in breadth, and has a few rocks, just above the water, off several parts of it. Its surface is uneven, and its aspect is described as romantic, it having the appearance of two distinct islets, when seen from a distance of nine or ten miles. On its western side is a small bay, which has not been examined.

Roca Partida.—This is a dangerous barren rock, 50 or 60 fathoms long, in a N.N.W. and S.S.E. direction, lying in lat. 19° 9′ N. and long. 112° 2′ W. Its breadth is only 25 or 30 fathoms, and both ends are 100 or 120 feet in height, the north-west end appearing forked, and the

south-east end like a ragged hay-cock. The two heights are separated by a ragged saddle, which rises 18 or 20 feet above the surface of the sea, and is nearly perpendicular. At a boat's length from the rock there are 35 fathoms; and at half a mile off, 50 fathoms; and afterwards no bottom with 100 fathoms of line. The rock appears from every direction like a sail under a jury-mast.

CLARION ISLAND.—To the westward of Revillagigedo Islands is Clarion Island, a small island of considerable height, and very similar in its natural features to Socorro Island. The hills are lofty, the highest peak being estimated to be 1500 feet high, and when bearing to the N.E. they make in three hummocks, which give the island, from a distance, the appearance of three distinct islets. It is probable that it contains but little fresh water, although there must be a great deal precipitated from the clouds, which almost constantly hang over the high land. Neither wood nor other necessaries can be obtained, still a vessel in great distress might have her wants to some extent relieved.

The island is about five and three-quarter miles long, and two miles broad, and has been but little examined, particularly the north shore. On its southern side is a small bay named Sulphur Bay, the east side of which is in lat. 18° 20′ 36″ N. and long. 114° 40′ 19″ W.; in this Sir Edward Belcher attempted to moor, but was prevented by the breaking of his anchor. The east end of the island appears to be steep and precipitous.

In the vicinity of Clarion, several islands have been reported, and Sir Edward Belcher sought for them for a considerable time, without success. It may therefore be concluded that as the position of the island was not till lately very accurately ascertained, it has been seen by various parties, and reported by each as a distinct discovery.

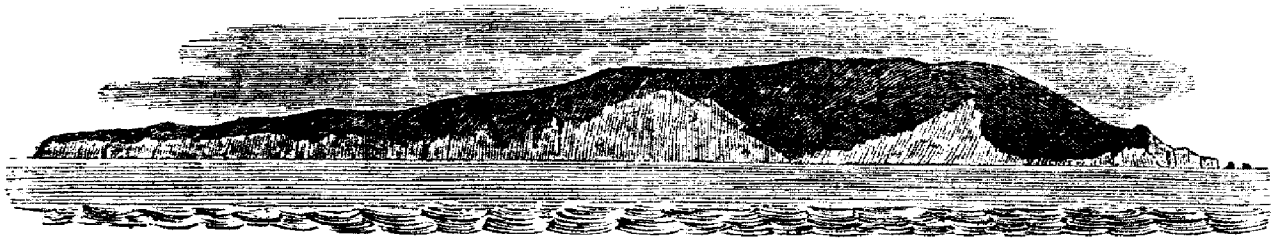
ALIJOS ROCKS.—This is a very dangerous group of rocks, lying off the coast of California, in lat. 24° 57′ 25″ N. and long. 115° 45′ 20″ W.

ALIJOS ROCKS, bearing about S. 14° E., distant two miles.

The southernmost and largest rock is about 110 feet high, and there are many above and under water close to it. See view of them in the chart of the coast of California, published by the proprietor of this work.

GUADALOUPE ISLAND.—This island is to the northward of the Alijos Rocks, and its north point is represented to be in lat. 29° 10′ 50″ N.,

and long. 118° 18′ 30″ W. It is about 15 miles long by five miles broad, and is very lofty in the interior, a chain of hills extending through the whole length of the island. The highest of these hills is over 2000 feet high, and one near the north point of the island is estimated to be even 3412 feet in elevation. The island can be seen a distance of about 60 miles, and will appear, when bearing either east or west, lower at its southern extremity than at its northern.



GUADALOUPE ISLAND, the North Point bearing S. 46° E., five and a half miles.

Off the south end of the island are two rocky islets at some distance from the shore, the outermost of which is 500 feet high. The shores are in general bold, but have not been closely examined; although it is said that a small cove exists on the south-east shore, which is formed by some rocky islets, and contains the only anchorage in the island, the riding being in seven fathoms, and the shelter from all winds except those between S.E. and E.N.E.

But few supplies of any description can be obtained here, the island being quite barren and rocky, and affording very little sustenance for any thing except goats. It is said that wood and water may be obtained from a cove on the north-east side of the island.

Vancouver says that the Spaniards were accustomed to make this island when bound to the southward from Monterey, or from their other northern settlements; in which route they passed to the westward, out of sight of the islands forming the canal of Sta. Barbara, for the advantage of continuing in the strength of the N.W. winds; and thus they reached this island, and afterwards steered a course for Cape San Lucas.

APPENDIX.

GULF OF TEHUANTEPEC.

DURING the period that this work has been going through the press, the elaborate report of the engineers engaged in the survey of the Isthmus of Tehuantepec, with a view to the construction of a railroad from the Gulf of Mexico to the shores of the Pacific, has appeared; which supplies some additional information to that by Captain Masters, contained in the body of the work, pp. 34—41.

LA VENTOSA.—The bay selected as the place of junction for the railroad with the Pacific is that of La Ventosa, situated in latitude 16° 11′ N. and longitude 95° 14′ W., according to the determination of the surveyors; which position is about 12 miles to the south-eastward of the Town of Tehuantepec. It is not very extensive, being only two or three miles across; but it presents some advantages which the other bays on this coast do not possess. Although open to the South and East, vessels may safely ride at anchor in it, as the holding-ground is excellent, and the depth of six and seven fathoms almost all over the bay, very convenient. The soundings are gradual from three fathoms at the distance of 100 yards from the beach, to seven and eight fathoms at the distance of 1000 yards; and the anchorage is on a muddy bottom extending E.N.E. from the Point of the Morro.

Mr. Temple says of La Ventosa:—"I am of opinion that La Ventosa is not only the best, but *the* point for a harbour on the Pacific coast of the Isthmus. It is a far better and safer port than either Valparaiso in Chili, or Monterey in California; ports in constant use the year throughout. I speak from personal observation, as well as from an examination of the several charts, and the similarity of outline has suggested the comparison; for, although the indentation of the coast is possibly a little deeper at each of these places than at La Ventosa, yet they are both open to the northward, and as the general trend of the coast is nearly north and south, the prevailing gales blow directly along shore nd into these harbours, creating a heavy swell, and often forcing vessels to slip and go to sea for safety: whereas, at La Ventosa the trend of the coast is east and west, so that the Northers blow directly off-shore, and create no swell

whatever. The danger being from the *sudden* strain brought upon a cable by the surging of a vessel in a sea-way, and not from the steady strain caused by the wind, it follows that northers may be disregarded in an estimate of the safety of this anchorage, as was satisfactorily shown in the case of the *Gold Hunter*. But Northers, although frequent during the winter, and seldom occurring at other seasons, are the only gales that blow in this region. The southerly winds, characteristic of the summer and autumn, are said to be nothing more than thunder squalls of short duration, and incapable of raising a sea. Even the fresh and steady sea-breezes that prevailed during the latter portion of our stay at La Ventosa were unaccompanied by any increase of swell."

The following is an extract from the Report on La Ventosa by the engineer, P. E. Trastour, Esq. :—

"The western extremity of the bay is formed by the Cerro Morro, an isolated rock of oblong shape, rounded at the summit, about 150 feet high and 2600 in circumference; and a little more to the south by a pointed rock, separated from the former by an interval filled in with sand, and forming an angular projection into the sea, known under the name of the Point of the Morro.

On the west, the Point of the Morro is contiguous, by its base, to an uninterrupted series of rocky hills, lining the beach and covering an extent of 6000 feet. They cut perpendicularly the flank and rear of an agglomeration of moderate heights, somewhat rugged and precipitous at their summits, and forming together a thick cluster of granitoidal structure, disposed in strata wherein feldspath and amphibole are predominant. It is the last link of that chain which, detaching itself at the north-west from the Cordillera of Oaxaca, descends by an irregular series of decreasing heights, passes to the north of Huamelula, turning it at the south-east, and terminates at the Pacific Ocean, where it separates the Bay of La Ventosa from the Bay of Salina Cruz.

The sandy strand of La Ventosa commences at the foot of the lateral portion of the Cerro Morro, facing the east, and describes from the south to the north-east an arc nearly two and a half miles in length; then takes an easterly and almost rectilinear direction, but drawing a little towards the south, extends on about six miles further, where it runs into the sea: after which it turns back again abruptly and inclines towards the north, though 'trending' all the while in an easterly direction.

From the summit of the Cerro Morro looking toward the east, the beach loses itself in a distant horizon, and unfolds to the eye a long belt of white sand from two to three hundred feet wide, terminating inland by a vast plain, scarcely broken upon by the isolated hillocks of Huazontlan. This plain, of a slightly undulating nature, is composed of sand, clay, and vegetable earth. It is covered with trees of middling size, which grow both

thinner and smaller, as one advances towards the east. But in the direction of the Cordillera which separates the Isthmus into two parts, north and south, this alluvial country is generally flat, presenting at rare intervals detached heights, easily avoided in the planning of a road of any character whatever, offering to the view fields of corn, indigo, sugar-cane, palm-trees, nopals, bananas, orange-trees, cocoanut-trees, and plants of which the vigour and variety bear witness to the great fertility of the soil.

The sandy beach of La Ventosa itself is cut by lagoons of little depth, having several outlets into the sea, and by the bed of the Tehuantepec River. At the time of the periodical overflow, this current flows over a low country before reaching the Pacific Ocean, in which it then empties itself, not only by its mouth, situated 16° 20′ 40″ N. latitude and 95° 15′ 25″ W. longitude, but also by means of those lagoons, its sole outlets during the dry season.

The volume of the water of the river is subject to very great variations in the course of the year. In the rainy season it reaches 12 feet depth, in years of an extraordinary character.

The rainy season usually commences in the month of June and finishes in the beginning of October. The Isthmus, in general, offers as many different climates as localities, differing from one another by their situation, the nature of their soil, the atmospheric phenomena, and the position of their mountains in respect to the cardinal points.

Advantages.—The immense basin of La Ventosa presents a safe and commodious barbour to vessels of all sizes. Closed at the west by the heights of the Morro, it is open at the south and east. This configuration of the bay allows vessels to have ingress and egress, irrespective of the quarter from which the wind blows. Throughout its great extent, and on entering it from the sea, no shoals are to be met with; everywhere a good anchorage is to be found. The bottom is of compact sand, and a great proportion of it is mixed with clay.

The depth is almost regularly graduated: it presents at from 350 to 8000 feet distance from the shore, a progressive running from 17 to 53 feet, and averaging, for the first thousand feet, two feet increase per hundred feet, and about six inches per hundred feet for the following thousand feet.

The greatest difference that has been observed in the level of the water was six and a half feet.

Winds.—Besides the variable winds, which are rather light, and the land and sea breezes of the morning and evening, two prevalent winds, the north-north-east and south-south-west winds, reign during a great portion of the year on the southern coast of the Isthmus. The first of these two atmospheric currents is not felt at 60 miles east of La Ventosa,

beyond the Barra de Tonala; nor at 62 miles west, beyond the mountain of Chahuhé, which bounds on the west the lagoon of Tengulunda.

The north-north-east wind usually begins to blow about the 15th of October and ceases in the fore part of April. In the month of November it blows without interruption, and at that time it reaches its maximum. Towards the middle of December it ceases during intervals of from 10 to 12 days, and then begins anew to blow one or two weeks. These alterations or interruptions and renewals are reproduced at short and unequal periods. But the length of the period of discontinuance goes on gradually increasing till the wind only blows one day, and finally ceases completely.

The Indians of Santa Maria del Mar are familiar with the indications announcing the coming of the north-north-east winds. In the evening at about sun-down, if the summits of the mountains of Guichicovi and San Miguel Chimalapa (seen from the coast) are concealed from the view by quantities of slate-coloured vapour, it is indicative that the northers will blow the day following, and will last as many days as the summits of those Cordilleras continue to be covered with similar clouds. Vapour of a corresponding hue, seen at the same hour, at the horizon of the Pacific Ocean, announces that the south-south-west wind will blow on the day following.

The south-south-west wind, which in winter succeeds the north wind, during one or two days at most, is the only general wind prevailing during the months of June, July, and August. After some gales of more or less intensity, which may be compared to the violence of the north wind, and not exceeding one and a half or two hours' duration, the southerly wind is definitely fixed. Towards evening its intensity decreases till the next morning, when the same phenomenon is renewed. Still, this wind is subject to more interruption than the north wind, and the intervals of repose last longer. The south-south-west wind, passing over the ocean, reaches the coast of the Isthmus laden with vapours, which at certain hours of the day resolve themselves into abundant showers.

In winter and in summer, during the prevalence of the southerly and northerly winds, the current of the sea is from east to west; its greatest velocity is about one and a half mile per hour. This continual movement in the waters of the Pacific is only discernible at a distance of about 6000 feet from the shores of La Ventosa.

The bay of La Ventosa is much safer than the harbour of Vera Cruz. Violent tempests frequently render the latter inaccessible during several days, and even when the north wind blows, the communication between the town and the vessels in the harbour is interrupted. During our

sojourn at the Isthmus of Tehuantepec, we have never had to record one tempest or hurricane on the Pacific Ocean.

In December, 1850, while we were at La Ventosa, the north-north-east wind blew (off shore) with extreme violence from the 7th to the 17th of that month, and we remarked, with surprise, that the sea was not agitated.

To enable you to appreciate the condition of the sea at La Ventosa, such as it actually is, it would perhaps be well here to mention that our soundings were effected by means of an open boat, five feet beam by 18 feet long, which we had brought from New Orleans, and which was conveyed across the Cordillera; with this boat we were able to sail out eight miles into the open sea."

BOCA BARRA.—At about 22 miles to the eastward of La Ventosa is the Boca Barra, the entrance to an extensive lagoon. The coast between is low and flat, and has soundings of five and a half to eight fathoms at one and a half to two miles from the shore. The lagoon runs into the land about 12 miles, and is altogether fully 30 miles in extent, but it is of little use to navigation, there being numerous shoals scattered over its surface, and the entrance being too shallow to admit vessels even of a moderate size. On the bar breakers constantly prevail, which add greatly to the difficulty experienced in running in.

The soundings immediately outside the entrance of the Boca Barra are two and a half to four fathoms, fine sand. On the 9th of November, 1850, at 11h. 45m. a current was found setting out of it at the rate of seven and a half miles an hour.

WINDS IN THE PACIFIC.

THE following remarks on the winds which prevail in some parts of the Pacific, and on the North-western Coast of America, are by Lieutenant James Wood, late commanding H. M. S. *Pandora* :—

"The prevailing winds of the Pacific, with the exception of those on the coasts of Chili and Peru, are little known. A few remarks, therefore, on those that obtain along the western coast of America, from the river Guayaquil to Vancouver Island, as well as on the more regular and extended aerial currents which traverse the vast expanse of the open ocean, condensed from observations and information collected during a four years' cruize over the greater part of it, may not be destitute of interest and utility, especially as the northern portion is but little known, and promises, ere long, to become the theatre of an important trade between the coasts of China and the new and rich countries which American enterprise and energy are now so rapidly peopling and raising from obscurity on the coast of California.

The whole of this extensive line may be divided into three portions or zones :—

First.—The intertropical, which is more or less affected by the fine and rainy seasons.

Secondly.—The dry and arid portion which extends from 23° to 32° north, where the winds blow with almost the regularity of a trade wind.

Thirdly.—The more variable northern coast, which is subject to greater vicissitudes of climate.

GUAYAQUIL RIVER TO GUASCAMA POINT.—The Intertropical.—Along the whole of the coast from the river Guayaquil, in lat. 3° S., to Guascama Point in 2° N., the wind is mostly from south to west all the year round ; the exceptions are few, and generally occur in the fine season. Both in beating up this coast to the southward, and in running down it, the former in the months of May and June, the latter in those of October, November, and January, we had the wind from S.S.E. to W. (by the south,) with a constant current to the north-eastward, the

only difference being that the winds were lighter, and the weather finer in May and June as we got to the southward; whilst the contrary took place in October and November; and in January the weather was generally fine, with moderate breezes.

CHOCO BAY.—After entering the Bay of Choco, of which Point Guascama forms the southern horn, the winds become more variable; but during the time we were in the bay (from the end of January to the middle of March) it never blew very fresh, though the weather was often unsettled and heavy rains frequent. The prevailing wind was from south-west, but north-westerly winds were not uncommon.

CHIRAMBIRA POINT TO THE GULF OF SAN MIGUEL.—When past Chirambira Point (the northern horn of Choco Bay) we had the wind more from the northward, and in the latter end of March had to beat up to Panama Bay against north-westerly and north-easterly breezes, blowing a fresh breeze at times, especially as we approached the bay.

In surveying this last-named part, in January, 1848, we found the winds more variable, heavy rains almost always accompanying a change to south-west, from which quarter we once or twice had a stiff breeze.

GULF OF SAN MIGUEL TO THE GULF OF DULCE, INCLUDING THE BAY OF PANAMA.—First, or Intertropical Winds.—Between the southern point of the Gulf of San Miguel and the Gulf of Dulce, including Panama Bay and the coast of Veragua, the winds are regulated by the seasons. Towards the end of December the northers begin to blow. These are fine, dry breezes which generally come on in the afternoon, and blow very fresh from N.N.E. to N.N.W. till near midnight, with a perfectly clear and cloudless sky, and the air so dry and rarified that objects on a level with the horizon are distorted and flattened, and the same effects are caused as are seen during an easterly breeze off our own coast. Though generally a double-reefed topsail breeze, they occasionally blow much harder, especially off the coast of Veragua, where, in the months of January and February, even a close-reefed topsail breeze is not uncommon. During even the strongest of these, a dead calm often prevails 10 or 15 miles off the land, the only evidence of the gale that is blowing within a few hundred yards of you being the agitation of the water, which is raised into short hollow waves, which break on board of and tumble you about awfully.

Towards the end of March up to the middle of April, the Northers begin to cease, and are succeeded by calms and light sea and land breezes, with occasional squalls from the south-westward. As April advances the squalls get stronger and more frequent, and by the early part of May the rainy season generally sets in, during the greater part of which south and south-westerly winds prevail: these are not very violent within the Bay of Panama; but from Punta Mala, westward, gales from the above

quarters are frequent, and sometimes severe, bringing a very heavy sea with them.

Gulf of Dulce to the Gulf of Fonseca.—From the Gulf of Dulce, proceeding westward along the shores of Costa Rica, Guatemala, and Mexico, we find the winds still follow the changes of the seasons, modified, however, by locality. For instance, whenever the northers prevail, we find them blowing off the shore at nearly right angles to the run of the coast; thus, as soon as the coast of Nicaragua is approached (which takes a more northerly direction than that before mentioned), we find, during the fine season, the northers exchanged for breezes called 'Papagayos.' These blow from N.N.E. to E.N.E. or E., and are accompanied by the same clear fine weather as the northers; the prevailing wind, however, during this season (from January to April) is from south-east to north-east. From May to November, which is the rainy season, the weather is mostly bad, gales from the west and south-west with thunder, lightning, &c., being frequent and at times violent.

Gulf of Fonseca to the Gulf of Tehuantepec.—After passing the Gulf of Fonseca, where the land again trends nearly due west, the northerly winds are lost, till on reaching the Gulf of Tehuantepec we meet them once more, but under a different name, and assuming a more violent character. Along this portion where the mountains approach, and even in some places form the coast line, the winds during the fine season are the usual tropical land and sea breezes; the former from N.W., the latter from S. to W.S.W. and W. The remaining months are marked by even worse weather from the same quarters as is found on the Nicaragua coast.

The Gulf of Tehuantepec to Tejupan Point.—First, or Inter-tropical Winds.—The heavy blasts which blow over the Isthmus of Tehuantepec, derive their source from the country they cross. They seem to be caused by the northers in the Gulf of Mexico, which here find a vent through the opening formed between the Mexican and Guatemalian mountains. They blow with great force from North to N.N.E., and raise a very high short sea; their force is felt several hundred miles off the coast. During the season when they prevail (December to April) every preparation should be made to meet and carry sail through them: if this can be done they are soon crossed, and 200 to 250 miles of westing (or easting) made; otherwise, if you are obliged to heave to, 36 to 118 hours of heavy weather may be expected, exposed all the while to a very high and short sea. In the rainy season these cease; but the weather here, as along the whole coast of Mexico, is then very bad, gales and strong breezes from S.E. to S.W. constantly occur, whilst squalls accompanied by thunder and lightning, with heavy, and almost inces-

sant rain, characterise the season throughout. These gales are at times very severe, rendering the navigation of such a coast very unpleasant, as, with one exception, there is scarcely any shelter from them to be found. During the fine season, however, nothing can be more regular or quiet than the weather on the Mexican coast; a regular sea breeze sets in about noon, beginning from S.S.W. to W.S.W., and getting more westerly as the sun goes down, decreasing with it, and gradually sinking into a calm as the night closes in. This is succeeded by the land wind off the shore, which is more irregular in its direction and force, but these winds, and the method of making a passage to the westward, along the coast, have been so well, and so truly described by Dampier and Basil Hall, that nothing remains but to add my testimony to the correctness of the accounts they give, as far as their phenomena fell under my own observation.

As soon as the coast begins to trend northerly again, which it does about Tejupan Point, we meet the northerly winds which blow down the Gulf of California, and which are found pretty steady during the fine season a few miles off the coast: by taking advantage of these, and the daily variations caused by the land and sea breezes, the passage is made from this point to San Blas and Mazatlan; but it is always a tedious beat, owing to a contrary current and frequent calms.

Cape St. Lucas to San Diego.—Second Portion or Division.—From Cape St. Lucas to San Diego, or from 23° to 32° N., the general direction of the wind is from west to north, but during the winter months, or from November to April, this coast is subject to violent gales from the S.E., which, as most of the bays and anchorages are open towards that quarter, are much dreaded. This is especially the case along the northern portion of this division, as towards Cape San Lucas they are less frequent; however, they always give ample warning of their approach. The only way, therefore, of making a passage up this coast, is by standing off upon the starboard tack; as you get out, the wind draws to the eastward, till either the variables are reached, or you can fetch your port on the other tack. In the summer season the only alteration is that the wind is more westerly in the mornings, and draws round with the sun as the day advances.

From San Diego to San Francisco.—Third Division.—From San Diego to San Francisco the wind prevails from the north-westward nearly all the year round. This coast is subject to the same south-easterly gales as the coast of Lower California, but they are more frequent here, and blow with greater force. All its bays and roadsteads are similarly exposed with the exception of the above named ports, which are perfectly secure and defended from all winds. During the winter, therefore, vessels always anchor in a convenient berth for slipping, with

springs and buoys on their cables, so that on the first appearance of heavy clouds approaching from the south-east, with a swell rolling up from the same quarter (the invariable signs of the coming gale), they may be able to slip and go to sea without loss of time. These gales last from 12 hours to two days, and are accompanied by heavy rain, which lasts till the wind changes, which it often does very suddenly, and blows as hard for a few hours from the north-west, when the clouds clear off and fine weather again succeeds. Off Conception Point gales and strong breezes are so frequent as to obtain for it the appellation of the Cape Horn of California. They are mostly from north to west, and frequently blow with great force, especially in the winter, when they sometimes last for three days together, without a cloud to be seen, till they begin to moderate. But here one of the most remarkable features of this coast first shows itself, viz., the frequent and dense fogs, which, during more than half the year, render the navigation from San Diego northward most unpleasant. In making the land, the only way to deal with them, is to feel your way into the coast with the lead during the day-time, as it frequently happens that a thick fog prevails at sea, while, at the same time, within a mile or two of the land, a beautiful clear bright sky, and open horizon are to be found: if disappointed in this, you have but to wear, haul off again, and heave to till the desired change does take place.

From San Francisco to Vancouver Island.—From San Francisco northward to Fuca Strait, the north-westerly are still the prevailing winds; in the months of June, September, and October, we found them almost constantly so: hard gales from all points of the compass, however, may be looked for here at all seasons, especially during the winter, and the equinoxial months. These begin generally from S.E. to S.W., bringing thick rainy weather with them. After blowing from these quarters for some hours, they fly round to the northward, (by the west,) with little if any warning, except the increased heaviness of the rain, and blow even harder than before. During the spring, easterly and north-westerly breezes are more prevalent than at other seasons. In the summer months, westerly winds and fine weather prevail, but from the end of July to the end of August the fogs are so frequent that many weeks will sometimes pass without a clear day.

From the Southward to Panama Bay.

Method of Making Passage within the 1st Division.—From what has been said respecting the winds which prevail within the first division, it will be seen that the passage from the southward to Panama Bay is easily made during the greater part of the year; but in the fine season, when

within the influence of the northers, the following plan should be adopted. Make short tacks in-shore, as there is generally a set to the northward found within a few miles of the land, and where that is interrupted, a regular tide is exchanged for a constant current farther off. Between Chirambira Point and Cape Corrientes the land is low and faced with shoals, caused by the mouths of the numerous rivers which have their outlets on this part of the coast, but after passing Cape Corrientes, it may be approached pretty closely, except off Francisco Solano Point, where some shoal rocky patches extend to seaward, as the coast is in general bold-to. Care, however, should be taken not to run into the calms caused by the high lands, as it is difficult to get off into the breeze again, and the swell sets in-shore where it frequently happens that no anchorage is to be found till close to the rocks.

In beating up the Bay of Panama, in the fine season, the eastern passage, or that between the Islas del Rey and the main is to be preferred, as, with one exception, it is free from dangers. The water is smooth, and a regular tide enables you to make more northing than it would be possible to do in nine cases out of ten, against the strong current and short high sea which at this season prevail in the centre or on the western side. During the rainy season a straight course up the bay is preferable to entangling yourself with the islands, the current generally following the direction of the wind.

From Panama Bay to the Southward.—But the great difficulty, at all times, consists in getting either to the southward or westward of Panama. The passage to the southward is made in two ways,—either by beating up the coast against a constantly foul wind and contrary current, or by standing off to sea till sufficient southing is made to allow you to fetch your port on the starboard tack. Both plans are very tedious, as it frequently takes twenty days to beat up to Guayaquil, whilst six or seven days are an average passage down.

From Panama Bay to the Westward.—If bound to the westward during the northers, a great deal of time may be saved by keeping close in-shore, and thus take advantage of them; they will carry you as far as the Gulf of Nicoya. When past the Morro Hermoso, 'Papagayos' may be looked for, and with them a course should be steered for the Gulf of Tehuantepec, when it will depend on the port you are bound to, whether, after crossing the gulf by the aid of one of its gales, you should keep in or off shore. If bound for Acapulco, keep in, and beat up; but if bound to the westward, you cannot do better than make a west course, as nearly all the winds will allow you: but as the in-shore winds are now under discussion, we will leave the consideration of the best means of reaching the trade-winds for a future occasion.

The passage to the westward of Panama, during the rainy season, is a

most tedious affair, calms, squalls, contrary winds, and currents, accompanied by a heavy swell, and extreme heat, as well as an atmosphere loaded with moisture and rain, are the daily accompaniments. It often occurs that 20 miles of westing are not made in a week, and it is only by the industrious use of every squall and slant of wind, that the passage can be made at all. Opinions are divided amongst the coasters as to the propriety of working to the southward and trying to get rid of the bad weather, or beating up within a moderate distance of the land. My experience would lead me to prefer the latter, as the strong winds and frequent squalls which so often occur near the land, sometimes allow a long leg to be made to the north-westward, while, farther off, this advantage is sacrificed for only a shade finer weather.

General Observations respecting the Off-shore Winds.—With respect to the winds which prevail in the open ocean, the same general rules obtain in the Pacific, as are recognised throughout the rest of the globe, *i. e.*, a north-eastern trade within the limits of the northern tropic, and a south-eastern within the southern; also as to the prevalence of westerly winds when either to the northward or southward of those boundaries. There are, however, exceptions to these rules. Within the tropics, wherever large groups of islands are found, the trades are subject to great variations both in direction and force. Also to the northward of the tropic of Cancer, when bound from the Sandwich Islands for the American coast, there are many instances, during the spring and summer, of 45° or even 50° of north latitude being reached, before a westerly wind could be obtained.

From the Galapagos Islands to Cape St. Lucas.—I have already alluded to the difficulty of getting to the westward from the Bay of Panama. The trade wind seems to possess no steady influence to the eastward of a line drawn from Cape St. Lucas, in 22° N., to the Galapagos Islands on the equator. Amongst these islands the south-eastern trade wind is steady during nine or ten months of the year, and it is only in January and February, and sometimes March, that they are interrupted by long calms, and occasional breezes north and north-west, but these are never of any strength. To the northward of them, the eastern limit of the trade seems to depend upon the time of the year. In the early part of April, I have found it between the parallels of 8° and 13° North, 900 to 1000 miles farther to the eastward than at the end of June; and in the intermediate months, either more or less to the eastward as it was earlier or later in the season, but in no case that I have met with has a steady or regular trade been experienced till the above line has been reached. It is this circumstance, and the prevalence in the intermediate space of westerly winds, calms, and contrary currents, that makes the passage from Panama to the westward, as far as this line, so tedious. I

have been 40 days beating from the entrance of the bay, in 80° W., to the eastern edge of the trade, in 111° W., a distance of less than 2000 miles, or, on an average, about 40 miles per day.

FROM THE MERIDIAN OF CAPE ST. LUCAS, WESTWARD. — When once within the influence of the trades, a passage is easily made either to the southward, westward, or northward; but it must be borne in mind that the eastern verge of this trade seems, in these parts, to be influenced by the seasons. Thus in June and July, I found it fresh from N.N.W., and even at times N.W., as far out as the meridian of 125° W., whereas in March and April it was light from N.N.E. to E. and E.S.E. from our first meeting it in 98° W. till passed the meridian of Cape St. Lucas in 110° W., where I picked up a good steady breeze from N.N.E.

As a general rule the wind is found to haul more to the eastward as you get farther off the land, and I did not find this rule affected by the latitude, as, although, as I have stated, the wind hangs to the northward, and even at times to the westward of north, near the eastern limit of the trade, from the tropic of Cancer to the variables near the equator, I found it about the meridian of the Sanwich Islands, as far to the eastward on and near the line as it was in 35° north, in which latitude the westerly winds are in general met with.

FROM THE SANDWICH ISLANDS TO THE NORTHWARD AND EASTWARD.—The passages, therefore, from the Sandwich Islands to any part of the north-west coast of America, are made by standing to the northward till the westerly winds are reached, when the run into the coast is easily made, taking care, however, if bound to a port to the southward of you, not to bear up till well in with the land, when, as I have said, north-westerly winds will be found to carry you down to the southward.

On this coast, as a general rule, the land should always be made to the northward of the port you are bound to, as in almost all cases the wind and current both prevail from the northward from Vancouver Island to Cape Corrientes of Mexico.

Though lying between the parallels of 19° and 23° north, the Sandwich Islands are often visited during the winter months with strong breezes and gales from south and south-west, but for the rest of the year the trade-wind blows pretty steadily. In making a passage from thence to the coast of Chili or Peru, the best way is to stand across the trade as near the wind as the top-mast-studding-sail will stand. This, as the direction of the wind is in general from E.N.E. to E., will enable you to make Tahiti, and pass the Society Islands by one of the clear channels to the westward of it. It is of little use trying to fetch to the eastward of these, as not only do you lose much time by hugging the wind too close, but also the strong current which sets to the westward, from 20 to 40 miles a day, is pretty sure to drift you that much to leeward; and even

were this not the case, so difficult, tedious, and dangerous is the navigation amongst the archipelago of low coral islands which lie to the eastward, that unless you can weather the Marquesas altogether, it is better even to bear up, than to entangle yourself in such a labyrinth. After passing the Society Islands, stand on to the southward, till in or about the 30th parallel the westerly winds will be found. These will carry you into the coast; care being taken, as on the northern coast, not to bear up when within the influence of the southerly winds, till near enough to the land to ensure keeping them down to your port.

Trade Winds affected by Groups of Islands.—I have before stated, when once within the influence of these island groups, the trade winds are found to be subject to great alterations and deflections, or lost altogether. This is especially the case during the time the sun is to the southward of the equator amongst those in the southern hemisphere. West and south-west, as well as north-west winds are then often experienced, and amongst the far western groups, heavy gales almost amounting to hurricanes are experienced, when from their latitude they should be in the very centre of the trade winds. As a proof of this deviation from the usual course of the trades when near large groups of islands, I may mention, that when making the passage from the Sandwich to the Society Islands, in June, 1849, I had the wind nearly east all the way to the parallel of the Marquesas (10° S.), when it came from the south-eastward; but I left Tahiti at the same month for Valparaiso with a north-westerly wind, though this island is situated in 17° South. This carried me 500 miles to the westward, nor did I again meet the trade, though the usual boundary (the parallel of 30° S.) was not passed till I had sailed with (for the most part) a fair wind, upwards of 2000 miles to the eastward.

From the time I left Pitcairn's Island (13th July) to within 100 miles of the American coast, a distance of more than 3000 miles, I experienced strong winds, and sometimes gales from south round by west to north-west, only one day's interval; this being, from all accounts, the general character of winds in these latitudes."—*Naut. Mag., Sept.* 1850.

WEST COAST OF MEXICO.

COMMANDER C. B. Hamilton gives the following remarks on the west Coast of Mexico:—

"This is considered highly dangerous in the bad season, viz. from June to 5th November, and all the vessels obliged to remain in the neighbourhood lie up, either in the secure harbour of Guaymas, or at Pichiligue, in the Bay of La Paz, both in the Gulf of California.

The hurricanes that occasionally visit this coast are so much dreaded, that in the months of July, August, September, and October, the ports are deserted, and trade ceases. I believe the *Frolic* is the first vessel of any nation, whether man-of-war or merchant-ship, that ever remained the whole bad season on the coast. And, that off the two most dangerous ports, viz. San Blas and Mazatlan. I shall therefore give all the information I can, relative to the bad season.

The hurricane so much dreaded on this coast is called the Cordonazo de San Francisco, a name given by the Spaniards on account of the hurricane prevailing about the time of San Francisco's day, the 4th of October, the word Cordonazo signifying a heavy lash with a rope or whip; but from my own experience, and all I can learn, these Cordonazos may be expected any time from the middle of June to the 5th of November; the worst ones that have been experienced of late years having occurred on the 1st of November, although the weather usually clears up about the 20th of October, and sometimes even sooner; and as soon as the weather does begin to clear up, a ship may, with common precautions, venture into the anchorages again, for this reason, as soon as the weather has cleared up, the change in the appearance of the sky and weather will give ample warning of a coming hurricane, whereas, in the previous four months before the weather has cleared up, the thing that adds to the danger of this coast is, that owing to the threatening appearance of the sky every evening, and the violent thunderstorms and squalls at night, accompanied by heavy rain and lightning, the wind veering about, you are first led to believe that the hurricane is coming every night, and latterly you see it is utterly hopeless to foresee the coming of it, as, every night, appearances were as bad as they could be;

the barometer here being of little or no use, and a tremendous sea occasionally setting in. Thus the remaining off this coast during the hurricane season will cause great anxiety.

The squalls and gales usually commence about S.E., and quickly fly round to the southward and S.W.: you have generally time to get to sea when it commences at S.E.; but, as I have before shown, you must go to sea every night, if you can, if you would be free from the danger of the Cordonazos coming on. But a tremendous swell frequently sets in whilst the weather is in this threatening state, and the wind still light, which makes it impossible to get out. Moreover, if our boats happened to be out and on shore when the swell came, it was impossible to hoist them in, and for this reason we have frequently been obliged to send our boats from the ship, with their crews, to be hauled up on shore, and remain there until the swell went down, that I might be ready to slip and go to sea.

It appears that the Cordonazos come on an average once in six or eight years, and we experienced none during our stay, although we had a gale on the night of the 21st of September. I was fortunately under weigh, and had plenty of room when it came on, having stood out to sea on the evening of the 19th, on account of the weather being bad, and fearing the full of the moon on the 20th.

It commenced about 9h. 30m. P.M., from S.E., flying round to S.W.; heavy rain, thunder, and lightning, with a very heavy sea, reducing us to close reefed main-topsail, and fore-staysail, washing away a boat, and obliging us to batten down. The squalls came on very suddenly, the prevailing winds being in the bad season from S.E. to S. and S.W., and the heavy swell usually before and after the full and change of the moon. The swell is such as is seen in the Bay of Biscay in a heavy gale, and unfortunately usually sets into the bays before the wind comes.

I therefore think that a ship caught at anchor off San Blas or Mazatlan by a Cordonazo, would have small chance of escape, especially off the former, as she would either go on shore or go down at her anchors; to slip and stand out the instant it commences from S.E. is her best course.

The range of the thermometer for June was 77° to 86°; July, 80° to 87°; August, 81° to 89°; September, 83° to 92°; October, 83° to 90°.

The barometer appeared to be of little service, usually remaining at 30 inches: seldom varying above a tenth, except during a heavy squall, when it rose considerably.

Our anchorage off San Blas during the bad season was usually in 12½ fathoms, soft mud,—Piedro de Mer, N. 58° W.; Piedro de Tierra just open to southward of bluff to the southward of San Blas River, N. 47° E.; Point off watering-place, N. 72° E.

Off Mazatlan, during the same season, in 23 fathoms, soft mud; centre of Creston Isle, N. 13° E.; north-west extreme of North Vienado Isle, N. 28° W.; southernmost rock on south side of Mazatlan, N. 30° E.; small black rock nearly covered, N. 28° E.

I should not recommend a ship to lay closer than this, which is the best berth to get out from, in case of bad weather.

Excellent biscuit can be procured at Guaymas, at a very moderate price; and a most superior spirit, not inferior to the best whiskey, called Tequella Mascal, can be procured in any quantity at San Blas, at a very reasonable price, by applying to the consul at Tepic.

After the 4th of November the coasting and other vessels again make their appearance on the west coast of Mexico. San Blas is very sickly during the bad season. Guaymas is healthy, although the thermometer stands there at the astonishing height of 106° in July, August, and September, and owing to the extreme dryness of the atmospere, ships receive much injury, by the wood opening. Furniture, apparently well seasoned, there cracks and falls in pieces.

On this coast there are some immense fish of the ray species. I caught one of them, and with difficulty hoisted one on board; it measured 19 feet in breadth across the back, the mouth was three feet five inches wide, and the flesh was three feet six inches deep in the centre. I had no means of ascertaining the weight, but found I could not lift it with the yard tackles and 60 men, it requiring 130 men, with the heaviest purchases in the ship, to hoist it in.

These fish are common on the west coast of Mexico and Gulf of California, where they are more dreaded by the pearl divers than sharks, or any other fish." *Naut. Mag.*, Sept., 1849.

To these remarks we will also add the following, by Captain Masters:—"On the whole coast of Mexico (on its Pacific side) from June to November, the weather is very tempestuous, with rain, thunder, and lightning, and in many parts of it this season is also very sickly. On the coast of Oaxaca, and in the Gulf of Tehuantepec, the rainy season generally commences about the end of April, or the beginning of May, from which time the roadsteads are very unsafe, until the bad weather breaks up, which is in December, and on the Sea of Guadalaxara and Sonora in November.

The dry season is generally fine, the sky generally clear, and the winds moderate, and rain falls very seldom. From our leaving Mazatlan, in January, to our sailing from the coast of Oaxaca, on the first of April, we had not even a sign of a shower.

A heavy fall of dew is almost a sure indication of a breeze from the northward. A few hours previous to its springing up, the air becomes sultry and parching, and continues so during the time the norther is

blowing. In the Gulf of Tehuantepec, particularly, the norther is very uncomfortable. A dismal haze hangs over the land, and the wind comes off in gusts as if it had passed over a furnace, veering from N.N.W. to N.N.E. On the western coast it is generally to the westward of North.

In the dry or summer season, a vessel bound to the northward of Cape Corrientes from Chili, or round Cape Horn, should cross the equator in long. 105° or between it and 110°, and proceed due north if possible. The wind in her progress to the northward will haul round from S.E. to E. and N.E., with a current setting in the same direction as the wind is blowing, or nearly so, and at times at the rate of one mile per hour. It is very probable that in standing with the starboard tack on board, that westing will also be made. If a ship be on the larboard tack, and the wind supposed to be N.N.E., she would make a very bad landfall, taking the current into consideration, even allowing her to be as far north as 15°, but by standing on as far as the latitude of Cape San Lucas, there is every chance, indeed almost a certainty, of having the wind from the north-west, and at the same time the whole range of coast under the lee. I stated this opinion to the captain of an American whaler who had been on the coast several times; he fully agreed with my observations, and said that the prevailing wind on the coast of California is north-west, and that the best way to make a short passage to the Gulf of California or Mazatlan would be to keep clear of the coast of Mexico, and stand well to the northward. In the winter, or rainy season, as the wind is often from the south and east, a direct course would be most advisable.

In my passage to Mazatlan we did not stand to the northward, as I afterwards found, far enough, although we did not tack to the eastward until we were in latitude 18¼°, the wind in general being N.E. As we got to the eastward the wind gradually hauled to the northward, when we made the coast of Mexico, about 40 miles to the south-east of Cape Corrientes, from which it took us three days to get to the southward of the Tres Marias. When in-shore, the wind, when it blew fresh, was from the N.W.; and when moderate, from N. to N.N.E. In the morning we had an irregular land-breeze, the current setting constantly to the S.E. From the Tres Marias we were two days getting to Mazatlan, with the wind as already stated.

It appears that in the Gulf of California, in the dry or summer season, the wind is mostly from the N.W., in strong breezes, with a short chop of a sea running. The coasting-vessels always keep the California shore aboard in beating up the gulf.

The port of Guaymas is said to be the best in the whole coast of Mexico. It is also more healthy than the southern part of the coast. Vessels

in the rainy season lay up here; it is the only place, with the exception of San Blas, that can be considered safe, on this part of the coast."

Lieutenant S. Osborn says :—

"A vessel anxious to keep on the coast of Mexico or its neighbourhood, during the bad season, cannot do better than run over to the Bay of La Paz, on the west shore of the Gulf of California, and but little to the north of Mazatlan. This spendid harbour is formed by the main land of South California on the starboard hand going in, and a long chain of islands with shallow passages between, on the port hand. The most eastern island is Espiritu Santo, the north end of which lies in lat. 24° 30′ N. and long. 110° 22′ W., and has a large rock due north of it, distant five miles.

In approaching this bay from Mazatlan, the Island of Cerelbo will be first made, high and mountainous, north end lat. 24° 23′ N., long. of south end 109° 45′ W.; from it Espiritu Santo will be seen, bearing about W. by N. The bay is at least 30 miles deep, and for the first 20 miles a deep bold shore on either hand, no bottom with 20 fathoms close to the islands. Large vessels anchor under the Island of San Juan de Neponnek; but small ones anchor within half a mile of the village of La Paz: fish, water, turtle, cheese, and fruits are to be obtained here; and cattle, also, in the wet season, when pasturage is to be found on the coast. Snakes are very numerous and venomous.

A knowledge of the tides and currents in the neighbourhood of this port would be very serviceable; it has been much frequented by the Americans during their operations against Mexico. A vessel bound to California could only have one object in making the Mexican coast, *en route*, namely, that of communicating with her owners, by overland despatch through Mexico, and as that is a possible occurrence, I will give the few following notes for general guidance.

A vessel making the passage northward from San Blas had better make an in-shore track, until she reaches the latitude of, or sights Cape Lucas, the southern promontory of South California, as she will there get the true wind, which blows almost without intermission along the line of coast from the northward. A west, or may be *south* of west course will only be first made good, but as an offing is obtained, the wind will be found to veer a little to the eastward. However, it will always be the object to make headway, and get out of the tropic without any reference to the longitude, as a strong north-west wind will soon in 25° or 28° N. run off the distance, provided you have sufficient northing.

The attempt to beat up in-shore amounts to perfect folly, if it does not deserve a worse name, a strong current accompanying the wind; and the latter must be taken into consideration, when running in for your port with westerly winds.

MONTEREY.—A vessel bound to Monterey ought to make the high

land of Santa Cruz on the northern extremity of the bay, and then shape a course for the anchorage. A man-of war, in 1846, was nearly cast away by standing for Cape Pinos, the southern extreme, and being set into the dangerous bay of San Carmel, in one of the thick and sudden fogs peculiar to this coast.

The anchorage of Monterey is in a small elbow formed on the northern side of Cape Pinos. With north-west winds, there is sufficient scope from the Santa Cruz shore for a considerable sea to get up; but, with good ground tackling a vessel need not hesitate to ride out any gale; the offset from the shore, which is steep-to, and the kelp, materially increasing her chances of safety. The shore should not be approached nearer than 10 fathoms, and the vessel moored open hawse to the north-west.

The bearings from our anchorage were as follow:—Point Santa Cruz, N. 45° W.; land of Cape Pinos, N. 62° W.; and the pier head, S. 22° W.

Watering at Monterey is attended with much trouble and inconvenience. The Americans promised to improve it by carrying water to some point near the landing-place, but the present gold mania has most likely destroyed their projects.

Supplies in the shape of beef and mutton are plentiful, good, and were cheap. The climate all the year round allows of the most successful salting. Vegetables grow in profusion at Carmelita; and potatoes, though small, are good: cheese is to be got in any quantity.

Wood for planks or spars is plentiful, though not of the first quality; but from the little port of Santa Cruz a superior quality of pine is obtainable, it growing to a very large size. Santa Cruz boasts of a ship-building establishment, and many of the schooners trading on the coast have been launched from the yard of an enterprising Frenchman residing there.

From the pine forest about Monterey we cut three top-gallant masts; the trees requiring little trimming, as the following dimensions will show:—diameter of tree at base three feet, whole height of tree 110 feet, height of first branches from the ground 70 feet. These top-gallant masts, when fidded, stood tolerably well, and were only set aside in consequence of getting very superior spars from Puget's Sound.

The sportsman will be repaid in the neighbourhood of the town, indeed the whole country is one great game preserve, from elk to quail. I had forgotten to mention that the American oak grows here in vast profusion, and affords excellent crooked timber for knees, &c., and is, moreover, first-rate fire-wood.

Should a vessel, however, be bound to California direct, I would cross the Equator in the Pacific Ocean in about 100° W. long. Cross the N.E. trade with a top-mast-studding-sail set, and thus pass into the limit of the westerly winds, about 300 miles to windward of the Sandwich Islands, and once in them take good care to keep to the northward of my port, for as

you approach the shore, the wind will draw round north, and the current to the southward increase.

Captain Beechey will be found an excellent guide as to the harbour of San Francisco, and has in no way exaggerated its capabilities. It has only two drawbacks, that of a narrow entrance in an unsheltered line of coast, where fogs are both sudden and dense, and the sudden manner in which the rollers set in on the bar at the mouth. A merchant-man, however, is not so likely to miss his port when its being correctly made depends principally on knowing his latitude."

FURTHER REMARKS. — The following extract from the remarks of H. M. S. *Spy*, Lieutenant-Commander S. O. Woolridge, as to Mazatlan and Moleje Bays, Gulf of California, may prove interesting, though there are in it many points stated, irrelevant to the present purpose:—

"Our passage from Callao to Mazatlan, of a few hours less than 26 days, is considered exceedingly good; indeed, one of the best ever made. As we drew in-shore, I found the current affected by the wind. With northerly winds, the current set to southward, and *vice versâ*. We remained at Mazatlan 10 days, during which time the weather was, upon the whole, fine. At night we had occasionally strong squalls, with rain.

July 17th, 1847, weighed for Guaymas. All the charts of the gulf are miserably incorrect, and not to be trusted; but, I see no difficulty in navigating it by the lead. The water appeared to shoal very gradually from 17 to 6 fathoms, when I always tacked. I used to stand into 10 fathoms at night, and six by day. As far as I can judge, Captain Hamilton's (*Frolic*) positions of the coast are very fairly correct; and there is no doubt we are indebted to him for a capital assistance in navigating the gulfs, in the absence of all Government charts. The shoal laid down in black in his chart, off Ignacio Point, I passed over; but, I placed the island further to the eastward (in lat. 25° 22′ N., long. 109° 18′ 36″ W.) than Captain Hamilton's red Ignacio Isle.

I arrived at Guaymas on the 21st, in four days from Mazatlan. During this passage, we experienced strong currents running to the N.W., from a mile to one and a half a mile an hour. They were much influenced by the wind, which, from the 19th to the 21st, was south-easterly and southerly. Current also runs with more force on the eastern shore, which side we kept.

Cape Haro can be easily distinguished by the Tetas, or Paps, which resemble the teats of a goat; they are to the northward. The Island of St. Pedro Melasco is just visible from the deck, to the N.W. The land on the Yagui shore is high and peaked; keeping this broad on your starboard bow, steer to the northward of a deep bay where the land breaks off, and you will soon perceive the Island of Pajaros, which is at the entrance, or facing Guaymas. The water is deep all along the Island of

Pajaros, that is to say four fathoms, so close as to throw a biscuit on shore.

A large ship will have to anchor soon after passing Pajaros; that is, abreast the Morro, in five fathoms. A small ship can anchor inside the Isles of Ardilla and Almagre, and in four and three and a half fathoms, just inside them; and in three fathoms, as far in as the point off the town. You may go close to either of the Isles Ardilla or Almagre, in three and three and a half fathoms.

Fresh beef and vegetables are to be obtained here, but the price depends greatly on the season of the year. In August, when the *Spy* was there, it was a bad time of the year, being the hottest season; the thermometer averaging 98° in the shade (Farht.), when the country is very dry, and there is no herbage for cattle, which makes it difficult to obtain, and higher in price. *Spy* paid eight dollars a quintal for it, and the same for vegetables; but in October I am told it is much lower. There is also very good flour to be obtained here, between July and March, that is, all the end and beginning of the year; and with little difficulty (chiefly depending on time) very good biscuit can be made. In August this article is also scarce, and dear in comparison, because the new batch of flour is just coming in, and the difficulty of transportation from the interior is very great, owing to no herbage for the mules. I contracted for 640 quintals of biscuit for H. M. ships *Constance* and *Spy*, at 10 dollars the quintal, to be delivered at the contractor's house, and bags found by purchaser. Flour at this time was sixteen dollars the carga, or 300 lbs. But I am told in September and October it will fall to nine dollars the carga, when biscuits will be proportionably cheaper. Water is very difficult to be got; it is to be obtained by sending about four miles for it, or it can be purchased; but owing to its having to be brought in on mules or in carts, the price is very high. I wanted 12 tons, which I found could not be obtained for less than 30 dollars, which would be nearly 10 shillings a ton; I therefore weighed, August 10th, and proceeded to Moleje Bay." Captain Hamilton speaks of this place, but gives no information for making it.

"Conception Point is difficult to make out, when you have about a dozen of the same kind within a few miles of each other. However, the best marks I can give are some table-land which is very remarkable, and is rather to the right of Moleje village. Keep this about two points on your starboard bow, and you may stand in, until you discover some sandy islets which are off a point called Punta Ynes. When you are east and west with them, you will be distant from them about three miles. After passing these islets, then steer S. and S.S.W., until you make out the Pyramid Rock, spoken of by Captain Hamilton. This rock is named Sombrerito, or Little Hat. I think it bad to call it Pyramid Rock, as there is a point

which, in standing in, may be easily mistaken for it, resembling also a pyramid; but the rock is a pyramid fixed on a round pedestal like a fort. Another good way of making out this place is, when the wind is fair, to keep Tortuga Island about 20 miles (?) distant, bearing about N.W., and steer in S.E., till you make out the sandy islets, and proceed as above. There is a passage between the islets and the main land for small vessels, but, though very inviting, should not be attempted. I tried it, but getting into two and a half fathoms, I put about as quick as possible. My anchorage marks in Moleje Bay were as follow, in five fathoms:—Point Conception, N. 84° E.; Tortuga Isle, N. 4° W.; Lobos Isle, N. 2° E.; Sombrerito, S. 67° W. (Pyramid Rock of Captain Hamilton); Equipalito, S. 22° W. (Rock on south side of entrance to the river); and Punta San Ynes, N. 10° W.

This is very close in, but I wished to facilitate the watering: about half a mile further to the northward, in eight fathoms, is a very good berth. In going into the bay after making out the Sombrerito, if you wish to go close in, take care not to bring the Sombrerito at all on your starboard bow; that is, do not open the mouth of the river, as, by sounding, I discovered a rock with only one fathom on it; it is on a sand-bank with three fathoms all round it, about three-quarters of a mile from the shore; but the rock itself has only one fathom. It lies with the entrance of the river open, directly between the Sombrerito and the Equipalito rocks, distant from half to one mile off shore. I am surprised Captain Hamilton has not mentioned it, for I must have gone very close to it, in rounding my vessel to. The report of the facility of watering is very delusive and uncertain.

In the first place I cannot think it possible to water out of the river, as it is salt for at least two or two and a half miles, and a great portion of the time, boats could not possibly get up so far. I was there, fortunately, when the moon was nearly full, and the water was only low between eleven at night and four in the morning, so that I was enabled to water about 18 hours out of 24, and though I had but one small boat (23-feet cutter), I managed to get 12 tons in two days. She had to go one and a half mile up the river, to the house of Joseph Padras, and the casks were rolled about 100 yards to a small stream in his garden; with a force pump it might be obtained without running the casks. The water is delicious to drink at the stream, but it is so very low, and our water, after being a day or two on board, became so black, and smelt so strong of decayed vegetable matter, that, though it improved by keeping, it served chiefly for cooking and washing.

In going up the river, in boats, keep close to the Sombrerito, and keep the starboard shore on board, till you are a mile or one and a quarter up the river, when you will encounter a sand-bank in the centre of the

river, and must keep over on the port shore to clear it. Abreast this sand-bank is the Rancho of Jose Padra. At the time I visited this place, in August, owing to the dryness of the season, and the want of fodder, there was no beef or vegetables to be procured. The bay is open to the north-east winds, and there is no shelter from the sea, which rolls in heavily; but with all other winds I think any man-of-war could get out, if she did not leave it too late, till the sea was too heavy, as there is plenty of room for beating.

The passage from Guaymas to Moleje Bay can be easily done in 20 hours. I left Moleje again on the 14th, and arrived at Guaymas on the 16th, being 36 hours. On the 26th of August I sailed from Guaymas for Mazatlan, where I arrived on the 3rd of September, in eight days. This, at this season of the year, is considered very fair, as south-easterly winds and calms prevail. I kept over, by advice, on the western shore, and passed inside of Catalon Island; but I think the more you can keep in mid-channel the better. We experienced little or no currents, but the wind was very light, and the weather fine all the way.

On the 30th and 31st of August we had an easterly current, about 14′ per diem. We anchored off Mazatlan, about 4′ off Creston, on the following bearings, 23 fathoms water:—Creston Island, N.N.E. ½ E.; Rock, N.E. ½ E.; Vienado, N.N.W.; and Town, N. by E. ½ E. This is a very good berth for a large ship like the *Constance*, but on the 8th I went about 1½′ further in, with the following bearings, in 22 fathoms water:—Creston, N.N.E. ½ E.; Town, N. by E. ½ E.; and Rock, N.E. ½ E. This is a very good berth for a small vessel, and quite far enough off for safety, and more convenient when you have occasionally to communicate with the shore, with only one boat fit for the purpose. Here I lay till the 23rd of September: during the whole time we experienced light winds, and generally fine weather. The nights were always and invariably attended with heavy thunder, and very vivid lightning, and generally heavy rain with an occasional squall.

On the morning of the 19th we experienced a very heavy squall, which lasted for about two or three hours, and the water regularly boiling, which, for the time, made me imagine that it was the commencement of a very heavy cordenazo; but in four hours it had passed off, and was quite fine. As far as I could judge, the weather was not worse than you would meet with anywhere at certain seasons, but the rolling your boats into the water every now and then is the natural consequence of being anchored three or four miles off the land, in the open sea where the current at times keeps the ship swung across the wind.

On the 23rd, the barometer being very low all day, the moon being near the full, and the sun near the Equinox, it was deemed advisable to

weigh, but we experienced nothing more than very terrific lightning and thunder, with heavy rain.

On the 26th, I weighed for Guaymas again. During this passage, of seven days, we had very light winds, and chiefly from the north-west.

On the 2nd October, we experienced a very heavy long rolling swell, from the south-east, which lasted two days. It was subsequently accounted for by being informed that on that day, at Mazatlan and San Blas, it blew a very heavy gale of wind; but in the gulf we had no wind but only the swell.

We arrived on the 4th of October, and sailed on the 6th for Mazatlan, where we arrived on the 13th, in seven days. During most of this passage, the winds were very light and variable, and I kept about the mid-channel. The last three days, though the wind was from south-east and south-west, the current ran to the southward, from half a mile an hour. I anchored outside Creston, about two miles at first, but requiring about 28 tons of water, and seeing two merchant-ships inside, I weighed on the 16th, and ran in also.

Anchorage marks:—Town, N. by W. ¾ W.; Creston, N.W. by W. ¼ W.; Outer Rock, S. ¼ E. At this season it is better not to anchor nearer Creston, in case of blowing you have room to drag."—*Nautical Magazine*, 1848.

PASSAGES TO AND FROM

VARIOUS PORTS IN THE PACIFIC.

THE following remarks on passages to and from various ports on the Coast of Western America, and in the Pacific, are by Captain Beechey, R.N.:—

"KOTZEBUE SOUND TO CALIFORNIA.—These passages were made from October 14th to 7th November, 1826, and October 6th to 29th, 1827, when north-westerly winds prevail, and consequently at a favourable time for getting to the southward. In both years they occupied exactly 23 days; and it is further remarkable, that in each, the Alentian Islands were passed on the ninth day after our departure. The route pursued by the *Blossom* was to the westward of King's Island, and between St. Lawrence Island and the mainland of America, and thence, within sight of St. Paul's and St. George's Islands, to the Strait of Oonemak.

To the eastward of King's Island the soundings are very irregular, varying from nine to six fathoms; and as at the season above mentioned the weather appears to be generally bad, it is advisable to go to the westward of the island, where the water is deep. Between St. Lawrence Island and the continent of America there is a bank with 11 fathoms water upon it. If, on approaching it in foggy weather, it be doubtful, from the shoaling of the water, whether it be not the island that is the occasion of the decrease of soundings, haul over to the American shore, and the water will deepen. To the southward of St. Lawrence it is necessary only to mention the islands of St. Paul and St. George, which apparently may be safely approached within four or five miles; but I could not get near them in either year to ascertain what dangers lie close off the shore.

I should recommend the passage being always made to the eastward of these islands, as between them and Oonemak there is a strong current from Bristol Bay, which in 1827 drifted the *Blossom* 35 miles to the S.W. in the course of the day. The Strait of Oonemak, lying between the

Islands of Oonemak and Coogalga, appears at present to be the safest opening to the Pacific from Kamschatka Sea. The Aleutian Islands in the autumn appear to be enveloped in fog about half-way down, and to have a region of mist lying to windward of the archipelago, which makes it necessary for a ship to be certain of her position, before she attempts any of the channels as she might be led down so close upon the land in the fog, that she would not have room to rectify a mistake, should she unhappily incur any, which is very likely to happen, from the irregularity and velocity of the currents about the islands. Under these circumstances I should recommend making the north-west end of Oonemak, and afterwards keeping along the coast of that island to the southward. As this island lies 40 miles to the northward of the other islands of the chain, Amnak excepted, which is three degrees to the westward, it cannot be mistaken, unless the reckoning of the ship is very incorrect indeed. And by so doing, in the event of not liking to attempt the passage, a vessel will still be far enough to windward, supposing the breeze to be from the northward, to weather the other islands of the chain; and if from the westward, she may reach into Bristol Bay.

We had no opportunity of seeing the summits of either Oonemak or Alaska, which, when clear, are good guides for the strait; but when the low land of the former can be seen, the south-west point of Oonemak may be known by a pointed rock situated near the base of a remarkable wedge-shaped cliff, conspicuous from the northward and north-westward. The narrowest part of the strait is between this rock and Coogalga Island, and the distance exactly nine and a half miles, in a S. 1° 30′ E. (true) direction. In a line between these, at the distance of four miles from the rock, there are soundings in 30 fathoms, and I understand that if necessary there is anchorage close under Oonemak.

Coogalga Island is about four miles in length, and may be known by a remarkable peak near its N.E. extremity, in lat. 54° 16′ 52″ N. and long. 164° 47′ 6″ W. The variation off it is 20° 50′ E.

From the Aleutian Islands to San Francisco we steered nearly a direct course, with winds generally from N.W. and W., and made Punta de los Reyes on the 3rd November. In this passage the currents were variable. From Beering's Strait to the Alentian Islands they prevailed to the westward, and near the islands ran strong, but afterwards they continued between S.E. and S.W. On our arrival off California, the whole amount, in 1826, was S. 89° W., sixty-four miles; and in 1827, S. 26° W., forty miles.

MONTEREY TO WOAHOO, SANDWICH ISLANDS.—This passage (January 5th to 25th, 1827,) was begun at a period when the north-west and westerly winds are proverbially prevalent upon the coast of New Albion, and extend a considerable distance to the westward.

We sailed from the Bay of Monterey on the 5th January, and im-

mediately took a northerly wind, which carried us into the trades; and we arrived off Mowee on the twentieth day. Our passage might have been considerably shorter, had we not taken a circuitous route in search of some islands reported to lie to the southward, and had sail been carried throughout the 24 hours, instead of hauling to the wind as soon as it was dusk, to maintain our position during the night, that nothing might be passed unseen within the limit of our horizon.

As we left the extra-tropical latitudes, the atmosphere gradually became more hazy and humid, the clouds increased, and in 18° N. we had some showers of rain. On the 18th, in lat. 16° 18′ N. and long. 136° W., we had a very strong trade at N.E., with squally weather, and a long cross sea from the westward, which was afterwards found to be the effect of a gale of wind in the parallel of 21° N.; but which did not reach us.

There was very little current in this passage; this little generally ran to the southward and westward, and averaged 3·6 miles a day. The barometer, though so far entered in the tropical latitudes, was perceptibly affected by the changes of weather, but maintained its horary oscillations.

On my arrival I found that from the 15th to the 21st there had been very strong gales from the westward at Woahoo, and from S.W. at Owyhee. This was, no doubt, the cause of the high cross sea we experienced from the 18th to the 23rd. I found also that the *Harbinger*, an American brig which quitted Monterey nine days after the *Blossom*, was obliged to lie-to for three days, from the 20th to 23rd January, in a strong gale from the S.W. She had steered a direct course from the Sandwich Islands, in which she experienced very variable winds, and, on the whole, had bad weather, and was only one day less performing the passage than ourselves: whence I think it fair to conclude that nothing is lost by running well into the trade. During the winter season, I should recommend ships gaining the 17th parallel before they shaped a direct course for the islands. This seems to me to be the best mode to ensure a good passage and fine weather.

SAN FRANCISCO TO SAN BLAS (MEXICO).—We found no difficulty (December 6th to 21st) in getting to the southward, the prevailing wind at this season being from the N.W. It is advisable, however, to stand about 40 or 50 leagues off the coast, to avoid interruptions from variable winds, which occur near the land. These winds are in general taken advantage of by vessels bound in the opposite direction to that of our present course.

The weather throughout this passage was remarkably fine. The wind was from W.N.W. to N.N.E., until we made Cape San Lucas, when it veered to E.N.E., and obliged us to pass between the Tres Marias Islands. This route occasioned the loss of a day, and I should advise any vessel making the passage to close the land to the northward of Cape San

Lucas, provided the wind were in the north-east quarter; as in addition to the inconvenience which a shift of wind to the E. would occasion, there is another arising from a strong current, which generally sets out of the Gulf of California. From the Cape steer for Isabella Island, and thence for Piedro de Mer.

Between 33° N. and Cape San Lucas we found a current to the westward, and from the Cape to the Tres Marias to the southward. The whole effect of current from San Francisco to these islands was S. 58° W., 80 miles.

SAN BLAS TO ACAPULCO AND VALPARAISO.—At this season (March 8th to May 1st, 1828) north-westerly winds prevail upon the coast between San Blas and Acapulco, inclining towards the land in the day, and to the sea in night. We passed four miles to westward of Corveteña (a small rock, situated N.W. by N., nineteen miles, from Cape Corrientes,) without having soundings in eighty fathoms. On the 10th were within sight of the volcano of Colima, 12,003 feet above the sea, and on the 13th anchored at Acapulco.

At San Blas we heard various opinions upon the best route from Acapulco to Valparaiso, some being in favour of a passage to the eastward of the Gallapagos, by keeping along the land, and carrying the N.W. wind, and others to the westward, by steering at once out to sea. We adopted the latter mode of proceeding; and after light and variable winds, principally from the eastward, crossed the equator in 99° 40′ W. on the eleventh day of our passage, about two degrees more to the westward than was intended.

After two days' unsettled weather and hard showers of rain we got the S.E. trade in 3° S. latitude. It was at first held to the southward, but, as we proceeded, veered gradually to the eastward, and obliged us to make a long sweep, in which we went as far to the westward as 108°, and having brought us into 23° S. and 106° W. it left us. We had afterwards variable winds and squally weather, and found some difficulty in approaching our destination. At this season very unsettled weather prevails on the coast of Chili, and storms and heavy rains from the northward are by no means unfrequent. It appears to me to be advisable at this period to steer direct for the port, if possible, and to disregard the chances of winds and of currents near the land. The currents in the first part of this passage run about seven miles a day to the eastward, but from 8° N. and 98° W. to 19° S. and 108° W. they flowed in a S. 88° W. direction, at the average rate of about 28 miles per day, and on our arrival at Valparaiso they had drifted the ship S. 87° W., 401 miles, or at the average rate of 11½ miles a day.

On account of these strong currents it is desirable to cross the equator well to the eastward, in about 96° or 97° W., and to pass the latitudes in which they prevail as quickly as possible, by keeping clean full."

MONTEREY TO THE COLUMBIA RIVER.

It has been mentioned in the course of the work, that the coasts of Oregon and California are being surveyed by order of the United States Government. The following sailing directions by Commander W. P. MacArthur, assistant in the survey, are the first results of that survey :—

"Previous to giving sailing directions for this part of our coast, I propose to notice the character of the winds, at different seasons, with their effect upon the sea and currents.

From March to October the prevailing wind along the coast, and for many miles to the westward, is fresh from the north-west, being freshest from 10h. A.M. to 2h. P.M., and not unfrequently falling light during the night. During this season of the year, the north-west wind blows with almost the regularity of a trade-wind. During the months of August and September, fogs prevail to a great extent, and impede and endanger navigation materially.

During the greater part of the year above-mentioned, there were no heavy gales of wind and little or no rain.

These winds cause a current of about half an knot per hour along the coast, setting to the southward.

From October to March the wind is variable, both with regard to velocity and duration. During this season heavy gales occur from the south-east, south, and south-west, generally accompanied by protracted rain, and causing a very heavy sea and swell along the coast.

The current during this season acts generally to the northward, varying in velocity with the strength of the wind.

These facts being known, it is now to be considered how directions should he given which would be most useful to navigation.

Sailing vessels bound to the northward from Monterey, or any more northern port during the summer season, should stand well off-shore, not too close hauled until about 200 miles from the land, when they will be beyond the influence of the southerly current, and in a situation to take advantage of a slant of wind, which frequently occurs from the W.N.W. They would do well not to approach the land, unless favoured by the

winds so as to enable them to lay their course, or nearly so, until up with the latitude of the destined port.

Steamers should follow the coast from point to point as nearly as possible, always keeping within 15 miles of the land. They will by this means shorten the distance, and frequently avoid the strong north-west wind, as they will often find it quite calm close in with the shore, when there is a wind to seaward.

Vessels bound to the northward in the winter season should keep as close along the land as practicable, and take every advantage of all southerly winds to make latitude. They should always endeavour to make the land at least 20 or 30 miles to the southward of the destined harbour.

If bound to the southward keep the coast in sight, and take advantage of either tack upon which the most latitude may be made, always making the land to the northward of the port in summer, and to the southward in the winter season.

Bound to *San Francisco* or *Monterey*, use every opportunity to observe for latitude and longitude, so as to know the vessel's position up to the latest moment, as fogs and haze, preventing observations prevail near the land. Allow generally for a southerly set of half a mile per hour, until within about 50 miles of land; after which, at times, it is not appreciable. With these precautions vessels may steer boldly on, shaping a course for the South Farallon, an islet about 250 feet high and a mile long, having 14 fathoms water, and good holding-ground on the S.E. side. This islet has been recommended as the site for the outer light of San Francisco.

On approaching soundings the water becomes of a pale green colour. Soundings may be had in 60 to 40 fathoms, soft ooze, if approaching Punta de los Reyes. Below 40 fathoms is near the land, and the surf should be heard, if haze prevents the land from being seen. If the soundings are 30 fathoms or under, and the sea smooth, anchor with a kedge until the land becomes visible, so as to take a compass bearing, as the position cannot otherwise be relied on.

If up with the South Farallon and night approaching, or there are appearances of fog, anchor at the Farallon and wait till daylight, when the morning breeze will carry the vessel to the bar, or pilot-ground; course N.E. ¼ E. (by compass), 27 miles.

Inside the Farallones the 'set' is generally towards the north shore, but it may be approached without risk, keeping outside of the kelp, which marks rocks under water.

Duxbury Reef is six miles, W. by N. ¼ N., from Boneta Point, projecting nearly two miles from the bluff; is well marked by the bluff, and the sea generally breaks on it.

To enter San Francisco without a pilot, bring Alcatraz Island in range with Port Point, and run on. This gives Point Boneta a good berth, and all dangers on the south shore are plain in sight.

If bound into Monterey, shape the course for Point Año Nuevo, in order to avoid Point Pinos. At Año Nuevo there is no danger clear of the shore line. When up with Cape Año Nuevo, the Point Pinos (the the only point where the pines reach the sea,) will be clearly seen, and as the beach rises to view the Town of Monterey also. Give the south shore a good berth, (most necessary near night, as it generally falls calm,) and stand on; anchor nearest to the western shore, a short distance from the wharf. The holding-ground is good, and with good tackle vessels can ride at anchor in safety at all seasons of the year.

Going out, make long stretches towards *Año Nuevo*, in order to avoid the 'set' and swell off Point Pinos.

The Bay of Carmel, south of Point Carmel, must be carefully avoided.

Punta de los Reyes is a high, bold, and very prominent head-land, visible in clear weather 50 miles.

Between May and October vessels may anchor in Sir Francis Drake's Bay, but it is not advisable, as a kedge is equally safe to preserve position outside in case of fog.

From Punta de los Reyes to Bodega the coast is variable in height, but clear of danger, and with a commanding breeze may be approached at pleasure. Should the wind fail when to the northward of Punta de los Reyes, drop the kedge on reaching 30 fathoms, as the swell will set the vessel gradually towards the beach.

Bodega Head is known from Punta de los Reyes by having a beacon on the sea bluff like a block-house, 25 feet square, and near it a staff, on which there is usually a flag.

Falling in with the land northward of Bodega, do not pass inside of fixed kelp, as it indicates foul ground.

From Bodega to Cape Mendocino the coast consists of high, bold cliffs, with but few indentations; the dangers are only at the shore line.

Near Cape Mendocino is Blunt's Reef (a small patch of rock under water), sea generally breaking upon it.

There is a clear channel, two and a half miles in width, between the reef and the Sugar Loaf Rock at the Cape.

There are no dangers from Cape Mendocino to Trinidad Head; the beach may be approached to within one mile, and the anchorage is good all along the shore in 13 fathoms.

Having passed to the westward of Cape Mendocino, Trinidad Head will be readily known by referring to the view. Trinidad Head is an open roadstead, only available from April to November. The southerly winds of winter render it an unsafe anchorage. To enter, pass between

the main round bluff, or headland, and the islet until the town is opened, when anchor in eight fathoms, good holding-ground. In April and October anchor well outside, to have room for getting under way if necessary. Do not pass inside the Turtles, as the ground is broken and the swell generally heavy.

Captain Ottinger, U. S. Revenue Service, reports three fathoms at low water on the bar of this harbour; no directions can be given until surveyed.

North of Trinidad Head do not approach the shore closely, unless the breeze is steady. The dangers are in plain sight. At night it generally falls calm, and if calm the swell will set the vessel too near the beach.

Klamath River has 15 feet on the bar at low water. It is not difficult of entrance with a good breeze, but very difficult to get out of, the current running so strong that sailing vessels must come out *stern foremost to be steered.* There is a staff on the south side of the river, on which a white flag, with black ball, is generally hoisted.

Port St. George is a safe anchorage in the summer at the point indicated by the anchor. The reef off Cape St. George consists of rocky islets. The in-shore channel is good and clear, and shown by the track of the schooner *Ewing*. From Pelican Bay, with a breeze, take this channel.

From Cape St. George to the Toutounis, or Rogue's River, there are no special dangers. In the summer, vessels may anchor anywhere along the coast, and there are landing-places south of all the rocky points. The Toutounis, or Rogue's River has but 10 feet on the bar, is rapid, and passes between high mountains.

Avoid the kelp, which indicates rocks under water, and do not approach the shore at night.

Ewing Harbour is a safe anchorage in summer. There is no surf in the landing cove.

From Cape St. George to Cape Orford, the coast is thickly inhabited by bands of wild Indians, and care is necessary not to be surprised by them.

There is a reef of rocky islets off Cape Orford.

From Cape Orford to Cape Arago there is no danger clear of the beach.

The Kowes River has not yet been examined. The anchorage to the northward of the bluff is good.

The Umpqua is accessible for steamers, and for small sailing vessels only, under very favourable circumstances.

When off Cape Arago, in clear weather, the high sand bluffs of the Umpqua are plainly seen.

The coast from the Umpqua River to the Columbia is generally

bordered by a sand beach, with white sand hills, and the interior is densely wooded with fir or pine. The cliffs, when they occur, are bold, but afford no shelter for anchoring. In the summer, a vessel may anchor in 20 fathoms off any of these beaches.

The Alseya, Yaquinna, and Killamook Rivers require further examination.

In proceeding to the northward in winter, make Killamook Head, and if the weather renders approach to the bar of the Columbia undesirable, keep to the southward of Cape Hancock, (Disappointment,) as the current is northerly in winter.

There are good pilots in attendance at the mouth of the Columbia, and the chart of the entrance and bar will give directions for approaching. The pilots are usually off the south channel, in a small schooner showing a fly at the main. If not seen, fire your guns.

Cape Hancock (Disappointment) has several trees trimmed up, showing a 'broom top,' and may be thus known from the cape to the northward of Shoalwater Bay.

To avoid mistaking Shoalwater Bay for the mouth of the Columbia (the soundings being similar), make *Killamook Head.* Never omit this in winter. There are no dangers off the beach northward of Killamook Head, and the soundings in approaching it are regular.

NOTE.—Notwithstanding the remarks as to the general fact of the winds prevailing in the N.W. and N.N.W. quarter during the summer, it is proper to state that, in the month of June, 1850, the winds to the northward of San Francisco were light from the southward and westward, with showers north of Mendocino for the whole month, and the coasters ran to the northward with all steering sails.

It is, however, yet to be demonstrated whether June is a regular period of southerly breezes.

BEARINGS AND DISTANCES, WITH THE VARIATION OF THE COMPASS, FROM SAN FRANCISCO TO MONTEREY, AND FROM SAN FRANCISCO TO THE COLUMBIA RIVER.

POINTS.	True Bearings.	Variation.	Distance in Nautical Miles.
FROM SAN FRANCISCO TO THE SOUTHWARD, AS FAR AS MONTEREY.			
Point Boneta to Point San Pedro	S. 3° E.	15° 30′ E.	16
Point San Pedro to Point Año Nuevo	S. 11 E.		22½
Año Nuevo to Santa Cruz	S. 42 E.		20
Santa Cruz to Monterey	S. 30 E.		22
FARALLONES DE LOS FRAYLES.			
S. Farallon to Point Boneta	N. 62 E.		28
S. Farallon to N.W. Farallon	N. 38 W.		9
S. Farallon to Point Reyes	N. 3 W.		25
N.W. Farallon to Point Reyes	N. 11 E.		17½
N.W. Farallon to Point Boneta	N. 80 E.		31
S. Farallon to Point Año Nuevo	S. 52 E.		39
FROM SAN FRANCISCO TO THE NORTHWARD.			
Point Boneta to Duxbury Reef	N. 62 W.		5½
Point Boneta to N.W. Farallon	S. 80 W.		31
Point Boneta to S. Farallon	S. 62 W.		28
Point Boneta to Point de los Reyes	N. 64 W.		30
Point Reyes to Point Fornales	N. 3 W.		13
Point Reyes to Bodega Head	N. 5 W.		17
Point Reyes to Port Ross.....	N. 17 W.		34
CAPE MENDOCINO TO THE NORTHWARD.			
Cape Mendocino to Blunt's Reef.....	N. 80 W.	16° 30′ E.	2½
Cape Mendocino to False Cape.....	N. 8 E.		4
False Mendocino to Eel River	N. 33 E.		16
False Mendocino to Humboldt Bar	N. 31 E.		23
False Mendocino to Trinidad Head	N. 20 E.		38
Humboldt Bar to Trinidad Head.....	N. 11 E.		16

POINTS.	True Bearings.	Variation.	Distance in Nautical Miles.
Redding's Rock to the Turtles	S. 11° E.	16° 30′ E.	13
Redding's Rock to the Klamath River ..	N. 45 E.		14
Redding's Rock to Port St. George.....	N. 20 E.		22
Port St. George to Klamath River	S. 16 E.	18° E.	10
Cape St. George to N.W. end of reef	N. 43 W.		6
Rogue's River Reef to Cape St. George Reef, S. W. extremity	S. 15 E.		38
Ewing Harbour to Rogue's River Reef, S.W. extremity	S. 16 W.		17½
Ewing Harbour to southern end of Orford Reef	N. 61 W.	19° E.	9
Cape Orford to southern extremity of Orford Reef	S. 37 W.		7½
Cape Orford to Coquille River.....	N. 18 E.		20
Coquille River to Cape Arago	N. 3 E.		14
Cape Arago to Kowes River	E. 5 N.	20° 40′ E.	5
Cape Arago to Umpqua River	N. 17 E.		18
Umpqua Head to Cape Perpetua.....	N. 14 E.		27
Cape Perpetua (S. end) to Alseya River ..	N. 9 E.		28
Alseya River to Cape Foulweather	N. 5 W.		6½
Foulweather to Yaquinna	N. 5 E.		21
Yaquinna to Cape Lookout	North.		17
Cape Lookout to False Killamook	N. 5° W.		25
False Killamook to Killamook.....	North.		7½
Killamook Head to S. bar of Columbia ..	N. 3° W.		17
Killamook Head to Cape Hancock (Disappointment)	N. 3 W.		21½

FINIS.

P. P. THOMS, PRINTER, 12, WARWICK SQUARE, LONDON.